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3.3.1: Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

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Front pages of papers Published 3.3.1.1

Purakala
Vol 31 Issue 2, 2022
ISSN: 0971-2143
UGC CARE APPROVED JOURNAL

Received: 10th April 2022 *Revised: 28th April 2022* *Accepted: 25th May 2022*

A STUDY ON MARITAL DISHARMONY AND ESTRANGEMENT IN ANITA DESAI'S FEMALE CHARACTERS

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Abstract

Human beings are social creatures. Relationships among people are necessary for human socialization. Individuals' lives are rapidly changing as a result of globalization, and they are being pushed to various poles of the ecosystem, resulting in less rapport. In the existing world, only a small percentage of people have seen an improvement in their quality of life by means of relationships and prosperity. As a result, all interactions and relationships are converted into commercials. It has produced a culture in which morality and human values are discarded in the name of prosperity, which has led to alienation. This paper aims to draw attention to marital disharmony and alienation in the female characters of Anita Desai. It can be revealed that the study reveals that Desai has clearly characterized the root causes of modern women. It also addresses the psychological issues that Indian women face, particularly after marriage.

Keywords: Alienation, Martial, Disharmony, Women, Estrangement

Introduction

Alienation is the separation from natural attachments and emotions, which makes people less productive. The contemporary writers across the globe consistently observe it. Although it does not belong to any single school, it is possibly the most notable theme of the all times. According to Erich Froromin *The Sane Society* (1955), he reveals:

By alienation is meant a mode of experience in which the person experiences himself as an alien. He has become, one might say, estranged from himself. He does not experience himself as the center of his world, as the creator of his own acts... The alienated person is out of touch with himself as he is out of touch with any other person. He, like the others, is experienced as things are experienced; with the senses and with common sense, but at the same time, without being related to oneself and the world outside productivity. (120)

In India, women occupy the throne of "Mother and Goddess," which is greatly respected by all. She never stops bringing joy and happiness to a family. Her contented expression and wide smile serve as representations of satisfaction and mutual relationship in family. However,men frequently misinterpret women,where she needs a space inside her. When women need a special attention, men do not get there and solace her. Therefore, there is sorrow, and depression in women's

GUSTAD'S SPIRITUAL JOURNEY IN ROHINTON MISTRY'S- *SUCH A LONG JOURNEY*

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Abstract

The novel *Such a Long Journey* revolves around a Parsi middle class family.The protagonist of the novel is Gustad Noble. He is a middle-aged Parsi man of modest dreams and aspirations longing for a prestigious life. The novel captures the socio-political cultural turmoil of the sixties and early seventies. Infact, historical incidence provides an effective backdrop for the novel during the period of emergency. The novel throws light on the problems of corruption,issues and concerns of the Parsi community and its effect on the common man.This is addressed through the narration and experience of Gustad Noble. Through the character Mistry has highlighted the true facts that occurred in the 1970s associated with society and politics during the time of the State of Emergency declared by Mrs.Indira Gandhi. The paper attempts to study the struggle and painful journey of Gustad Noble for his family and friends. Milan Kundera suggests, " The struggle of man against power is the struggle of memory against forgetting."(qtd. In Rushdie 14)

Keywords: Identity, Parsi community, society.

Rohinton Mistry's first novel '*Such a Long Journey*' published in 1991. The novel has won Governors Generals Award, short listed for the booker prize. It is set in Bombay now Mumbai against the backdrop of the Indo-Pakistan war of 1971 and the emergence of Bangladesh as a separate independent nation. It narrates the painful journey of Gustad Noble which gives a message that man must carry on whatever may come on his way. Anjana Desai say-

"The journey is the journey of a nation, of a city, of an ethnic minority and of an individual man of his community and the question it raises is the same one that baffles Eliot's Magi: was it for a birth or a death that they travelled."(quoted in Bharucha 134)

The novel *Such a Long Journey* depicts the life style of Parsis living in Khodadad Building, the microcosm of the Parsis in India. Blackout paper has covered their windows since the war with China years before. Mistry explores various issues of political-historical events, corruption, violence ethno-religious minority, the wars between India and Pakistan and India and China and its effects on the common man. The novel is similar to Boman Desai's *The Memory of Elephant*, which deals with the relationship of Parsis with the British during the colonial period. Thus, one can see religion as an important marker of identity. The title of the novel has been taken from the poem "*The journey of the Magi*", by T.s.Eliot

"A cold coming we had of it
Just the worst time of the year
For a journey and such a long journey." (SLJ Preface)

The novel is symbolic. Like the three wise men in T.S.Eliot's poem, the novel represents the long journey of Gustad Noble from despair to hope. Amrit Singh says "*Such a long journey* is the story of Gustad Noble, the little man who holds on to his dignity, strength and humanity in a sweltering tide of disappointment, confusion, betrayal and corruption".(p.214)

Gustad Noble is the protagonist of the novel. He is a strong follower of Zoroastrianism. He belongs to the Parsi community. He is a God-fearing man who is aware of his own situation.Moreover, he carries the glorious past of the Parsi community.

ISSN: 0974-8946
Vol. 47, तृततया अंक, No.01: 2022

DISSECTION OF EMERGENCY IN ROHINTON MISTRY'S A FINE BALANCE

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Abstract: Rohinton Mistry, an award winning novelist is one of the most important contemporary writers of postcolonial literature. He belongs to Parsi Zoroastrian culture and ethos. His powerful narratives are engrossed through the lens of diaspora and minority hegemonic discourse. The past memories keep on pondering in the mind of diasporic writers. He has given a distinctive voice redolent of Parsi culture, their customs, struggles, their dilemmas etc. He is observed with the colonial and post colonial experiences in India. He also portrays the memories of his birth place Bombay and his own Parsi religious community. In this paper an attempt has been made to delineate the dissection of Emergency in the novel- *A Fine Balance*. While analysing, the issues like State of Emergency, predicament of marginalised communities have been examined closely. A clear vision is set that corruption makes the society hollow from inside.
Key words: Parsi community, Identity, marginalisation, society, state of emergency, corruption

A Fine Balance is a 1995 novel by a diasporic writer Rohinton Mistry. He occupies a significant position among the writers of Indian Diaspora. Nilufer E.Bharucha traces the Indian diaspora which she says had begun "in the nineteenth century with the first group of indentured labourers who were being transported in Mauritius in the 1830 and is now over a hundred and seventy years old" (21)

Rohinton Mistry's novel is rooted in the streets of his birth place Bombay. In an interview he says "I grew up in Bombay. Now I'm here. I'm a writer. I am determined to write good literature. That is my primary concern. But to write well, I must write about what I know best. In a way I automatically speak for my tribe". As a postcolonial writer he has a quest for a buried cultural identity.

Rohinton Mistry's - *A Fine Balance* novel depicts the background story of India's Emergency in 1975-77. The novel also portrays the dark period of India's history. Indira Gandhi was the Primeminister of India(1917-1984). She declared a State of Emergency as she was found guilty of electoral corruption in June 1957. She targeted the poor. "Police had orders to remove all jhopadpatti ". The realism of the novel made Winfrey Oprah "*A Fine Balance*", 1996 for her television book club in 2001; with whom Mistry discussed " the villain is injustice and that's the villain anywhere in the world where there is discontent and suffering". Mistry very clearly shows the social trauma of the downtrodden in Indian society. Their pain, sufferings are noticed by many but ignored by most. The voice of the chamar Dukhi "the upper caste bastards treat us worse than animals" is more effective because it is the marginal characters that get a voice and is reflected in the play always from the days of forefathers''.

The novel- *A Fine Balance* reflects personal and cultural identity. Mistry has portrayed the nostalgia for his homeland. It throws light on the Parsi community in India. He portrays their lifestyles, customs and traditions. It also reflects the slums of Bombay and the lifestyle of Parsi middle class families. Dina- the protagonist fights for her independence but she faces failures and threats by the society. And she was forced to live with her brother as a servant. It also illustrates the struggle of suffering of a common man, the search for identity which has become an archetypal and a universal motif. The characters grow in self-confidence and self-knowledge and they create a new world and freedom though they are young and middle aged people. Rohinton Mistry works can be compared with Tolstoy, Dickens and V.S.Naipaul. The moral of the novel is one has to keep on working in life though we face many difficulties or obstacles in life. All the characters struggle very hard to live. Dina, Ishvar, Omprakash successfuly maintains a fine balance where as Maneck Kholal was not being able to do so, he commits suicide. Dina suffers in silence. She struggles a lot in her life. Mistry says:

Kanpur Philosophers
ISSN 2348-8301
International Journal of humanities, Law and Social Sciences
Published biannually by New Archaeological & Genological Society
Kanpur India

Vol. IX, Issue II, No.4 : 2022

KAMALA MARKANDAYA'S *SOME INNER FURY* (1955): AN ANGLOPHILE AND NATIONALISTIC IDEOLOGY PORTRAYAL

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Abstract

One of the best-known contemporary Indian English novelists is Kamala Markandaya. Her production has been extensive and significant. She is undoubtedly one of the most researched contemporary Indian female novelists in English. She shares Anita Desai's experience of living abroad and is aware of the racism present there. Because they deal with racial discrimination and cultural problems, it is true that Indian writers who live abroad are more aware of their Indian identity than Indians who live in India. Her fiction portrays westernisation quite objectively. Her characters demonstrate the existence of excellent people from both Indian and English cultural backgrounds. The cultural tensions between English and Indian people are almost always present in Kamala Markandaya's books. In Some Inner Fury (1955), in particular, we can see how anglophilic the Indian characters are. This essay focuses on how nationalistic and anglophilic tendencies are portrayed in Some Inner Fury and how they affect the interactions between the characters.

Suggested Key Words: *Nationalism, Westernisation, Anglophile, Patriotism*

Introduction

Exactly one year after Nectar in a Sieve (1954), Some Inner Fury was released. It explores the subject of inter-racial love between Mirabai, a vivacious Indian woman, and Richard, a learned Englishman. At first, it appears as though their love will continue unhindered, but as the novel's plot develops, it begins to sputter on the sands of national loyalty following the 1942 commencement of India's Independence movement. Mira and her English-speaking lover Richard experience a clash of national interests as a result of Mira's intense commitment in the fight for India's independence. Her affinity with England immediately disappears. They thus go their separate ways and stick to their courses.

The majority of the components of various cultural conflicts are justified. The political struggle between the British and the Indians for dominance served as the framework for its writing. It demonstrates how national interests cause conflicts in people's personal lives. Kamala Markandaya merges the two threads of the story into one thanks to her acute sensitivity. The novelist's impressive

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Journal
of the
Oriental Institute
M.S. University of Baroda
ISSN: 0030-5324

UNEMBELLISHED DEPICTION OF WOMEN IN THE WORKS OF KAMALA MARKANDAYA

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Abstract

In Indo-Anglian literature, Kamala Markandaya is a prominent female author. In her writing she has skilfully outlined endearing, fully realised and unembellished depiction of characters especially the women. The majority of the women in her well known works lack personality and she portrays the female characters realistically.. She has extensive first hand experience of South Indian communities, including the true plight of rural women and their hardships. She has captured the difficulties experienced by rural women inside a conventional social system. She does not, however, support any of her characters; instead, she empathises with their suffering and believes that women are capable of greater things. Her goal is to arouse polite society. This is why her novels' favourite theme is the realistic representation of female characters. The present article emphasises a picture of the realistic representation of female characters in Kamala Markandaya's fiction in this setting.

Introduction

The majority of Kamala Markandaya's books depict a woman's search for identity and self-improvement. Through her characters, including Rukmani, Nalini, Ira, Mira, Roshan, Helen, Lalitha, Mohini, and Usha, she creates a realistic portrait of modern women in works like *Nectar in a Sieve (1954), A Handful of Rice (1966), Some Inner Fury (1956), Two Virgins (1974), A Silence of Desire (1960)* and *Possession (1963)*. Rukmani, a peasant lady who encounters several obstacles in life, is depicted in Kamala Markandaya's book *Nectar in a Sieve* along with her struggles. In the same way, Rukmani's situation in the book *A Handful Rice* is similar to that of Nalini, a carefree girl who saves her family from all difficulties. In the other book *Two Virgins*, Kamala Markandaya paints a realistic portrait of the challenges faced by the average lady growing up in a typical modern Indian family. The author of *The Golden Honey Comb* writes about a woman who is related to a royal family. In addition, there are several additional female protagonists who struggle with various issues. She has succeeded in giving her fictional female characters a vivid and genuine picture.

Sufferings of Rukmani

The heart breaking and mind-blowing book *Nectar in a Sieve* by Kamala Markandaya tackles the subject of hunger and malnutrition. The protagonist, a woman named Rukmani, serves as the novelist's vehicle for highlighting the issue. In this case, Rukmani is a peasant woman who is able to withstand all hardships. She is also a role model for Indian women. The book is titled A Novel of Rural India by Kamala Markandaya in order to reveal the very qualities of rural India via the lives of the numerous Indian peasants who suffer from extreme poverty, starvation, and exploitation. To create a village microcosm of rural India, she has chosen to remain anonymous about the imaginary setting.

Shodhsamhita: Journal of Fundamental &Comparative Research
Vol. IX, No. 5: 2022
ISSN: 2277-7067

The treasure of human relationships in Githa Hariharan's novels

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Abstract

A family is a group of people who have a marital relationship as well as blood relatives who live under the same roof. A society is defined as a group of many families living together. In other words, a modern family is a social system. Every individual is responsible for encouraging the family in ways to construct a happy family. In today's world, the man plays a unique role that affects not only his immediate family but also future generations. This study examines the primary causes, vulnerabilities, and gaps that lead to separation, family issues, and the isolation of healthy relationships only through the perspective of this hypothetical togetherness.

This study examines two forms of human relationships. These are the relationships between parents and children and between men and women. This paper also attempts to examine how these relationships influence the construction of self.

Keywords: human relationships, modern family, interpersonal interactions

Introduction

Githa Hariharan is a well-known literary personality among the Indian writers in English who are not only a novelist but also a philosopher, storyteller, teacher, and literary critic. The story of *The Thousand Faces of Night, The Ghosts of Vasu Master, and In Times of Siege* were examined in detail. She has presented a variety of relationships such as the illiterate, well-educated, brahmin family background, low castes, rich and poor.

Kanpur Philosophers
ISSN 2348-8301
International Journal of humanities, Law and Social Sciences
Published biannually by New Archaeological & Genological Society
Kanpur India

Vol. IX, Issue II (E): 2022

SELECT NOVELS OF GITHA HARIHARAN: INTERTEXTUAL STRATEGIESAND AESTHETIC PARADIGMS

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Abstract

Githa Hariharan's techniques have been studied from individualist, social, political, feministic, and multidimensional perspectives. A microanalysis of her five novels reveals a new conclusion. She depicts her themes familiar with contemporary Indian writers' writing styles and societal trends. Githa Hariharan has been successful in bringing to light several issues concerning gender inequality, communal violence, and religious politics. In her novels, she has addressed these issues. Githa Hariharan purposefully chose an open ending. This research paper explores the collection of narrative techniques such as plot structure, description, situation, narrative settings, and language occupied in her novels.

Keywords: Narratology, conflicts, psychological trauma, methods of teaching, tradition and modernity, aesthetic paradigm.

Introduction

The versatile writer, Githa Hariharan's novels demonstrate her narrative skills that pleased both her artistic concerns and her social reflections. Her remarkable writing style is presented a positive conclusion through her variety of themes and her outlook on life. The structure of the novels also explains the themes as well as analyzes and interweaves with other related themes in a valuable approach. Githa Hariharan fabricates her techniques for the reader's psyche. It helps to experience the past and understand the present life and prepared for the future.

The analyses of her select novels adopt different themes and styles of writing. Her Commonwealth award-winning novel, *The Thousand Faces of Night* deals with the internal conflicts of the protagonist Devi. And her second novel, *The Ghosts of Vasu Master* depicts the protagonist Vasu's clash with the methods of teaching and in her other novel *In Times of Siege*, the protagonist experiences his basic right being disturbed by a fundamentalist group.

Storytelling

The term, Narratology was coined by Tzvetan Todorov in 1969. Narratology refers to storytelling that became well-known in the mid-twentieth cecentury with the theory and practiceof description in all literary forms. It illustrates the types of narrators. A narrative is storytelling in prose or verse. It depicts the events and characters of literary forms such as prose and verse. In prose and verse are clear storylines that are told by the storyteller. Storytelling is the earliest art of narration. It reveals social, religious, and political issues. Stories are told to highlight a particular personality or incidents. It helps future generations of retaining them.

PANDIYA BHARATI JOURNAL OF PHILOSOPHY
ISSN : 0972-0057

BASICS OF GOODS AND SERVICES TAX AND ITS REVENUE TREND

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Abstract

The GST was first introduced by France in the year of 1954. After the Goods and Services Tax implemented by France, the concept was attracted and implemented more than 150 nations in the world wide. Aim of this paper is to present the basics of goods and services tax and to project the future revenue of GST in India. Trend analysis is used to project the future revenue of GST based on last Nine Quarters (July 2017- December 2017 to July 2021 – December 2021) Revenue Data. From the analysis result shows the positive trend for next Five Half years (January 2022 –June 2022 to January 2024 – June 2024) but due to global recession Revenue trend may be affected.

Keywords: *Goods and Services Tax, Input Tax Credit, Output Tax Credit, Tax liability.*

1. *Introduction:*

Goods and Services Tax - the model of GST was introduced by France in the year 1954. The existing indirect tax system was replaced by Goods and Services tax, it overcomes the con's of VAT and others taxes. GST success in France attracted by many nations and it leads to adopt it. In India Government had discussion about implementing GST around more than one and half decades, finally in 2017 the Hon'ble Indian Prime Minister Shri. Narendar Modi passed the bill in parliament and the GST Act was implemented on 1st July 2017.

2. Scope of the study:

The current indirect tax system Goods and Services tax (GST) is a new tax evolution to our country. Goods and services tax practiced in last Four and Half years in our country, till many people not have an idea about basic GST information. The main aim of present study is to give some basic information about GST to the public, students and other peoples in the society.

3. *Objectives of the study:*

- To present the basics of GST
- To analysis the latest GST Revenue Trend

4. *Methodology of the study:*

This study is based on the secondary data which is collected from the official websites, other websites, books and etc. Four and Half years GST revenue datas from July 2017- December 2017 to July 2021 – December 2021 were collected and split it into half yearly revenue to analysis the trend by using trend analysis.

Basics of Goods and Services Tax:

The basic information about Goods and Services Tax (GST) are concepts, types, registration, documents required for registration, tax liability, slab rate, HSN code, E-way bill and return filing.

JOURNAL OF EDUCATION: RABINDRA BHARATI UNIVERSITY
ISSN : 0972-7175

LIQUIDITY AND SOLVENCY ANALYSIS OF THE HOTEL INDUSTRY IN INDIA

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Abstract

The purpose of this research paper is to analysis the liquidity and solvency position of the hotel industry in India, in terms of financial ratios. The present study is based on a sample of five Indian hotel companies with net sales above 350 crores that are listed on Indian stock exchanges, namely Indian Hotels Company Limited (IHC), East Indian Hotels Limited (EIH), Mahindra Holidays and Resorts India Limited (MHRIL), Chalet Hotels Limited (CHL), and Speciality Restaurants Limited (SRL).The One way ANOVA-Test is used to evaluate the impact of selected variables on the liquidity and solvency position of the identified unites. The Hotel Industry is significant in providing employment and boosting economic prosperity in India; it serves as an economic development and social stability. It has a significant difference in liquidity and solvency.
Keywords: Liquidity and Solvency, Hotel Industry, Financial Ratios and economic development.

INTRODUCTION

Hotels are among the fastest-growing sectors of the tourism industry. They are considered the key component of any country's development. The presence of enough hotels also helps to boost a region's economy. In India, the hospitality industry is largely supported by tourism, which is a significant source of foreign exchange and employment. The government has made a number of steps that have aided the hotel industry's growth.

In India, the hotel sector is part of the travel and tourism industry. Because of the tremendous expansion of the IT industry and the establishment of various multinational enterprises, the number of business travelers is rapidly expanding.

In Financial year 2020, the Average Room Rate (ARR) was INR 5,458.68, down from INR 5,671.00 in financial year 2017. It is predicted to reach INR 6,292.85 by financial year 2025; with a Compound Annual Growth Rate (CAGR) of 2.49 percent between financial year 2021 and financial year 2025.The Revenue Per Available Room (RevPAR) in financial year 2020 were INR 1,951.34 and is predicted to reach INR 3,336.28 by financial year 2025. Since India would host the ICC Men's World Cup in 2023, the hotel industry is expected to grow at a rapid pace. It is expected that this event would increase the number of foreign tourists to visit the country (DUBLIN, 2020).

REVIEW OF LITERATURE

Andrew and schmidgall (1993) categorized the financial ratios into different types for the hospitality industry: Solvency ratios, Liquidity ratios, Profitability ratios and Operating ratios.

SrinivasaRao.G and IndrasenaReddy.P (1995) stated in their study that the financial position of the paper industry had improved from year to year. The company's success in raising internal funds in the form of reserves and surpluses was excellent and the company was also doing well in mobilising external funds.The liquidity position of the company was sound, as shown by the current ratio and the quick ratio above the standard. The solvency ratio indicated that the company adopted a strategy of low capital targeting from 1990 to 1991, as these ratios decreased from this year.The performance of the company in terms of profitability was not up to the anticipated standard. The company's ability to use assets for sales generation has not been significantly improved over the study period, as shown by its turnover ratios.

Prasanta Paul (2011) examined the "Financial Performance Evaluation-A Comparative Study of Some Selected NBFCs," five NBFCs for financial performance comparison. Various statistical methods, including Arithmetic Mean, Standard Deviation, Coefficient of Variance,

ISSN: 0974-8946
Vol. 47, Issue. 01, No.2: 2022

A STUDY ON GROWTH AND DEVELOPMENT OF INDIAN HOTEL INDUSTRY

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Abstract:
The aim of this paper is to illustrate the Indian hotel industry. The paper traces the history of the Indian hotel industry from its beginning to its current state. And also this examines the growth in foreign tourist arrivals and domestic tourist visit in India from 2010 to 2019 and present position of Indian hotel industry. It has been observed that the arrival of foreign tourists in India is increasing. Similarly, hotel rooms are growing at a healthy rate.
Keywords: Indian Hotel Industry, History, Growth, Foreign tourist arrival, domestic tourist visit and Hotel rooms.

INTRODUCTION

Hotels play an important role in the global economy by providing leisure and entertainment, meeting and conference facilities, and business transmission. When hotels are necessary for economies and societies, transportation is appropriate. Hotels contribute to the production of goods and services that improve the well-being of their countries and communities.

Hotels are undeniably one of the fastest-growing segments of the tourism sector, which is reasonable considering that accommodation is a vital part of any country's or region's tourism growth. Tourism and the hotel industry are closely linked, and having enough hotels boosts the region's economy by adding demand and a variety of other factors.

The developing tourism and hospitality sectors have emerged as main growth drivers, and the hotel industry contributes significantly to this. Its culture and heritage have also contributed significantly to India's tourism sector. It has enormous potential due to the country's rich diversity of ecology, terrain, and scenic wonders.

The GST council's rate decrease for luxury hotels from 28 percent to 18 percent, and for mid-scale hotels from 18 percent to 12 percent, is projected to be a significant growth factor for the Indian hotel industry in the coming years. In India, hotels and their tourism efforts have resulted in a significant boom. This improving economy has been a major source of foreign exchange for the country as well as a source of jobs. India's tourism industry is the country's third-largest source of foreign exchange earnings.

SIGNIFICANCE OF THE STUDY

In recent years, India's hotel industry has experienced tremendous growth. The hotel industry is inextricably connected to tourism, and the growth of the Indian tourism industry has fuelled the growth of the Indian hotel industry. The Indian hotel industry has benefited from the country's booming economy and increased business opportunities. The government, entrepreneurs, and investors will plan their activities more effectively if they understand the growth of tourist arrivals and hotels. Keeping in mind the growing importance of tourist visits and the hotel industry for the growth of the tourism industry, the specific objectives have been identified.

OBJECTIVE

To study the origin and growth of hotel industry in India.
To examine the present position of hotel industry in India.

SOURCES OF DATA

The study is based on secondary data collected and summarized from various articles, websites, and statistical bulletins from the Government of India's tourism.gov.in website.

ORIGINAL RESEARCH PAPER

MILLENNIALS ATTITUDE OF ONLINE ADVERTISEMENTS ON CONSUMERS' PURCHASE DECISION – LITERATURES REVIEW

KEYWORDS: Advertisements, Attitude, Creativity, Online, Viewers

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ABSTRACT

Advertisement provides required information about products to customers without having any boundaries and persuade the potential customers to buy the products, satisfying needs and wants of consumers by creating demand for products advertised. Advertisements also attempts to remind existing customers about brand preference and brand loyalty by neutralising the effects of competitors' advertisements. As a result, it is a paid form of non-personal communication with a target audience through mass media such as newspapers, magazines, bill boards, radio, television, internet, and so on. Among these mass media, this literature review focuses specifically on online advertisements by analysing the perception of the consumers towards purchase decision. Although, several studies have been conducted in the field of advertisements, research on the online media for advertisements are still emerging. This is due to the fact that now-a-days, online advertising is fostering a new culture by presenting about products and their feedback in a variety of ways and requesting opinions on whether or not they satisfy customers. Hence, this paper attempts to analyse the perception of the consumers towards online advertisements for their purchase decision and identify the research gap.

TRODUCTION

e information technology (IT) revolution has made mendous changes in India in terms of socio-economic well ng of the general public. The well-established commercial plexes, huge malls, entertainment theatres, railways and aking sectors, etc., are the significant attributes of the IT olution. Although, internet in India starts its journey in 1986 ERNET (Educational Research Network), accessibility of internet by the general public began on 15th August 1995. e-days the internet occupies major role in every one's y-to-day life and at present there 718.74 million active rnet users in India which comprises 54.29% of the total pulation. The internet being the mass media for interactive mmunications, builds the relationship with manufacturers ng with internet users and bridges the gap between them. manufacturers who want to promote their products ong the consumers can advertise through the various ms of online advertisements viz., banner advertisements, p-up and pop-down advertisements, interstitial vertisements, etc., and influence the internet users to view ir purchase decision. But the internet users being the sumers who are having intention to buy the product are ng the varied opinion about the product promotion such brand, quality, price, flavor, shopping practices etc. ough several researches have been conducted on the t of online advertisements among the consumers to know ir attitude, the research gap need to be identified for ering the further research. Hence, this paper attempts to ew the earlier literatures on consumers' attitude rds online advertisements for their purchase decisions.

(1998) suggested that mentality towards advertisement es an accumbent to watchers' brains in a positive and ative consideration which depends on every notice. erally, it draws out the various kinds of feeling free.

Bauer, Shavitt and Kanfer (1999) found in their overview, respondents believe that E-promotions to be more ractive and convincing than a demographically ainable example found in similar publicising.

Núñez (2000) proposed to link genuinely situated owers' attitudes to directional advertising in the Yellow ectory environment. The client's purchasing performance is give more data about particular products, which brighten up the customer buying conditions.

Brackett and Carr (2001) further approve Ducoffe's model and stretch out the model to incorporate validity and shopper socioeconomics. Believability is demonstrated to be honestly connected with each promoting worth and demeanor towards publicising. The best attitude toward promotion appears to be influenced by product segmentation factors.

Online applications, according to Lu et al., (2005), are simple to use stages for clients, in any case, delivering notices on the place of customers. Their findings show that internet applications are customized to the preferences of individuals. As a result, individuals can visit each and every online store.

A study by Chan Mei Lee et al., (2008) was to look at the elements that influence consumers' attitudes regarding online advertising. The findings show that buyers' attitudes regarding online advertising have an optimistic relationship. For many shoppers, internet advertising is the most valuable since it pushes them to expand their brand image throughout research.

Big name-based notices have a durable effect on the watcher's mentality, according to a study supervised by Lalitha Balakrishnan and C. Shalinikumar (2011). People are nowadays spending more money to improve their standard of living. A good method for advertisement is to enlist the help of well-known people. The findings suggest that a VIP-backed campaign increases the buyer's interest.

Abdul aseem and zia culhaq (2012) investigated on "discernment toward online publicising" with the help of three distinct phase gatherings, this evaluation was broken down. The purchaser mindset on the internet is the forerunner of a term. This examination reveals that online advertisement among phase elements, there are numerous members of one's own family who have strong convictions and mentalities.

According to Priyanka and Srivastava (2012), a web-based notice allows people to become familiar with the goods and clarifies the overall products. If any observers have any doubts about the item, they can check through the entire data People can use the internet to trade goods and services

JETIR | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

SENSIBILITY OF ONLINE ADVERTISEMENTS – AN ANALYSIS ON INTERNET USERS' PERCEPTION

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Abstract:
The internet revolution in the digital media for advertisement has led the consumers to search the product information and brand availability round the clock and anywhere of accessibility. In recent days every one is having their own tablet, MacBook and mobile phone devices with internet connectivity. The online advertisement by making use of the internet facility through these electronic devices delivers the product promotional messages at large. But at the same time, it is of crucial importance to measure the sensibility of advertisements which are placed online platform in terms of its capacity to attract the attention of the internet uses, enjoyable and entertaining the interest of the internet users to view online advertisements. Similarly, the online advertisements should be believable and not irritating and boring the internet users. Thus, this paper explores the perception of the internet users towards sensibility attributes of online advertisements.

Index Terms – Advertisements, internet, online, sensibility.

INTRODUCTION

Advertising in today's scenario is rapidly growing along with the growth of digital media. The advent of information technology has contributed more for doing the business and capturing the market by the companies for its products and services with the help of internet. The traditional media for advertisements like newspaper, magazine, television and radio are now replaced by internet advertising which is otherwise called as online advertising. The online advertising is a new emerging media for advertisements because now-a-days everyone is having their own tablet, MacBook and mobile phone devices with internet connectivity. The online advertisement by making use of the internet facility through these electronic devices delivers the product promotional messages at large. The advertisements placed in the online platform should have the ability to influence the internet users' perception in terms of company's product and brand image. The message delivered through the online media for advertisements should enhance the qualitative peculiarities such as accuracy, informativeness, truthfulness and approachability to the internet users (Siau & Shen, 2003). Similarly, the advertisements posted in online forum should contain concise and humorous message to arrest the quick attention of the internet users' perception (Katterbach, 2002). The perception of any audience towards any media for advertisements is always subjective in nature and influenced by their psychological factors such as believability, sense of coherence, motivation etc., and demographic factors such as age, gender, education, occupation, income level, etc. (Kotler and Armstrong, 2011). Hence, the high level of significance is arisen to study and analyze the perceptional factors of internet users towards sensibility of online advertisements. The perception of the audience about any media for advertisements are always not static in nature and hence it should be measured from time to time to judge the quality of advertisement messages. Thus, this paper explores the positive or negative feelings of internet users such as the online advertisements are entertaining and enjoyable, fun and easy to use, exciting and retaining attention, irritating and boring, confusing and unbelievable.

Research methodology

The Erode District of Tamil Nadu was chosen as Universe for the study and it was decided to adopt analytical study to investigate the respondents. The target groups of respondents for the study were students and teachers of engineering, arts & science and polytechnic colleges of Erode District. The samples were drawn using snow ball sampling technique from these colleges and totally 929 sample respondents were identified. The required data were collected using questionnaire from these respondents.

Objectives of the study

- To study the viewing pattern of online advertisements by the internet users
- To analyze the purpose of viewing online advertisements by the internet users
- To analyze the relationship between demographic profiles of the respondents

IJNRD.ORG ISSN : 2456-4184

INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG

An International Open Access, Peer-reviewed, Refereed Journal

PROSPECTS OF ONLINE ADVERTISEMENTS AND ITS INFLUENCES – A PERCEPTIONAL STUDY AMONG INTERNET USERS

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Abstract : The online system created a new way of adverting the products and services,with a rapid advertising technology. Online advertising is booming with potential growth and it is considered as most powerful tool to promote products and services in the cut throat competition. It is also considered as interactive medium on the part of the consumers who are able to post queries, information, reviews about products and services advertised. Although, the online advertising has its own potential growth in terms of its reliability, accessibility and getting the attention of the audience, still its effectiveness needs to be measured. Hence, this paper explores the importance of analyzing the perception of the internet users across their demographic characteristics.

Index Terms - Advertisements, Internet, Online, Potentiality.

Introduction

The World Wide Web was invented by Tim Berners Lee a British scientist in the year 1989 to full-fill the need for information sharing between scientists in universities and research institutions across the world automatically (Berners-Lee 1996). The web in short is supported by internet technology in recent days enables the internet users to share and gather information, access huge array of documents, pictures, videos in online round the clock. The quantum of internet usage is increasing day by day and users by internet users are also increasing exponentially. With the massive growth of internet usage, the advertisements placed in online platform are also growing rapidly. Online advertising is booming with potential growth and it is considered as most powerful tool to promote products and services in the cut throat competition. The online advertisements facilitate the consumer who wants to interact for queries, receive product information in an easier way and to make an order and purchase products and services accordingly (Hendrix, 2014). The internet users highly prefer to post information and forms discussion forums in social media such as facbook, Instagram, whatsapp, twitter, etc. (Rowles, 2013). These social media has its own peculiarity in placing advertisements in the pages along with the purpose for which it is there for the users. It also offer the opportunity to interact with each other for 'likes' and 'dislikes' and serving as multi-dimensional source of product promotion (Schivinski&Dabrowski, 2016). The online advertising is also potential to the advertisers as it reveals the number of hits for advertisements by online and measuring their effectiveness (Smith, 2015).Although there are several factors which determined the prospects of online advertisements, but still some of the advertisements in online are biased, deceptive and overstated and unable to get more attention of the all segments of audience. Hence, this paper demonstrates the potential factors of online advertisements and its level of influence among the internet users.

Research design

The study was mainly focusing on analyzing the potential factors for online advertisements across the various demographic factors of the internet users. For this purpose, it was decided to adopt analytical study to investigate and examine respondents' perception. The Erode district of Tamil Nadu was chosen as Universe and college students and teachers of this district who are actively involved in internet usage are considered as population for the study. Using snowball sampling technique, 929 sample respondents proportionately consisting of college students and teachers were drawn from the population. The data were collected from the sample respondents using questionnaire in online mode.

Objectives of the study

- To determine the type of online advertisements mostly preferred by the internet users
- To test the relationship between demographic factors of respondents and their perception on potentiality of online advertisements

RABINDRA BHARATI JOURNAL OF PHILOSOPHY
ISSN : 0973-0087

GST IN RETAIL SECTOR – LITERATURE REVIEW

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ABSTRACT

GST or goods service tax is an indirect tax imposed on the supply of GST. It is a multi-stage, destination oriented tax imposed on every value addition replacing multiple income taxes, including VAT, Excise duty, service taxes, etc. GST has impacted the Retail sector by re-adjusting tax brackets and potentially reducing distribution costs for various companies over the long run. Some companies have "gain" with lower taxes and distribution costs, and thus have responded by increasing product volume and lowering prices, while others may have "lost" with higher taxes, and thus need to compensate by increasing prices. This is why there is an ongoing attempt on the part of the GST authorities to rationalize the tax rates. However, the two rate rationalizations in 23rd GST council meeting in November 2017 and 28th GST Council meeting in July 2018 have been positive for this segment as a whole. The aim of this study is to present the literature review on GST in retail sector. The study concluded that the implementation of GST has a mixed impact on Retail industry.

Keywords: GST, RETAIL SECTOR.

INTORDUCTION

Goods and Services Tax (GST) is an indirect tax (or consumption tax) used in India on the supply of goods and services. The introduction of GST is truly a game changer for Indian economy as it has replaced multi-layered, complex indirect tax structure with a simple, transparent and technology–driven tax regime. It will integrate India into a single, common market by breaking barriers to inter-State trade and commerce. By eliminating cascading of taxes and reducing transaction costs, it will enhance ease of doing business in the country and provide an impetus to —Make in Indial campaign. GST will result in - one nation, one tax and one marketl.

The imminent implementation of goods and service tax (GST) is expected to result in greater transparency, an improved flow of credit, and reduced trade barriers from a tax perspective. The timely release and revision of the draft GST model law, GST rules, and documentation templates reflect the government's commitment and keenness to implement the GST law in India in 2017.

The reform in indirect taxes was introduced by VISHWANATH PRATAPSINGH. By introduction of modified value added tax (MODVAT), GST will be levied.

Retail business in India is a key pillar of the economy and accounts for about 10% of the GDP. The Indian retail market is estimated to be more than US$ 600 billion and one of the to five retail markets in the world by economic value.

The retail sectors is often said to one of the most important for a country's economy because it is a sort of litmus test of on economy's level of well – being. In a healthy economy there is high production and consequently, wealth is reflected on consumption, most of which is concentrated in retail.

It is also widely agreed that GST will usher in a series of changes to how businesses will operate and the Retail industry will be no exception.

OBJECTIVE:

The aims of this study is to present the literature review on GST in retail sector.

LITERATURE REVI EW

1. **NishithaGuptha (2014)** in their paper titled Goods and Services Tax: Its Implementation on Indian Economy. The states that Implementation of GST in the Indian framework will lead to commercial benefits which were untouched by the VAT system and would essentially lead to economic

शोध प्रभा
Shodha Prabha (UGC CARE Journal)
ISSN: 0974-8946
Vol. 47, Issue. 01, No.4: 2022

LITERATURE REVIEW ON E-HRM AND ITS PRACTICES

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ABSTARCT

Human resource management (HRM) strategies have taken centre stage in today's workplace as a result of the transition. The nature of HRM practices has evolved to such advances, which have been accompanied by changes in technology and information system developments. The goal of this work is to focus on the topic of electronic HRM (e-HRM) in research, based on the current trends compiling a review of the literature (literature survey) on the use of e-HRM in a variety of service industries, including insurance, banking, telecommunications, and information technology. The growing use of electronic human resource management (e-HRM) has substantial theoretical and practical consequences for managers, employees, and researchers. Since its inception in 1995, the e-HRM has become a hotly discussed topic that has got a lot of scholarly attention in tandem with advancements in information technology. This study examines literature review as a research approach and provides an overview and collection of several sorts of reviews on a multi-dimensional perspective of E-HRM levels, practice and outcome.

Keywords: e- HRM, e-HRM Levels, e-HRM Practice, Literature Survey, e-HRM outcome

INTRODUCTION

The term electronic human resource management (e-HRM) was originally used in the 1990s. Swart & Kinnie, 2003 define the word as "the use of information technology or intranet for performing transactions involving Human Resource Management." In recent years, the phrase has been referred to as a "umbrella term" that attempts to include all potential contents and elements of Human Resource Management as well as Information Technology by integrating it with all of the organization's primary Human Resource responsibilities. It aims to provide value to both management and staff. - Bondarouk and Ruel, 2009.

As defined by Harris, 2008 & Dowling et al., 1994, e-HRM enables businesses to integrate domestic and global HRM activities, removing possible overlapping HR practises and activities, enabling better access to communicate and attract talents from abroad, and providing better insights in cost reductions of potentially outsourced HRM practises. E-HRM is utilised to conduct all Human Resource functions, whether they are related to classic HR practises or contemporary transformational efforts, and it is involved in increasing the effectiveness of the organisation. Human Resource departments are changing from traditional HRM to e-HRM to get a competitive advantage in the twenty-first century's modern web-based technologically innovative era. Several studies have been conducted in this field in order to cover all of the advantages of e-HRM apps and to assess all of the potential results of these web-based applications. With comprehensive review collections on E-HRM levels, practice, and outcome, this article will be an aid to researchers on the notion of e-HRM.

E-HRM

E-HRM is a term that refers to the tools or applications that are used to implement all Human Resource strategies that are related to policy making and/or explaining aspects. "Planning and implementing all IT applications to provide support and help in networking for executing various Human Resource operations" is another definition of e-HRM. HRM was influenced by the integration of computers into work life, as well as quick advances in Internet technology, which turned this management method into e-HRM. Although the term e-HRM was derived from the term e-trade (Rul, Bondarouk, & Looise, 2004), it is now commonly used to denote the administration of

SOUTH INDIA JOURNAL OF SOCIAL SCIENCES
ISSN: 0972 – 8945

AN OVERVIEW AND ANALYSIS ON IMPLEMENTATION STRATEGIES OF E- HRM IN INDIAN AUTOMOBILE INDUSTRY

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ABSTRACT

The disruption of business models is the main trend that is causing the other trends. The majority of large corporations are in the process of reinventing their operations in response to digital challenges and change, motivated either by competition or a chance to better what they are doing. HRM is of utmost relevance in today's corporations. The labour market has an adequate supply of workers, although there are concerns over "skilled labour." As a result, choosing the right workers for the proper jobs is important. Good employees are valued by organisations because they contribute to the success of the company through their work output. Human resources processes and procedures have been supported for the past three decades by a variety of technologies, including automation, web-based technology, numerous systems, and databases with a single version. Important components of the information and communication with knowledge based economy have been raised to new economy thanks to the broad adoption of the internet as a method of communication, production, and commerce. The terms "new economy" and "knowledge economy" are frequently used interchangeably, and this study article focuses on the difficulties and problems associated with E-HRM practises in Indian businesses.

Key Words - e-HRM, Virtual HR, Web based HR, HR Intranet , HRIS, Implementation Strategy

INTRODUCTION

The difficulty of navigating technological change in HR management in a business serves as the starting point of this study. The implementation of e-HRM is challenging, and there are instances when practises are changing from traditional HR management to e-HRM. This is more difficult for both employees and organisation managers, in particular. To prepare for managing the changes in a way that satisfies the needs of the organisation and employees, managers act as change agents in this situation.

How does a business decide whether to implement technology innovations in HR management that are organised or unstructured? How can one deal with change's opposition? It is nothing new that HR management scholars and practitioners are paying more attention to changes in HR practises. The purpose of this study was to better understand how HR managers and staff felt about e-HRM practises in a firm.

E-HRM is a good way to implement HR strategies, policies, and practises in a company through ongoing and directed support by making full use of Web technology-based channels and networks, claim **Ruel, Bondarouk, and loosie**. Planning for human resources is one of an organization's more complicated tasks. Planning for intellectually talented human resources is what it entails. Planning for human resources can be seen as predicting what an organization's needs will be in this area. Human resource planning is dependent on data related to human resources, hence industrial firms should maintain this data in a correct manner. It is challenging to create efficient human resource planning in the absence of trustworthy data. Recruitment, evaluation of candidates, induction, training, and development rely up on effective human resource management planning.

Two key research concerns about the management of organisational transformation are addressed in this study. What beliefs sway employees' support for and opposition to change?

JOURNAL OF EDUCATION: RABINDRA BHARATI UNIVERSITY
ISSN : 0972-7175

PRIVATE SCHOOL'S WOMEN TEACHERS CURRENT LIFE STATUS IN CORONA PANDEMIC PERIOD AND THEIR SOCIO-ECONOMIC CONDITIONS IN TAMILNADU.

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ABSTRACT

Teaching is one of the holy professions in the world. The teachers are one of the very important persons in every pupil life. This study focused on the private school teacher's current life status in corona pandemic period and their socio-economic conditions in Tamilnadu state. The researcher followed stratified random sampling technique and decided 600 as sample respondents from the 12419 private school in Tamilnadu. The interview was conducted to the teachers in direct method through their religious language. Due to pandemic situation, many of teachers are interviewed through phone calls and send the questionnaire through mail and received from them. The applicable statistical tools are applied for this research. They are percentage analysis, ranking method, chi-square analysis and multiple correlations. The corona pandemic situation creates poor economic conditions for all people. So, the private school managements unable to give 100% salary to their teachers. Many of the teachers are doing some other labor works for their additional family income. So, the government should take the necessary measures to develop the private school teachers' life status and help them to come over from the poor economic conditions through the end of pandemic situation.

Keywords: Teachers, Profession, Salary, Pandemic situation, students, society, consequences, manipulated.

1. INTRODUCTION

Teaching is one of the largest professions in the world. The teachers play a versatile role in teaching service. The well-being of society depends upon the students. These students are cared by the teachers and make them a successful person in the world. The teachers are creating the future pillars of our nation. After that this contagious disease was spread out through china. On 30th January 2020, the World Health Organization (WHO) declared covid19 outbreak as a Public Emergency of International Concern (PEIC). They announced the global shutdown for all activities. The infection of the virus causes severe issue in human health. It results the shutdown of schools in all over the world. So, the teachers are instructed to teach the lessons from home through online mode in the pandemic period. The teachers are restless during that pandemic period. They are active always. They taught the lessons to the students from home through online mode in their own mobile phones. The teachers had a social responsibility to develop their nation through education. Every teacher around the world, we have two words for them "Thank you". But the teachers are faced many problems due to the shutdown of schools. They are not received full salary in pandemic period. Due to the low salary, they cannot face their even family commitments. It is a one of the major problem in private school teacher's life. Some teachers leave this profession due to low salary. Therefore, there is a necessary to protect their life status and remove their poverty conditions through this present study.

2. STATEMENT OF THE PROBLEM

This corona virus dangerous disease causes shutdown of all over the world. During the lockdown period the teaching professionals felt high uncertainty in their job. Many of the teachers were having bad situation to do some other works to run their family. Because, the outbreak of this pandemic situation affect the psychological, Physiological and economic consequences among the teachers. So, there is a necessary to analyze the current life status of private school teachers and their socio-economic conditions in their situation.

CONSUMER PREFERENCE TOWARDS ONLINE SHOPPING DURING COVID-19 PANDEMIC PERIOD

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Abstract

Online Shopping is a major growth in the field of e-commerce and is certainly the buzz word of shopping across the world during pandemic period. In the present era, all business are managing their business online and initiate necessary steps to sell their products or services online. Online shopping offers a tremendously different shopping experience for people in developing nations like India. Convenience is one of the main reasons for going into online shopping. Large discounts and offers provided by the online sellers also appeal to numerous buyers. This study tries to discover the consumer preference towards online shopping during pandemic period in Tirupur City.

***KEYWORDS** : Online Shopping, e-commerce, consumer preference, covid-19, pandemic.*

Introduction

Increasing use of internet in India makes motivation towards online shopping quite easy. At present customers are gradually employing electronic channels for acquiring their daily essential goods. The rising utilization of the Internet by the younger generation in India offers plenty of opportunities for online retailers. To do well in the competitive market, most of the manufacturers have started using the Internet with an aim to reducing marketing expenditure, thereby bringing down the cost of goods and services. Companies make use of the Internet to disseminate information, sell products, and obtain feedback and carryout customer satisfaction surveys. Customers realize the benefits of online shopping not only for buying products but also for comparing prices, ascertaining product characteristics and after sale service facilities available. As per ASSOCHAM report, demonetization and a reduction in cash transaction, along with development in net banking facilities would offer better opportunities for the Indian E-commerce sector.

Statement of the problem

The COVID-19 pandemic is a global pandemic of coronavirus diseases 2019 caused by severe acute respiratory syndrome Coronavirus 2 (SARS-COV-2). The novel coronavirus was first identified from an outbreak in the Chinese city of Wuhan in December 2019.The disease has spread worldwide, leading to a pandemic. The Coronavirus spread out worldwide tremendously and the World Health Organization declared it as a pandemic. Online shopping has become a growing trend in the retail world today, particularly in developed nations. Statistics show that the amount of shoppers purchasing online are rising and the quantity of their purchases is also increasing rapidly (Monsuwé et al., 2004). This change began in the 1990s when e-commerce blew up and significantly transformed the landscape of the retail environment (Chen & Chang, 2003).Online shopping has gained more importance in today's marketing conditions. But at the same time, there is an increase in the number of scams, fraudulent practices and cheating of consumers. Such cheating activities had created fear in the minds of customers and also negative impact in the attitude of consumers towards online shopping during pandemic period. In this context, the present study has been carried out to analyse the preference of the consumers towards online shopping during covid-19 pandemic period in Tirupur City.

Objectives of the study

The present study has been carried out with the following objectives:

- To study the socio economic profile of the consumers of online shopping in Tirupur City.

AN ANALYSIS OF FREIGHT FORWARDERS SERVICES IN TIRUPUR

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Abstract

The freight forwarder is an essential member of the international trade and logistics commune. The freight forwarder organizes for the international shipment of merchandise. Like travel agents – but dealing with cargo rather than travellers – freight forwardersutilize their knowledge of varying freight rates to offer the shipper "package deal".In addition to booking freight, freight forwarders may also handle export and customs clearance documentation, insurance and port terminal charges. Small exporters frequentlyseek advice from freight forwarders before quoting a Price in a tender forappropriate international transaction.Some forwarders present extensive range of functions, whereas others restrict themselves to a single professional. This study has been conducted with the objectives of analyzing the level of difficulties and identifying the most prevalent risk while performing the services by freight forwarders in Tirupur.

Keywords: Freight forwarders, Services,Difficulties, Risks, International logistics.

Introduction

The freight forwarder is an indispensable member of the international trade and transport community. The freight forwarder arranges for the international shipment of merchandise. Like travel agents – but dealing with cargo rather than passengers – freight forwarders uses their knowledge varying freight rates to offer the shipper the best "package deal". In addition to booking freight, freight forwarders may also handle export and customs documentation, insurance, port and terminal charges. Small exporters often consult with their freight forwarders before quoting a price in a tender for a particular international transaction. Some forwarders offer a wide range of functions, whereas others restrict themselves to a single specialist or particular geographical coverage.

International logistics

Logistics is the management of supply and transportation to deliver the goods on time and in good shape. Handling of operations is important part of the logistics industry, and the need to perform efficient and cheap operations is of utmost importance in the modern competitive world. Managing a warehouse or warehousing means keeping track of inventory and making sure orders are filled. It also involves managing warehouse infrastructure and processes, such as freight forwarder where orders are received, processed, and sent out (shipped to the customer).Most warehousing operations use software like ERP to manage the warehouse efficiently.Warehousing as an industry is a part of the logistics industry.Customs management, also called "global commerce management," is often thought of as a part of logistics because of the paperwork that must be done at international borders and shipping ports to show that government rules are being followed.

Objectives of the Study

1. To analyzethe level of difficulties while performing the services by freight forwardersin Tirupur.
2. To identify the most prevalentrisk involved while performing the services by freight forwardersin Tirupur.

Review of Literature

Rabiya hanif and Edward kalwa (2016) in their research article titled "analysis of transport logistics challenges affecting freight forwarding operations in Malawi" say that high transport cost, deficiencies in road and rail infrastructure, inefficient port and transit border delays port service challenges to transport logistics. The selection of a freight forwarding agent by various stakeholders is critical in ensuring that the flow of trade is moved with minimum delays.

ISSN 2319-8796
Humanities and Social Science Studies, Vol. 12, Issue 1, No. 3, January - June 2023

EFFECTS OF DIGITAL ENGAGEMENT STRATEGIES ADOPTED BY THE BEAUTY INDUSTRY FOR MEETING NEW DEMANDS OF CONSUMER

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ABSTRACT

The continuous development of digital marketing since the 1990's until today has changed brands and businesses use of technology and their advertising methods. As people tend to use digital devices more than a physical visit to shops, digital marketing had become more effective to the brands Digital marketing has become a necessary concept since technology has become pervasive in recent years.The world is quickly moving from simple to the digital world. Individuals are investing more in online content and companies that find it hard to digest this fact in their advertising strategy need to adjust quickly. The more time individuals spend on the internet every year, the more digital platform they use play an ever-developing function in their lives. The main aim of digital India is to promote digital medium. Because people can use digital platform any time anywhere from the world companies needs to change their marketing strategy from traditional to digital.

Keywords: Digital marketing, Online Content,Investing. Digital World.

INTRODUCTION

Digital Marketing strategies carried by the beauty Industry. Beauty is growing at a faster phase in India. The industry includes different faces such as innovating new products, generating new services manufacturing and distributing various beauty products which are preferred by X, and Z new generation customers. The revenue earned by the industry was 27.23 billion in 2023 all over the world. The volume of the market accounts for 12.59 US dollars in 2023. Among the various beauty brand was Lakme. In the next five years, India will have enormous Indian and International brands meeting the demand of the consumer. The high awareness and disposable income levels have pushed the growth. It is expected that India's beauty industry will touch a revenue of 33.33 billion in the coming 2027 with a compound growth rate of 6.32% (cascare medies.com). During the year 2016, the market size of the beauty industry was 868 billion Indian rupees; in 2019 it has increased to 1267 billion, Indian rupees (statista.com). The other radiant brand in the beauty industry of India was Procter & Gamble and L'Oreal. The domestic companies which equally penetrate were mama Earth, Khadi Essentials Plum, and Soul tree.

NEED FOR THE STUDY

Marketing is critical to meeting the global needs of mankind and modern businesses use marketing strategy to enhance sales and achieve organizational strategy. There has been relatively sparse information and research about the emerging changes in marketing dynamics, particularly with regards to the upsurge of digital marketing. The rapid growth in web-based advertisements and rapid growth in digital usage is the biggest change in human interaction; all the changes happening recently caused a huge change in the nature of human habitats, interests and activities. This movement into the digital world had made the movement of every business and brand including marketing as this digital movement had changed the consumer behavior that requires the businesses and brands to rethink their marketing

SOUTH INDIA JOURNAL OF SOCIAL SCIENCES
ISSN: 0972 – 8945

PERCEPTION OF MIDDLE CLASS PEOPLE TOWARDS POST OFFICE SAVINGS IN COIMBATORE DISTRICT

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ABSTRACT
Post Office Savings is a traditional practice of savings of the civilized society. It has become integral part of human life. It has a vital role for Socio-economic development of rural households. Savings habit depends upon the income level of different income group. Increase of income as well as number of earning member in the family is an important aspect for better savings attitude. Present study entitled "Perception of Middle Class People towards Post Office Savings in Coimbatore District" is based on primary data as well as secondary data. The study has exposed that Post Office Savings in north Coimbatore district is growing slowly. Massive awareness program, financial literacy, modernization of Post Office services and products, building of understanding and trust, increase of income by income generation schemes run by Govt. may make a gracious environment of Post Office Savings in north Coimbatore district.

KEYWORDS: Post Office, Savings, Investment, Household, North Coimbatore District.

INTRODUCTION
Post Office savings is a historical practice of savings in India. It was established in India with a historical dating back to 1880 A.D. when other formal savings practices were not available in the country. It is a biggest savings bank in India with 1,55,000 branches across the country. Most of the Post Offices are situated in the remote areas where modern banking systems are not available till the date. The present study entitled "Perception of Middle Class People towards Post Office Savings in Coimbatore District" is an empirical study on the pattern of Post Office savings.The study has tried to reveal the obstacles and opportunities of Post Office savings in north Coimbatore District. The study has also tried to analyze and unfold the avenues for better understanding of Post Office savings at different levels of income group in north Coimbatore.

REVIEW OF LITERATURE
A lot of studies on Post Office savings have been carried out by the researcher. Some studies regarding the topic are quoted in subsequent lines:

Chitranka Dalakoti and Dr. P. K. Pathak (2010) who made an analysis on a Study of Impact of Household Savings and Investment Behaviour on the Economic Development of Uttarakhand. They examined that the households are good saver in general under this study. A high majority saves regularly from their monthly income with main motives to save for their retirement, education and marriage of their children.

Dr. Hiram Jain and Ruhika Kothari (2012) examined investor attitude towards Post Office deposits schemes in Udaipur District, Rajasthan. They highlighted that demographic factors have no significant influence over sources of awareness, majority of the respondents invest in Post office deposit schemes for the purpose of safety and security, and the major problems of the Post office schemes are low rate of interest.

B. Saranya and G.B. Karthikeyan (2014) made an analysis on Investor behavior towards Post Office savings Schemes, they highlighted that the age groups of the investors play an important role in the selection of investments. The investment objectives may tend to vary with the variations in the age group of the investors. For instance investors in the age group of 50 years and more do not like to take higher risks while making investments and instead they may prefer to invest in risk less and safe investments like bank deposits.

International Journal of Advance and Applied Research
www.ijaar.co.in
ISSN - 2347-7075 Impact Factor - 7.328
Peer Reviewed Bi-Monthly
Vol.10 No.3 Jan - Feb 2023

Health Insurance Industry in India

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ABSTRACT
Nature is uncertain and unpredictable. The same is true with the life of an individual which is surrounded by risks and uncertainties in this volatile world. Any kind of misfortune may lead from minor to serious injuries or plane loss of life. Diseases too never knock our doors to enter our body. Money was and will never overly be worldly-wise to buy life or cure diseases till the existence of this world but to cope up with nonflexible times in our life and life of our near and dear ones when we leave for heavenly abode, insurance is the perfect solution. Generally, insurance is of two types: life insurance and non life insurance or unstipulated insurance. The present paper is a struggle to outline the current picture of health insurance sector in India which is a part and parcel of unstipulated insurance.
Health insurance sector in India has gained huge escalations since liberalization due to introduction of private health superintendency financers, increase in health consciousness among all sections of the society, increase in income of the households, price and service competition between health insurers and sparsity of bureaucratic vein in health insurance employees.

Key terms: General insurance, health insurance, liberalization, health consciousness.

INTRODUCTION

Individual and family life is generally peaceful unless health problems arise that are indeterminate and whose occurrence cannot be predicted. Needs such as the desire to own a house or a car or some other instrument of social status or other commodity of comfort may be postponed if the family does not have sufficient savings and limited sources of income. However, the situation is different for unforeseen medical obligations that require an immediate cash flow and negatively affect the family's savings.

Financial obligations for medical reasons can certainly frustrate a family's long-term financial goals, which may include children's education or marriage and retirement planning, in addition to the desires mentioned above. One may ask how to overcome such situations, and the answer is none other than health insurance, which helps in maintaining good health of a person and a family without causing a financial crisis and affecting financial stability.

Health insurance is a general insurance product that covers the cost of medications and surgical procedures of an insured, which can be an individual, a family or a group of people. It is an arrangement in which individual, family, or group purchases health insurance coverage in advance by paying a fee called a premium. In other words, health insurance is an arrangement that helps delay, defer, reduce, or avoid payments for an insured's medical expenses. The insurer provides either cashless treatment for illnesses or reimbursement for medical expenses incurred under the policy at one of the network hospitals throughout the country.

OBJECTIVE OF THE STUDY

1. To study the concept and structure of health insurance in India.
2. To describe the sector wise distribution of health insurance in India.
3. To identify the key areas for improvising this sector.

LITERATURE REVIEW

AN EMPIRICAL STUDY ON CONSUMER'S PERCEPTION TOWARDS HEALTH INSURANCE IN COIMBATORE CITY

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ABSTRACT
Health insurance is an insurance coverage purchased in advance by an individual or a group after paying a fee called premium'. It is a complimentary financing mechanism for enhancing access to quality health. Health insurance is one of the products offered by the general insurance companies as well as by life insurance companies in India. Health indicators of a nation are assessed through parameters like infant mortality, maternal mortality rate, life expectancy, birth and death rate. India recorded notable achievement in all the parameters since independence. This paper attempts to know the perception among the customers towards Health Insurance of various service providers and to find out customers purpose and various factors for purchasing Health Insurance. A survey method with structured questionnaire using likert scale given to the sample of population. Single cross sectional and descriptive research design was used to find out customer's perception towards Health Insurance. This paper makes a precious involvement known the fact that there was only unsatisfactory researches commerce with the customer's perception towards Health insurance.
Keywords: Consumer's perception, Healthcare Industry, Health Insurance.

1.1 INTRODUCTION AND PROBLEM DISCUSSION

Health and health care need to be distinguished from each other for no better reason than that the former is often incorrectly seen as a direct function of the latter. Heath is clearly not the mere absence of disease. Good health confers on a person or groups' freedom from illness - and the ability to realize one's potential. Health is therefore best understood as the indispensable basis for defining a person's sense of well being. The health of populations is a distinct key issue in public policy discourse in every mature society often determining the deployment of huge society. They include its cultural understanding of ill health and well-being, extent of socio-economic disparities, reach of health services and quality and costs of care and current bio-medical understanding about health and illness. Healthcare has emerged as one of the fastest growing sectors in India. Health insurance is an insurance against the risk of incurring medical expenses among individuals. By estimating the overall risk of health care and health system expenses, among a targeted group, an insurer can develop a routine finance structure, such as a monthly premium or payroll tax, to ensure that money is available to pay for the health care benefits specified in the insurance agreement. The benefit is administered by a central organization such as a government agency, private business, or not-for-profit entity. The Indian health insurance industry was primarily dormant before the opening up of the market for private players. It is only after the privatization of the health insurance market and introduction of the insurance regulator that one has seen rapid growth in this segment. The growth is also fueled by the complexities and challenges within the health care market. The health needs of the population are majorly funded through private means and different options are being explored for financing of health care in the Indian context.

MARKETING PROBLEMS OF WOOD PRESSED EDIBLE OIL PRODUCERS IN COIMBATORE DISTRICT

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Abstract

Edible vegetable oils include the majority of the fatty acids, vitamin E, and numerous phytochemicals that are necessary in the human diet on a daily basis to enable the necessary physiological processes. These nutrients can be found. Natural plant oils extracted through wood pressing are becoming increasingly popular as consumers become more health conscious and interested in the potential health advantages of these oils. There is a large selection of uncommon edible plant oils available on the market; yet, there is still a lot of mystery around their quality and composition. The difficulty in the market for wood-pressed edible oil that exists today is not only connected to the production method, but also to the marketing strategies that are used. As a result, it is essential to do research into the nature of the marketing methods utilised by these competitors. As a result, the goal of this inquiry is to assess the marketing challenges that the producers of wood-pressed edible oil in the Coimbatore area are facing in order to better serve their customers.

Key words:
Human Diet, Wood Pressed Edible Oil, Marketing Problems.

Introduction

According to Peter F. Drucker, "the purpose of business is to create a customer," and the ultimate goal of any activity in any healthy system, be it capitalism or socialism, is to ensure that the satisfaction of the system's consumers is achieved. As a result of the fact that customers are an essential component of the economic machine, it makes perfect sense for academics to concentrate their efforts on gaining an in-depth knowledge of consumer behaviour. The purpose of modern marketing is to determine the requirements of certain consumer groups and to meet those requirements in ways that are superior to those of the other companies in the marketplace. Therefore, doing research and performing an analysis of consumer behaviour is an essential component of every marketing campaign. The idea that one should consider the product from the perspective of the consumer and offer them with what they desire rather than what they feel they need is essential to the subject of consumer behaviour. One should supply them with what they want rather than what they believe they need. When analysing consumer behaviour, some of the aspects that are taken into consideration are the things that individuals buy, where they buy those things, and how frequently they buy those things. Conducting research on customers is essential since increasing one's market share can be accomplished by gaining a deeper comprehension of the factors that influence consumer purchasing decisions.4 When marketers have a better understanding of the psychological and social influences on consumers, they are better able to predict how consumers will react to new product releases, changes in pricing, and advertising campaigns. Therefore, having a solid understanding of customer behaviour makes it much simpler to analyse the market and devise strategies that are successful. Discovering new market opportunities, providing more precise market segmentation and meaningful product differentiation, and developing marketing strategies with consumer responses as a major variable all benefit from having a comprehensive understanding of the economic, psychological, and sociological characteristics of consumers, in addition to their motivations, attitudes, cognitions, and personalities. As a direct consequence of this, the focus of the marketing strategy is on the final consumer. The examination of consumer behaviour should therefore serve as the starting point for any marketing strategy.

Journal
of the
Oriental Institute
M.S. University of Baroda
ISSN: 0030-5324

MARKETING STRATEGIES OF THE PRODUCERS OF WOOD PRESSED EDIBLE OIL IN COIMBATORE DISTRICT

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Abstract
Due to the fact that many of the country's original oil mills are still in operation, the market for wood-pressed edible oil is extremely robust in India, making it one of the most lucrative marketplaces in the world. The market for edible oil in India has a value of USD 20.5 billion in 2020, and a report by Mordor Intelligence estimates that it will increase at a compound annual growth rate of 6.7% between the years 2021 and 2026 solely owing to the fact that health concerns are becoming more prevalent. The use of natural oils that have not been refined is expected to become increasingly common in Indian households, which the report predicts would lead to an increase in demand for edible oils that are created through the process of wood pressing. The demand for edible oil that has been created through the process of pressing wood is expanding not just in India but also in other places. This need is not limited to India. The purpose of this study is to uncover the marketing methods that producers of wood-pressed edible oil employ, and it has been discovered that these strategies are connected with the demographic profile of the producers.
Key words: Wood-Pressed Edible Oil, Health, Marketing Strategies

Introduction

The oil seeds are subjected to pressure in order to extract the oil from the wood. During the process of extracting the oil, none of the oil's flavour, aroma, or nutritional value are altered in any way. This includes the increased phenolic content of the oil. Some examples of nutritionally significant bioactive components in wood-pressed oils are tocopherols, sterols, carotenoids, and phospholipids with the ability to oxidize. These components are either partially removed from refined oils or destroyed during the process of industrial refining of oils. Wood-pressed oils have been shown to have a nutritional advantage over refined oils. The oil that is extracted from wood has a wide variety of applications due to the fact that it is naturally high in cholesterol and does not include any trans-fatty acids. The nutritional and medicinal characteristics of the original seed are preserved in oil that has been extracted through the use of a wood press. Since oils had to be extracted from wood in the ancient world, people have always placed a high premium on them due to the fact that they are beneficial to one's health both nutritionally and therapeutically. People used to bring an empty container with them to oil merchants in order to make retail purchases of wood-pressed oil. This practice began around fifty years ago. The seeds are crushed in a wood crusher that was fashioned from an East Indian walnut tree, and the oil is extracted using a very large stone that is squeezed using bullocks to turn it. Producing oil through the use of a wood press has been done in this way for generations. When compared to oils that were extracted at higher temperatures, those that were pressed at room temperature maintained a greater amount of their nutritional worth as well as their flavour. These oils do not require any form of refining process since they are already of the highest quality. The consumption of this oil by our ancestors contributed to the length and quality of their lives since it bolstered their physical and immune systems and increased their stamina.

Contents lists available at

Journal of Photochemistry & Photobiology, A: Chemistry

journal homepage:

A simple triphenylamine based turn-off fluorescent sensor for copper (II) ion detection in semi-aqueous solutions

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ARTICLE INFO

Keywords:
Triphenylamine
Schiff base
Cu^{2+} sensor
Fluorescence
DFT

ABSTRACT

An efficient donor triphenylamine aldehyde Schiff-base with p-toluene sulfonyl hydrazine fluorescent probe (TPA-PTH) was synthesized and characterized by various spectroscopic techniques. The probe TPA-PTH displayed drastic color changes with Cu^{2+} ions over metal ions in aqueous environment with a fluorescence-off mechanism. The detection limit of Cu^{2+} was found to be 1.25×10^{-8} M by using the equation LOD = K × SD/S. The 2:1 binding stoichiometric mode of TPA-PTH with Cu^{2+} ion was further tested by HR mass and Job's plot analyses. Furthermore, the proposed probe has been effectively applied to determine the trace amount of Cu^{2+} ions in different water samples with 96%–98% recoveries. The sensing mechanism of TPA-PTH was further investigated by Density Functional Theory (DFT) calculations using a Gaussian 16 program. DFT calculations were theoretically supported the experimental findings.

1. Introduction

Copper (II) ions also received significant interest among many transition metal ions [1–4]. On the one hand, as a crucial aspect of a diverse variety of enzymes, copper is the third most abundant metal ion in human bodies and other physiological process in species ranging from bacteria to mammals [5,6]. In the meanwhile, there are a variety of human clinical symptoms and signs that can be triggered by excessive consumption, like chronic fatigue, anxiety, major depression, hysteria, psychosis, Parkinson's disease, schizophrenia, etc. [7,8]. Thus, it is substantial to develop the techniques for selective recognition of copper (II) ions in environmental and biological samples received significant consideration in modern centuries.

Compared with the existing analytical techniques of copper (II) ions like cold vapor-atomic absorption spectrometry (CV-AAS), anodic stripping voltammetry (ASV), cold vapor-atomic fluorescence spectrometry (CV-AFS) and inductively coupled plasma emission or mass spectrometry (ICP-ES, ICP-MS) involve high-cost instrumentation and tedious procedure [9–11]. While, the fluorescence spectroscopic techniques are many benefits due to cheap, non-harmful analysis, high sensitivity and selectivity for sensing of copper (II) ions and the excellent cell permeability of fluorescent sensors also makes them ideal for use in biological systems [12,13]. However, with a d^9 structure copper (II) is paramagnetic, which has a good fluorophore quencher [14]. Turn-on ratiometric fluorescent receptors for copper (II) [15,16] are thus difficult to create. Special attention has been drawn to ratiometric fluorescent probes, as they can be used to evaluate the specific metal ion concentration with a constructed matrix effect correction [16,17].

Based on the literature survey [18–20], we have designed and developed a novel fluorescent dye by combining triphenylamine act as fluorophore and p-toluene sulfonyl hydrazide act as a chelating group in the present work. Both fragments are connected by a C = N bond to form a chelation complex for metal ions. Also, the presence of the C = N bond gives the flexibility and free rations between triphenylamine and hydrazide ring systems, facilitating the formation of the chelation complex with the incoming metal ions (Cu^{2+}) and producing the optical signals.

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Received 17 November 2021; Received in revised form 14 January 2022; Accepted 5 February 2022
Available online 8 February 2022
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Contents lists available at

Materials Today Communications

journal homepage

An anti-inflammatory controlled nano drug release and pH-responsive poly lactic acid appended magnetic nanosphere for drug delivery applications

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ARTICLE INFO

Keywords:
Curcumin
Poly lactic acid
Hydrazone
Magnetic nanosphere
Hydrazone linkage reactive responsive
Targeted drug delivery

ABSTRACT

The drug delivery based on reactive oxygen species (ROS) sensitive saponin (SA) layered magnetic iron oxide nanoparticles (Fe_3O_4 NPs) containing curcumin (CUR) encapsulated in PLA-PVA magnetic nanospheres (Fe_3O_4@SA-CUR-PLA-MMS) were synthesized and reported in this research article. The prepared nanospheres were characterized through various spectroscopic techniques such as Fourier Transform Infrared (FTIR), X-ray diffractometer (XRD), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and Thermogravimetric Analysis (TGA) analysis. Drug release profiles demonstrated that the Fe_3O_4@SA-CUR-PLA-MMS released Curcumin (CUR) based on pH, even in the presence of ROS and hydrogen peroxide (H_2O_2). Under slightly acidic environments of pH 5.2–7.4, the ROS-responsive polymeric nanocarriers were present in the drug release of CUR from Fe_3O_4@SA-CUR-PLA-MMS that was pH-induced. Further, Fe_3O_4@SA-CUR-PLA-MMS showed better cytotoxic properties as well as inhibited colony formation from model cancer cells including HeLa and A549 cells with IC_{50} values of 12.2 and 11.7 μg/mL respectively, at 24 h. Further proof of the prepared nanospheres cytotoxic activity towards cancer cells at 15 μg/mL for 24 h was supplied by fluorescence microscopy images obtained with the aid of AO/EB, MTT assays, fluorescence labeling microscopy, and colony formation assays suggested that the Fe_3O_4@SA-CUR-PLA-MMS might be a viable anticancer drug for numerous biomedical applications. In conclusion, the current in vitro study presents a potent nanostructured-based approach for enhanced cancer theranostics that has to be further investigated.

1. Introduction

One of the primary barriers to the effective treatment of many diseases is the inability to deliver therapeutic medicines to specific tissues or cells via blood circulation [1]. Drug delivery methods (DDSs) that are sophisticated and controlled can deliver therapeutic molecules to the desired spot while minimizing negative side effects. Some examples of such DDSs are dendrimers, liposomes, nanocapsules, hydrogels, nanofibers, and hydrogel nanoparticles (sometimes referred to as polymeric nanogels) [2–4]. Strategies for drug delivery using nanoparticles take advantage of important characteristics such as high surface area, the efficacy and safety of encapsulated cargo, biodegradability, and nanoparticles that can pass cellular membranes, and others [5]. The introduction of nanotechnology has had a positive impact on the efficacy and safe delivery of numerous chemotherapeutic medicines to tumor sites. Cancer-related conditions like cystic fibrosis, asthma, and atherosclerosis have all been linked to inflammation, which is the immune system's initial reaction to infection and/or irritation [6]. The existence of oxidative stress (i.e., the overproduction of oxidants such as OH^- and $ONOO^-$ from H_2O_2 and ^-NO, respectively) and a decrease in pH are two of the most distinguishing features of inflammation [7]. Reactive Oxygen and Reactive Nitrogen Species such as H_2O_2 and NO interact with various biomolecules including DNA, proteins, and lipids, which can result in cell death [8–10]. Further, many conventional

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Received [illegible] 2022; received in revised form 14 December 2022; Accepted 7 January 2023
Available online 9 January 2023
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Contents lists available at

Pharmacological Research - Modern Chinese Medicine

journal homepage:

An effective biodegradable curcumin loaded magnetic microsphere: Applications for drug delivery and cancer treatment

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ARTICLE INFO

Keywords:
Curcumin
Microspheres
Ferrite
Anticancer
Biodegradable
Drug Delivery

ABSTRACT

Introduction: The non-specific delivery of drugs to tissues is one of the major problems in traditional chemotherapy that creates problems, importantly cytotoxicity to healthy cells. A drug carrier can be designed and synthesized using a variety of techniques that allow the drug to be delivered to a specific target site with sustained release. Here, we designed novel polymer-encapsulated magnetic microspheres as drug carriers that enable site-specific and controlled drug delivery to improve therapeutic outcomes. In our study, we developed a novel emulsion-based technique to produce curcumin-loaded polymer-encapsulated magnetic microspheres.

Methods: The method involves the preparation of a binary emulsion system (water-in-oil-in-water (W1-O-W2) followed by evaporation of the continuous aqueous phase to produce magnetic polylactic acid (PLA) microspheres containing curcumin (CUR) and ferrite magnetic nanoparticles (FA-MMS). The construction of the prepared Ferrite@FA-CUR-PLA-MMS drug carrier was characterized using various spectroscopic and microscopic techniques.

Results: The prepared Ferrite@FA-CUR-PLA-MMS drug displayed a unique and constant pH-dependent curcumin release from the drug carriers. The cytotoxicity determination of the Ferrite@FA-CUR-PLA-MMS drug by MTT assays confirmed a low cytotoxic effect on A549 and Hela cancer cells with a minimum inhibitory concentration (IC_{50}) for A549 cells at 15 μg/ml for 24 h and for Hela cells, the IC_{50} value was 12 μg/ml. After 24 h, the IC_{50} values for A549 and Hela cancer cells were found to be 10.2 μg/ml and 8.8 μg/ml, respectively. After 10 days of incubation, the drug exhibited total destruction of the A549 and Hela cancer cells.

Discussion: Our findings have greater implications for the potential use of magnetic nanoparticles in cancer chemotherapy. Further investigations on the application of this drug delivery system could be extended to the site-specific and controlled delivery of other cancer chemotherapeutic agents.

1. Introduction

Polymeric magnetic microspheres have recently attracted a lot of attention in the biotechnology and biomedical engineering fields due to their prospective uses in a number of areas, including enzyme immobilization, biochemical tests, cell isolation, RNA and DNA refinement, protein and immunoassays, drug targeting and administration, hyperthermia for cancer therapy, and so forth [1–5]. Magnetic polymeric microspheres with an inorganic magnetic core and a polymer shell have been created using a variety of techniques. These processes start with the creation of iron oxide nanoparticles, which are then enclosed or adsorbed inside polymeric microspheres [6,7].

Although the immune system is involved in a variety of activities, including the body's first response to infection and/or irritation, inflammation has been linked to a number of disorders, including cancer, atherosclerosis, asthma, and cystic fibrosis [8,9]. Among the numerous carriers used in drug delivery systems (DDS), mesoporous inorganic materials [10–13], microspheres [14–17], fibrous membranes [18–20], gelatin [21,22] and polymeric scaffolds [23–27] have all been extensively used to encapsulate drugs within the DDS system while also improving drug stability and bioavailability [28–30]. The processes and

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Received 18 November 2022; Received in revised form 5 January 2023; Accepted 11 January 2023
Available online 18 January 2023
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Contents lists available at

Applied Surface Science Advances

journal homepage:

Green synthesis of CdS Quantum dots for photocatalytic and anti-corrosive applications in aqueous media

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ARTICLE INFO

Keywords:
CdS Quantum dots
Green synthesis
Photocatalysis
Corrosion inhibition
Surface analysis

ABSTRACT

Inorganic pollutants are the leading cause of water pollution, which harms human health and the environment. The most highly efficient nanoparticles with enhanced photocatalytic activity are semiconductor quantum dots (QDs). The heterogeneous photocatalysis using UV radiation on quantum dots is a fascinating technique for treating polluted sewage with a naturally available plant-based product. In this study, CdS QDs were synthesized using a facile green synthetic protocol in the presence of Coccinia grandis (CG) and Punica granatum (PG) fruit sap as capping and stabilizing agents. XRD, HR-TEM, FT-IR, UV-DRS, and photoluminescence spectroscopy were used to analyze the synthesized CdS QDs. The photocatalytic degradation activity of CdS quantum dots was performed against anionic and cationic dyes under UV light irradiation. The results revealed that PG-capped CdS QDs have the best photocatalytic activity compared to CG-capped CdS QDs.

Further, the pseudo-first-order model is used to analyze the kinetics studies. Moreover, the electrochemical measurements of pure zinc and CdS QDs coated Zn (Zn/CdS QDs) plate were tested in three electrolytes: sodium chloride, potassium hydroxide, and hydrochloric acid, which demonstrated the corrosion inhibition ability of prepared CdS QDs. The electrochemical impedance spectra, Tafel plot, and in-situ SPM analysis depict the improving corrosion resistance of the Zn metal plate due to the prepared CdS QDs coatings. Based on the results, the prepared CdS QDs by the green method can be a potential candidate in the water purification and corrosion resistance field.

1. Introduction

Low-dimensional (0-D) nanostructured quantum dots (QDs) are inorganic materials that consist of atoms belonging to group II and VI elements or group III and V elements that are encased in a nanoscale range of 10 nm [1,2]. Integrating nanotechnology with materials enhances the electronic, optical, and catalytic properties. Quantum confinement substantially changes the materials' chemical, physical, and electrical characteristics. When a semiconductor is exposed to light with higher energy ($h\nu$) than E_g, the electron moves from the valence band region to the conduction band region, which results in the valence band being vacant [3]. As a result, it is considered that this hole behaves like a particle, with its positive charge and effective mass. [4]. Quantum dots are promising for catalyst application since their huge surface-to-volume ratio [5]. Moreover, the CdS quantum dots have unique properties, such as stability, self-cleaning, and high photocatalytic degradation. A wide range of semiconductors with suitable band gaps have been developed for various applications. In addition, metal sulfides (such as CdS, SnS, and MoS_2) are active semiconductors that can use solar energy [6–7]. Although a CdS semiconductor with a narrow band gap (2.4 eV) can absorb more visible light, it suffers from rapid charge recombination, severe photo-corrosion, and low surface area, restricting its wide application. To overcome these drawbacks, numerous efforts have been made. Because of their exposed active sites, quantum confinement, and unique interfacial properties, CdS quantum dots (QDs) are considered ideal photocatalysts. Thus, a facile and

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Received 27 July 2022; Received in revised form 25 November 2022; Accepted 25 December 2022
Available online 6 January 2023
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A Review of Artificial Intelligence Techniques for Analysing and Making Recommendations Based On User Preferences

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Abstarct

Successful companies in today's competitive market know their customers and tailor their products and services to meet their needs. In order to make more informed decisions about product creation and marketing, businesses must first understand how their target demographics think. Thus, it is important for businesses to learn about their customers' product preferences so they may better promote their own items. Customers with low product expertise may have trouble endorsing the goods if they aren't aware of the additional sustainability components. In recent days, the Machine Learning (ML) and Deep Learning (DL) models are best suited models to build a predictive preference model to recommend the suitable products for customers. This paper presents an inclusive analysis of customer preference models and recommend the products using ML and DL algorithms. Initially, a cursory analysis of several consumer preference models based on ML and DL models developed by many researchers is performed. Then, a comparative analysis is conducted to learn about the problems with these algorithms and provide a new way to enhance the preference capacity to make sound product recommendations to customers.

Keywords: Customer Preferences, Machine Learning, Deep Learning, Preference Model, Preference ability

1. Introduction

These days, customers and businesses alike face a double-edged sword in the form of the plethora of accessible options for products and services. Customers benefit from a wide range of options, but must shoulder more of the cognitive load associated with selecting the best one. On the flip side, the open market system places huge obstacles in the way of businesses gaining a part of the market [1] due to the difficulties of recruiting new clients and keeping the loyalty of existing ones. So, the product must be delivered in accordance with the tastes of the target market.

JOURNAL OF OPTOELECTRONICS LASER ISSN: 1005-0086

Volume 41 Issue 9, 2022

Customer Churn Prevention in Telecom Industry Using Dwhbi and Accelerated LR Model

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ABSTRACT

In recent days, telecom industry plays a vital role in our daily life. During corona pandemic time entire world depends on the telecom services domain. But telecome industry has been facing many surivival problems in the global market since last 15 years due to heavy competition between competitors. To stand in this field, service providers have to understand the complete customer needs and provide the efficient services to stop the customer migration from one service provider to another service provider. Customer churn is one of the most critical problem faced by all the industries.. The objective of customer churn prevention is to find the subscribers that are ready to move from the current service provider in advance. The high volume of data generated by telecom industry , with the help of data ware housing and business intelligence implementation would become the main asset for predicting the customer churn. To prevent the churn many models and methods are used by researchers.

This research paper is using DWHBI and Accelerated LR model to predict the churn result.

DWHBI model used to get the historical and current data information based on the mapping transformation logics.

The Accelerated LR Algorithm boosting the model performance and assume the existence of a linear relationship between likelihood of the predicted event and the independent variables.

I. INTRODUCTION

India is the world's 2nd largest telecommunication marke and customer churn is a term, which is used to mention the customer movement from one service provider to another service provider. Literature discovers following type of customer churns.

A) Volunteer churn - Customer quit the contract and move to the next service provider

B) Non – Volunteer churn - Company quit the service to a customer

C) Rotational Churn - Customer can terminate the contract without any prior knowledge of both parties (Customer and Company). Sometime it call it as Silent churn.

II. LITERATURE SURVEY

Bo Jin, Jia shi [1]proposed a new set of approach called PBCCP neural network algorithm which executes particle classification optimization (PCO) and particle fitness calculation (PFC). PCO classifies the categories according to their fitness but PFC calculates the fitness values of each forwarding training process of Back Propagation NN (Supervised Learning Algorithm). Here gradient descent is used to minimize the error function. The actual performance of BP on a specific problem is dependent on this input data. This experiment demand us to do multiple time until we reach the desired result.

$$Wx = Wx - a\,(\delta \text{ error} / \delta Wx)$$

Asif & Kadan[2]discovered the approach based on machine learning and big data platform. In order to measure the performance they used Area Under Curve (AUC) and Social Network Analysis (SNA). Here SNA has given the significant performance compared to AUC. This model was developed and tested through hadoop framework environment which handles large set of dataset. This model experimented with 4 Algorithms: Decision Tree, Random Forest, Gradient Boosted Machine (GBM), Extreme Gradient Boosting (XGBOOST). Here the data model needs to be updated each time. They concluded XGBOOST gives the best result with 93% accuracy.

Pamina J, Beschi Raja, Sathya Bama [3] divulged the method which based on machine learning process and the objective of this churn prediction is to perform binary classification with subscriber records and to figure out who are likely to cancel the contract in near future. Performance of the model evaluated by various measures like Accuracy, Recall, Precision, F-Score, ROC & AUC. This model experimented with KNN model, Decision Tree, Random Forest model, NN model. After experimental they found decision tree is the best model for real time business problem. Here they additionallyPCA model for preprocessing and reduce the dimension of the data which is important from the whole dataset.

Maurus Riedweg , Pavol Svaba and Gwendolin Wilke [6] discovered the semi auto predictive analytics and campaign management. They have chosen large data set from switzerland telecom company and they perfomed the calculation based on Naive bayes prediction model and corresponding nomogram values and this prediction accuracy exceeded decision tree approach as well as the currently used bench mark.

DOI: 10.050086.2022.09.16

TELEMATIQUE
ISSN: 1856-4194

Volume 22 Issue 1, 2023
569 - 582

Acute Lymphoblastic Leukemia Prediction using Classification

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Received 25/01/2023 **Accepted** 18/02/2023

Abstract

Leukemia's are cancers of the hematopoietic stem cells that cause the bone marrow to be replaced by neoplastic cells in a diffuse manner. Leukemia has been linked to a variety of potential causes, including genetic and environmental factors, infections, and immunodeficiency conditions. Based on the cell type involved, the blast cells' level of maturity, and the leukemia's swiftly deadly course in untreated individuals, leukemia's are categorized. The primary objective of this work is to predict Acute Lymphoblastic Leukemia (ALL) image classification using a proposed EHO_ LLRBFNN classification algorithm. The proposed algorithm is compared with popular existing classification algorithms such as k-Nearest Neighbor (k-NN), Naïve Bayes (NB), Support Vector Machine (SVM), and Elephant Herd Optimization (EHO). From the result observation, it is noticed that the proposed EHO_ LLRBFNN algorithm provides high Precision, Recall, F-Score, Accuracy, and minimum error rate than existing algorithms.

Keywords: Medical Images, Leukemia, Acute Lymphoblastic Leukemia (ALL), Classification.

1. INTRODUCTION

Medical images in digital format facilitate in-depth analysis resulting in a more accurate diagnosis. Leukemia's are cancers of the hematopoietic stem cells that cause the bone marrow to be replaced by neoplastic cells in a diffuse manner [2] [6]. The leukemic cells typically spread into the blood, where they can be observed in significant amounts. These cells may also invade the lymph nodes, liver, spleen, and other bodily tissues. Although the most apparent sign of leukaemia is an abundance of aberrant cells in the peripheral circulation, it is important to keep in mind that leukemias are primarily bone marrow illnesses [16].

Leukemias account for roughly 2% of all cancers and affect about 9 in 100,000 persons annually [5]. All leukaemia patients have a 5-year survival rate of about 42%, but this rate varies substantially depending on the kind of leukaemia. The disease strikes men more frequently than women, and white people more frequently than members of other racial or ethnic groups. Approximately 2000 cases are diagnosed each year in the US [1]. Its peak occurrence occurs between the ages of 2 and 6. This age peak has historically occurred at

Int J Syst Assur Eng Manag
https://doi.org/10.1007/s13198-023-01871-x

ORIGINAL ARTICLE

A combined deep CNN-lasso regression feature fusion and classification of MLO and CC view mammogram image

V. Sridevi[1] · J. Abdul Samath[2]

Received: 11 September 2021 / Revised: 26 January 2022 / Accepted: 24 January 2023
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Abstract Breast cancer is the most frequent disease among women, and it is a serious threat to their lives and well-being. Due to high population expansion, automatic mammography detection has recently become a critical concern in the medical industry. The emergence of computer-assisted systems has aided radiologists in making accurate breast cancer diagnoses. An automated detection and classification system should be implemented to prevent breast cancer from spreading. Breast densities vary widely among women, which causes missed cancers. In the case of breast density, the deep CNN algorithms can significantly reduce radiologist workload and improve risk assessment. The goal of this paper is to offer a deep learning strategy for identifying MLO and CC views of breast cancer as malignant, benign, or normal using an integration of deep convolutional neural networks (CNN) and feature fusion of LASSO (Least Absolute Shrinkage and Selection Operator) regression. The proposed method comprises pre-processing, data augmentation, feature extraction, feature fusion, and classification. The generated features were fed into LASSO regression for the best prediction in this system, which utilized CNN for feature extraction. The fused features were then transferred to CNN's fully connected layer for mammography classification. In our experiment, the publically available dataset CBIS-DDSM (Curated Breast Imaging Subset of DDSM) was employed. The proposed work gained an accuracy of 99.2%, specificity of 98.7%, AUC of 99.8%, sensitivity of 99.4%, and F1-score of 98.7%, which is higher than multi view CNN without a feature fusion based system.

Keywords CNN · LASSO · Mammogram cancer classification · Regression · Feature fusion · Breast cancer

Abbreviations

CNN	Convolution neural network
MLO	Medio-lateral
CC	Cranio-caudal
DDSM	Digital database of screening mammography
CBIS-DDSM	Curated breast imaging subset of DDSM
LASSO	Least absolute shrinkage and selection operator
CAD	Computer aided diagnosis
ROC	Receiver operating characteristic
AUC	Area under ROC curve
SVM	Support vector machine
ReLU	Rectified linear unit
ADASYN	Adaptive synthetic sampling
TP	True positive
TN	True negative
FP	False positive
FN	False negative
FC	Fully connected layer

1 Introduction

Due to the architecture of the human body, Women are easily influenced to breast cancer. According to the American Cancer Society, the number of new breast cancer

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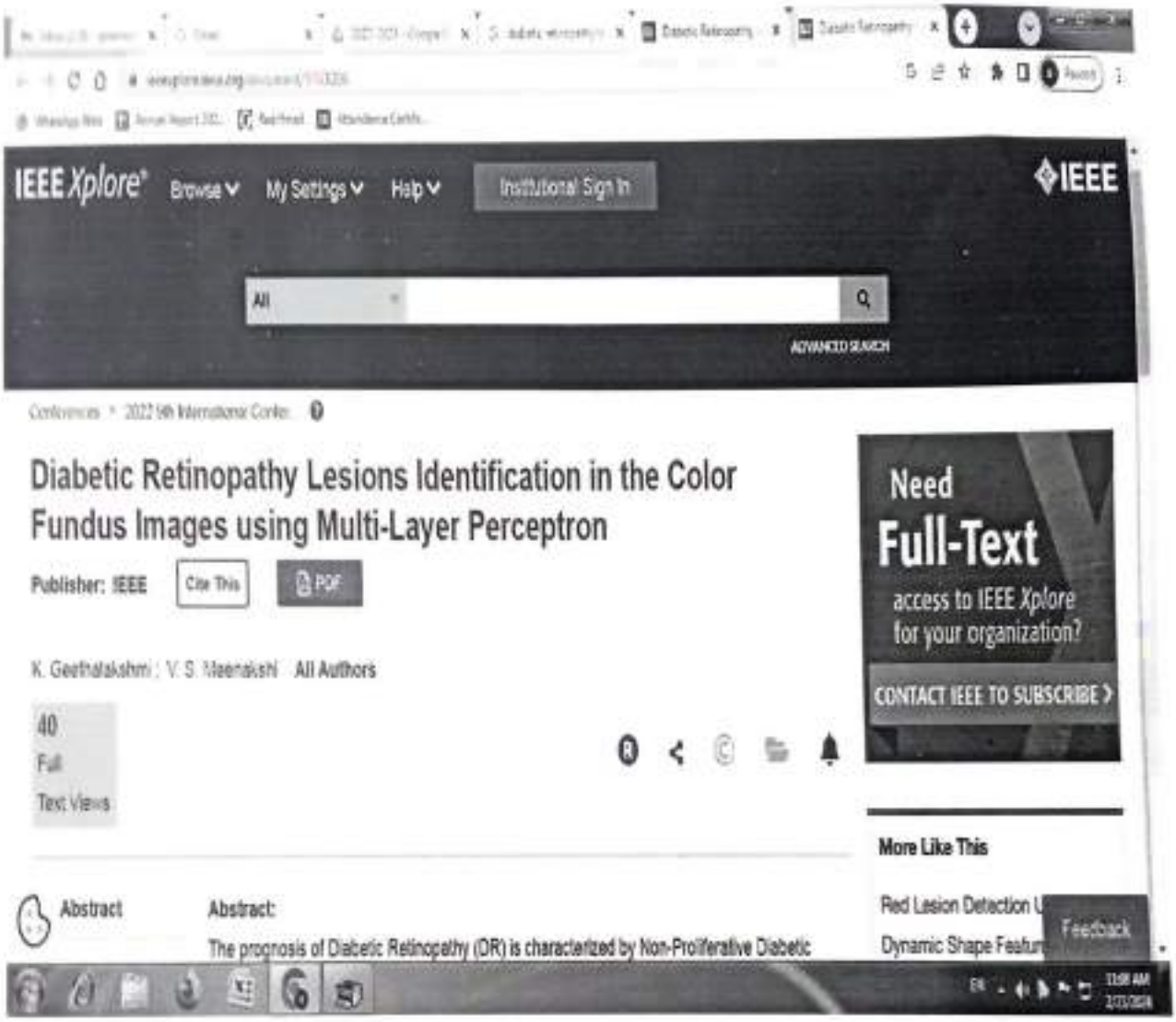
Published online: 27 February 2023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VOL. 18, NO. 4, FEBRUARY 2023 ISSN 1819-6608
ARPN Journal of Engineering and Applied Sciences
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MULTI-SCALE REGION-OF-INTEREST BASED DEEP LEARNING FOR FRUIT DISEASE IDENTIFICATION AND CLASSIFICATION

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ABSTRACT

Agricultural productivity is mainly affected by the different types of fruit diseases. To reduce such impacts, automated fruit disease identification and categorization model is vital. So, a Multi-scale Deep Learning (MDL) model was designed to identify and categorize the variety of strawberry fruit diseases. This model has an Adaptive Receptive Field Module (ARFM), a Bottleneck Block (BB), Depth-wise Residual Blocks (DRBs) and the Squeeze Excitation Residual Network (SE-ResNet) units to extract the Feature Maps (FMs) related to all disease classes. But, this model cannot partition individual fruit samples. Also, the number of fruits with multiple infections within a particular image was not easily captured. So, this article develops a Multi-scale Region-Of-Interest (ROI)-based DL model called (MRDL) to improve the accuracy of identification and categorization of a single fruit sample with a certain disease in a real-time scenario. This model is performed in 2 different phases. First, more robust features are extracted by the DRB, ARFM, and BB in the initial phase. Then, an ROI Fused (ROIF) unit, the SE-ResNet unit, a classification unit, and a mask unit are involved in the second phase. The ROIF unit obtains the FMs for all candidate ROIs using the candidate bounding boxes from the initial phase. The extracted FMs per sampled position are aggregated to get the fused FM, which is resized by integrating the attention strategy with the SE-ResNet unit. Those resized fused FMs are independently passed to the classification and mask units to classify the candidate bounding boxes and localize the infected pixels in the candidate ROIs, respectively. Finally, the test results exhibit that the MRDL model achieves 91.1%, 90.8%, and 91.6% accuracy on apple, citrus, and tomato disease databases, respectively compared to the classical models.

Keywords: segmentation, classification, multi-scale deep learning, squeeze excitation residual network, attention strategy, bounding box.

INTRODUCTION

India is ranked second in fruit production. Agriculture is the backbone of the Indian economy since it generates 18.5% of India's overall Gross Domestic Product (GDP) and offers the service to more than 52% of the population [1-2]. Owing to global warming, the varieties of fruit diseases tend to increase [3]. Such fruit infections are one of the most serious issues affecting agricultural production quality [4]. So, the identification and categorization of fruit lesions are the primary objectives to enhance agricultural productivity and quality for economic growth. It is critical to detect pathogens in fruits to supply high-quality goods. The conventional approach for fruit disease identification and categorization relies on exposed eye perception by professionals; however, in certain developing countries, counseling specialists are expensive and time-consuming due to their availability in remote places [5]. In contrast, with the broad availability of digital cameras, automated systems that process digital images of fruits and conduct a proper prognosis of fruit infections was established to increase the efficiency of identifying and categorizing the varieties of fruit diseases.

Generally, the automated systems involved many image processing and artificial intelligence algorithms to increase the quality of fruit images, obtain image characteristics and identify the infection of interest [6]. Artificial intelligence encompasses machine learning models (e.g., Support Vector Machine (SVM) [7], random forest [8], Artificial Neural Network (ANN) [9-10]), which exploit hand-crafted features for distinguishing and quantifying the diseased regions. There are many hand-crafted features [11] obtainable like texture, shape, etc. But, it is impossible to evaluate all types of features, as well as ambiguous to select suitable features. To combat these challenges, DL frameworks have been developed and outperformed the traditional algorithms in fruit disease identification and categorization [12]. Specifically, the Convolutional Neural Network (CNN) has established a significant efficiency in fruit picture classification processes.

The CNN can able to obtain visual information with no personal involvement and categorize a sample into a relevant category via a sequence of convolution and pooling procedures. Several deep learning frameworks using the CNN structure were developed for recognizing and categorizing fruit diseases. On the contrary, most prior CNN frameworks merely conduct a classification task, i.e., for a picture of fruit, it produces a unified category tag, defining whether a specified sort of illness occurs or what sort of infection it was [13]. A sample may include multiple diseased regions of one or more sorts of infections. In such a circumstance, it is preferable to localize the specific position of the diseased regions, giving detailed illness information and allowing further assessment of disease by both human specialists and automated systems.

According to the DL principle, Ilyas *et al.* [14] developed a Multi-scale Deep Learning (MDL) model-based semantic partition, which comprises a deep convolutional-based encoder-decoder structure to recognize and categorize the different strawberry fruit diseases, including the class of overgrown or infected

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JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

A REVIEW ON IMAGE SEGMENTATION ALGORITHMS FOR DISEASE DETECTION IN LEAVES AND FRUITS

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Abstract - The image segmentation is the process applied in order to fetch the significant objects from the given input image which in turn is used for further analysis. Image segmentation can also be coined as the technique of separating an image into different segments. Basically the segmentation is based on features such as pixel intensity value, gray scale, color, depth, brightness, texture, etc. Based on these there exists several image segmentation techniques. In this paper we present the review of the image segmentation methods.

Index Terms: - segmentation, clustering

I. INTRODUCTION

Image processing has an immense application in agriculture area. Detection of diseases at its earlier stage is much essential to avoid the huge loss. This can also help the farmers to safeguard them from the economical loss caused to them.

Studying the image understanding it and then extracting information from the image to accomplish an activity is considered as an important task and it is process of image segmentation. There is no need to process the entire image and only the required area of the image needs to be processed for further analysis. Segmentation is a process which is used for identification of such areas of interest. The image is made up of set of different pixels. The pixels which have related attributes are grouped together using image segmentation techniques. Pixels are grouped on the basis of the properties they have such as gray level, color, texture, motion, etc.,[1].

The segmentation focuses to limit the objects among all other and separating the image into significant illustrations. Apart from playing an important role in image processing the segmentation process forms the basis for feature extraction and image recognition. Based on certain criteria the given image is divided into number of segments. Many applications needs to process different areas of plants like leaves, fruits, vegetables etc., in order to identify the disease, identify the matured fruits and so on.
The main focus of this article is to update the researchers about the current segmentation techniques applied in the areas of disease detection in plants.

https://zenodo.org/records/6510667

Feature Extraction Based on GLCM and GLRM Methods on COVID-19 Dataset

N. Suganthi and K. Sarojini

Abstract COVID-19 epidemic had devastating effects on both the economic and social infrastructures of all countries in the world. Several researches are still being carried out in order to develop effective models for the diagnosis and treatment of COVID-19 patients. A COVID-19 infected person may experience dry cough, muscle ache, brain pain, fever, sore throat, and mild to severe respiratory illness. At the same time, it has a negative impact on the lungs. The severity of COVID-19 contamination over the lungs can be examined using X-Ray and CT scan images of the chest. The examination of the severity of disease is carried out by Manual characterization. However, it may lead to human error. To overcome this drawback, an exact and proficient indicative tool is highly required. Hence, this research provides a new topology for COVID-19 diagnosis using CT scan images. In this topology, features from the images are extracted using Gray Level Co-event Matrix (GLCM), Gray Level Run Length Matrix (GRLM). An automatic classification is carried out with supervised ML algorithms. In order to examine the effectiveness of the proposed model, an experiment was carried out on the COVID-19 Dataset. Various performance evaluation metrics are utilized to identify the best ML method.

Keywords COVID-19 · SVM · NB · DT · KNN

1 Introduction

COVID-19 is a widespread dangerous infectious disease, which is caused by severe respiratory syndrome. By December 2019, a coronavirus outbreak had been discovered in Wuhan, China. The outbreak of this COVID-19 has posed serious health and economic risks around the world. Fever, cough, muscle soreness, breathing problem,

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R. J. Kannan et al. (eds.), *Computer Vision and Machine Intelligence Paradigms for SDGs*, Lecture Notes in Electrical Engineering 967,
https://doi.org/10.1007/978-981-19-7169-3_25

Journal of Current Science and Technology, May-August 2023 Vol. 13 No. 2, pp. 205-220
ISSN 2630-0656 (Online)
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Cite this article: Sheeba, C. M., & Sarojini, K. (2023, May). Optimal feature selection and detection of sickle cell anemia detection using enhanced whale optimization with clustering based boosted C5.0 algorithm for tribes of Nilgiris. *Journal of Current Science and Technology, 13*(2), 205-220.
https://doi.org/10.59796/jcst.V13N2.2023.1737

Journal of Current Science and Technology

Journal homepage: https://jcst.rsu.ac.th

Optimal feature selection and detection of sickle cell anemia detection using enhanced whale optimization with clustering based boosted C5.0 algorithm for tribes of Nilgiris

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Received 23 May 2022; Revised 6 October 2022; Accepted 5 November 2022; Published online 15 July 2023

Abstract

Degradation of red blood cells (RBC) causes many diseases, like sickle cell anemia. Diagnosing this disease takes more time because peripheral blood samples must be examined under the microscope. Since the isolated RBC observation is subjective and high error rate leads to reduce the accuracy, the technology is needed to perform this approach. To fulfil these requirements, optimal feature selection and detection of sickle cell anemia using enhanced whale optimization with clustering based boosted C5.0 algorithm in tribes of Nilgiris is proposed in this manuscript. The input dataset is taken from real data set via non-government organization named NAWA (situated in Kotagiri). The reason behind of Nilgiri region is considered in this work is a collection of sickle cell anemia test results of the tribe people who lives in different areas of Nilgiri region. These images are pre-processed using wavelet packet transform cochlear filter bank method to eradicate the noises and to improve the superiority of image. After that, the features are extracted using force-invariant improved feature extraction method. To select the optimal features, enhanced whale optimization (EWO) algorithm is used. These optimal features are classified utilizing clustering based boosted C5.0 algorithm. The proposed method is activated on PYTHON. The proposed method shows 52.32%, 43.78%, 32.78% and 45.90% higher accuracy compared with the existing methods, such as RGSA-MLP-SCA, CRFA-SVM-SCA, AO-LSTM-SCA and BOA-CNN-SCA.

Keywords: *classification; clustering based boosted C5.0 algorithm; enhanced whale optimization; features selection; sickle cell anemia; sickle cell disease*

1. Introduction

Sickle cell anemia is a genetic disorder, it is categorized by a change in the shape of red blood cells (RBCs) from soft donut shape or half-moon shape to the crescent (Carden, Fasano, & Meier, 2020; Rajesh, Shajin, Rajani, & Sharma, 2022). Degenerated cells lack plasticity, block small blood vessels, impairing blood flow, which reduces the survival of red blood cells, finally it causes anemia (Woukam et al., 2020; Shajin, Rajesh, & Thilaha, 2020). The World Health Organization has designated this condition as a health priority. Without proper care, the lower oxygen levels of blood and blockages of blood vessel can cause persistent pain, severe anaemia, bacterial and recurrent infections, necrosis, clinical signs of thrombosis in internal organs, central nervous system disease, episodes of neurophysiological disease even patient's mortality

INTERVAL VALUED PYTHAGORAN FUZZY SOFT SETS AND THEIR PROPERTIES

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ABSTRACT

The Pythagorean soft set theory is a mathematical model for dealing with uncertainty and vagueness in (multi criteria decision making problems. In this paper, we introduce the concept of interval valued Pythagorean fuzzy soft set theory which is a combination of interval valued Pythagorean fuzzy set and soft set theory. Some operations such as complement, union, intersection, necessity and possibility operations are defined on the interval valued Pythagorean fuzzy soft set. Also some of their properties were studied.

KEYWORDS : Soft sets, fuzzy soft sets, Pythagorean fuzzy sets ,Pythagorean soft sets, Pythagorean fuzzy soft sets, interval valued Pythagorean fuzzy sets, interval valued Pythagorean fuzzy soft sets

1. INTRODUCTION

Soft set theory, a parametrization of objects has been introduced by Molodtsov [4] which helps in dealing with uncertainty. Later on Maji et al. [2] proposed the theory of fuzzy soft set. Atanassov [1] extended fuzzy soft sets to intuitionistic fuzzy soft sets. The characteristic that sum of membership and non membership degree in intuitionistic fuzzy soft sets are less than or equal to one is insufficient for multi criteria decision making problems. Hence Yager et al. [9] introduced the concept of Pythagorean fuzzy sets which satisfies the case. Since a crisp value cannot quantify the opinions made by experts in decision making, interval valued Pythagorean fuzzy set theory has been developed by Peng and Yang [6], some operations their properties were discussed in it.

In this paper, we propose interval valued Pythagorean fuzzy soft set theory which is a combination of interval valued Pythagorean fuzzy set and soft sets. Some basic operations were defined and its properties were discussed.

2. PRELIMINARIES

In this section, we recall some basic definitions such as Pythagorean fuzzy set, Pythagorean fuzzy soft set and interval valued Pythagorean fuzzy set.

Definition 2.1[9]: Pythagorean fuzzy set, A is defined as a set of ordered pairs over a universal set X given by $A = \{< x, \mu_A(x), \vartheta_A(x) > | x \in X\}$, where $\mu_A, \vartheta_A: X \to [0,1]$ are the degrees of membership and nonmembership of the element $x \in X$, respectively, with the condition that $(\mu_A(x))^2 + (\vartheta_A(x))^2 \leq 1$. Corresponding to its membership functions, the degree of indeterminacy is given by $\pi_A(x) = \sqrt{1 - (\mu_A(x))^2 - (\vartheta_A(x))^2}$.

Definition 2.2[4]: A pair (F,E) is called Pythagorean fuzzy soft set if a map $F : E \to P^U$ defined as $F_{u_i}(e_j) = \{(u_i, \zeta_j(u_i), \vartheta_j(u_i)): u_i \in U$ where P^U is the Pythagorean fuzzy subset of U and ζ, ϑ satisfies $\zeta^2 + \vartheta^2 \leq 1$ for all $u_i \in U$.

A pair (F,E) is termed as Pythagorean soft set and denote $F_{u_i}(e_j) = \{(u_i, \zeta_j(u_i), \vartheta_j(u_i))$ called as Pythagorean fuzzy soft number (PFSN) with $\zeta^2_{F(e_j)} + \vartheta^2_{F(e_j)} \leq 1$ for $\zeta^2_{F(e_j)}, \vartheta^2_{F(e_j)} \in [0,1]$.

Definition 2.3[6]: Let X be the universe of discourse. An interval-valued Pythagorean fuzzy set (IVPFS) A defined in X is given as $A = \{(x, [\mu^L_A(x), \mu^U_A(x)], [\vartheta^L_A(x), \vartheta^U_A(x)]) : x \in X\}$, where

INTERVAL VALUED PYTHAGOREAN FUZZY SOFT MATRIX THEORY

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ABSTRACT

In this paper, we define the concept of interval valued Pythagorean fuzzy soft matrix(IVPFSM), its different types and some of its properties were discussed in it.

KEYWORDS: Soft sets, Fuzzy soft set, Pythagorean fuzzy set, Pythagorean fuzzy soft set, interval-valued Pythagorean fuzzy set, interval valued Pythagorean fuzzy soft set, Pythagorean fuzzy soft matrix.

1. INTRODUCTION

In day to day life, we face many unpredictable situations. Therefore, to handle such type of situations, Zadeh[15] introduced fuzzy set theory. Atanassov[2] proposed the concept of IFS, extension of fuzzy set, which is the membership and non membership degree whose sum is less than or equal to one. Since we have many alternative solutions to deal with, Molodtsov[7] developed the concept of soft set theory which is a parametrization of alternatives. Later fuzzy soft sets were defined by Maji P. K., Biswas R., and Roy A. R.[3]. Again they extended the concept to IFSS.

In scientific fields and in real life, application of matrices are much important. Hence Yong and Chenli[14] represented fuzzy soft set in matrix form for some decision making problems. Rajarajeswari and Dhanalashmi[11] introduced IFSM and studied some of its properties and extended the concept to IVIFSM. Yager R. R.[12] introduced PFS, which is the membership and non membership degree whose square sum of it is less than or equal to one. For some MCDM problems, PFSM was defined by Abhishek Guleria and Rakesh Kumar Bajaj[1].

In this paper, IVPFSM were defined, its types, properties were discussed. Some weighted averaging operators were defined for IVPFSM and discussed.

2. PRELIMINARIES

In this section, we recall some basic definitions such as Pythagorean fuzzy set, Pythagorean fuzzy soft set and interval valued Pythagorean fuzzy set and soft set.

Definition 2.1[12]: Pythagorean fuzzy set, A is defined as a set of ordered pairs over a universal set X given by $A = \{< x, \mu_A(x), \vartheta_A(x) > | x \in X\}$, where $\mu_A, \vartheta_A: X \to [0,1]$ are the degrees of membership and nonmembership of the element $x \in X$, respectively, with the condition that $(\mu_A(x))^2 + (\vartheta_A(x))^2 \leq 1$. Corresponding to its membership functions, the degree of indeterminacy is given by $\pi_A(x) = \sqrt{1 - (\mu_A(x))^2 - (\vartheta_A(x))^2}$.

Definition 2.2[8]: A pair (F,E) is called Pythagorean fuzzy soft set if a map $F : E \to P^U$ defined as $F_{u_i}(e_j) = \{(u_i, \zeta_j(u_i), \vartheta_j(u_i)): u_i \in U$ where P^U is the Pythagorean fuzzy subset of U and ζ, ϑ satisfies $\zeta^2 + \vartheta^2 \leq 1$ for all $u_i \in U$.

Indian Journal of Natural Sciences www.tnsroindia.org.in ©IJONS

Vol.14 / Issue 80 / Oct / 2023 International Bimonthly (Print) – Open Access ISSN: 0976 – 0997

RESEARCH ARTICLE

A New Approach for Finding IBFS of Interval Valued Picture Fuzzy Transportation Problems

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Received: 16 Aug 2023 Revised: 30 Aug 2023 Accepted: 04 Sep 2023

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ABSTRACT

In order to handle uncertainty and hesitancy in real-world problems,Researchers and businesspeople are becoming more interested in Picture Fuzzy Sets(PFS).Interval Valued Picture Fuzzy Set (IVPFS) is more effective tool for dealing with uncertainty and impressions.The transportation problem offers practical solutions to the problem of how to deliver goods to customers in a more expert way.Real-world problems, such as traffic restrictions and weather conditions, frequently involve unpredictable events.In this study, we introduced the three different types of formulae namely WIDTH, GM and PERT are used to convert the IVPFS into crisp values and RANGE method was used to find IBFS of IVPFTP. Three types of Interval Valued Picture Fuzzy Transportation Problem(IVPFTP) are considered namely Type1(supply, demand),Type 2(cost only) and Type 3(supply, demand and cost) in which above parameters represented as IVPFS. Finally the results obtained from Type 1, Type2 and Type3 IVPFTP compared with each other.

Keywords: Picture Fuzzy Sets, Interval Valued Picture Fuzzy Sets, RANGE method

INTERVAL VALUED PICTURE FUZZY SOFT MATRIX AND ITS APPLICATION IN MEDICAL DIAGNOSIS.

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ABSTRACT
Picture fuzzy soft matrix theory is a newly developed mathematical approach to handle uncertainties. In this paper, a new concept namely interval valued picture fuzzy soft matrix is defined and by applying this matrix for solving a decision-making Problems in medical diagnosis is discussed. The proposed method gives better solution than compared to the problem solved by interval valued intuitionistic fuzzy soft matrix. The proposed method is illustrated with suitable example.
KEYWORDS: Interval valued intuitionistic fuzzy soft matrix, Interval valued picture fuzzy soft set, Interval valued picture fuzzy soft matrix.

INTRODUCTION:
In recent years Fuzzy has been discovered that traditional methods are insufficient for solving many complex problems containing uncertainties that arise in the domains of engineering, social science, economics and other sciences. In the actual world, there are lot of uncertainties in all facts of life. The traditional fuzzy set idea developed by Zadeh's [15] is effective in addressing issues of their nature. As an extension of fuzzy sets, Atannassov introduced intuitionistic fuzzy set [3] which has been found to be particularly useful and applicable among higher fuzzy sets. The intuitionistic fuzzy set was expanded by Atannassov and Gargov [4] to the interval valued intuitionistic fuzzy set which is distinguished by a membership function and non-membership function with interval values. Since Molodtsov [2] first described the concept, soft set theory has drawn a lot of interest. Later. Maji et al.[9] proposed the theory of fuzzy soft sets, presenting the idea and fundamental characteristics of soft set theory. Majumdar et al [10]. generalised the definition of fuzzy soft sets. Maji et al [8]. Extending fuzzy soft sets to intuitionistic fuzzy soft sets which is based on the combination of the intuitionistic fuzzy set and soft sets. By fusing the terms interval valued fuzzy sets and soft set Yang et al[12]. introduced the idea of the interval valued fuzzy soft sets.

In the process of making decisions under an intuitionistic fuzzy environment, a decision maker may present their preferences over alternatives with interval valued intuitionistic fuzzy values due to the growing complexity of the scientific environment and the lack of precise data regarding the problem area. Interval valued intuitionistic fuzzy soft set theory an extension of intuitionistic fuzzy soft set theory was introduced by Jiang et al [13]. Picture fuzzy set was generalised by Coung [1] which has three components including membership, neutral, and non-membership Values.

Matrices are crucial in the larger field of science and engineering. The conventional matrix theory, however, is unable to resolve issues involving numerous kinds of uncertainty. A fuzzy soft matrix representation was developed by Yang [14] and used to solve some decision-making issues. The extended fuzzy soft matrix theory and its use were developed by Borah et al [5]. the intuitionistic fuzzy soft matrix theory is investigated in [6,11]as well as its applications. Rajarajeswari and Dhanalakshmi [7] has introduced paper interval valued intuitionistic fuzzy soft matrix and also studied some of its operations

In this paper, using interval valued picture fuzzy soft matrices, we offer a novel idea that can be used in the field of medical diagnosis. Also in this paper we have discussed about the reduction of interval valued

APPLICATION OF QUIN – TERRANEAN FUZZY SET IN TRANSPORTATION PROBLEM UNDER FUZZY ENVIRONMENT

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Abstract
Quin Terranean fuzzy set is one of the most efficient approach in decision making analysis than Intuitionistic fuzzy set, Pythagorean fuzzy set and Fermatean fuzzy set. To handle uncertainty in optimization problem, Quin – Terranean fuzzy set plays an important role. In this paper, we applied the concept of Quin – Terranean fuzzy set. While applying Quin – Terranean fuzzy set, it is possible to minimize the transportation cost in Pythagorean fuzzy transportation problem. A new grading function for Quin- Terranean fuzzy set is defined and a numerical example is given to illustrate the grading technique. An advanced algorithm involving the grading technique is proposed to solve the transportation problem. The proposed algorithm is illustrated with examples.
Mathematics Subject Classification: 03E72, 90C08
Keywords: Quin-Terranean fuzzy set, Quin-Terranean fuzzy number, grading technique and Quin-Terranean fuzzy transportation problem.

1. Introduction

Fuzzy set is defined as a set of objects possesses a continuum of acceptance grades. Fuzzy sets are defined by a acceptance function. It assigns the acceptance grade that ranges between zero and one. In 1965, L. A. Zadeh [14] proposed the new concept of fuzzy set. The basic operations such as union, intersection, inclusion, complement, convexity, relation are characterized to the fuzzy set. Various properties of the fuzzy sets are established. In 1986, Krassimir T.Atanassov [1] defined the new generalization concept known as Intuitionistic fuzzy set and described with the examples. The operations and relation of the Intuitionistic fuzzy set are defined and several properties of Intuitionistic fuzzy set are also proved. In 2000, Supriya Kumar De et al. [11] studied new operations on Intuitionistic fuzzy set. In 2018, K.Meera and Lija Ponnappen applied Intuitionistic fuzzy set in choice of discipline of study. In 2018, Divya S.L described a new operation for Intuitionistic fuzzy set. In 2017, Yager [13] established the q-rung orthopair fuzzy set. In 2016, Gou [2] proposed a several Pythagorean fuzzy mappings and also studied the basic properties of PFS such as derivability, continuity and differentiability. In 2019, Senapathi and Yager characterized the basic operations on Fermatean fuzzy sets.

In 2016, Mollah Mesbahuddin Ahmed et al. [8] proposed a new approach to solve Transportation problems. In 2012, Abdallah A. Hlayel, Mohammad A. Alia [3] solved the transportation problem using best candidate method. In 2013, M. Shanmugasundari and K. Ganesan [10] proposed a novel approach for the fuzzy optimal solution of fuzzy transportation problem. In 2016, P. Malini and Ananthanarayanan [7] solved the trapezoidal fuzzy transportation problem using ranking function. In 2020, F.S. Josephin et al. [4] applied a dynamic method to determine the optimum solution of the Intuitionistic fuzzy transportation problem. In 2019, R. Kumar et al. [6] presented a Pythagorean fuzzy approach to the transportation problem. In 2021, S. Krishna Prabha et al. [5] investigated the geometric mean with Pythagorean fuzzy transportation problem.

2. Preliminaries

Definition 2.1 [12]

(A, β) - QUASI NORMAL OPERATORS BY FUGLEDE – PUTNAM THEOREM AND JOINT (A, β) - QUASI NORMAL OPERATORS

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Abstract

In this work we focus our study on (α, β)-quasi normal operators by Fuglede – Putnam theorem acting on a complex Hilbert space H. An operator $T \in B(H)$ is said to be (α, β)-quasi normal operator then $T[\alpha^2 T^* T] \leq [TT^*]T \leq T[\beta^2 T^* T]$ where $(0 \leq \alpha \leq 1 \leq \beta)$

If T is (α, β) -quasi normal operator, f is an analytic function in an open neighbourhood of $\sigma(T)$, where $\sigma(T)$ represents the spectrum. And also study of new class of multi operators. We show that the product of a joint (α, β) -quasi normal tuple by an m - tuple of operators satisfying suitable conditions is joint (α, β) -quasi normal tuple.

Keywords

Operator, Hilbert space, Normal, (α, β) - quasi normal operator, Fuglede–Putnam theorem, joint (α, β)-quasi normal operator.
AMS Classification Code : 47B02, 47B15

Introduction

In this paper, we will study some properties of totally (α, β) - quasi normal operators. An operator $T \in B(H)$ is said to be normal if $TT^* = T^*T$, hyponormal if $TT^* \leq T^*T$, (α, β)-quasi normal operator $T[\alpha^2 T^* T] \leq [TT^*]T \leq T[\beta^2 T^* T]$ where $(0 \leq \alpha \leq 1 \leq \beta)$. Throughout in this paper, H denotes the usual Hilbert space over the complex field and B (H) is the Banach algebra of all bounded linear algebra on an infinite dimensional separable Hilbert space H. T is a normal operator for $\alpha=1=\beta$ and for $\alpha=1$ we perceive from the left inequality that T^* is hyponormal and for $\beta=1$, from the right inequality we say that T is hyponormal. Moslehian has declared this class of operators as covered in [3]. Dragomir and Moslehian [4] has declared various inequalities between the operator norm and the numerical radius of (α, β)-normal operator. The familiar Fuglede–Putnam theorem states that if $T \in B(H)$ and $S \in B(H)$ are normal operators and $TX = XS$ for some $X \in B(H)$, then $T^*X = XS^*$ as covered in [6].
The general form $\delta_{S,T}: B(H) \to B(H)$ for $S, T \in B(H)$ is defined by $\delta_{S,T}(X) = SX - XT$ for $X \in B(H)$ and let $\delta_T = \delta_{T,T}$ then the following inequality

$$\| S - \lambda I \| \| X - \lambda I \| \geq \| X \| \text{ holds for all } S \in \ker \delta_T \text{ and for all } X \in B(H)$$

An operator $T \in B(H)$ is finite if

$$\| I - \lambda T \| \| X - \lambda T \| \geq 1$$

holds for all $X \in B(H)$. For $S, T \in B(H)$, the operator $\Gamma_{S,T}$ defined as $\Gamma_{S,T}: C_2(H) \to C_2(H), X \to SXT \in C_2(H)$. We know that

$$\| \Gamma \| \leq \| S \| \| T \| \text{ and } (\Gamma_{S,T})^* X = S^* X T^* = \Gamma_{S^*,T^*} X$$

where $T \geq 0$ and $S \geq 0$ then $\Gamma_{XT} \geq 0$.
Let $T=(T_1, T_2, \ldots, T_m) \in B(H)^m$ be a m-tuple of operators T is said to be jointly quasi normal if $T[T,T_i] = [T,T_i]T$ and every T_i is a quasi normal operator for all $i,j=1,\ldots,m$ [9].

Intuitionistic Fuzzy Approach to Three Player Prisoner's Dilemma Game

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Abstract: ***In this paper an Intuitionistic fuzzy approach is proposed to solve the three player Prisoner's Dilemma game, this approach will use the inequality condition between Triangular Intuitionistic fuzzy numbers to obtain the optimal strategy in the game.***

Keywords: Intuitionistic fuzzy sets, Nash Equilibrium, Prisoner's Dilemma, Bi-Matrix games

1. Introduction

A game is a decision making situation which involves one or more players, where each of them have goals to achieve their outcome. The player may be an individual or an organisation. The concept of game theory was introduced in The theory of games and Economic behavior by Von Neumann and Morgenstern [5]. The players of the game may be cooperative or non-cooperative in a given situation. J.Nash accelerated the concept of non-cooperative games and the equilibrium points [3] [4]. The general methods to find the optimal solution of a game are min-max or using the linear programming method [12]. In real life situation there are other considerations which may affect the process of choosing the optimal strategies such as philosophical motives, moral aesthetics, environmental conditions and lack of information. So to evaluate the outcome of the game in the presence of imprecision or uncertainty we use the concept of fuzzy numbers introduced by L. A. Zadeh [11] [10]. Atanassov[7] proposed the concept of Intuitionistic fuzzy seta which uses the membership and non-membership functions[6]. Using the Triangular Intuitionistic Fuzzy Numbers to solve Bi-matrix games involving two players was introduced [8] [9] in which the inequality conditions between TIFNs are used to find the optimal solution and equilibrium points in the game. Prisoner's Dilemma is a traditional game model in game theory which generally involves two players [12]. The triangular fuzzy membership is used to solve the prisoner's dilemma game in fuzzy game theory [1]. The iterative form of prisoner's dilemma is a game involves more than two players which is called Three player Prisoner's Dilemma (3p-PD) game [2]. In this paper we introduce the concept of solving 3p-PD game using the triangular Intuitionistic fuzzy Numbers and finding the Nash Equilibrium solution of the game.

The paper is organised as follows: In section 2 the inequality relation between two TIFNs is given. In section 3 the concept of prisoner's dilemma game in bi-matrix form is introduced. In section 4the computational procedure is explained using a Numerical example of 3p-PD game with Intuitionistic fuzzy payoffs.

2. Intuitionistic Fuzzy Sets

Definition 2.1
Let $X = \{x_1, x_2, \ldots\ldots, x_n\}$ be a finite universal set. An intuitionistic fuzzy set $\tilde{T}$ in a given universal set X is of the form

$$\tilde{T} = \{(x_i, \mu_T(x_i), \nu_T(x_i)) : x_i \in X\},$$

Where the functions $\mu_T(x_i), \nu_T(x_i)$ are the degree of membership and degree of non-membership of an element $x_i \in X$, and they satisfy the condition
$0 \le \mu_T(x_i) + \nu_T(x_i) \le 1, \forall x_i \in X$.

Definition 2.2:
A triangular intuitionistic fuzzy number (TIFN) denoted by $\tilde{t} = (t, l, r; w_t, u_t)$ is a intuitionistic fuzzy set on a real number set R, which has the membership and the non-membership functions of the form

$$\mu_{\tilde{t}}(x) = \begin{cases} \dfrac{x - t + l}{l} w_t ; t - l \le x < t \\ \dfrac{t + r - x}{r} w_t ; t \le x \le t + r \\ 0; \quad otherwise \end{cases}$$

$$\text{and } \nu_{\tilde{t}}(x) = \begin{cases} \dfrac{(t-x)+u_t(x-t+l)}{l} ; t - l \le x < t \\ \dfrac{(x-t)+u_t(t+r-x)}{r} ; t \le x \le t + r \\ 1; \quad otherwise \end{cases}$$

where t is the mean value and l, r are called spreads. The maximum degree of membership and the minimum degree of non-membership are denoted by w_t and u_t and they satisfy the condition $0 \le w_t, u_t \le 1$ and $0 \le w_t + u_t \le 1$.

Definition 2.3:
A (α, β)- cut set of a TIFN $\tilde{t} = (t, l_t, r_t; w_t, u_t)$is a subset of R, which is defined as
$\tilde{t}_{\alpha,\beta} = \{x : \mu_{\tilde{t}}(x) \ge \alpha, \nu_{\tilde{t}}(x) \le \beta\}$, where $0 \le \alpha \le w_t, u_t \le \beta \le 1$ and $0 \le \alpha + \beta \le 1$. A α –cut set of a TIFN $\tilde{t}$ is a subset of R, which is defined as $\tilde{t}_\alpha = \{x : \mu_{\tilde{t}}(x) \ge \alpha\}$; where $0 \le \alpha \le w_t$ and $\tilde{t}_\alpha$ is defined by the closed interval $[t_L(\alpha), t_R(\alpha)]$ where

$$t_L(\alpha) = (t - l_t) + \frac{l_t \alpha}{w_t}, \qquad t_R(\alpha) = (t + r_t) - \frac{r_t \alpha}{w_t}$$

EQUILIBRIUM SOLUTION IN BI-MATRIX GAME WITH TRAPEZOIDAL INTUITIONISTIC FUZZY PAYOFF

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Abstract : In this paper the concept of cut sets of Trapezoidal Intuitionistic Fuzzy Numbers (TrIFN) is introduced. The Inequality relation between TrIFN is derived using the ranking method for solving Bi-Matrix games having TrIFNs as payoff. The method is applied on the investigation of market share of fast food chain companies to find their suitable strategies when the demand is unknown.
Keywords – *Intuitionistic fuzzy sets, Trapezoidal Intuitionistic fuzzy Number, Bi-Matrix game, Nash equilibrium.*

I. INTRODUCTION

Game theory is a concept which examines the strategic interaction between rational decision makers on a decision making situation. The decision makers are also called players who might be an individual or an organization [5]. The decision makers works on their best interest to improve the outcome. In real life situations the decision making is affected by lack of information. Fuzzy game theory is introduced to deal with these type of situations [7]. Intuitionistic Fuzzy(IF) sets are established by Atnassov [6] which has characteristic functions to express the degree of membership as well as the degree of non membership. Intuitionistic Fuzzy sets are wildly used in game theory to obtain the optimal strategies to get the best possible solution of the given situation [8]. J.F.Nash created the concept of Nash Equilibrium which plays an important role in finding the expected outcome of a two person game [4]. M.R.Shiek, M.pal and P.K.Nayak defined the method to rank the Intuitionistic Fuzzy Numbers(IFN) in Bi-Matrix games[9][10]. Rahul kar and A.K.Shaw studied the arithmetic operations between Trapezoidal Intuitionistic Fuzzy Numbers (TrIFN) [12]. The (α, β) cut sets are derived to find the average ranking index of membership and non membership functions. In this paper we formulated a concept to find the best possible strategy of Bi-Matrix game with Trapezoidal Intuitionistic fuzzy payoff. The equilibrium strategies are defined by the Inequality relation of TrIFN.

This paper is organized as follows. In section-2 the definitions and (α, β) cut sets of TrIF sets are given. In section-3 the derivation of Inequality relation between TrIFNs are derived. Section-4 contains the Bi-Matrix game and Equilibrium condition. The illustration of the proposed method is applied in solving the game of two fast food chain companies trying to find their best possible strategy when their demand is unknown. Section 5 concludes the paper.

II. PRELIMINARIES

Definition 2.1:

Let $X = \{x_1, x_2, \ldots\ldots, x_n\}$ be a finite universal set. An intuitionistic fuzzy set $\tilde{A}$ in a given universal set X is of the form

$\tilde{A} = \{\langle x_i, \mu_{\tilde{A}}(x_i), v_{\tilde{A}}(x_i)\rangle : x_i \in X\}$,

Where the functions $\mu_{\tilde{A}}(x_i), v_{\tilde{A}}(x_i)$ are the degree of membership and degree of non-membership of an element $x_i \in X$, and they satisfy the condition

$0 \leq \mu_{\tilde{A}}(x_i) + v_{\tilde{A}}(x_i) \leq 1, \forall x_i \in X, i = 1,2,3, \ldots.$

Definition 2.2:

IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

SOLVING MATRIX GAMES WITH TRAPEZOIDAL INTUITIONISTIC FUZZY PAYOFFS

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Abstract: In this paper matrix game with payoff matrix in the form of Trapezoidal intuitionistic fuzzy numbers(TrIFN) is solved by using a methodology defined using the α and β −cut values of the TrIFNs . Based on the ranking function the problem is reduced into a crisp payoff game problem. The method is illustrated with a numerical example.

Index terms: Game theory, Intuitionistic fuzzy set, Trapezoidal fuzzy Number, α, β −cut.

I.INTRODUCTION

Game theory is a way to study about the cooperation or non-cooperation and conflicts between the rational decision makers known as players on a decision making situation in which each player are working as an individual or group to attain certain goal by choosing a proper course of action called strategies[2]. There are many ways to obtain the optimal strategies and value of the game in classical game theory such as dominance, simplex, graphical and algebraic[5]. L.A.Zadeh introduced the concept of fuzzy sets[6] which are then used in game theory to solve real life situations contains crisis due to the lack of information or practical difficulties which makes the decision making tricky to the players. Fuzzy game theory uses[1] the membership function to deal with the imprecision and uncertainty. Atnassov[4] proposed the concept of Intuitionistic fuzzy sets which uses the membership as well as the non-membership functions.

In recent past ranking methods[7] are used to solve the matrix games with triangular Intuitionistic fuzzy payoffs. In these methods fuzzy payoff matrix are converted into a crisp payoff matrix using the ranking method which is also called defuzzification process. Then the reduced payoff matrix is solved by using the existing methods to find the optimal strategies[10] and value of the game.

In this paper we present the concept of ranking method to solve the games with Intuitionistic Trapezoidal fuzzy payoffs. The relations between two Trapezoidal Intuitionistic fuzzy numbers are discussed[11]. The α, β −cut values of the TrIF sets are given. The ranking method is derived by using the value and ambiguity index for the sets. The ranking function is a function from collection of all trapezoidal Intuitionistic fuzzy sets to the real line denoted as $D: F(D) \rightarrow \mathbb{R}$ and uses the weight function. The TrIF payoff is converted into a crisp payoff and solved by using the Graphical method, Dominance method, Algebraic

SOLVING 2*2 FUZZY GAME MATRIX PROBLEM USING OCTAGONAL, NONAGONAL FUZZY NUMBERS

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Abstract:

In this paper, we consider a two player zero sum game with infinite value in pay-off matrix. Now we determine on solving a fuzzygame problem using octagonal, polygonal fuzzy number. To solve a problem using Pascal's triangular graded mean integration for finding a solution. We can convert a fuzzy valued game problem into a crisp valued game problem by changing the payoffs.

Keywords: Fuzzy set, Octagonal Fuzzy Number, Polygonal Fuzzy Number, Crisp Set, Pascal's Triangle Graded Mean Approach.

1. Introduction

Game theory has played an important role in the fields of decision making theory such as economics, management etc. This paper uses the concept of Pascal's triangle graded mean integration. It mainly uses octagonal fuzzy number, Polygonal fuzzy number to solve a fuzzy game problem.The defuzzified value can then be converted into a crisp value query, Which can then be answered using the conventional approach.

In this paper, First section includes some basic definition and second section includes mathematical formulation of fuzzy game problem and the third section includes algorithm for the problem and some numerical examples and in the final section we concludethe conclusion.

2. Preliminaries

In this section, we represent basic idea about the fuzzy numbers and definitions which involved in the research work.

Definition 1: A fuzzy set $\tilde{A}$ in X (set of real numbers) is a set of ordered pairs $\tilde{A}=\{(x, \mu(\tilde{A}))/x \in X\}$ is called membership function of x in $\tilde{A}$ which maps X to[0,1].

Definition 2: A fuzzy collection A based on real numbers. If the membership function $\mu_A: R \rightarrow [0, 1]$ of R has the following properties,it is said to be a fuzzy number.

(i)A is normal. It implies that $X \in R$ exists such that $\mu_A(x)=1$.

(ii)A is convex. It implies that for every $x_1, x_2 \in R$

$\mu_A(\lambda x_1 + (1-\lambda)x_2) \geq \min \mu_A(x_1), \mu_A(x_2), \lambda \in [0,1]$

(iii) μ_A is upper semi-continuous

(iv) Sup(A) is bounded in R.

Definition 3: A crisp set is a special case of a fuzzy set, in which the membershipfunction only takes two values, commonly defined as 0 and 1.

Definition 4: A Octagonal fuzzy number $\tilde{A} = (a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8)$ is a normal fuzzy number where $a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8$ are real numbers and its membership function is given by

$$\mu_A(x)=\begin{cases} 0 & for\ x < a_1 \\ h\left(\frac{x-a_1}{a_2-a_1}\right) & for\ a_1 \leq x \leq a_2 \\ k & for\ a_2 \leq x \leq a_3 \\ h+(1-h)\left(\frac{x-a_3}{a_4-a_3}\right) & for\ a_3 \leq x \leq a_4 \\ 1 & for\ a_4 \leq x \leq a_5 \\ h+(1-h)\left(\frac{a_6-x}{a_6-a_5}\right) & for\ a_5 \leq x \leq a_6 \\ h & for\ a_6 \leq x \leq a_7 \\ h\left(\frac{a_8-x}{a_8-a_7}\right) & for\ a_7 \leq x \leq a_8 \\ 0 & for x > a_8 \end{cases}$$

SOLVING FUZZY GAME PROBLEMS USING OCTAGONAL FUZZY NUMBERS

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Abstract : In this paper, we consider a two person zero sum game with imprecise values in payoff matrix. The imprecise values of payoff matrices are represented by Octagonal fuzzy numbers . By using Ranking to the payoffs we convert the fuzzy game problem into crisp valued game problem, which can be solved by graphical method.
Keywords – *Fuzzy set, Fuzzy numbers, octagonal fuzzy number fuzzy number.*

I. INTRODUCTION

In a fuzzy game problem, all parameters are fuzzy numbers. Fuzzy numbers may be normal (or) abnormal, triangular, trapezoidal, octagonal, etc. Using this ranking to the payoffs we convert the fuzzy valued game problem to crisp valued game problem, which can be solved using Graphical method.

II. PRELIMINARIES

Definition 1. Fuzzy Set And Membership Function

The characteristic function of a crisp set assign a value of either 1 or 0 to each individual in the universal set, thereby discriminating between members and non mem- bers of the crisp set under consideration. This function can be generalized such thatthe values assigned to the elements of the universal set fall within specified range and indicate the membership grade of these elements in the set large value denote higher degrees of set membership. Such a function is called a membership function, and the set defined by it a fuzzy set.

$$\mu_A : X \rightarrow [0, 1]$$

Definition 2.Crisp Set

A crisp set is a special case of fuzzy set, in which the membership function only takes two values, commonly defined as 0 and 1.

Definition 3. α– Cut Set

Fuzzy set A defined on X and any number $\alpha\epsilon[0, 1]$. The α –cut, ${}^{\alpha}A$, and thestrong α –cut, ${}^{\alpha+}A$, are the crisp sets.

$${}^{\alpha}A = \{x/A(x) \geq \alpha\}$$

$${}^{\alpha+}A = \{x/A(x) > \alpha\}$$

This is, the α cut (or the strong α –cutα) of a fuzzy set A is the crisp set ${}^{\alpha}A$ (or the crisp set${}^{\alpha+}A$) that contains all the elements of the universal set X whose membership grades in A are greater than or equal to (or only greater than)the specified value of α.

Definition 4. Fuzzy Numbers

A Fuzzy set are defined on the set $\Re$of real number membership function $\mu_A : \Re \rightarrow [0, 1]$. Satisfies the following three properties.

(i). A must be a normal set.

(ii). ${}^{\alpha}A$ must be a closed interval for every $\alpha\epsilon(0, 1]$

(iii). The support of A, ${}^{\alpha+}A$ must be bounded.

J. Environ. Nanotechnol.
Volume 2 (2013), 15-21 pp.
ISSN (Print) : 2279-0748
ISSN (Online) : 2319-5541
doi: 10.13074/jent.2013.02.ncnet33

Impulse Modelled Response of a 300 MHz ST-Quartz SAW Device For Sensor Specific Applications

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Abstract

In recent years a big spurt has been observed in the usage and applications of Surface Acoustic Wave(SAW) devices as sensors not only for the detection of physical and chemical quantities but also as environmental biosensors for detecting volatiles, toxic agents, explosives and narcotics. The design of such sensors assumes importance as the technology enables reproducibility, reliability, portability and cost-effective sensing in real time. This paper presents the frequency response of a 300 MHz ST-Quartz SAW delay line device fabricated with uniform IDTs. Based on the first order Impulse response model and employing a unique custom made MATLAB algorithm, the device is accurately modelled. The results obtained are analyzed to ultimately help in the effective design, development and modelling of such devices as application specific sensors. Comparison of modelled and simulated results with experimental device response shows good agreement.

Keywords : Impulse Response Model, Interdigital Electrodes (IDT), Surface Acoustic Wave (SAW) devices, SAW Sensors

1. INTRODUCTION

Surface Acoustic Waves (SAWs) are elastic waves that prop-agate along the surface of an isotropic elastic medium such that the energy density is confined to a depth of few wavelengths below the surface. Even though discovered by Lord Rayleigh in the year 1885 [1], these waves had to wait for nearly eight decades, when in 1965 the situation changed dramatically with the invention of the thin-film *Inter-Digital Transducers (IDT)* by White and Voltmer at the University of California, Berkeley [2] who suggested that SAWs can be excited and detected efficiently in the laboratory by using an metal thin-film IDT placed on a piezoelectric substrate fig. 1. This discovery enabled a relatively simple yet efficient and reception of SAWs and signalled a new interest in the application of acoustic waves.

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The IDTs consists of two comb-like structures of metal electrodes made of aluminum/ gold photo-deposited on a precisely oriented suitable piezoelectric substrate such that these IDTs act as transmitters and receivers of acoustic wavesin a SAW device. This device is bidirectional as SAWs are launched both to the left and to the right from the IDTs. The geometry of these IDTs plays an important role in the functioning of the device and usually the devices are designed such that the widths of the electrodes are adjusted to be equal to the widths of the electrode gaps. In its simplest form, a SAW device with IDTs and all external components (Fig.1) can be modelled as one wherein,

- an alternating voltage V_{in} applied to the

Journal of
Environmental
Nanotechnology

Research Article

Synthesis and Studies on Polymer Electrolyte Membrane using Polyvinyl Alcohol, Polyvinylidene Fluoride and Ammonium Bromide as Dopants for Proton-conducting Electrolyte

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ABSTRACT

Different compositions of Polyvinyl alcohol (PVA), Polyvinylidene fluoride (PVDF) and Ammonium bromide (NH_4Br) were employed to synthesize the proton-conducting polymer electrolyte membranes by Solution casting method, which have potential applications in proton (H^+) ion batteries and fuel cells. Structural, vibrational and electrical properties of the synthesized polymer electrolyte membrane were characterized by X-Ray Diffraction (XRD), Fourier Transform Infrared (FTIR) spectroscopy and Electrical Impedance Spectroscopy (EIS) analysis and results were reported. The semi-crystalline nature of the prepared polymer was confirmed by XRD analysis. FTIR spectroscopy revealed the vibrational spectra of the prepared polymer membrane. The Nyquist plot drawn from the AC Impedance analysis was a straight line, confirming the dielectric nature of the prepared membrane.

Keywords: Fuel cell; Polymer electrolyte; Proton-conducting; PVA; PVDF.

1. INTRODUCTION

Polymer electrolyte membrane (PEM) is fast becoming one of the best electrolytes for electrochemical energy storage devices and in the practical usage and importance in developing solid-state batteries, fuel cells and electrochromic devices (Hema *et al.* 2008). The main challenge in using polymer electrolyte membranes is to attain good ionic conductivity at ambient temperature.

A detailed literature survey suggested that Polyvinyl alcohol (PVA) is the main polymer used for the preparation of PEM by most of the researchers because it can conduct ions between the electrodes in a fuel cell (Gabriele *et al.* 2020). Since the ionic conductivity of the PVA membranes is not remarkable, the researchers are focused primarily on the enhancement of proton conduction between the electrodes of a fuel cell. The methods involve blending the polymer with another polymer and incorporating proton-conducting salts (doping).

Research articles (Rajendran *et al.* 2004) suggest that the polymer PVA is miscible with polyvinylidene fluoride (PVDF) with high intermolecular interaction. PVA is a polymer with carbon attached to a hydroxyl (-OH) group. The hydroxyl groups are involved in hydrogen bonding. Hence, it can be easily blended with other polymers (Li *et al.* 2010; Paul and Barlow, 1980; Mijovic *et al.* 1997; Muthiah *et al.* 2013). PVDF is a semi-crystalline fluoropolymer with low surface energy, high permittivity, relatively low dissociation factor and high dielectric constant, which assists more ionization of salt, providing a high concentration of charge carriers. Ammonium salts, like Ammonium bromide (NH_4Br), are good proton donors. The present work is focused on the synthesis and characterization of PVA-PVDF-NH_4Br polymer electrolytes.

2. EXPERIMENTAL TECHNIQUE

PVA (Mw: 1,25,000, LR grade) as flakes, PVDF (Mw: 1,80,000, Sigma Aldrich, AR grade) as pellets, NH_4Br (LR grade) as powder salt and N, N-Dimethyl formamide (DMF) (extra pure 99% from Sisco Lab) were used as raw materials for the synthesis.

The polymer electrolyte membranes were prepared by the Solution casting technique with DMF as the solvent. The polymers PVA and PVDF were mixed in 80:20 ratios. Ammonium bromide was taken in three different amounts (2%, 4% and 6%) as the dopant. The hot plate was set at 200 °C and the raw materials PVA, PVDF and NH_4Br were brought together with DMF in a beaker and stirred with a glass rod manually until a homogeneous solution was obtained. The solution was then poured into a glass Petri dish to form a thin

molecules

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Article

Nanotechnology, Green Synthesis and Biological Activity Application of Zinc Oxide Nanoparticles Incorporated Argemone Mxicana Leaf Extract

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Citation: Chinnapaiyan, M.; Selvam, Y.; Bassyouni, F.; Ramu, M.; Sakkaraiveeranan, C.; Samickannian, A.; Govindan, G.; Palaniswamy, M.; Ramamurthy, U.; Abdel-Rehim, M. Nanotechnology, Green Synthesis and Biological Activity Application of Zinc Oxide Nanoparticles Incorporated Argemone Mxicana Leaf Extract. *Molecules* **2022**, *27*, 1545. https://doi.org/10.3390/molecules27051545

Academic Editor: Ashish Kalkar

Received: 30 December 2021
Accepted: 21 February 2022
Published: 25 February 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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Abstract: Nanomaterial is a rapidly growing area that is used to create a variety of new materials and nanotechnology applications from medical, pharmaceuticals, chemical, mechanical, electronics and several environmental industries including physical, chemical and biological nanoparticles are very important in our daily life. Nanoparticles with leaf extract from the healthy plant are important in the area of research using biosynthesis methods. Because of it's used as an environmentally ecofriendly, other than traditional physical and chemical strategies. In particular, biologically synthesized nanoparticles have become a key branch of nanotechnology. The present work presents a synthesis of zinc oxide nanoparticles using an extract from the Argemone leaf Mexicana. Biosynthetic nanoparticles are characterized by X-ray diffraction (XRD), Ultraviolet visible (UV-vis) spectroscopy analysis, a Fourier Transform Infrared Spectroscopy analysis (FTIR) and a scanning electron microscopy (SEM), X-ray analysis with dispersive energy (EDAX). XRD is used to examine the crystalline size of zinc oxide nanoparticles. The FTIR test consists in providing evidence of the presence of targeted teams. UV is used for optical properties and calculates the energy of the bandwidth slot. The scanning microscope emission reveals the morphology of the surface and the energy dispersive X-ray analysis confirms the basic composition of zinc oxide nanoparticles. It is found that zinc nanoparticles are capable of achieving high anti-fungal efficacy and therefore have a high potential antimicrobial activity of ZnO NPs, like antibacterial and high antioxidant. Zinc Oxide nanoparticles from the Argemone Mexicana leaf extract have several antimicrobial applications, such as medical specialty, cosmetics, food, biotechnology, nano medicine and drug delivery system. ZnO nanoparticles are important because they provide many practical applications in industry. The most important use of nanoparticles of ZnO would be strong antibacterial and antioxidant activity with a simple and efficient biosynthesis method may be used for future work applications.

Keywords: nanoparticles ZnO NPs; green biosynthesis; characterization techniques; antibacterial and antifungal activities; antioxidant activity

Separation and Purification Technology 294 (2022) 121189

Contents lists available at ScienceDirect

Separation and Purification Technology

journal homepage: www.elsevier.com/locate/seppur

Specific charge separation of Sn doped MgO nanoparticles for photocatalytic activity under UV light irradiation

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ARTICLE INFO

Keywords:
Sn-doped MgO nanoparticles
Electron microscopy
Vibrating sample magnetometer
Photoluminescence studies
μ-Raman spectroscopy
BET studies
Photocatalytic performance

ABSTRACT

Recent developments of material science envisioned to synthesis nanomaterials with unique characteristics and potential applications in various fields. In this study present the hydrothermal synthesis pure and Sn doped MgO nanoparticles and investigation their photocatalytic properties. The synthesized Sn doped MgO nanoparticles was characterisation using X-ray diffraction (XRD), Ultraviolet-visible (UV–vis), photoluminescence (PL), and Fourier transform infrared (FTIR) spectroscopy. The FTIR spectra showed the presence of MgO and Sn nanoparticles by exposing relevant absorption bands against definite wavenumbers. The scanning electron microscopic (SEM) images of Sn-doped MgO nanoparticles was used for determination their morphological characteristic and the energy dispersive X-ray (EDX) analysis was used for the surface element quantitative information. Transmission electron microscopy (TEM) the average size of the particles as recorded in the TEM images was around 50 nm for the pristine sample and around 20 nm for the Sn doped MgO nanoparticle thereby indicating the fact that tin substitution has indeed brought about a considerable decrease in the particle size. Crystallographic interpretations of the as prepared sample were done in the reciprocal space by recording the selected area electron diffraction patterns (SAED) of pure MgO and doped Sn/MgO nanoparticle. With increasing the quantity of Sn in the sample, it was discovered that the dielectric parameters of the obtained samples, such as the dielectric constant and dielectric loss, decreased as a function of the applied frequency. Vibrating sample magnetometer (VSM) the magnetic properties of synthesised samples were examinations and shows that the magnetization (Ms) of samples decrease with increases the Sn concentration in n-MgO composites. The methylene blue (MB) and phenol degradation was used for determination of photocatalytic activity of Sn doped n-MgO composites and undoped n-MgO under UV irradiation. The observed MB and phenol removal efficiency depends on the amount of loaded Sn doped n-MgO catalyst.

1. Introduction

Currently the research interest to developing novel nanocomposites by combining various metal oxides substantially increases. This allows to obtain materials with unique and attractive optical, electrical, mechanical properties which make its for use in opto-, micro- and nano-

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https://doi.org/10.1016/j.seppur.2022.121189
Received 14 March 2022; Received in revised form 20 April 2022; Accepted 26 April 2022
Available online 30 April 2022
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Materials Science for Energy Technologies 6 (2023) 472–483

Contents lists available at ScienceDirect

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Materials Science for Energy Technologies

journal homepage: www.keaipublishing.com/en-journals/materials-science-for-energy-technologies

Specific charge separation of Cd doped TiO_2 photocatalysts for energy applications

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ARTICLE INFO

Article history:
Received 9 June 2022
Revised 30 April 2023
Accepted 30 April 2023
Available online 5 May 2023

Keywords:
Titanium oxide (TiO_2)
Cd-doped TiO_2 nanoparticles
Hydrothermal techniques
X-ray diffraction
Electron microscopy
Water-treatment technologies
Photocatalytic degradation

ABSTRACT

Titanium dioxide (TiO_2) nanostructures are well known for their excellency in photocatalytic activities. In this work, additive-free and Cd metal ion - incorporated titanium dioxide (TiO_2) nanoparticles have been prepared to employ a facile route of synthesis using a hydrothermal method. Metal-metal nanocomposites have been synthesized by incorporating cadmium (Cd) with the appropriate amount of TiO_2 nanoparticles. The properties of the derived materials had been investigated by employing various characteristic tools such as various techniques, including X-ray diffraction (XRD), Scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR), UV–visible absorbance spectroscopy (UV–vis), and photoluminescence spectroscopy (PL) are all examples of advanced imaging techniques, that may be used to study materials. Using a method known as a vibrating sample magnetometer, we measured the magnetic properties of bare and Cd-doped TiO_2 nanoparticles. The investigations on crystalline nature of samples are agreed well with the standard crystalline features of TiO_2 nanoparticles. Emerged grain sizes have been estimated for all samples of pure and additive incorporated TiO_2 samples. Morphological characterization revealed that different particle features varied with the compositional changes. Spectral and optical absorption spectra of the prepared nanoparticles ensured the yield of derived TiO_2 nanoparticles with the additive component. An evaluation of the photocatalytic activity of Cd doped TiO_2 nanoparticles under UV irradiation was made using the methylene blue (MB) degradation method. The photodegradation efficiency were studied under visible light which confirms that the material is gifted one for water-treatment technologies to meet the rising clean water shortage.

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1. Introduction

Titanium dioxide (TiO_2) is a non-harmful semiconductor with a bandgap of 3.0 eV. Titanium oxide is a well-known inorganic metal oxide semiconductor with an n-type configuration [1]. Titanium dioxide could be employed in water parting and oxidation steps because of its unique optical properties and synthetic soundness [2]. Controlled doping with the appropriate elements would improve the appropriate electronic properties (specifically all around located band holes) in many, of these TiO_2 gadget applications [3]. There is wide spread recognition that TiO_2 combined with iron (III) impacts the charge transporter significantly [4]. The additive incorporation is to diminish the enactment energy of the anatase-to-rutile stage change, particularly in TiO_2. In comparison to traditional powder union strategies in the production of oxide powders, aqueous cycles in sol–gel synthesis have the capacity for immediate planning of glass-like fired powders and provide a low-temperature alternative. Cadmium (Cd) is a remarkable semiconducting medium widely used in various applications such as

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https://doi.org/10.1016/j.mset.2023.04.010
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Research Article

Journal of Environmental Nanotechnology

Synthesis and Studies on Polymer Electrolyte Membrane using Polyvinyl Alcohol, Polyvinylidene Fluoride and Ammonium Bromide as Dopants for Proton-conducting Electrolyte

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ABSTRACT

Different compositions of Polyvinyl alcohol (PVA), Polyvinylidene fluoride (PVDF) and Ammonium bromide (NH_4Br) were employed to synthesize the proton-conducting polymer electrolyte membranes by Solution casting method, which have potential applications in proton (H^+) ion batteries and fuel cells. Structural, vibrational and electrical properties of the synthesized polymer electrolyte membrane were characterized by X-Ray Diffraction (XRD), Fourier Transform Infrared (FTIR) spectroscopy and Electrical Impedance Spectroscopy (EIS) analysis and results were reported. The semi-crystalline nature of the prepared polymer was confirmed by XRD analysis. FTIR spectroscopy revealed the vibrational spectra of the prepared polymer membrane. The Nyquist plot drawn from the AC Impedance analysis was a straight line, confirming the dielectric nature of the prepared membrane.

Keywords: Fuel cell; Polymer electrolyte; Proton-conducting; PVA; PVDF.

1. INTRODUCTION

Polymer electrolyte membrane (PEM) is fast becoming one of the best electrolytes for electrochemical energy storage devices and in the practical usage and importance in developing solid-state batteries, fuel cells and electrochromic devices (Hema *et al.* 2008). The main challenge in using polymer electrolyte membranes is to attain good ionic conductivity at ambient temperature.

A detailed literature survey suggested that Polyvinyl alcohol (PVA) is the main polymer used for the preparation of PEM by most of the researchers because it can conduct ions between the electrodes in a fuel cell (Gabriele *et al.* 2020). Since the ionic conductivity of the PVA membranes is not remarkable, the researchers are focused primarily on the enhancement of proton conduction between the electrodes of a fuel cell. The methods involve blending the polymer with another polymer and incorporating proton-conducting salts (doping).

Research articles (Rajendran *et al.* 2004) suggest that the polymer PVA is miscible with polyvinylidene fluoride (PVDF) with high intermolecular interaction. PVA is a polymer with carbon attached to a hydroxyl (-OH) group. The hydroxyl groups are involved in hydrogen bonding. Hence, it can be easily blended with other polymers (Li *et al.* 2010; Paul and Barlow, 1980; Mijovic *et al.* 1997; Muthiah *et al.* 2013). PVDF is a semi-crystalline fluoropolymer with low surface energy, high permittivity, relatively low dissociation factor and high dielectric constant, which assists more ionization of salt, providing a high concentration of charge carriers. Ammonium salts, like Ammonium bromide (NH_4Br), are good proton donors. The present work is focused on the synthesis and characterization of PVA-PVDF-NH_4Br polymer electrolytes.

2. EXPERIMENTAL TECHNIQUE

PVA (Mw: 1,25,000, LR grade) as flakes, PVDF (Mw: 1,80,000, Sigma Aldrich, AR grade) as pellets, NH_4Br (LR grade) as powder salt and N, N-Dimethyl formamide (DMF) (extra pure 99% from Sisco Lab) were used as raw materials for the synthesis.

The polymer electrolyte membranes were prepared by the Solution casting technique with DMF as the solvent. The polymers PVA and PVDF were mixed in 80:20 ratios. Ammonium bromide was taken in three different amounts (2%, 4% and 6%) as the dopant. The hot plate was set at 200 °C and the raw materials PVA, PVDF and NH_4Br were brought together with DMF in a beaker and stirred with a glass rod manually until a homogeneous solution was obtained. The solution was then poured into a glass Petri dish to form a thin

Poll Res. 41 (2) : 582-585 (2022)
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ISSN (0257–8050)

DOI No.: http://doi.org/10.53550/PR.2022.v41i02.027

A STUDY ON THE CONTINUOUS USAGE OF ORGANIC, INORGANIC PERSISTENT PESTICIDES IN THE AGRICULTURAL FIELDS IN AND AROUND SIRUMALAI AREA WITH A SPECIAL REFERENCE TO THE IMPACT ON GROUND WATER AND SOIL

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(Received 23 August, 2021; Accepted 7 October, 2021)

ABSTRACT

In the present study the impact of pesticide pollution due to the discharge of pesticide waste water from the agricultural field in the Sirumalai agro lands was studied. In order to evaluate the physical and chemical parameters of water, the pond water samples, and the ground water samples all the sides were collected and analyzed for various water quality parameters and soil parameters. The pond water is the main source of water for the bore wells located in and around the agricultural land. During the rainy season the pond water percolates into wells and bore wells. Now water is completely polluted due to percolation of pesticide waste waters which are potentially harmful, accumulation of various pesticides chemical residues in water reaches the ground water source. Bio – accumulation and bio-concentration of the pesticide waste water causes high degree of pollution. The bore wells in and around the northern side of the pond polluted with very high TDS and it is beyond redemption due to the higher limits of TDS, hardness, phosphate, ammonia and nitrate. All the water samples taken in and around the agriland are not chemically portable. The presence study reveals that the physico-chemical analysis of pond water in the pond as well as ground waters are above the permissible limit. The dissolved oxygen is analyzed and found to be deteriorated. It is due to utilization of dissolved oxygen in the water by organic matter and by the pesticides. The investigator observed that the solar evaporation tank made of black body tank, function more effectively during summer with very high evaporation rate. The investigator found that during the normal operation period, the colour of the effluent varies and becomes clear after treatment with alum, which favours the penetration of solar energy easily and hence the efficiency of the evaporation tank increases than the normal cement slab. The advantage of utilizing the black body natural kadappa tanks for evaporation is very strong and it can absorb very high degree of solar radiation which is converted into thermal energy. The investigator observed that the solar evaporation tank made of black body tank function more effectively during summer with very high evaporation rate. The solar evaporation tank is blessed in principle of black body surface which can absorb solar radiation more effectively than ordinary cement slab.

KEY WORDS : Pesticides, Black body radiation, Zero liquid discharge.

INTRODUCTION

Ideally a pesticide must be lethal to the targeted pests, but not to non-target species, including man. unfortunately, this is not the case, so the controversy of use and abuse of pesticides has surfaced. The

Optical and Quantum Electronics (2022) 54:758
https://doi.org/10.1007/s11082-022-04105-9

Synthesis, crystal structure, Hirshfeld surface, nonlinear optical properties and computational studies of Schiff based (*E*)-*N*′-(2,4-dimethoxybenzylidene) benzohydrazide single crystals for optoelectronic applications

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Received: 24 June 2022 / Accepted: 14 August 2022 / Published online: 27 September 2022
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Abstract

Optically transparent organic single crystals of *(E)-N'*-(2,4-dimethoxybenzylidene) benzohydrazide (DMBBH) have been grown by slow evaporation technique. The detailed crystal structure of DMBBH was determined from Single crystal X-ray diffraction (SCXRD) study. The presence of active functional groups in the compound was identified by the experimental and computational Fourier transform infrared (FTIR) and NMR analyses. The UV–Vis Spectrum reveals the optical transparency of the grown crystal in the visible region. The natural bond orbital (NBO) analysis results show that the interaction between the donor π(C2-C7) and acceptor π*(C1-N8) has the highest stabilization energy (111.9 kJ/mol) and it shows the hyperconjugation within the –CONH– group. The first order hyperpolarizability value $\beta_0 = 2.8501 \times 10^{-30}$ esu of the synthesized compound was eight times greater than that of urea (0.3728×10^{-30} esu). The Z-scan approach revealed the nonlinear optical (NLO) behaviour and optical limiting characteristics of the molecule.

Keywords Schiff base · Hirshfeld surface · UV–Vis · NLO · DFT

This article is part of the Topical Collectionon Recent Advances of Advanced Functional Materials for Optics,Lasers and Photovoltaics Applications.

Guest edited by OksanaKrupka, Anna Zawadzka, Hassane Ergnig, Alexander Quant andBouchta Sahraoui.

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Generation of Axially Splitted Ultra-Long Multiple Optical Needles/Optical Tubes Using Generalized Cylindrical Vector Bessel Gaussian Beam Phase Modulated by Annular Walsh Function Filter

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Research Article

Keywords: Annular Walsh function filter, Generalized CVB, Bessel Gaussian beam, SAM, energy flux density

Posted Date: March 11th, 2022

DOI: https://doi.org/10.21203/rs 3.rs-1429823/v1

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Plasmonics (2022) 17:213–224
https://doi.org/10.1007/s11468-021-01507-5

Platinum Layers Sandwiched Between Black Phosphorous and Graphene for Enhanced SPR Sensor Performance

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Received: 20 May 2021 / Accepted: 26 July 2021 / Published online: 6 August 2021
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Abstract
Highly sensitive surface plasmon resonance (SPR) sensor consisting of Ag–Pt bimetallic film sandwiched with 2D materials black phosphorus (BP) and graphene over Pt layer in Kretschmann configuration is analyzed theoretically using the transfer matrix method. Numerical results show that upon suitable optimization of thickness of Ag–Pt layers and the number of layers of BP and graphene, sensitivity as high as 412°/RIU (degree/refractive index unit) can be achieved for p-polarized light of wavelength 633 nm. This performance can be tuned and controlled by changing the number of layers of BP and graphene. Furthermore, the addition of graphene and heterostructures of black phosphorus not only improved the sensitivity of the sensor but also kept the FWHM of the resonance curve much smaller than the conventional sensor utilizing Au as plasmonic metal and hence improved the resolution to a significant extent. We expect that this new proposed design will be useful for medical diagnosis, biomolecular detection, and chemical examination.

Keywords Surface plasmon · Sensitivity · Black phosphorous · Platinum · Graphene

Introduction

Surface plasmon resonance (SPR) is the one of the most powerful optical techniques used for medical diagnostics, enzyme and gaseous detection, and food safety [1–8]. This technique has been widely used for a quick and accurate detection of various physical and biochemical parameters. Most of the SPR-based sensor uses Kretschmann's attenuated total reflection (ATR) method, in which the p-polarized incident light excites a surface plasmon wave (SPW) along the metal–dielectric interface on the thin metallic layer deposited on the base of an optical coupling prism [9]. The choice of metallic film is one of the crucial aspects in designing SPR-based applications. Usually gold (Au) is considered as the most suitable plasmonic material as it is highly resistive to oxidization, possesses better chemical stability, and provides higher sensitivity. Silver, on the other hand, shows better resolution whereas it oxidizes easily and possesses lesser sensitivity compared to Au. The bimetallic configuration of Au/Ag utilizes the advantages of both the metals and has been demonstrated in several works. It is noted that the usage of bimetallic film, though it improved the resolution of the sensor, its sensitivity seems not much improved [10–13]. Apart from Au and Ag, more metals have been identified for SPR sensing such as aluminum (Al), nickel (Ni), copper (Cu), and platinum (Pt), and each of these metals has their own advantages and disadvantages [14–16]. Recently, platinum has been identified as a potential SPR-active metal owing to its strong dependence of reflection coefficient on wavelength in the visible region of the spectrum, high reflecting property, inert, chemically stable with high melting point, and prolonged stability [17–19]. Shukla et al. theoretically

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Optics & Laser Technology 149 (2022) 107864

Contents lists available at ScienceDirect

Optics and Laser Technology

journal homepage: www.elsevier.com/locate/optlastec

Generation of 1D array of focal segments using spirally polarized beam and Complex Phase Filter

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ARTICLE INFO

Keywords:
Vector diffraction theory
Complex Phase Filter
High NA Lens

ABSTRACT

A new approach for generating and tuning 1D array of sub wavelength scale electric and magnetic spot, hole, flattop and bubble profiled segments using tightly focused **spirally polarized beam phase and amplitude modulated with suitable complex phase filter is proposed and investigated numerically using vector** diffraction theory. Numerical result shows that by using a well optimized single Complex Phase Filter (CPF), one can generate and tune the geometry of the 1D chain of electric and magnetic field distribution from sub wavelength scale hole to spot and then to a chain of flattop profiled or bubble structure segments by properly tuning the spirality of incident spirally polarized beam. These focal field distributions may find potential applications in laser direct writing and optical microscopy, as well as multiple-particle trapping, alignment, and acceleration along the optical axis.

1. Introduction

Recently, the interest in highly focused vector optical beam attracted significant interest due to its unique polarization features, which strongly influence the shape and size of the focal-plane intensity distributions. The vector properties of the light, which admit spatially variant states of polarization (SoPs) and thus exhibit unique features compared with uniformly polarized (UP) beams [1]. Different kinds of non-uniformly polarized beams and the methods for generating and characterizing them have been proposed [2–9]. Gori et al. introduced a new class of beam called spirally polarized beam to describe a new polarization basis for paraxial non-uniformly polarized optical beams [9]. These beams possess axially symmetric polarization patterns, with linear polarization at any point of the transverse profile and with the electric field lines being logarithmic spiral. The Radially and azimuthally polarized beams are considered as particular cases of a more general class of spirally polarized beam. Spiral polarization can be realized in practice by using computer-generated dielectric gratings [10,11], spatial light modulators in combination with wave plates [12], polarization converters and rotators [13], geometric phase manipulation through q-plates [14], optical fiber micro-axicons [15], and fiber-optic modes [16]. Ramirez-Sanchez investigated the generation, characterization and paraxial beam quality parameter of spirally polarized beams [17,37]. Borghi et al. investigated the free-propagation features of such beams both in the paraxial and the non paraxial realms [18]. They also investigated the focusing properties of spirally polarized optical beams by high-NA optical systems using vectorial multipole expansion [19]. Bing Hao and James Leger proposed the numerical aperture (NA) invariant focus shaping using spirally polarized beams [20]. Pu et al. investigated the tight focusing properties of spirally polarized vortex beam and reported that the same OAM can be obtained for different polarized state at certain distance along the propagation direction [21]. Recent investigation of the tight focusing properties of spirally polarized beam suggested several possible applications such as optical tweezers, particle trapping, laser cutting, material processing, microscopy, etc. [22–26]. Recently there is a lot of interest in creation of focal segments with double or multiple identical focal spots along the optical axis with prescribed polarization [27]. Since generating and

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https://doi.org/10.1016/j.optlastec.2022.107864
Received 30 November 2020; Received in revised form 14 August 2021; Accepted 5 January 2022
Available online 24 January 2022
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Optical and Quantum Electronics (2022) 54: 654
https://doi.org/10.1007/s11082-022-04037-4

Generation of axially splitted ultra-long multiple optical needles/optical tubes using generalized cylindrical vector Bessel Gaussian beam phase modulated by annular Walsh function filter

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Received: 8 March 2022 / Accepted: 22 July 2022 / Published online: 29 August 2022
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Abstract
Based on vector diffraction theory and annular Walsh function filter, axially splitted ultra-long multiple optical needles/optical tubes of electric as well as magnetic field distributions are numerically generated by generalized cylindrical vector Bessel Gaussian beam phase modulated by annular Walsh function filter. This multiple optical structures can be conveniently tailored by properly tuning the initial phase of the Cylindrical vector beam (CVB) and Walsh order of the annular Walsh function filter. Furthermore, the effect of energy flux density (Poynting vector) as well as Spin angular momentum(SAM) distribution in the focal region are theoretically analyzed. We expect that such an axially splitted focal systems could be applicable in optical trapping and manipulation of multiple particles, optical super resolution microscopy etc.

Keywords Annular Walsh function filter · Generalized CVB · Bessel Gaussian beam · SAM · Energy flux density

1 Introduction

Axially splitted sub wavelength multiple focal spots/holes with extended depth are useful for many potential application such as optical super resolution microscopy, optical trapping &manipulation of multiple particles, high density optical data storage etc. (Bingen et al. 2011; Rong et al. 2015; Yehoshua et al. 2015; Liang et al. 2020; Fuxi and Yang 2015; Li et al. 2015a; Ren et al. 2014). Recently, two extreme case of generalized cylindrical vector (radial & azimuthal) beams with different types of amplitude and phase filters are used to produce the axially splitted multiple focal spots/holes. For example radially polarized beam

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Research Article

Journal of Environmental Nanotechnology

High Performance Bimetallic(Cu-Co) Surface Plasmon Resonance Sensor using Hybrid Configuration of 2D Materials

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ABSTRACT

The performance of prism-based surface plasmon resonance sensor utilizing kretschmann configuration composed of, thin metallic (Cu–Co) film coated with 2D material such as BP/Graphene layer is investigated theoretically based on angular interrogation method. It is observed that optimizing the thickness of bimetallic (Cu–Co) and BP/Graphene layers, the sensitivity of the sensor improved greatly and still can maintain its minimum reflectivity and line width of the SPR reflectivity curve. We also observed that addition of BP/ Graphene over the bimetallic layer, its further enhanced the sensitivity. Numerical results shows that sensitivity as high as 504deg/RIU is achieved for the well optimized bimetallic configuration consist of 45nm of Cu and 10nm of Co thickness for the analyte refractive indices ranging from 1.330 - 1.335.

Keywords: Surface Plasmon Resonance; Graphene; Sensitivity; Copper; Cobalt.

1. INTRODUCTION

Surface plasmon resonance (SPR), a subset of surface plasmons (SPs), exhibits a wide range of unique optical features, including varying resonant frequencies in host media with varying refractive indices.Numerous practical applications in biosensors to detect and identify chemical, environment and biological substances have been discovered, owing to SPR's distinctive optical properties (Roli*et al.*2011; Rikta*et al.*2021).Otto's and Kretschmann configurations are the two types of configurations used to excite SPR waves. Otto's configuration maintains an air gap between the prism and the metal layer, whereas in a Kretschmann configuration, the metal layer is directly coated on the prism. As it is difficult to maintain air gap in Otto's configuration usually the kretschmann configuration are considered as simple and most effective method (Homola*et al.*,1999; Lee *et al.* 2015; Cai*et al.*2008; Gwon and Lee, 2010; Flanagan and Pantell, 1984; Nylander*et al.*1982; Huang *et al.*2010). SPR sensor performance has significantly improved with the use of bimetallic layer combinations (Maharana*et al.*2013; Sharma *et al.*2017).The most common bimetallic combinations for SPR excitation are Au-Ag. Thus, it takes advantage of gold's large shift in resonance dip matching to changes in refractive index of the sensing medium, which improves the sensor's sensitivity, and silver's short FWHM, which gives the sensor an good signal to noise ratio(SNR) (Zynio*et al.*2022; Wu and Ho, 2002; Ong *et al.* 2007). Several researchers have demonstrated the benefits of using bimetallic arrangements, but Au and Ag have been found to have poor adhesion with prisms, therefore thin coatings of (Cr), Teflon, and InP have been employed to improve adherence, sensitivity, and SNR (Yuan *et al.*2006; Ghorbanpour*et al.*2013; Chen *et al.*2011; Tran *et al.*2017). Rouf et al was Design of a new bimetallic SPR sensor and reported that utilization of thin InP layer with the coupling Ag-Au films enhances the sensitivity from 65°/RIU to 70°/RIU (Hasan*et al.*2018). Yuan et al analyzed Sensitivity–stability of a surface plasmon resonance sensor with double-metal-layer (gold-silver) configuration which utilizes stability of the gold and sensitivity of the silver and reported the obtained FWHM of the reflectivity curve for the bimetallic-layer configuration is 4.8 times narrower than the conventional configuration and its stability is better than that of the silver film configuration as well (Yuan *et al.*2006). Copper (Cu) is the most common conductive material after silver and is substantially cheaper than Au and Ag. Since Cu oxidizes much easily, it has not receive much attention as a plasmonic material. Recently Singh et al. suggested that the oxidization problem of Cu can be avoided by suitable oxide coatings (Mitsushio*et al.*2006; West *et al.*2010). Sharma *et al.* (2017) suggested that utilizing a thin layer of Pt over copper can enhance the sensitivity of the SPR sensor apart from preventing the cu being oxidized (Singh *et al.*2013).Rifat et al. suggested that graphene coating over Cu protects the Cu being oxidized and improved durability of the sensor, and

Journal of Environmental Nanotechnology

Research Article

Sensitivity Enhancement of Surface Plasmon Resonance-based Biosensor using Aluminium-Cobalt-Tungsten Disulfide-Graphene Heterostructure

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Received: 07.11.2022 Accepted: 21.11.2022 Published: 30-12-2022
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ABSTRACT

An attempt has been made to enhance the sensitivity of a high-sensitive surface plasmon resonance (SPR) biosensor with an aluminium-cobalt bimetallic layer covered by a tungsten disulfide-graphene heterostructure. A thin layer of cobalt coated on an aluminium layer contributed substantially to increase the sensor performance. The use of Al and Co metals instead of noble metals like Ag and Au reduced the cost of the sensor. Further, tungsten disulfide (WS_2) layers were employed to improve sensitivity and protect the bimetal Al-Co from becoming oxidized, whereas graphene served as the biomolecule trapping medium. The number of WS_2 and graphene layers have optimized for better sensitivity. The proposed biosensor Al-Co-WS_2-graphene structure displayed an excellent sensitivity of 300°/RIU, convenient for sensing biomolecules.

Keywords: Surface Plasmon Resonance; Biosensor; Sensitivity; Cobalt; 2D materials.

1. INTRODUCTION

Surface plasmon resonance (SPR) biosensor is a sensing technological marvel, owing to its fast detection, high accuracy, stable performance and high sensitivity, with several applications in many sectors including DNA hybridization (Rahman *et al.* 2017), drug discovery (Rich *et al.* 2002), environmental monitoring (Mauriz *et al.* 2007), medical diagnostics (Yonzon *et al.* 2004), food safety (Zhou *et al.* 2019), enzyme detection (Pumera, 2011), plasmonic detectors (Ooi *et al.* 2012) and immune sensor (Ramanaviciene *et al.* 2000). In the SPR biosensors, the angular interrogation-based Kretschmann configuration is customarily used owing to the ability to function without an intermediary between the prism and metal layer with utilization of monochromatic light to gain high signal-to-noise (Kretschmann *et al.*1968). The SPR biosensor frequently uses the plasmonic materials - gold or silver (Mishra *et al.* 2015; Maharana *et al.* 2013). Gold is the most desirable material as it has a good prohibition to oxidation and erosion, is chemically stronger and has excellent optical behavior (Maurya *et al.* 2015). However, Au produces wider resonance curve that affects the analyte identification accuracy. Moreover, the biomolecular binding potential of Au is weak (Dash *et al.* 2014). Conversely, SPR sensor utilising Ag layer shows better resolution, but sensitivity is weaker when compared with Au (Wang *et al.* 2017). However, silver is chemically susceptible because of its oxidized nature (Verma *et al.* 2015; Klantsataya *et al.* 2015). Nowadays, bimetallic blends, oxide layers and 2D materials are recommended to solve the Ag oxidation trouble (Dash and Jha, 2014; Sharma *et al.* 2007; Jha *et al.* 2009; Fouad *et al.* 2016; Kravets *et al.* 2014; Suresh *et al.* 2021). However, these approaches have a limited range of sensitivity and are not suitable for durable plasmonic applications. Aluminium (Al) is a low-price metal than Au and Ag. Al provides a fine SPR curve, but it oxidizes very easily (Jha *et al.* 2009). Recently, Maharana *et al.* suggested that the oxidization issue of Al can be overcome by coating Au layer on Al (Maharana *et al.* 2013). Maharana also proposed that using a graphene layer over aluminium can improve sensor sensitivity while also protecting Al from oxidation (Maharana *et al.* 2014). Recently, cobalt (Co), a ferromagnetic metal, has gained attention owing to its notable magneto-optical properties and magnetic properties (Yu *et al.* 1968; Gilliot *et al.* 2006; Maheswari *et al.* 2022). Shukla *et al.* suggested that the magnetic metal cobalt used in SPR sensors reduces the cost and enhances the sensitivity (Shukla *et al.* 2016).

Transition metal dichalcogenides, TMDCs, (MoX_2 and WX_2, namely Molybdenum disulfide (MoS_2),

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Orbital Angular Momentum Carried by ShGB Vortex Beam for FSO and its Aberration Effects

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Research Article

Keywords: Vortex Sinh beam, z-tilt aberration, Defocus aberration, Astigmatism aberration, Coma aberration, Spherical aberration, Topological charge

Posted Date: April 6th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1512547/v1

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Generation of light sheet focal patterns for light-sheet fluorescence microscopy via phase modulated radial and azimuthal variant vector beam

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Research Article

Keywords: Annular Walsh function, tight focusing, states of polarization (SoPs) ,petal shape beam, multiple optical trapping

Posted Date: November 1st, 2022

DOI: https://doi.org/10.21203/rs.3.rs-2215617/v1

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Generation of axial multi foci pattern

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Research Article

Keywords: Axially splitted multi foci, higher order cylindrical vector beam, annular Walsh function filter

Posted Date: October 14th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-2144299/v1

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RESEARCH ARTICLE

Tight Focusing of a higher order Radially Polarized sinh-Gaussian beam Transmitting through Cosine Phase Plate

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ABSTRACT: The tight focusing of a double ring-shaped radially polarized sinh-Gaussian beam with a cosine phase plate is studied on the basis of the vector diffraction theory. Under a high-NA focusing condition, the strong longitudinal component forms a sharper spot at the focal point for both fundamental mode (R-TEM01*) beams and higher-order, radially polarized mode beams. Due to destructive interference between the inner and outer rings, double-ring-shaped radially polarized mode (R-TEM11*) beams in particular can significantly lower the focal spot size. Simulation results show that the focused fields and phase distributions at focus are largely influenced by both the cosine parameter and truncation coefficient of the incident beams. Moreover, shifted focal spot, optical cage patterns can be flexibly achieved by carefully choosing the cosine parameter (C) and it is also observed that the intensity distribution of the different mode has little variation among the degree of truncation (β) of the input beam beside the pupil. This work is important for optical manipulation, particle limitation systems, laser surface modification and laser direct writing techniques.

KEYWORDS: Higher order Sinh Gaussian beam, Vector diffraction theory, High NA lens, cosine phase plate.

https://doi.org/10.29294/IJASE.10.1.2023.3329-3335 **©2023 Mahendrapublications.com, All rights reserved**

INTRODUCTION

A single-ring-shaped radially polarized beam, which is often referred to as an R-TEM01* mode beam, is of particular interest. In the case of high-numerical-aperture (NA) focusing the R-TEM01*beam can generate a strong longitudinal electric field at the focus [1]. This strong longitudinal component creates a tight focus that may increase the resolution of microscopes [2,3] and improve laser cutting capabilities in processing materials [4].Numerous techniques for producing the radially polarized beam have been described due to the benefits of the beam that were previously discussed. Zhan [5] discovered that the scattering force along the optical axis is zero in 2004, when he estimated the radiation forces on metallic Rayleigh particles at the focus using a highly focused vector R-TEM01* beam. This performance is highly helpful in capturing metallic particles that absorb metal. Due to the decreased scattering, Kawauchi et al., [6] and Nieminen et al., [7] showed that R-TEM01* beams can be utilized to enhance the functionality of optical tweezers in the geometrical optics domain and the Mie regime. Yan and Yao [8] demonstrated, the radiation forces on more general dielectric particles with size ranging from the Rayleigh regime to several wavelengths, illuminated by a highly focused R-TEM01* beam. Ahluwalia et al.,[9]reported experimentally the polarization-induced torque of an R-TEM01* beam acting on anisotropic micro-particles.

The R-TEM01* beam is superior to the linearly polarized beam in the Rayleigh domain, according to the analytical studies reported by Chen et al., [10]. A doughnut-shaped (single-ring) radially polarized beam was produced by superimposing the two orthogonally polarized Gaussian modes TEM10 and TEM01 outside or

*Corresponding Author: prabakaran27mar@gmail.com
Received: 20.06.2023 Accepted: 17.07.2023 Published on: 25.08.2023

J Opt (June 2023) 52(2):589–596
https://doi.org/10.1007/s12596-022-01010-y

RESEARCH ARTICLE

Engineering axially polarized sub-wavelength scale focal structures using annular Walsh filter

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Received: 18 August 2022 / Accepted: 1 November 2022 / Published online: 2 December 2022
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Abstract Based on vector diffraction theory, the tight focusing properties of radially polarized Bessel Gaussian beam (BGB), phase modulated by annular Walsh function filters and focused by a high NA parabolic mirror system are studied numerically. The annular Walsh filter derived from the annular Walsh functions forms a complete set of orthogonal phase filters that takes values of either 0 or π phase corresponding to + 1 or − 1 over the domain specified by the inner and outer radii of the annulus. Numerical results show that by properly modulating the annular obstruction of Walsh filter and pupil to beam ratio of the input BGB, one can generate many novel focal patterns such as three-dimensional multiple sub-wavelength scale focal spot segments, optical needle, axial flat top profile, etc. We expect that such three-dimensional chain of focal structures is useful for nano-lithography, particle trapping and transportation, as well as confocal and STED microscopy, microstructure fabrication and so on.

Keywords Annular Walsh filters · Self-similarity · High NA parabolic mirror

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Introduction

Axially polarized sub-wavelength scale focal structures with extended depth have potential applications in multiple optical trapping, high density data storage, high-resolution imaging microscopy, etc.[1–7]. The radially polarized beam, in particular, possesses attractive characteristic that it can create much confined focal spot with a strong longitudinal electric field [8]. Recently variety of pupil plane filters combined with radially polarized beam to generate sub-wavelength focal patterns has been proposed[9–12]. On the other hand, Walsh filters as an energy efficient phase filters derived from Walsh functions can also generate self-similar multiple intensity distributions in the image plane as it has because it has finite number of discrete phase levels and can be conveniently synthesis from reflective phase spatial light modulators (SLM)[13–17]. Hazra et al. developed the radial Walsh filter [18] derived from the Walsh function for the azimuthal invariant case for solving problems of apodization and adoptive optics [19, 20]. The same group proposed that annular Walsh filters derived from Walsh functions can be used a pupil plane filters for tailoring the resolution of microscopic imaging and observed that the obscuration ratio of the annular Walsh filter is an addition and highly useful degree of freedom in tailoring the far field diffraction patterns [13, 14]. However, these studies have mainly concentrated on aplanatic systems and used scalar diffraction theory to describe the focal fields. Lens is not only the focusing element in the modern microscopy but high NA mirrors on the other hand show much superiority over aplanatic lens system. Since, the aperture angle of a high NA parabolic mirror can be close as π/2 and thus they serve as an ideal focusing element having the ability to focus the parallel beam travelling along the optical axis to one point without any aberrations in the geometrical optics. The apodization factor of a

Optical and Quantum Electronics (2023) 55:395
https://doi.org/10.1007/s11082-023-04654-7

Generation of multiple focal pattern via phase modulated radial and azimuthal variant vector beam

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Received: 16 November 2022 / Accepted: 5 February 2023 / Published online: 7 March 2023
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Abstract
The multiple focal patterns such as longitudinally/transversely polarized multiple focal spots/holes, longitudinally/transversely polarized annular dark multiple spots with petal shapes are in high demand for applications such as multiple optical trapping and manipulating, light-sheet fluorescence microscopy and optical lithography. This article numerically demonstrated the possibility of achieving the above task by subjecting phase modulation of radial and azimuthal variant vector beam through suitable annular Walsh function filter. Here it is demonstrated that the inherited self similarity properties of annular Walsh function and the flexibility of tuning the radial and azimuthal index of input beam is a state of art in landscaping multiple focal segment of desirable spatial and polarization distribution.

Keywords Annular Walsh function · Tight focusing · States of polarization (SoPs) · Petal shape beam · Multiple optical trapping

1 Introduction

Due to its potential applications in optical fields such as axial multiple optical trapping and manipulating, optical fluorescence microscopy, high-density optical storage, optical lithography, and others, the generation of multiple focal patterns has been extensively investigated in recent years (Li et al. 2015, 2020; Pesce et al. 2020; Liang et al. 2020; Tang et al. 2019; Field et al. 2016; Nhu et al. 2020; Gao et al. 2014; Olarte et al. 2018; Gohn-Kreuz and Rohrbach 2017; Gu et al. 2014a; Gan et al. 2013; Stuerzebecher et al. 2015; Salter and Booth 2019). Many ways have recently been developed by researchers to construct such multiple focal patterns by modifying the amplitude, phase, or polarization of incident vector beams at the input pupil plane using various types of pupil plane filters. Special types of novel multiple optical structures, such as axial multiple sub wavelength

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Results in Optics 11 (2023) 100407

Contents lists available at ScienceDirect

Results in Optics

journal homepage: www.sciencedirect.com/journal/results-in-optics

Designing high sensitivity and high figure of merit SPR biosensor using copper and 2D material on CaF_2 prism

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ARTICLE INFO

Keywords:
Surface plasmon resonance
Biosensor
Sensitivity
CaF_2 prism
Copper
Black phosphorus

ABSTRACT

This theoretical work proposed an ultra-high sensitive hybrid structure for modified Kretschmann configuration comprised of copper-2D material layer on CaF_2 prism for biosensing applications through angular interrogation method. Here, it is reported that such a configuration in association with the low refractive index CaF_2 prism provides major contribution for improving the sensitivity. Using 2D materials in the proposed configuration not only acts as a medium for trapping biomolecules but also protect copper from becoming oxidized. On the basis of transfer matrix method, the thickness of copper layer suitability and the number of 2D layers are optimized to achieve high sensitivity, small FWHM, and minimum reflectance. Numerical results shows that a well optimized structure can achieves outstanding results exhibiting sensitivity as high as 514°/RIU with high FOM as 208.69RIU^{-1}. Hence, copper and well optimized 2D material coated on CaF_2 prism can be an excellent approach in sensor design for detecting biomolecules.

1. Introduction

Surface plasmon resonance (SPR) biosensor is an efficacious optical sensing technology owing to its unique characteristics such as highly sensitivity, very precision, rapid detection, durability, user-friendly, low-price, and the capability to identify a small variation in sensing medium refractive index. As a consequence, the SPR sensor has been fruitful for many sectors, which are gas sensing (Mishra et al., 2014), temperature detecting (Mollah et al., 2020), environmental observing (Jiang et al., 2013), pharmaceutical diagnostic or pharmacology (Cooper, 2002), monitoring food safety (Homola, 2004), chemical sensing (Zeng et al., 2014), biosensing (Homola, 2008), pressure measurement (Rahman et al., 2020), identify of virus proteins, antibodies, and antigens (Barik et al., 2020), DNA hybridization (Rahman et al., 2017), enzyme sensing (Kumar et al., 2021), and human blood group detecting (Sharma et al., 2019). Mariani et al. reported the state of the art of clinical target detection with SPR-based biosensors (Mariani and Moramarco, 2014). In most of the SPR sensor, the Kretschmann angular interrogation configuration is desirably used due to its simple structure where the metal sheet directly merged with the prism base without an intermediate like air space, as in Otto configuration (Kretschmann and Raether, 1968). Nowadays, calcium fluoride glass prism (CaF_2) has been used rather than other prisms (SF10 or BK7) for improving the sensor performance. The low refractive index of CaF_2 helps to increase sensitivity and it has better angular error rejection during installation (Hasib et al., 2019; Shukla and Arora, 2021; Pandey and Sharma, 2018; Singh et al., 2021; Pandey et al., 2016; Pandey, 2020; Bijalwan et al., 2020; Nur et al., 2019; Wang et al., 2021; Hasib et al., 2019). Pal et al. reported that Ag-BlueP/MoS_2-MXene($Ti_3C_2T_x$) structure coated on CaF_2 prism exhibits maximum sensitivity around 302° /RIU upon other prism such as BK7, SF10, and CaF_2 (Pal et al., 2020). Nur et al. reported that the configuration of CaF_2-Ag-BP-TMDC sensor provides greater sensitivity around 367.8571°/RIU (Nur et al., 2019).

In the usual SPR biosensors, silver (Ag) and gold (Au) are the most preferable SPR active metals. Gold is generally thought to be the more appropriate metal because it holds high sensitivity (SPR curve shifting is high), chemical unchangeability, durableness, and provides better inhibition to corrosion and oxidation. Nevertheless, it provides a broad

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https://doi.org/10.1016/j.rio.2023.100407
Received 15 December 2022; Received in revised form 21 February 2023; Accepted 7 March 2023
Available online 11 March 2023
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Generating novel focal patterns for a radial variant vector beam focusing through a dielectric interface

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Received February 21, 2023; accepted March 31, 2023; published March 31, 2023

Abstract— Electric and magnetic energy densities as well as energy flux (Poynting vector) for a radial variant vector beam focusing through a dielectric interface is analyzed numerically based on vector diffraction theory. Electric and magnetic energy densities are tailored by properly manipulating radial as well as initial phases to generate novel focal patterns in the focal area. These peculiar properties may find application in fields such as optical trapping, optical recording, magnetic recording, magnetic resonance microscopy and semiconductor inspection.

In recent years, tight focusing of a laser beam with different states of polarization (SoP) has attracted intensive attention and extensive investigation, because of their fascinating features and wide potential applications [1–5]. Additional amplitude and phase filters in the input pupil demonstrated the generation of novel focal structures such as a sharper focus, optical needle, multiple focal spots/holes, flat-top profile, optical chain, optical cage, focal spot arrays etc. [6–8]. However, these filters greatly affect the strength of the input beam, and the alignment of such filters is very complicated and tedious. On the other hand, these novel focal patterns can also be demonstrated by utilizing the intrinsic degree of freedom of polarization of an input beam without any additional phase or amplitude filters. Recently, radially variant vector beams have been numerically explained and experimentally generated [9–11]. More recently, Zhongsheng Man *et al.* numerically have studied the focusing properties of a radial variant vector beam [12–14]. Most of the previous cases, only concentrate on the focal properties of electric field distribution in the focal plane. As a counterpart, demonstration of both the magnetic field distribution as well as the Poynting vector distribution (energy flux) in the focal plane, are of great interest in optical trapping experiment. On the other hand, Kotlyar et al report so many articles based on energy flux in the reverse direction [15–17]. Moreover, in some practical applications such as optical trapping and semiconductor inspection, the laser beam focusing through the media of different refractive indices are mentioned [18]. Based on the Richard and Wolf formulas, Török *et al.* obtained explicit expression for laser beam through a dielectric interface [19–20]. Z. Zhou *et al.* studied tight focusing properties of high-order axially symmetric polarized beams through a dielectric interface and calculated the electric and magnetic field intensity distribution in the focal plane [21]. Recently, many reports have explained focusing through a dielectric interface with different amplitude and polarization distribution [22–23]. In this paper, based on the Richards and Wolf vector diffraction theory, there are analyzed numerically the properties of electric and magnetic fields as well as energy flux for tightly focused polarized beams with arbitrary geometric configurations of linear polarization through a dielectric interface.

Figure 1 shows the schematic diagram of a focusing system. A radially variant vector beam is focused from air (medium 1) on to silicon (medium 2). Here d is the distance between the interface and geometrical focus.

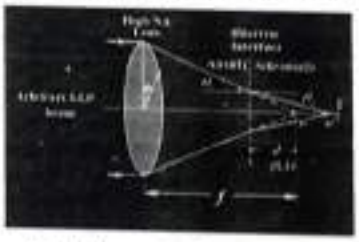

Fig.1. Scheme of a focusing system.

The electric and magnetic energy densities in the cylindrical coordinate system (r, ϕ, z) are given by [24]:

$$E(r,\psi,z) = \frac{-iC}{2}\int_0^{\alpha}\int_0^{2\pi} \sin\theta_1 \sqrt{\cos\theta_1}\, A(\theta_1,\phi) \exp[ik_n(\Phi)]$$
$$\exp[ik_2 z\cos\theta_2 + ik_1 r\sin\theta_1\cos(\phi-\psi)] E_\infty d\phi d\theta_1,$$

$$H(r,\psi,z) = \frac{-iC}{2}\int_0^{\alpha}\int_0^{2\pi} \sin\theta_1 \sqrt{\cos\theta_1}\, A(\theta_1,\phi)$$
$$\exp[ik_n(\Phi)] \exp[ik_2 z\cos\theta_2 + ik_1 r\sin\theta_1\cos(\phi-\psi)] H_\infty d\phi d\theta_1.$$

where C is the constant, $\alpha = \sin^{-1}(\mathrm{NA})$ is the maximal angle determined by the NA of the objective; $A(\theta_1, \phi)$ is the relative amplitude of the incident beam, which is considered as unity in over calculation. E_∞ and H_∞ are the

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Journal of
Environmental
Nanotechnology

Research Article

Theoretical Design of Highly Sensitive Ag-Ni-Thiol-based Hybrid SPR Biosensor for Viral Detection

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Received: 15.08.2023 Accepted: 29.08.2023 Published: 30-09-2023
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ABSTRACT

In this work, a biosensor under Kretschmann configuration with enhanced sensitivity utilizing thiol on the bimetallic layers of magnetic material nickel (Ni) over silver (Ag) is proposed and analyzed numerically using the Fresnel equation and the Transfer Matrix Method (TMM). Results have shown that such a hybrid configuration with a well-optimized thickness of a bimetallic layer of Ni over Ag and the proper utilization of thiol with fixed thickness can increase the sensitivity substantially higher than the conventional sensor. The minimum reflectivity, FWHM of the Surface Plasmon Resonance (SPR) curve and sensitivity were examined in order to optimize the thickness of metal layers for the fixed thickness of the thiol. It is observed that sensitivity as high as 321°/RIU is obtained for the configuration consisting of 15 nm of Ni over 40 nm thickness of Ag added with a 4 nm thickness of thiol. Such high-sensitivity sensors can be used for protein-protein interaction and virus detection in the field of biosensing applications.

Keywords: Surface Plasmon Resonance; Biosensor; Sensitivity; Thiol and Bimetal.

1. INTRODUCTION

Surface Plasmon Resonance (SPR) is one of the powerful techniques for the study of biomolecular interactions and the detection of analytes and it is currently being researched as a rapid diagnostic platform for a variety of viral diseases (Karki *et al.* 2022). Recently, SPR techniques finds more applications such as detection of cancerous basal cells (Daher *et al.* 2022), blood plasma (Almawgani *et al.* 2022 a), infected red blood cells with plasmodium falciparum (Daher *et al.* 2023), detection of fat concentration in milk (Almawgani *et al.* 2022b), detection of severe acute respiratory syndrome corona virus-2 (SARs CoV-2) (Uddin and Kabir, 2021; Moznuzzaman and Khan, 2021; Srivastava and Das, 2011) and detection of formalin (Moznuzzaman and Khan, 2021). Silver performs better than Gold (Au) in the SPR because the Ag metal film has a narrower resonance peak, which increases the SPR sensor's accuracy and sensitivity (Maharana and Jha, 2012; Verma and Jha, 2011). In the proposed design, oxidation and corrosion were the problems due to the direct use of Ag layer, as a plasmonic metal was inhibited through attributing bimetallic approach in which Ni layer is used as a protection layer to prevent the deterioration of Ag in ambient conditions. Recently, several approaches on utilizing bimetallic layers for protecting plasmonic metals from oxidization and corrosion with improved performances have been reported (Jha and Sharma, 2009; Yuan *et al.* 2006). Recent interest in plasmonic metals has been focused on ferromagnetic metals such as nickel (Ni) and cobalt (Co) because of their exceptional magneto-optical properties (Maharana and Jha, 2013; Ordal *et al.* 1985). Hence in the proposed design of Ni is considered as a protective layer over Ag. Shah *et al.* suggested that using magnetic materials reduces the cost as well as improves the sensitivity of SPR sensors to a higher extent (Shah and Sharma, 2018). Thiols (RSH) could be found in low molecular weight compounds like protein cysteine residues as well as glutathione. Thiols and their derivatives play important roles in catalysis, regulation, protein folding and triggering due to their high chemical versatility. Thiol-dependent redox systems are common in living organisms and are involved in a variety of living systems (Alvarez and Salinas, 2022). Thiol-tethered DNA can be used as receptors for sensing immobilized receptor molecules (Uddin and Kabir, 2021; Malmqvist, 1999). Sandstrom *et al.* reported the thiol-specific and non-specific binding of single and double-stranded DNA to colloidal gold nanoparticles. The geometry of the bound strands depends on the type of immobilization, with thiol-attached oligonucleotides most likely being more extended from the surface than the nonspecifically bound molecules (Sandstrom and

High performance SPR biosensor using Cu-Pt bimetallic layers and 2D materials

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In this present paper, we propose a surface plasmon resonance(SPR)sensor having better performance parameters based on Kretschmann configuration. The proposed SPR sensor is a modified Kretschmann configuration comprised of BK7 prism-Cu-Pt-Graphene/BP/WS_2. The bimetallic layer provides consistent enhancement of sensitivity over other SPR structures. Extensive numerical analysis based on transfer matrix theory has been performed to characterize the sensor response considering sensitivity, full width at half maxima (FWHM), detection accuracy(DA), quality factor(QF) with other conventional reported SPR sensor. We have also analyzed the electric field intensity enhancement factor(EFIEF) for the proposed SPR sensor. We have found that maximum sensitivity of 309deg/RIU corresponds to the four layer of BP configuration. We believe that this proposed SPR sensor could find the new platform for the chemical examination, medical diagnosis, gas detection and biological detection.

(Received November 30, 2022; Accepted February 14, 2023)

Keywords :Surface plasmon resonance(SPR), Sensitivity, Electric field intensity enhancement Factor(EFIEF), Detection accuracy(DA), Quality factor(QF)

1. Introduction

Surface plasmons are transverse magnetic (TM)-polarized electromagnetic excitations at the metal-dielectric interface with their fields decaying exponentially in metal as well as in the dielectric medium. The SPR sensing technique utilizes the Kretschmann configuration to excite surface plasmon using an evanescent field of P-Polarized light. The most popular configuration for analyzing the SPR technique is the Kretschmann configuration[1-2]. The SPR sensor has been implemented in various fields such as environmental monitoring, chemical compound detection, food sciences , forensic identification, bio sensing and photonic industry[3-5]. Sensitivity is the essential parameter of a SPR biosensor and to enhance the sensitivity using several method to improve the overall performance of the sensors such as air gap, bimetallic layers, 2D materials etc[6-8]. Recently, research work have been done for enhancing the performance of SPR sensor using bimetallic layer. Dyankov et.al., suggested that using bimetallic layer of silver-gold(Ag-Au) to enhance the sensitivity of the SPR biosensor[9]. Chen & Lin reported a bimetallic SPR sensor chips based on Kretschmann configuration, the results shows low FWHM and high sensitivity than the SPR sensor with single silver layer[10]. B. H. Ong et al. analyzed bimetallic Ag-Au film configuration to enhance the high sensitivity surface plasmon resonance sensing and found a sharp resonance FWHM and evanescent field enhancement [11]. Gao C. et al theoretically investigated the performance of SPR sensor with a enhancing prism and bimetallic Ag-Au alloy nanoparticles which may enable many plasmonic applications with high performance, long lifetime and especially for those involving corrosive species[12]. Zynio et.al., investigated a bimetallic layer of Au-Ag for chemical sensors, bimetallic films shows a high shift in resonance angle on changes of

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https://doi.org/10.15251/DJNB.2023.181.221

Optical and Quantum Electronics (2023) 55:83
https://doi.org/10.1007/s11082-022-04198-z

Vortex carrying circular airy beam in free space optics and aberration effects in turbulent atmosphere

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Received: 17 August 2022 / Accepted: 13 October 2022 / Published online: 11 December 2022
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Abstract
In this paper, a detailed analysis of the distribution of intensity of vortex circular airy beam (CAB) propagating in a turbulent atmosphere applying Fresnel–Kirchhoff diffraction integral equations is presented. A turbulent atmosphere consists of different types of aberrations. The existence of aberrations in an atmosphere under turbulence plays a vital part in affecting the quality of optical beams. Here, the effect of different aberrations such as z-tilt, defocus, astigmatism, coma, and spherical aberration on the intensity distribution and structure of vortex CAB at two different propagation distances under four different atmospheric turbulent conditions with topological charge m = 1 were investigated. The two different propagation distances which we have used in this scenario are $z = 2000$ m and $z = 5000$ m. A numerical analysis was performed for each aberration, and corresponding 3d and 2d plots were plotted. The results show that spherical aberration has the highest effect than the other four aberrations on the intensity distribution of vortex CAB and z-tilt aberration has the least effect. Also, the analysis shows that the quality of the beam reduces with an increase in propagation distance. A comparison study was also done to identify the difference between vortex CAB and non-vortex CAB. Based on the comparison results, it is revealed that the maximum intensity distribution and quality of beam could be achieved more with vortex CAB than with non-vortex CAB.

Keywords Vortex · Airy beam · Aberration · Turbulent atmosphere

1 Introduction

Airy beam (AB) belongs to a special species of beam having a wide range of applications in the field of free space optical communication, optical micromanipulation, plasma guidance, vacuum electron acceleration, etc. Airy Beam can be treated as radially symmetric

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A Review On Various Doped Tio2using Metallic And Non-Metallic Nanocrystals

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Abstract: In this study, various approaches for producing doped TiO_2 using metallic and non-metallic nanocrystals are examined. Due of a number of characteristics, including great physicochemical stability, low cost, and non-toxicity. In photocatalytic, photovoltaic and dye dye-sensitized solar cells applications; TiO_2 is one of the most often used semiconductors. TiO_2 has differing bang gaps in its rutile and anatase crystalline phases, respectively, of 3.0 eV and 3.2 eV.

Keywords: Co-precipitation method, Sol-gel method, hydrothermal method, doped components,

1.1 Introduction:

Fujishima et al. [1] reported that the Platinum electrodes are replaced with p-type semiconductor electrodes so that water can be electrochemically photolysis more effectively. Frank and Bard [2] have said that when compared to the doped or rutile forms, the high indensity radiation of CN^- disappearance was essentially at an ignition rate. The importance of physicochemical qualities in electronic devices including water splitting devices, solar cells, gas sensors, and dye sensitised photocatalyst [3-7]. The crystalline forms of this mineral are rutile, anatase, and brookite, which are all well-known. At ambient temperature, anatase is a common and stable phase in nanomaterial's [8–10].

TiO_2 has additional advantages such as non-toxicity, ease of production, and chemical stability [11].The n-type semiconductor titanium dioxide (TiO_2) is well-known. Under UV light (387 nm) with an energy greater than the band gap of 3.3 eV in the anatase crystalline phase, TiO_2 exhibits comparatively high reactivity and chemical stability. The development of photocatalyst with high reactivity under visible light (> 400 nm) could allow the use of the majority of the solar spectrum, even in low-light environments. Metal-ion implanted TiO_2 (using transition metals: Cu, Co, Ni, Cr, Mn, Mo, Nb, V, Fe, Ru, Au, Ag, Pt) [12-14], reduced TiO_2 photocatalyst [15-16], and non-metal doped-TiO_2 (N, S, C, B, P, I, F) [17-20] have all been presented as methods for TiO_2 modification.

TiO_2 is a low-cost, easy-to-handle substance that is non-toxic and non-hazardous. In recent years, ceramic tiles have gotten a lot of attention for new uses and production processes, such as reduced thickness products, digital decoration, and antimicrobial activity, all of which add value to the construction materials. The method of doping TiO_2 with metallic and non-metallic species is described in this study, including a variety of dopant techniques that are now accessible.

1.2 The metaland non-metal ions nanocrystalsdoped TiO2using co-precipitation method:

TiO_2 has been doping with a many different metals such as Co, Nb_2O_5, Zn, $ZnFe_2O^{4+}$and $ZnFe_2O^{4+}$, Li ,Al,Cu,SnO_2, Ni, Ag, Fe and Ce. Because the Fermi levels of these metals are lower than that of TiO_2, photo excited electrons can be transferred from the conduction band of TiO_2 to metal particles deposited on the surface of TiO_2, while photo generated holes in the valence band remain on TiO_2. This greatly reduces the possibility of electron-hole recombination, resulting in efficient separation and higher photocatalytic activity [25]. To enhance the photocatalytic effect in the visible light region, many producing methods were, there are many techniques such as sol-gel, hydrothermal, spinning, co-precipitation, chemical vapour deposition, and pyrolysis and biosynthesis methods [26-27]. Among these, the co-precipitation method has several advantages such as cheap, better homogeneity, fine particle size, and time-saving.Detailed information about doped TiO_2 co-precipitations is shown in Table1 [28-44].

Doped Element	Preparation method	Characterization and its applications	Reference
Co	Co-precipitation method.	1. XRD results confirm the crystal structure and presence of anatase, brookite and rutile phase with particle size in the range of 43.63nmto 38.81nm. 2. UV spectroscopies studies band gap of cobalt doped TiO_2 nanoparticles was 2.59ev, 2.0ev, 1.68ev and 1.5evrespectively. 3. Wavelength was increased, bandgap shifted towards small values that's mean photocatalyst activity can be increased.	[28]
Co^{3+}	Co-precipitation method.	According to the X-ray diffraction and Raman spectroscopy analysis, the substitution of Ti^{4+} by Co^{3+} creates oxygen vacancies and promotes the anatase-to-rutile transformation. The enhancement of high temperature NO_2 sensing performance is related to the alteration in electronic structure as well as the formation of rutile polymorph in the Co-doped TiO_2 sample.	[29]
Co	Co-precipitation method.	The XRD results of t the crystallite size of Co-doped TiO_2 nanoparticles decreases from 18 to 12 nm with the increase of doping concentration. The scanning electron microscopy was used to detect the morphology of	[30]

Polymer Bulletin (2022) 79:4269–4286
https://doi.org/10.1007/s00289-021-03707-9

ORIGINAL PAPER

In-vitro and antibacterial activities of novel POT/TiO_2/PCL composites for tissue engineering and biomedical applications

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Received: 20 November 2020 / Revised: 29 March 2021 / Accepted: 3 May 2021 /
Published online: 10 May 2021
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Abstract

The organic/Inorganic nanocomposite poly-ortho-toluidine-TiO_2 was synthesized by chemical oxidative polymerization in the presence of TiO_2 using ammonium peroxo-disulfate as an oxidizing agent. The POT + TiO_2/PCL composite film scaffolds were fabricated by solvent casting technique. The prepared POT + TiO_2/PCL composite film was characterized through X-Ray diffraction (XRD), Fourier transform infrared (FT-IR)spectroscopy, Field emission scanning electron microscopic studies (FESEM) with EDS techniques.The conductivity measurement of the samples was carried out at room temperature by standard two probe technique using KEITHLEY electrometer. The surface roughness of composites was measured using a 3D laser profilometry–Zeta Optical–Profilometer. The diffraction pattern of POT + TiO_2/PCL composite film suggests the semicrystalline nature of the composites.FT-IR spectra confirms the formation of POT + TiO_2/PCL composite film. The inclusion of POT + TiO_2 component confirmed by FT-IR spectra also by the color change observed while blending PCL with POT + TiO_2. The FE-SEM images of POT + TiO_2 composites possesses the granular and spherical morphology also the TiO_2 nanoparticle seems to be well dispersed in POT. The EDX spectra confirms the presence of all elements in the POT + TiO_2/PCL composites.The POT + TiO_2 nanocomposites have conductivity in the semiconducting range 0.13×10^{-7}(S/Cm). Similarly, the DC conductivity of the POT + TiO_2/PCL film becomes semiconducting range 0.04×10^{-8} (S/Cm). Surface roughness provides a great influence on the viability of different cells. The activity of Vero cells on both the composites was detected through MTT technique to determine the toxicity of the samples. In vitro antibacterial activities of POT + TiO2 and POT + TiO2/PCL composite scaffold were evaluated on gram-positive *Staphylococcus aureus* (*S. aureus*) and gram-negative *Escherichia coli* (*E. coli*) bacteria using well diffusion technique.POT + TiO_2/PCL composite scaffold with improved surface roughness, cell viability and antibacterial activity. This work provides an economic and convenient method which

Extended author information available on the last page of the article

IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

A COMPARATIVE STUDY BETWEEN READYMADE AND SELECTED CHEMICAL WATERPROOF FUNCTIONAL FINISH

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ABSTRACT: The waterproof fabric comes in handy in harsh weather conditions like heavy rainfall or during deep sea sinking water can damage many fabrics. Cotton terry fabrics are commonly used in our homes after bathing or after hand wash, as the pile pulls excess water into it and it has a smooth texture finish. There are different types of readily available waterproof chemical and fabrics in the market. This research is a study between Readily available Waterproof and Selected waterproof Chemical Finish and its effect on the mechanical properties of the cotton terry fabric. During analysis the selected chemical for the study showed best performance.

KEY: Cotton, Terry fabric, Waterproof, Functional finish

I. INTRODUCTION

Cotton fibres are natural hallow fibres; they are soft, cool known as breathable fibres and absorbent. Cotton fibres can hold water 24-27 times their own weight. They are strong, dye absorbent and can stand up against abrasion wear and high temperature. In one word, cotton is comfortable says Hosseini Ravandi and Valizadeh (2021). Cotton fibres are the purest form of cellulose, nature's most abundant polymer. Nearly 90% of the cotton fibres are cellulose suggests Gordon and Hsieh (2007). There is an evolutionary dimension not only of the plants themselves but also of the climatic situations in which they occur says Jack Mauncy and James Stewart (1991). Cotton derived from the Arabic word 'Quotn' belongs to Gossypium genus, which was also derived from the Arabic word 'Goz" meaning a soft substance. Cotton is a unique natural fibre producing most common fibre crop of the world, which provides humanity with cloth and vegetable oil, medicinal compounds, meal and hull for livestock feed, energy sources, organic matter to enrich soil, and industrial lubricants say Ibrahim Abdurakhmonov (2016). Cotton is the most important fibre crop with an estimated world production of 23million tons of fibre. India is the third largest producer of cotton, producing about12% of the world production, but to low productivity conveys Frank Eyhorm et al. (2005). It has the largest area under cotton cultivation. The terry pile is a warp pile structure that has loops on its surface that are formed by certain warp ends. The fabric consists of one series of weft thread and two series of warp threads, the ground and the pile. The ground and the pile threads are separately beamed and tensioned; the former produces with weft the ground cloth from which the loops produced by pile warps are projected. The loops may be formed on one side or on both sides of the cloth says Jitendra Pratap Singh and Swadesh Verma (2017). Terry cloth fabric is a woven fabric. It is a unique fabric in terms of its making. The weaving of Terry cloth requires two warp beams are used. One beam forms the base of the fabric also known as ground warp another beam that is the top beam or pile warp forms the loop in the fabric. Based on the fabric requirements and end use, type of yarns, quality, weight, number of loops, length of loop and loop density is determined says Rutu Kanade (2020). Commercially 3 pick terry is most widely used where after each 3-weft insertion full beat-up is made and one loop pile is formed of the fabric.

Waterproof fabric is a natural or synthetic fabric that has been coated with a substance to repel water. Common waterproofing substances include polyurethane, polyvinyl chloride, silicone, and wax. The term "waterproof" applies to the fabric only, not the entire garment. Even if a fabric is entirely waterproof, the seams must be sealed or taped and the zippers must have storm flaps, or the garment is merely water-resistant clarify Angela Brady (2022). Waterproof fabrics are designed for use in garments that provide protection from the weather such as wind, rain and loss of body heat. Clothing that provides protection from the weather has been used for thousands of years suggest Perumalraj (2006). Consumers who are regularly involved in outdoor activities, such as sports and leisure, or subjected to extreme conditions (snow, rain, cold, and wind) require multifunctional clothing, and the global market for waterproof-breathable textiles is growing annually. Such clothing should keep the wearer dry and comfortable under cold, hot, and wet conditions. To achieve this, the fabric and clothing need to be waterproof and water vapor-permeable suggest Hyun-Ah Kim, (2021). Therefore, waterproofing and water-vapor-permeable

IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Effect Of Vetiver Roots On The Fabric Roller Window Blind

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ABSTRACT: Vetiver Roots have coolant, carminative, stomachic, constipating, expectorant, anti-spasmodic, anti-gout, and anthelmintic properties. The plant possesses hepatoprotective, antituberculosis, antidiabetic, antidepressant, antiemetic, cytostatic, and antimicrobial action. Vetiver extract improves skin hydration, skin glow and has anti-ageing properties too. Roller shades will unify the style of any window treatment and give any home a clean, uncluttered appearance. This form of shade can greatly benefit modern homes. Roller shades appear tidy and compact when installed properly. Roller Fabric window blind in which a voile layer is added to reduce glare if the sun is too bright will be a new innovation. The prepared vetiver fabric roller window blind is an unique product with aromatic and its results were very fruitful.

Key: Vetiver Root, Natural Dye, Fabric Roller window blind.

I INTRODUCTION

Medicinal and aromatic plants are looked upon not only as a source of affordable health care products but also as a source of income. Balasankar et al. (2013) describes that there is a growing demand for plant based medicines, health products, essential oils, fragrances, cosmetics and natural aroma chemicals in the national and international markets. Home textile is a branch of technical textile comprising application of textiles in household purposes. Vasanth kumar et.al (2012) suggest home textiles are an internal environment, which deals with internal spaces and their furnishings. Anjali Chhabra et al. (2010) aver home textiles are mainly used for their functional and aesthetic properties which provides us the mood and also gives mental relaxation to the people. A window blind is a type of window covering. There are many different kinds of window blinds which use a variety of control systems. Window blinds can be manoeuvred with either a manual or remote control by rotating them from an open position, with slats spaced out, to a closed position where slats overlap and block out most of the light. When comparing the light-blocking abilities of drapes vs. curtains vs. blinds, all three can do a fairly good job. However, when it comes to blinds, some light can seep through the cracks between slats and in around the edges. Still, blinds can be suitable for bedrooms and always can be topped them with curtains to more thoroughly block the light. Blinds can come in different colors and wood tones. Topping them with curtains or a valance can soften their rigid appearance and add some visual interest.

Vetiver root as an natural organic source can be used for preparing window blinds product. Jeremy Berkoff (2003) explain vetiver has traditionally been used as medicinal and aromatic plants in many countries, especially in Asia. Recently it has received widespread recognition as being an ideal plant for soil and water conservation as well as environmental protection. Agus Setyo Muntohar (2016) delineate as a campaign to go 'back to nature' is everywhere, the utilization of vetiver as a medicinal plant to produce pharmaceutical products on a commercial scale has great potential for development. Putiyanan (2006) explain the uniqueness of vetiver root crafts have certain function, have interesting characteristics, and also can be a good give a fragrance on the room. Weerachai Nanakorn and Narong (2010) says vetiver root crafts has been increasing year by year in local, national and international levels. This increase in demand, as well as tremendous competition in the market, opens up opportunities for value addition to all forms of textile materials. Vetiver crafters use Vetiver leaves and roots to create an extensive range of beautiful woven handicrafts. Vetiver would seem suited to producing soft, durable fabric. Dhirendra Kumar and Kumar Nikhil (2016) convey that dry aromatic roots are used to make curtains, mats, fans and other fancy goods as the product emits a sweet cooling aroma for a long period when moistened during summer season. Gopinath et al. (2015) suggest the oil is used for blending of perfumes, cosmetics and scenting of soaps. The roots have been used in Asia for centuries for their fragrance, and are woven into aromatic matting and screens. Jayashree et al. (2013) announce that the roots of some cultivars and ecotypes possess essential oil that has been utilized as fragrant material since ancient times. Negisa Darajeh (2019) clarify the plant also contains active ingredients used in traditional medicine and as botanical pesticide.

ROLLER SHADES
FIG .1

Window coverings can be static or dynamic. Static window coverings are fixed in place while dynamic window coverings can change their status manually or automatically. Dynamic

Technology and Innovation in Business
www.sankara.ac.in
Volume: I

ICTIIB 2023
ISBN: 978-93-5626-961-3
22nd April 2...

MOBILE BANKING SERVICES AND IT'S BENEFITS

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Abstract: - **Mobile banking is a facility that enables the customers to perform the banking tasks on mobile phones. This is provided by most of the banks in India and abroad. Customers can use mobile banking services to view their account balance, make instant fund transfers and pay bills, etc. it saves time, easy access, 24*7 hours services and etc.. There are different types of mobile banking, viz. via SMS, USSD and mobile apps in. This paper presents the various mobile banking services rendered by the banks and its benefits.**

Keywords: -*Mobile banking, Mobile banking services, Benefits*

I. INTRODUCTION

Banking sector is one of the oldest sectors in our country. The banks are accepting deposits from their customer's and providing loans to them. The banks providing various services to their customer are bill payment, discounting of bills, guarantee by banks, credit/debit card services and so on. In recent years banks innovates new ideas to increase their business and make easy banking to their customer. Innovation in banking includes internet banking, mobile banking, wholesale and retail banking, universal banking, narrow banking, offshore banking and multinational baking. These innovations are more help to the customers/account holder of the banks.

II. OBJECTIVES OF THE PAPER

- To present the mobile banking services and it's benefits

III METHODOLOGY AND DATABASE

The study is fundamental one and it is purely based on the secondary data. Datas were derived from the various journals, articles, books, magazines, websites and etc,.

IV. MOBILE BANKING

Mobile banking is a service provide by a bank or other financial institutions, which allows customer to make a financial transaction through the mobile banking applications provided by the bank or financial institutions in mobiles phones, smart phones, Tablets and etc,. It is very convenient in today's digital world. It reduces the time of customer and makes quick transactions.

V HISTORY OF MOBILE BANKING

- The earliest mobile banking services were done through SMS, the service was

Technology and Innovation in Business
www.sanbara.ac.in
Volume 1

ICTIIB 2021
ISBN 978-93-5636-96-3
22nd April 2022

AN OVERVIEW OF FORENSIC ACCOUNTING AND AUDITING IN INDIA

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Abstract: - **Increasingly, technology is being used in practically every field of business, which is resulting in diverse and complicated scams. As a result, authorities and industry leaders face greater problems in preventing fraud and risks. In the wake of an increase in the number of such frauds and threats as a result of modern technology, forensic accounting assists businesses in preventing fraud and executing their objectives in a systematic, methodical manner to improve the effectiveness of risk management, control, and governance practices. In the spirit of civil and criminal indictment, forensic accounting is the application of financial accounting and inquisitive dexterity to a standard acceptable by the court to control difficulties in disputes. Despite the fact that most worldwide corporations embrace this accounting as a separate unit, the Indian corporate sector continues to use it as an investigative tool rather than a preventive one. A forensic audit is a thorough review and assessment of a company's or individuals financial records for use as evidence in court. The paper's goal is to give a general review of forensic accounting and auditing in India.**

Keywords: - *Forensic accounting, Forensic auditing, Techniques and Tools, Problems*

I. INTRODUCTION

In today's economic environment, forensic accounting is a critical instrument for finding or investigating financial crime and determining the course of justice, offering definitive information about the facts discovered in connection with financial crime. Although it is a relatively young field, forensic accountants have become increasingly popular among banks, insurance companies, and even police departments in recent years. The rise in white collar crime, as well as the difficulties faced by law enforcement organisations in identifying fraud, has aided the profession's expansion.

In India, forensic auditing courses are offered by organisations such as India forensic, the Institute of Chartered Accountants of India (ICAI), and the Association of Chartered Certified Accountants(ACCA). Forensic accounting is a branch of accounting that focuses on investigating fraud and analyzing financial data for use in judicial proceedings. Forensic accounting is a skill set that combines accounting, auditing, and investigative skills to conduct financial fraud investigations. It

Pros and Cons Digital Banking in India

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Introduction

Digital banking, also known as internet banking, web banking, or home banking, is anelectronic payment system that enables customers of a bank or other financial institution to conduct a range of financial transactions through the financial institution's website. The onlinebanking system will typically connect to or be part of the core banking system operated by a bank to provide customers with access to banking services in place of traditional branch banking. Digital banking significantly reduces the banks' operating costs by reducing relianceon a branch network and offers greater convenience to customers in terms of time saved in coming to a branch and the convenience of being able to perform banking transactions even when branches are closed. Internet banking provides personal and corporate banking services, offering features such as viewing account balances, obtaining statements, checking recent transactions, transferring money between accounts, and making payments.

History of Digital Banking

The earliest forms of digital banking trace back to the advent of ATM machines and cardsLaunched in the 1960s. As the internet emerged in the 1980s with early broadband, digital Networks began to connect retailers with suppliers and consumers to develop needs for early online catalogues and inventory software systems. By the 1990s the Internet emerged and online banking started becoming the norm. The Improvement of broadband and ecommerce systems in the early 2000s led to what resembled the modern digital banking world today.

Theproliferation of smart phones through the next Decade opened the door for transactions on the go beyond ATM machines. Over 60% of Consumers now use their smart phones as the preferred method for digital banking.

The challenge for banks is now to facilitate demands that connect vendors with money through channels determined by the consumer. This dynamic shapes the basis of customer Satisfaction, which can be nurtured with Customer Relationship Management (CRM) Software. Therefore, CRM must be integrated into a digital banking system, since it provides Means for banks to directly communicate with their customers. There is a demand for end-to-end consistency and for services, Optimized on convenience and user experience. The market provides cross platform front Ends, enabling purchase decisions basedon available technology such as mobile devices, with a desktop or Smart TV at home. In orderfor banks to meet consumer demands, they need to keep focusing on improving digital technology that Provides agility, scalability and efficiencying levels of service and charges.

Technology and Innovation in Business
www.sankara.ac.in
Volume: I

ICTIIB 2022
ISBN: 978-93-5626-961-3
22nd April 2022

E - HR SYSTEM: STRENGTH AND WEAKNESSES

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Abstract: - **This study covers the advantages and disadvantages of electronic human resources, as well as potential research implications for the future. The software from e-HR provides a high level of homogeneity and consistency in a company, allowing for seamless operations. It aids in bringing the HR-required control and efficiency. The review's initial framework looks at how HR professionals at the company implemented a technology-based management information system (MIS). This system allowed employees to be managed more efficiently (in principle) through an impersonal system that enforced payroll, attendance, and punctuality regulations. As a result, e-HR software is used to make compensation determinations and other personnel-related decisions. Companies have realised this now. The function of e-HR has evolved as the organisation has grown, from being purely administrative to becoming a business partner. At the same time, e-HR provides the business with qualities like as stability and dependability, resulting in a high level of recognition inside the organisation. It also maintains relationships, streamlines procedures, and increases information access so that strategic and operational decisions may be made. The goal of e-HR is to connect people with information – customers, suppliers, and employees. It's all about making businesses more productive and efficient.**

Keywords: - e- HR, HRIS, Strategic HR, Strength, Weakness

I.INTRODUCTION

E-HR systems are fundamental programmes that help to cut the time it takes to manage human resources. It has gathered data from an administrative function in charge of payroll to aid in strategic decision-making that can bring value to a company. Managerial responsibilities have evolved in recent years, partly as a result of market development and partly as a result of new technology employed by the firm in which they operate. As a result, organisations must assess their own Human Resource functions. (Alleyne et al, 2007). Organizations and enterprises in today's global markets know that their ability to compete is reliant on the quality and efficacy of their people. Today's HR managers want a world-class HR management system to assist them in making daily strategic and operational decisions. Human Resource solutions such as electronic Human Resource management (HRM) have evolved in recent years as Intranet and Internet technology have advanced. (Hooi, 2009)

II. RECENT DEVELOPMENT IN e-HR OR HRIS

In 1990s, Client/server systems were the preferred arrangement for most businesses. However, in recent years, businesses have begun the process of transferring their legacy systems to new software packages

Digital Marketing and Its Impact on Buying Behaviour of Youth

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Introduction

Digital Marketing is defined as buying and selling of information, products, and services via computer networks or internet. Internet and electronic commerce technologies are transforming the entire economy and changing business models, revenue streams, customer bases, and supply chains. New business models are emerging in every industry of the New Economy. Travel industryand ticketing has seen a sea change in the last decade. One estimate suggests that online travel industry contributes about 76% of total net commerce in India. Ticketing is now done either in third party websites or airline sites. Customers of online shopping are delighted with prompt delivery and flawless payment mechanisms building trust in consumers. Even online classifieds have made a successful transition online with jobs and matrimonial taking the lead. Online retailers are now pushing a larger number of categories such as electronics and white goods. In these emerging models, intangible assets such as relationships, knowledge, people, brands, and systems are taking center stage.

The internet is a disruptive technological innovation but consumers everywhere are waking up to the idea of shopping online. The impact on retailing has been profound and as a result many businesses are changing the channels they use to sell their goods and services. In some parts of the world, retailers have been quick off the mark in developing their own individually branded e-commerce stores, whereas in other parts the e-market place dominates.

Digital Marketing Scenario in India

India is the world's 3rd largest internet population. After the proliferation of Internet, Marketing strategy has taken an off root to reach out to the public. The tremendous growth that digital marketing has shown cannot be match up with any other strategy. Looking up to the current scenario in India, people here are not only aware of Internet but are employing it for various purposes in life. Thus, there's a booming internet marketing industry in India. In India social media is the driving the adoption of digital marketing.

The retail sector in India is booming both on and offline. India is a relative latecomer to the online shopping revolution but it is predicted that online sales will grow by 50 per cent annually in the next few years. The country is already the third largest nation of internet users with over 120 million and the rapid uptake of mobile commerce is predicted to increase the number of users to over 330 million by 2015. Social media is helping to drive the development of digital marketing. Increasingly wealthy populations of young internet savvy customers are spending more time and money online and in doing so are influencing shopping trends.

Technology and Innovation in Business
www.snnharn.ac.in
Volume: I

ICTIIB 2022
ISBN: 978-93-5626-961-3
22nd April 2022

FUTURE BUSINESS TURN- UNDER CLOUD ACCOUNTING

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Abstract: **- Accounting based on the book keeping and recording. In future it will be changed on the basis of technology development. Recent years Cloud technology is famous for data storage and security. It is one of the tremendous IT innovations over the last decade. Cloud accounting is one the best software method to store the accounting. This paper aimed to research the advantages and importance of cloud accounting, and also to know the types and future place of the cloud accounting. This analysis has been made in an attempt to know the overview of cloud accounting. In this study, the information has been searched and prepared depending on the most recent articles and researches conducted by accounting and expert opinions.**

Keywords: *- Accounting, cloud Accounting and Technology*

I. INTRODUCTION

Accounting process is undergoing so many changes, introduction of more technologies they were updated. One of the evolutions of technology is Cloud Accounting. Cloud accounting is the on- demand availability of computer system resources that is data storage without direct active management by the user. without the paper work the cloud accounting to make the data and software accessible on line anytime, anywhere from having an internet connection. In this system user access software applications send through the internet to cloud application service provider. In cloud accounting, data is sent into the cloud, it is processed and returned to the benefiter, it is performed off-site which frees the business from having to install and maintain software on individual desktop computers. It is store the data in anywhere from our necessary places. Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service

II. OBJECTIVES OF THE PAPER

- To research the history and features of the cloud accounting.
- To analysis the types and suitability of the cloud accounting.

III. HISTORY OF THE CLOUD ACCOUNTING

Cloud computing is to have been invented by Joseph Carl Robnett Licklider. In the 1960, early stage the concepts of time sharing became popular via RJE, this technology was mostly associated with large vendors as IBM and DEC. Full-time-sharing solutions were available by the time of 1970s on such platforms as Multicast (on GE hardware), Cambridge CTSS, and the earliest UNIX ports (on DEC hardware). Yet, the "data centre" model where users submitted jobs to operators to run on IBM's

Int. J. Adv. Sci. Eng. Vol.8 No.2 2188-2193 (2021) 2188 E-ISSN: 2349 5359; P-ISSN: 2454-9967

RESEARCH ARTICLE

Strongly B* - Continuous Multiset Functions In Multiset - Topological Spaces

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ABSTRACT: In this paper, we introduce the new concept of Sb^*- Open, closed and continuous multiset function in multiset topological space. Also study some interesting properties of Sb^*-closed and Sb^* –continuous mutiset function in multiset topological space

KEYWORDS: Multiset function, strongly b*- continuous M-set functions, strongly b*-open maps and closed maps.

https://doi.org/10.29294/IJASE.8.2.2021.2188-2193 ©2021 Mahendrapublications.com, All rights reserved

1. INTRODUCTION

Levine [12] introduced the concept of generalized closed sets in topological spaces and a class of topological spaces called $T_{\frac{1}{2}}$ - spaces. Dunham [7] and Dunham and Levine [8] further studied some properties of generalized closed sets and $T_{\frac{1}{2}}$ - spaces. Strong forms of continuous maps have been introduced and investigated by several mathematicians. Strongly continuous maps, perfectly continuous maps, completely continuous maps, open continuous maps were introduced by Levine [14], Noiri [19], Munshi and Bassan [16] and Reilly and Vamanamurthy [21] respectively.

Semi continuous functions have been studied by several authors. Dontchev [5], Ganster and Reilly [6] introduced contra - continuous functions and regular set - connected functions. Erdal Ekici [9] introduced and studied a new class of functions called almost contra – pre - continuous functions which generalize classes of regular set – connected [6], contra – pre continuous [12], contra continuous [5], almost s - continuous [18] and perfectly continuous functions [19]. Sunil Jacob John and Girish introduced Multiset Topology [26]. In this paper, we introduce the new concept of Sb^*- Open, closed and continuous mutiset function in multiset topological space. Also study some interesting properties of Sb^*-closed and sb^* –continuous mutiset function in multiset topological space.

2. PRELIMINARIES

In this section the necessary basic definitions are studied.

Definition 2.1[21]: A map f: X → Y from a topological space X into a topological space Y is called semi- generalized continuous (sg-continuous) if $f^{-1}(V)$ is sg- closed in X for every closed set V of Y.

Definition 2.2[2]: A function f: X → Y is said to be generalized continuous (g-continuous) if f^{-1} (V) is g-open in X for each open set V of Y.

Definition: 2.3[4]: A function f: X→ Y is said to be αg - continuous if $f^{-1}(V)$ is αg - open in X for each open set V of Y.

Definition 2.4[20]: A subset A of a topological space (X, τ) is called a strongly b^*- closed set (briefly sb^*- closed) if cl(int(A)) ⊆ Uwhenever A ⊆ U and U is b open in X.

Definition 2.5[19]: Let X and Y be topological spaces. A map f: X → Y is called strongly b*-continuous (sb*- continuous). If the inverse image of every open set in Y is sb*- open in X.

Definition 2.6: Let X and Y be topological spaces. A map f: X → Y is called strongly b*-closed (sb*-closed) map, if the image of every closed set in X is sb*- closed set in Y.

Definition 2.7: A subset (X, τ) is said to be α-closed set, if cl(int(cl(A))) ⊆ A.

Definition 2.8: A subset R of $M \times M$ is said to be an M-set relation on M, if for every member $\left(\frac{m}{x}, \frac{n}{y}\right)$ of R has a count, product of $c_1(x, y)$and $c_2(x, y)$. we denote $\frac{m}{x}$ related to $\frac{n}{y}$ by $\frac{m}{x}$ R $\frac{n}{y}$.

Definition 2.9: An M-set relation f is called an M-

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Received: 15.09.2021 Accepted: 25.10.2021 Published on: 15.11.2021

Smart Intelligent Computing and Communication Technology
V.D. Ambeth Kumar et al. (Eds.)
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doi:10.3233/APC210063

Experimental Investigation of Pulse Modulation Schemes in Free Space Optical Communication Under Turbulence

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Abstract. When we allow an optical beam to travel through Free Space Optical (FSO) Communication system, the optical beam faces immense issues due to so many factors such as diffraction, scattering, signal absorption, etc. These factors put down the quality rate of FSO communication system. In this experimental analysis, an artificial controlled turbulence chamber was built to create FSO communication with optical source laser. The signal to be tested is generated with the help of a LASER source, is allowed to pass on through the immense turbulent states by employing various pulse modulation schemes such as Pulse Amplitude Modulation (PAM), Pulse Duration Modulation (PDM), and Pulse Position Modulation (PPM) separately. In all the three modulation schemes, the parameters such as phase Jitter and 3dB bandwidth are observed and the observed values are compared. The results show that phase jitter value is 9.8414 radians for PPM. Also, PPM has the highest ability to overcome jitter than the remaining two schemes under high atmospheric turbulence parameters. However, in the case of Bandwidth utilization, PDM modulation reduces its utilization to 12MHz.

Keywords. Free Space Optical communication; PPM; PAM; PDM; Phase Jitter; 3dB bandwidth, performance, measurement.

1. Introduction

In the current scenario, free space optical (FSO) communication focuses a deep attentiveness in optical community because of its immeasurable advantages such as huge amount of data transmission over unlicensed spectrum, wireless communication technique used to send and receive various types of data at faster rate, larger bandwidth, gives high performance in optical networks, etc. [7-12]. Although, along with the advantages FSO faces certain troubles due to the presence variety of turbulent factors present in the environment which effects its performance [1,13]. FSO chooses Laser as

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2020-21

தொகுதி 8 எண் 2
Vol. 8 No. 2

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பங்குனி - ஆனி 2051
April - June 2020

ISSN : 2321-984X

நவீனத் தமிழாய்வு

(பன்னாட்டுப் பன்முகத் தமிழ் காலாண்டு ஆய்விதழ்)

Journal of Modern Thamizh Research

(A Quarterly International Multilateral Thamizh Journal)

Arts and Humanities (all), Language Literature and Literary Theory, Tamil
UGC Care Listed (Group-I) Journal

Published by
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Published by Raja Publications, No. 10, Upstair Brahm Nagar Khajamalai Tiruchirappalli 620 023, Tamil Nadu, India Mobile 9600535041
Printed The Printing House, Tiruchirappalli 620 021 Tamil Nadu India Ph +91 431 2420121

ஆவணங்களில் கொங்கு வேளாளரின் சிறப்புப் பட்டப் பெயர்கள்

ர. சங்கமேஸ்வரன்
உதவிப்பேராசிரியர், வரலாற்றுத்துறை, சிக்கண்ணா அரசு கலைக்கல்லூரி
திருப்பூர், தமிழ்நாடு, இந்தியா

ஆய்வுச்சுருக்கம்

பயிர்த் தொழில் செய்துவந்த கொங்கு நாட்டைச் சேர்ந்த கொங்கு வேளாளர்கள் நாளடைவில் நிர்வாகப் பணிகளிலும் பங்குகொண்டு அரசர்களிடம் பல சிறப்புப் பட்டப் பெயர்களைப் பெற்றுள்ளது ஆவணங்கள் மூலம் தெரியவருகிறது தொடக்கத்தில் ஊர்ச்சபை, நாட்டுச்சபை உறுப்பினர்களாகச் செயல்பட்டு பின்னாளில் நாட்டுத் தலைவர்களாக உயர்ந்து அரையர், மாராயர், காவிங்கராயர், முதலிக் வேளாள், முதலிக்காமிண்டன், மன்றாடியார், பட்டக்காரர், பாளையக்காரர், வேணாடுடையார், வானவராயர், பகதூர் போன்ற பட்டங்களைப் பெற்று அரசர்களுக்கு நிரை செலுத்தி ஆட்சியுரிமை, நிர்வாகம், வரி வருவல், நீதி வழங்கள் ஆகியவற்றை மேற்கொண்டு சிறப்பெய்தினர்.

முன்னுரை

கொங்கு வேளாளர் வேளாண்மையைத் தொழிலாகக் கொண்டவர்களாக இருந்தபோதிலும் அரச தொடர்பான பல பணிகளையும் ஆற்றியுள்ளமை ஆவணங்கள் மூலம் தெரியவருகிறது அவர்கள் பல சிறப்புப் பட்டப் பெயர்களைப் பெற்று பட்டக்காரர்களாகவும், பாளையக்காரர்களாகவும், நீதிபதிகளாகவும், அரச அலுவலர்களாகவும் பல அரசர்களிடம் பணியாற்றியுள்ளனர்.

கலைச்சொற்கள்

கொங்கு நாடு; வெள்ளாளர்; கொங்கு வேளாளர்; கொங்குச்சோழர்; கொங்கிளங்கோன்; கொங்காள்வான்; மகமை; சந்தியா தீபம் அரையர்; மாராயர்; காவிங்கராயன்; வேளாள்; காமிண்டன் முதலி, மன்றாடியார்.

கொங்கு நாடு

நம் செந்தமிழ்நாடு சேர, சோழ, பாண்டிய நாடுகளைப் போலவே தொண்டை நாடு, கொங்கு நாடு என்ற இரண்டு தனிப்பிரிவுகளையும் பழங்காலந்தில் தன்னகத்தே கொண்டிருந்தது பழம் பெரும் இலக்கியமாகிய தண்டியலங்காரம், "மிகை தமிழ்நாடு ஐந்து" என்றும், சைவ சமய நூலகளில் மிகத் தொன்மையானதாகக் கருதப்படுகின்ற திருமந்திரம், "நமிழ் மண்டலம் ஐந்து" என்றும் தமிழ்நாட்டில் ஐந்து பிரிவுகளாக வகுத்துக் காட்டுகின்றன கொங்கு நாடு மிகப் பழங்கால முதலே தமிழகத்தின் ஒரு பகுதியாகவே இருந்து வந்துள்ளது கொங்கு நாடு தற்போதைய மாவட்ட பிரிவுகளில் கோயம்புத்தூர், நீலகிரி, திருப்பூர், ஈரோடு, கரூர், நாமக்கல், சேலம், தருமபுரி, கள்ளகுறிச்சி மாவட்டத்தில் ஏறகாடு, ஆத்தூர், கங்கவல்லி, திருவண்ணாமலை மாவட்டத்தில் செங்கம், திருச்சி மாவட்டத்தில் குளித்தலை, திண்டுக்கல் மாவட்டத்தில் பழனி ஆகிய வட்டங்களை உள்ளடக்கியதாக இருந்தது

கொங்கு வேளாளர்

"வேளாளன் என்பான் விருந்திருக்க உண்ணாதான்" என்கிறது திரிகடுகம்' வேளாண் என்பதற்கு உபகாரி எனப் பொருள் கூறுகிறது தமிழ் பேரகராதி' வெள்ளம் என்ற சொல்லிருந்தே வெள்ளாளர், வேளாளர், வேளாண்மை என்ற சொற்கள் வந்திருக்க வேண்டும்' வெள்ளத்தை ஆண்டு பயிர்த் தொழில் செய்தவர்கள் வெள்ளாளர்கள், வேளாளர்கள் எனப் பெயர் பெற்றனர் வேளாளர் என்ற பெயர் கி.பி. ஏழாம் நூற்றாண்டு முதலும், வெள்ளாளர் என்ற பெயர் கி.பி.ஒன்பதாம் நூற்றாண்டு முதலும் பெரு வழக்கிற்று வந்தன.' வேளாளர் தமிழகம்

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Published by : Raja Publications, No. 10, Upstair, Ibrahim Nagar, Khajamalai, Tiruchirappalli - 620 023, Tamil Nadu, India. Mobile : 9600535241
Printed : The Printing House, Tiruchirappalli - 620 023, Tamil Nadu, India Ph : +91 - 431-2420121

பர்கூர் வட்டார சோளகப்பழங்குடியினரின் நடுகற்கள்

சி. குருசந்திரபத்மன்
உதவிப்பேராசிரியர், வரலாற்றுத்துறை,
சிக்கண்ணா அரசு கலைக்கல்லூரி, திருப்பூர் - 2, தமிழ்நாடு, இந்தியா.

ஆய்வுச்சுருக்கம்:

தமிழக வரலாற்றைப் பொறுத்தவரையில் நடுகற்கள் முக்கிய வரலாற்று ஆதாரமாகக் கருதப்படுகிறது. இந்த ஆய்வுக் கட்டுரை புலிக்குத்திக்கல் என்ற நடுகல் வகையைப் பற்றி ஆய்வு செய்யப்பட்டதாகும். குறிப்பாகத் தமிழக வரலாற்றில் நடுகற்கள் வரலாறு. அதிலும் குறிப்பாக ஈரோடு மாவட்டம், பர்கூர் மலைப்பகுதி கிராமங்களில் உள்ள சோளகப்பழங்குடியினரின் புலிக்குத்திக்கல் பற்றிய ஒரு ஆய்வாகும். இவ்வாய்வின் மூலமாக இங்குள்ள நடுகற்கள் எந்த இனத்தைச் சார்ந்தவர்கள் உடையது, எதற்காக இந்த நடுகற்களை இவர்கள் அமைத்தார்கள், நடுகற்கள் பற்றிய நம்பிக்கைகள், நடுகற்களில் தற்போதைய நிலை போன்றவற்றை இக்கட்டுரை ஆராய்ந்துள்ளது.

முன்னுரை:

இந்திய வரலாற்றைப் பொறுத்தவரையில் இலக்கிய ஆதாரங்கள், கல்வெட்டு ஆதாரங்கள், நாணயங்கள், செப்பேடுகள், அகழ்வாய்வுகள் போன்றவற்றின் அடிப்படையில் வரலாறானது வடிவம் பெறுகிறது. அதன் அடிப்படையில் பார்க்கும் பொழுது கல்வெட்டு ஆதாரங்களின் வரிசையில் கிடைக்கப்பெறும் நடுகற்கள் வரலாற்றில் முக்கிய இடம்பெறுகின்றன. சில நடுகற்கள் எவ்வித உருவங்களும் இல்லாமலும் , கல்வெட்டுகள் இல்லாமலும் காணப்படுவதும் உண்டு அதை பெருங்கற்காலத்தைச் சார்ந்தவை என பிரிக்கப்படுகின்றது.இதற்கு புலிமான்கோம்பை நடுகற்களை உதாரணமாக கூறலாம் இன்னும் சில நடுகற்கள் புடைப்புச் சிற்பங்களை கொண்டதாகவும் கல்வெட்டுகள் அற்றதாகவும் காணப்படுகின்றன. மேலும் சில இடங்களில் கிடைக்கப்படும் நடுகற்கள் புடைப்புச் சிற்பங்களுடன் கூடிய கல்வெட்டுகளையும் கொண்டுள்ளன. மேற்சொன்ன வகையில் கிடைக்கப்பெறும் நடுகற்களின் மூலமாவும் அதன் சிற்பத்தின் தன்மைகளும் ஏற்றாற்போல வரலாற்றில் காலங்கள் நிர்ணயிக்கப்படுகின்றன. அதேபோல் ஒரு குறிப்பிட்ட மக்களின் வாழ்க்கை முறையைப் பற்றி அறிந்து கொள்ளவும் முடிகிறது. வீரதீர செயல்களைப் பற்றியும், தியாகங்களை பற்றியும் நாம் இந்த நடுகற்கள் மூலமாக சிறப்பான முறையில் அறிந்து கொள்ள முடிகிறது. எனவே நடுகற்கள் குறிப்பிட்ட மக்களது சமுதாய மற்றும் பண்பாட்டு நிலையை விளக்குவதால் இவை வரலாற்றில் முக்கிய இடம் பிடிக்கின்றன.

நடுகற்கள் எதற்காக அமைக்கப்படுகின்றன?

நடுகற்கள் அமைக்கப்படுவதற்கு சில காரணங்கள் இருந்து வந்துள்ளது. இன்றைய காலகட்டங்களில் இராணுவத்தில் போரிட்டு இறக்கும் வீரர்களுக்கு இந்திய அரசாங்கம் விருதுகளை வழங்குவதைப் போல அக்காலத்தைய மக்களின் உன்னதமான தியாகத்திற்கும், வீர மரணத்திற்கும் நடுகற்கள் அமைக்கும் முறை இருந்து வந்துள்ளது. இவ்வகையான நடுகற்களை அமைக்கும் பொழுதுதான், அவர்களின் வீர தீர செயல்பாடுகள் பெருமளவில் மக்கள் மனதில் நிலை பெற்றிருக்கும் என்ற நம்பிக்கையும் இருந்து வந்துள்ளது. தனது மன்னனின் விசுவாசத்திற்கு பாத்திரமாக போர்க்களத்தில் உயிர் நீத்திருந்தாலோ அல்லது நமது உயிரைக் காப்பாற்றுவதற்குப் போராடி நன்னுடைய இன்னுயிரை நீந்து இருந்தாலோ அவர்களுக்கு நடுகற்கள் வைக்கும் வழக்கம் பரவலாகத் தமிழ் சமூகத்தில் காணப் பெற்றுள்ளது.

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-8 Issue-9, July 2019

2019-2020

A New Paradigm of Evaluation Techniques to Develop the Writing Skill of Professional Students: A Step Toward Learner Autonomy

T. Anitha, K. Brindha

Abstract: *Grading technical writing is a challenging task which is comprised of content, style and form of the message. Testing, examination, measurement and evaluation are usually used words that signify the process of assessing or grading students' performance. Evaluation is an integral part of teaching which includes a series of activities designed to measure the effective of the teaching-learning system as a whole. In this regard, the present study has adopted a qualitative approach to explore the writing problems, factors that obstruct writing development, and suggestions to improve writing skills of Professional students using evaluation techniques like Comprehensive Continuous Evaluation and Portfolio Method. Language is used as a means of communication in both speech and writing. Writing is not only a linguistic to be acquired for its own sake, but it is also an important aid in fixing the language material already learnt.*

Index Terms: *Evaluation Techniques, Obstructions, Portfolio Method, Suggestions, Writing Problems*

I. INTRODUCTION

Language is used as a means of communication in both speech and writing. Writing is not only a linguistic to be acquired for its own sake, but it is also an important aid in fixing the language material already learnt. Written communication demands various traits like content, organization of thoughts and style of language. As Sylvia Plath [5] says, "Imagination to improvise", writing as a skill involves the power of imagination and thereby the students gain control over their thoughts. Their thoughts and imagination help them to pursue the skill of writing which in turn shapes not only their perception of themselves but also the world around them.

Written communication is the second form of communication which is transmitted through words. Hyland [3] believes that performance in language development is subject to improvement in writing skills. In the professional world, effective writing skills are required to write document such as business memos, email, proposals, minutes, notes and so on. Both professionals and students need excellent writing skills to survival and excel in their pursuits as there is hardly any academic or professional activity that does not required writing skills. However, writing is often considered as complex skill for language learners to excel. The difficulties lie not only in manipulating and correlating the ideas, but also in transforming these ideas into comprehensible text.

Revised Manuscript Received on July 05, 2019.

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According to Smith, "For some people writing often comes easily, others find it a continued struggle. Some people find writing a strain, others a release. Students very often find it hard to compose a piece of writing since they do not know the right words, they do not know the right grammar or they are not good at composing and organizing. Sometimes they cannot even think of anything to write. This results in dry, flat, mechanical prose full of grammatical errors and empty of life and contents."Therefore, the development of writing skills elicits considerable concentration to acquire from the very early stage of language learning. Nunan [4] argues that writing is an extremely difficult cognitive activity which requires the learner to have control over various factors.In every stage of life, we are familiar with writing. On the other hand, in education system writing is one of the means of evaluating learner achievement test. So, this focuses on the education techniques and tools of the present day and also prescribes some evaluation techniques which foster development in the writing skills.

II. DEFINITIONS OF EVALUATION

Evaluation is an integral part of teaching which includes a series of activities designed to measure the effectiveness of the teaching-learning system as a whole. It is a process of delineating, obtaining and providing useful information for judging decision alternatives.Quillen and Hanna said that "A measurement of the allround growth of a child, including his physical social and intellectual development, as his interests, aptitudes and abilities".Dandekar stated that "Evaluation can be defined as a systematic process of determining the extent to which educational objective are achieved by the students".

Kothari Commission briefed that 'Evaluation is a continuous process; it forms an integral part of total system of education and intimately related to educational objectives.'

A. Characteristics of Evaluation

Evaluation is a more comprehensive term than measurement or testing.

- It presents a continuous process and overall efforts for knowing about the progress of the learner.
- It provides quantitative as well as quantitative description of the outcomes of a teaching learning process.
- It helps in knowing about the changes in behavior related to the domains of learner's behavior as a result of process of teaching learning.

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-9 Issue-2S3, December 2019

2019-2020

An Exploration of Effective Evaluation Rubrics for Assessing the Writing Skill of Engineering Graduates

T.Anitha, K.Brindha

Abstract—The work breaks down the measurements pursued during the evaluation. The educators are liable for leading the appraisal. Consequently, the technique decides the different measures for examining composing strategies. A typical issue isn't finishing all parts of the assignment. Students should ensure they read the errand guidelines cautiously and find out precisely what they are required to do. The directions typically clarify that there are various explicit parts of the general assignment, all of which should be finished. To keep away from breakdowns in association and cognizance, it is prudent to compose a different section to manage every point. There ought to likewise be clear linkage between passages by alluding advances or in reverse in the content utilizing firm methods, for example, proper conjunctions, pronouns, redundancy or substitution of watchwords and expressions, and words, for example, 'this', 'that', 'already', 'next', and so on. Composing ought to be succinct and ought to exclude any superfluous or immaterial substance. Up-and-comers should ensure that they edit that they got done with composing cautiously to maintain a strategic distance from such syntactic blunders as poor sentence structure, off base subject action word understanding, conflicting or wrong utilization of particular and plural, poor word request, base tenses, erroneous utilization of grammatical forms (utilizing a modifier rather than an intensifier, or a thing rather than an action word, for instance) and inaccurate accentuation, just as spelling botches. Banalities, for example, 'enlarging their points of view's or 'accepting brilliant open doors' ought to be maintained a strategic distance from as they are now and again (mis)used and can prompt perplexity. Competitors are encouraged to invest more energy using English writings of the sort depicted in the Reading segment to build their jargon and to rehearse their composition. They ought to likewise be comfortable with the fundamental structure of a reasonable book. The review investigates the different measurements to be pursued when instructors right the test papers.

Keywords: Teachers, Students, Exam, Writing, Metrics

I. INTRODUCTION

Every homeroom should have a learned, capable teacher and instructive frameworks should enroll, prepare and hold instructors who can complete the duty. Anyway before long studies they generally make a horrible showcase of intentionally making and evaluating teachers.

Various course of action makers have starting late come to acknowledge that this mistake can benefit from outside intervention by finding out the improvement on stand-in marks on government-authorized exams in math as well as examining in a short time later depending strongly on these checks to survey, reward and remove the instructors of these attempted stand-in's.

While there are substantial avocations for stress over the present plan of teacher evaluation, there are furthermore legitimate defenses to be stressed over cases that assessing instructors' practicality by large stand-in exam values leads to incite improved stand-in achievement. Besides of innovative rules else courses of action unequivocally require that teachers be ended in case their stand-in exam values doesn't rise through particular whole, by a much noteworthy graduates likely could be finished then this by and by the circumstance. In any situation isn't strong verification to show neither they was an weakest guider who going to leave, or that the pulling back guiders may superseded by dynamically convincing ones. Here the in like way adjacent to no evidence in the scenario that educators will be intelligently persuaded to improve stand-in grasping while guiders was assessed or monetarily made up for stand-in exam results gains.

An review of the specific evidence drives us to gather that, but state-endorsed exam results of stand-in was an information for college superiors to utilize for settle on choices about teacher ampleness, such results should be only a bit of a common sweeping evaluationone or two of states or at once considering plans that may provide the maximum amount as 1/2 the load in pedagogue analysis and pay selections behalf of results on this preliminaries of basic aptitudes in scientific discipline and browsing.

A few techniques for assessment utilizing human decisions are habitually utilized. At times, the nature of framework yield is estimated straightforwardly, for example, with human decisions; in different cases, it is estimated by performing understanding tests or other downstream assignments, instill different cases it is estimated by computing the measure of work required to address the yield.

Two of the most widely recognized strategy human assessment measurements are familiarity and ampleness decisions. Familiarity requires a speaker conversant in the objective language to pass judgment on whether the framework yield is familiar, paying little heed to whether the substance of the yield is a precise interpretation of the source words.

Ampleness ignores the degree of familiarity with the framework yield and, to the extent; this is potential, measures whether the basic data in the source can be removed from the framework yield. The necessities for an

Revised Manuscript Received on December 30, 2019.

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2019-2020

Studies in Indian Place Names
(UGC Care Journal)

ISSN: 2394-3114
Vol-40-Issue-43-February -2020

REVISITING 'NU SHU': A CONUNDRUM FOR THE CHINESE WOMEN

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ABSTRACT

Human Interaction in society has defined a set standard for language sustainability. A language that is operative in speech or through writing tends to exist. Chinese are known for antiquity, culturally and linguistically. Its linguistic variability could be attributed to its numerous dialects. The peculiarity of Chinese language owes to the dialect of Mandarin. The women of China designed a unique form of secret writing with an aim of using it as a medium to express their true feelings and emotions. Lisa See, a contemporary Chinese American writer and novelist deals with the association between women and 'nu shu' in her novel *Snow Flower and the Secret Fan* (2005) that has a profound saga. This paper is an earnest attempt to revisit 'nu shu' writing that was developed by Chinese women some centuries ago. It is exclusively used for communication among women. Mothers, daughters, sisters and friends exchange their life secrets and life-changing stories through letters and fan. Unlike the Chinese Mandarin that uses logograms, 'nu shu' stands apart by using phonemes. Although some women could not write in 'nu shu', they are able to decipher the writing. It could have sustained if it was passed to the succeeding generations. As an ethnic form of writing adopted by the Chinese women, it is insignia of the varied emotions they feel during their days. Such a kind of writing is to be preserved for its sustenance. Encouraging its existence is equally important for it provides a personal space for the Chinese women who are bound to many cultural beliefs.

Key Words: 'nu shu', secret fan, phonetic, ethnicity, native ties, context.

INTRODUCTION

Human Interaction in society has defined a set standard for language sustainability. A language that is operative in speech or through writing tends to exist. China is a country that is known for its indigenous culture and traditions. It is known for a number of ethnic minority communities. The term ethnicity denotes any group or groups of men, women and children who are confined to rural life. They are rarely educated and mostly deprived of the privilege of education. Chinese language has numerous dialects. They speak in a language that is stranger or not used by commoners. Amongst numerous dialects, the peculiarity of Chinese language owes to the Mandarin. The ethnic groups speak in Mandarin. They have names in Mandarin. The Chinese are known for antiquity culturally and linguistically. In this sense, its linguistic variability could be attributed to its numerous dialects.

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BBA -19-20 2

Existing Law to GST Law-A Transformation A study on Implications of GST in construction Industry

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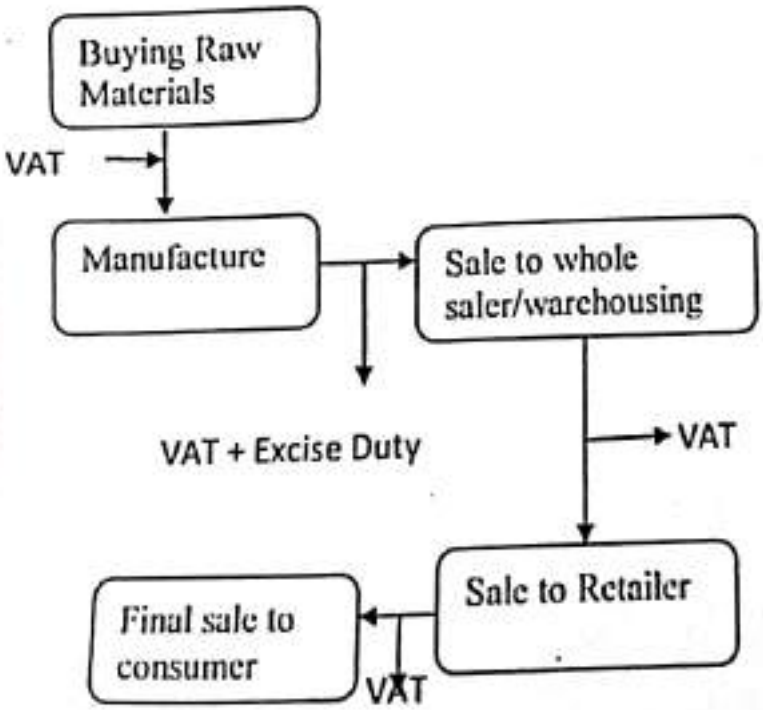
Abstract: *The introduction of the Goods and Services Tax (GST) is a very significant step in the field of indirect tax reforms in India. By amalgamating a large number of Central and State taxes into a single tax, GST will mitigate ill effects of cascading or double taxation in a major way and pave the way for a common national market. The author discussed in detail about the GST, its implications on various industries and in particular about construction industry. The author describes the path of GST, its salient features and various components of GST, which will help the readers to understand the basic concepts. The objective of this paper is to create awareness on GST and its implications in construction industry. The author took intensive effort to ascertain various factors affecting the construction industry and its causes and a possible solution.*

Keywords: *GST - Implications of GST – Construction industry etc,*

Introduction: Goods & Services Tax Law in India is a comprehensive, multi-stage, destination-based tax that will be levied on every value addition. In simple words, GST is an indirect tax levied on the supply of goods and services. GST Law has replaced many indirect tax laws that previously existed in India. So, before Goods and Service Tax, the pattern of tax levy was as follows:



POSITIVE IMPACT OF TECHNOLOGICAL ADVANCEMENTS IN LIFE INSURANCE INDUSTRY

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Abstract : Technology is disrupting all industries, and it is leaving significant footprints in the insurance industry too. Here are 5 technology trends that are impacting the insurance industry.Human lives and businesses are constantly surrounded by risks and uncertainties. The insurance industry plays a vital role in mitigating these risks and enables smooth functioning of an economy. It is a complex industry that covers a wide range of risks and is governed by numerous laws and regulations. Although these factors have led to a rather slow evolution of the insurance sector, it has come a long way. Innovations in the marketplace, technology advancements and digital interactions are transforming and modernizing the industry.Technology is both streamlining insurance business processes and enhancing customer experience, leading to a dramatic overall improvement in the way the industry operates. In order to sustain and grow in a rapidly digitizing world, the insurance sector needs to adopt emerging technologies and redefine their ways of operation. In this article, let's take a look at the top five tech trends that are shaping the future of the insurance industry.

INTRODUCTION

As stated in the abstract, disruption is the new normal and that's going to be the biggest challenge. It would be a BOON if perceived and executed, impeccably, else a bane for sure. As it's palpable, every industry seems to be posed with huge questions and daunting challenges on how to adapt, adopt and Transform confronting disruption, successfully. Life industry is no different and is sure, they are pondering on the same. Most of the LI companies' top leaders would have had sleepless nights to first confront and then to combat this challenge, as if they don't adapt and transform now, they would well wane from the business map, far too soon. On a deeper and profound analysis, we have determined that there are 5 technological trends that would be pivotal and instrumental in digitalisation of the organisation and have a huge impact on the insurance industry, specifically.

These are some of the integral solutions that, as an author, I found, would be useful and helpful to LI industry to scale amidst this disruption, at a steady pace and at the same time can penetrate at desired levels in a long range. Our further note would cover elaborately the FIVE key levers of technology that would have a huge impact on LI industry in the days to come.

ARTIFICIAL INTELLIGENCE

Artificial Intelligence is a disruptive technology that is impacting all industries across the globe and insurance is no exception. It is gradually seeping into almost all aspects of the insurance sector, adding value to the business processes.Today, machine learning algorithms are being leveraged in evaluating risks and identifying suitable insurance offers for customers. Enterprises are also combining AI with core activities such as claims processing and underwriting to enhance efficiency and achieve greater accuracy. AI-driven chatbots are allowing insurance companies to serve and support customers better with smart, human-like interactions.

BIG DATA AND ADVANCED ANALYTICS

It's the era of big data. Insurance companies accumulate chunks of data from individuals and business houses on a daily basis. This voluminous data becomes difficult to store, manage and analyze in the long run.To manage big data efficiently and make sense of silo data sets, insurance companies are now upgrading their data management systems and leveraging the power of analytics. Big Data technology stores and retains huge volumes of structured and unstructured data. Analytics enables businesses to arrive at meaningful and actionable insights. It also allows businesses to offer personalized insurance offers, and drive profitability in business.

CLOUD COMPUTING

Cloud Computing is turning out to be a game-changer in the business world due to its prominent features like cost-effectiveness, high security and easy deployment. Several insurance businesses are now shifting towards Cloud platforms to run and manage day-to-day business activities.Today, wide-ranging processes including premium billings, claims processing and policy management can be carried over the Cloud resulting in huge cost savings on servers and technical support staff. Adopting Cloud technology helps insurance providers gain operational efficiencies at lower costs and with less manual intervention.

BLOCK CHAIN TECHNOLOGY

Block chain is a Distributed Ledger Technology that is cryptographically protected with digital signatures. All transactions carried on a Block chain platform are highly secure and traceable at each point. The insurance sector has begun to use Blockchain for client validation and identification of fraudulent activities, like false claims and approvals.Transactions involving high-cost assets are tracked and validated on a distributed ledger, and the identity of a claimant is verified using trusted identity providers. The integrity of Blockchain technology helps minimize counterfeiting, double booking, contract alterations and fraudulent claims. It also brings about higher transparency and security in the overall insurance journey; right from client onboarding to policy management and claims processing.

Contents lists available at ScienceDirect

Colloids and Surfaces A

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A novel curcumin-loaded PLGA micromagnetic composite system for controlled and pH-responsive drug delivery

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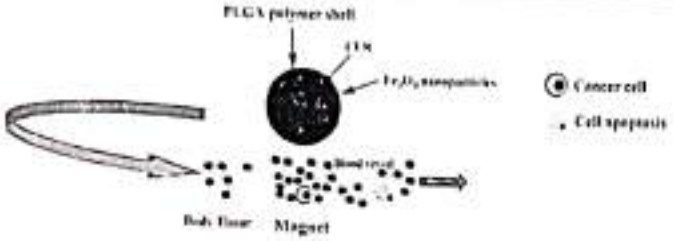
GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:
Drug delivery
PLGA microsphere
Curcumin
Controlled drug release
pH-responsive

ABSTRACT

Poly(lactide-co-glycolic acid) (PLGA) based magnetic microspheres (MMS) hold immense potential for reaching the target of controlled and specific drug delivery site with low toxicity. Herein, we have synthesized the biodegradable PLGA microspheres (MS) containing magnetic iron oxide nanoparticles (MIONPs) by the emulsion solvent evaporation method and loaded (them) with the well known anti-cancer drug, curcumin. The existing crystallinity of MIONPs in the MMS has been confirmed by powder XRD analysis. The prepared MMS displayed excellent superparamagnetism displaying a saturated magnetism with a value being 24.4 emu/g. The morphology of MS and MMS was found to have spherical shape along with a smooth surface of mean diameter of 0.5 μm and 1 μm (micrometer range). Moreover, the MIONPs content of 23.74 wt% in the MMS was evaluated referring TGA studies. However, the drug release profiles resulted that the MMS have a pH-induced drug-releasing asset with a cumulative CUR releasing efficiency of 72.25%. According to the results obtained from the cytotoxic studies, MMS has cytotoxicity against HeLa cell lines with a significant potency that is promising for targeted chemotherapeutic applications.

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https://doi.org/10.1016/j.colsurfa.2019.04.062
Received 11 January 2019; Received in revised form 19 April 2019; Accepted 20 April 2019
Available online 22 April 2019
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Journal of Drug Delivery Science and Technology 52 (2019) 722–729

Contents lists available at ScienceDirect

Journal of Drug Delivery Science and Technology

journal homepage: www.elsevier.com/locate/jddst

Reactive oxygen species (ROS)-responsive microspheres for targeted drug delivery of camptothecin

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ARTICLE INFO

Keywords:
poly(D
L-lactide-co-glycolic acid)
poly(vinyl alcohol)
Magnetic microsphere
Reactive oxygen species responsive
Targeted drug delivery

ABSTRACT

Non-selectivity of drugs used in the treatment of cancer inevitably leads to destruction of rapidly dividing normal healthy cells. In order to overcome this limitation a wide variety of targeted drug delivery systems have been reported. Among them, microparticulate drug delivery is a one of the most efficient routes and lacks responsiveness to external stimuli. In order to overcome this limitation a new drug delivery system based on reactive oxygen species (ROS) sensitive tween 80 coated magnetic iron oxide nanoparticles was developed. The rationale for this study is based on the literature reports that cancer cells accumulate oxygen free radicals at higher concentrations. The cancer chemotherapeutic agent camptothecin (CPT) was encapsulated in PLGA-PVA magnetic microspheres (CPT-MMSs) and its responsiveness to ROS was demonstrated by the specific release of camptothecin in the presence hydrogen peroxide. The experimental observations showed more marked cytotoxicity in human cervical cancer (HeLa) cancer cells mediated by CPT-MMSs as compared to tween 80 coated magnetic iron oxide nanoparticles (MIONs) and CPT alone.

1. Introduction

Nanoparticulate systems have turned out to be a very attractive tool for biomedical research due to their wide range of applications including drug delivery, bioimaging and tissue engineering. Polymeric nanoparticulates consisting of biodegradable polymers are of particular importance/interest in the targeted drug delivery applications [1–3]. Review of literature indicates numerous reports on polymeric nanoparticulate systems which are prepared by encapsulating drugs and biological agents such as genes and peptides [4–7]. Application of specialized polymers which could be engineered to release drugs and biotherapeutics in response to environmental stimuli such as pH [8], applied external magnetic field [9], and irradiation of light [10] have become more attractive for targeted dug delivery. More recently polymeric nanoparticulate systems have been designed to release drugs in response to reactive oxygen species (ROS) within the cancer cells [11]. Hydrogen peroxide (H_2O_2) is one of the reactive oxygen species (ROS), which plays a key role in cell signaling pathways. Metabolic imbalances lead to oxidative stress and has been implicated as an important cause of pathogenesis of cancer and cardiovascular diseases [12–14]. As cancer cells are metabolically more active, H_2O_2 is accumulated at relatively higher concentrations when compared to normal cells in their cytoplasm. This phenomenon is exploited for targeted delivery of anticancer drug triggered by ROS. Such a targeted release of encapsulated drug or biological molecule could by-pass degradation by endosomes [15,16]. Several biodegradable polymeric materials coated magnetic iron oxide nanoparticles (MIONs) have been reported in earlier literature for magnetic and other external stimuli responsive drug delivery applications [17]. The tween 80, PLGA and PVA based magnetic composites are of great importance as controlled drug delivery systems, due to their pH and ROS responsive properties [18–21]. They also possess better biocompatibility, swelling properties and drug loading efficiency

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https://doi.org/10.1016/j.jddst.2019.05.036
Received 12 February 2019; Received in revised form 19 April 2019; Accepted 22 May 2019
Available online 23 May 2019
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19-20 (3)

International Journal of Nanomedicine Dovepress

8 ORIGINAL RESEARCH

ROS-Responsive Chitosan Coated Magnetic Iron Oxide Nanoparticles as Potential Vehicles for Targeted Drug Delivery in Cancer Therapy

This article was published in the following Dove Press journal:
International Journal of Nanomedicine

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Background and Objective: Cancer cells accumulate high concentrations of reactive oxygen species as a result of their faster and uninhibited metabolic activity. Cancer chemotherapeutic agents release an excess of severe adverse reactions as a result of targeting normal cells. This demands an improvement in targeted drug-delivery systems to selectively discharge anticancer drugs in the vicinity of such highly metabolically and mitotically active cells.

Materials and Methods: Here, magnetic nanoparticles were synthesized by a traditional co-precipitation technique. Fe_3O_4@OA-CS-5-FLU-NPs were synthesized by an easy and rapid in situ loading method. The proposed Fe_3O_4@OA-CS-5-FLU-NPs were productively prepared as well as characterized by various spectroscopic and microscopic studies.

Results: The targeted drug release profile of the Fe_3O_4@OA-CS-5-FLU-NPs was studied in the presence of ROS including H_2O_2 and pH induction. The released product, Fe_3O_4@OA-CS-5-FLU-NP, exhibited desirable levels of cytotoxicity and demonstrated morphological changes and inhibition of colony formation for A549 and HeLa S3 cancer cells. The IC50 values at 24 hours were 12.9 and 23 μg/mL, respectively.

Conclusion: In summary, results from the MTT assay, fluorescence staining as well as colony formation assays, revealed that the Fe_3O_4@OA-CS-5-FLU-NPs were active and safe for anticancer biomedical applications. In summary, the present investigation provides a powerful nanostructured based system for improved cancer theranostics that should be further studied.

Keywords: magnetic iron oxide nanoparticles, oleic acid, chitosan, 5-fluorouracil, cytotoxicity, targeted drug delivery

Introduction

Successful cancer therapy depends on the outcome of surgical resection of the affected tissue in combination with chemotherapy or radiation therapy.[1–3] Although anticancer drugs are efficient at destroying tumor cells, they are potentially harmful as a result of their non-selectivity, which has limited their therapeutic use.[4–6] In the last few decades, there have been more and more cases of nanoparticles (NPs), such as Fe_3O_4NP, which have played a pivotal role in drug delivery specifically targeting cancer cells.[7] Fe_3O_4NP have gained great attention in various biomedical applications such as targeted delivery, localized hyperthermia treatment, as well as contrast agents for magnetic resonance imaging (MRI).[8–10] As the Fe_3O_4NP are unstable in aqueous media, they cannot be used as drug carriers alone. In order to overcome this drawback, a coating is applied to employ lipids, proteins, carbohydrates, liposomes, synthetic and bio-degradable polymers.[11–14]

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Applied Biochemistry and Biotechnology
https://doi.org/10.1007/s12010-019-03110-1

Biological Impacts of Metal(II) Complex-Based DNA Probes Derived from Bidentate N,O Donor Schiff Base Ligand

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Received: 24 April 2019 / Accepted: 18 July 2019/Published online: 31 July 2019
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Abstract

In this article, we have reported the preparation and structural characterization of a new Schiff base ligand (E)-2-(((2,6-difluorophenyl)imino)methyl)phenol (HSBL) and its derived metal(II) complexes $[Cu(SBL)_2]$ (1), $[Ni(SBL)_2]$ (2) and $[Pd(SBL)_2]$ (3). Using various analytical and spectroscopic techniques, their structural properties have been appraised. The proposed chemical structure of HSBL has been confirmed by Single crystal XRD studies. Bidentate characteristic of HSBL and its coordination with metal(II) ions through the oxygen atom of the phenolic group and nitrogen atom of the azomethine group have been evaluated from the FT-IR spectral analysis. Pd(II) complex of HSBL (complex 3) has found to be efficient in bringing about the interaction with DNA as well as BSA molecules. The in vitro antimicrobial studies have been demonstrated that complex 3 has a superior antimicrobial activity than HSBL, complexes 1 and 2. According to the values of zone of inhibition, the antimicrobial ability has

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12010-019-03110-1) contains supplementary material, which is available to authorized users.

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Nanomedicine: Nanotechnology, Biology, and Medicine
1549-9634/$ - see front matter

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Iron oxide nanoparticle core-shell magnetic microspheres: Applications toward targeted drug delivery*

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Received 17 October 2019; revised 19 November 2019; accepted 19 November 2019

Abstract

This study describes a sensitive reactive oxygen species (ROS)-responsive lecithin (LEC) incorporated iron oxide nanoparticle (Fe_3O_4 NP) system with potent anti-inflammatory properties and even more so when the antioxidant drug curcumin (CUR) is encapsulated in the PLGA hybrid magnetic microsphere system (Fe_3O_4@LEC-CUR-PLGA-MMS). The delivery system is responsive to ROS including an H_2O_2 environment to release the payload (CUR) drug. Greater cytotoxicity properties were observed in the presence of Fe_3O_4@LEC-CUR-PLGA-MMS against A549 and HeLa S3 cells with IC_{50} values after 24 h of 10 and 12 μg/mL and 10 and 20 μg/mL, respectively. The present Fe_3O_4@LEC-CUR-PLGA-MMS system demonstrated much better *in vitro* cytotoxicity, cellular morphological changes and moreover an ability to limit colony formation for A549 and HeLa S3 cancer cell lines than non-cancerous cells, and thus, should be further studied for a wide range of medical applications.
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Key words: Poly(D, L-lactide-co-glycolic acid); Lecithin; Magnetic core microsphere; Cytotoxicity; Targeted drug delivery

The survival of reactive oxygen species (ROS) homeostatically in the human body plays a key role in various human physiological processes.[1–3] Oxidative stress related diseases can be diagnosed and cured with the aid of ROS since ROS can serve both as pathological markers[4–9] and as therapeutic agents.[3,10] This motivates the development of various ROS responsive biological and chemical sensors, prodrugs, imaging agents, and ROS responsive polymeric systems.[11–20] Moreover, ROS causes harm to macromolecular substances such as nucleic acids, lipids and can cause cell apoptosis by delaying cell differentiation.[21] The main consequence of ROS includes the presence of oxidative stress and reduction of pH.[22–25] ROS including H_2O_2 derived oxidants are highly reactive with genetic molecules of DNA, plasma proteins, and lipids, which cause significant damage to cells.[26] The toxic effect of excessive ROS is consequently associated with an array of pathological conditions, including cancer, aging, diabetes, cardiovascular diseases, infection, as well as neurodegenerative diseases.[25]

Conflicts of Interest: There are no conflicts to declare.

This work was supported by DST-SERB (Ref. No. SB/FT/CS-130/2012) and the authors sincerely thank the Chikkanna Government Arts College, Tiruppur and Mohamed Sathak Engineering College, Kilakarai for their lab and instrumental facilities.

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1549-9634/$ - see front matter
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Applied Biochemistry and Biotechnology
https://doi.org/10.1007/s12010-020-03270-5

Bidentate Schiff Base Ligands Appended Metal(II) Complexes as Probes of DNA and Plasma Protein: In Silico Molecular Modelling Studies

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Received: 13 October 2019 / Accepted: 13 February 2020/Published online: 04 March 2020
Springer Science+Business Media, LLC, part of Springer Nature 2020

Abstract
HL1 and HL2 (HL1 = 5-diethylamino-2-({[4-(diethylamino)phenyl]imino}methyl)-phenol; HL2 = 5-diethylamino-2-({[4-(dimethylamino)phenyl]imino}methyl)-phenol) are new Schiff base ligands which were prepared along with their metal(II) complexes of $[Cu(L1)_2]$ (1), $[Cu(L1)_2]$ (2), $[Ni(L2)_2]$ (3) and $[Ni(L2)_2]$ (4) and characterized by different analytical as well as spectroscopic analyses. The single crystal XRD analysis confirms the proposed structure of ligands such as HL1 and HL2. EPR spectral analysis gives evidence about the tetrahedrally coordinated geometry of complexes 1 and 2. Density functional theory (DFT) analysis was executed using B3LYP/6-31G(d,p)-LanL2DZ level. The DNA sequence (along with Dickerson's sequence) specificity of complexes 1–4 was evaluated and it has resulted that the complexes 1–4 primarily interact with double helix of DNA via groove mode of binding. From plasma protein docking results, we can say that complexes 2 and 4 showed more binding towards HSA and may have good bioavailability and are prone to act as drug candidates. The observed findings show that these metal(II) complexes 1–4 are better DNA probes, will act as anticancer agents and stimulate strong research focusing on the design of new chemical probes of DNA.

Keywords Bidentate Schiff base ligands · Metal(II) complexes · Spectroscopic analyses · Density functional theory · DNA docking

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12010-020-03270-5) contains supplementary material, which is available to authorized users.

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(7) 19-20.

Research Article

Nanoporous Activated Carbon and Multi-walled Carbon Nanotubes from Renewable Botanical Hydrocarbons and their Impact on Efficiency of Supercapacitor Performance

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ABSTRACT

Highly activated carbon and Multi-walled carbon nanotubes (MWCNTs) are preferable materials for supercapacitor electrode. Activated Carbon was prepared from *Pongamia pinnata* shell by Chemical Activation process and MWNTs were prepared from *Pongamia pinnata* oil by Spray pyrolysis method, respectively. The electrochemical capacitor has been assembled with Multi-walled carbon nanotubes/Graphene composites as negative electrode and activated carbon as positive electrode with 6 M KOH as an aqueous electrolyte. The charge-discharge performance of fabricated electrodes was satisfactory for energy storage applications. It has to be improved by the addition of MWCNTs in anodes. It can be executed with a specific capacitance of 148 Fg^{-1} at a current density of 0.5 Ag^{-1}. The maximum energy density and power density were up to 5.1 $Whkg^{-1}$ at 0.5 Ag^{-1} and 5.0 $kWkg^{-1}$ at 10 Ag^{-1}, respectively. The galvano-static charge-discharge cycling studies have revealed the excellent capacity retention of 81% even after 4000 cycles. The unique fabrication strategy for the two-electrode SC assembly with highly conducting and stable-natured carbon nanomaterials expand the arms of energy storage devices.

Keywords: Activated Carbon and Multi-wall Carbon Nanotubes; Bio-waste *Pongamia pinnata* Shell and Oil; Electrochemical Analysis; Spray Pyrolysis; Supercapacitor Electrode.

1. INTRODUCTION

Electrochemical capacitors are rechargeable electrochemical energy storage devices, which can store a much larger amount of electrical energy with the capacitance of thousands of Farads in the interfaces between electrodes and electrolytes. Compared with other energy storage devices, nowadays, Lithium-ion batteries (LIBs) and electrochemical capacitors (ECs) are the important chemical energy storage devices (Miller and Simon, 2008; Kang *et al.* 2010). EC can offer great advantages of high-power capability, high rates of charge and discharge, flexible packaging and low weight. The invention of EC aims to bridge the critical performance gap between the higher energy density of battery and high-power density of conventional electrolytic capacitor (Zhang and Zhao, 2009; Zhai *et al.* 2011; Kotz and Carlen, 2000; David *et al.* 2011; Pasquier *et al.* 2004; Lee *et al.* 2010).

LIBs have a high energy density, but lower power density and lesser cycle life. ECs have high power density and long cycle life, but their energy density is far lower than the lithium-ion battery (Simon and Gogotsi, 2008; Winter and Brodd, 2004).

Compared to Activated carbon, graphene and MWCNTs also have good chemical stability and high electrical conductivity. It was considered as a promising material for high-performance super capacitors. The high-performance ECs with activated carbon as positive electrode and MWCNT/graphene composite as the negative electrode have been reported in this work. Their energy density, power density and cyclic performance were investigated.

Contents lists available at

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

One-pot green synthesis of CdS quantum dots using *Opuntia ficus-indica* fruit sap

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ARTICLE INFO

Article history:
Received 24 April 2019
Received in revised form 28 May 2019
Accepted 3 June 2019
Available online 8 July 2019

Keywords:
Opuntia ficus-indica
CdS
Quantum dots
Green synthesis
High-resolution transmission electron microscopy

ABSTRACT

A simple and novel one-pot synthesis of CdS quantum dots from naturally available fruit sap *Opuntia ficus indica* was performed. We have investigated a green route for the synthesis of CdS QDs using eco-friendly and naturally renewable *Opuntia ficus-indica* fruit sap as green template. Synthesized CdS QDs were determined by Fourier transform infrared spectroscopy, UV-visible (321 nm), X-ray diffraction (cubic structure), X-ray fluorescence, Dynamic light scattering (d_{av} = 9.56 nm), High resolution transmission electron microscopy (Spherical shaped). Overall the present work describes the green synthesis of CdS nanoparticles from *Opuntia ficus-indica* fruit sap with extrinsic crystallite size control in the quantum confinement range.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Emerging Materials and Modeling.

1. Introduction

Biosynthesis of low-dimensional semiconductor quantum dots (QDs) (<10 nm) have unique properties such as optical sensing, photo-degradation and bio-sensing compared to their high dimensional (>10 nm) nanoparticles (NPs). Synthesis of cadmium sulphide (CdS) QDs is one of the major challenges through green synthesis method [1]. The preparations of CdS QDs have been carried out using several methods such as microwave heating [2], hot injection [3], colloidal synthesis [4], plasma synthesis [5] and ultrasonic irradiation [6]. Generally, the chemical synthesis methods are complicated due to their cost, slow rate of reaction, low yield, risky and human health hazard concerns [7]. In the recent years, natural plant and agriculture waste extract are used as reducing, stabilizing and capping agents for the synthesis of QDs because of better biocompatible, environmental friendly and cost effective nature [8,9]. Especially, fruits sap contains remarkable organic capping agents like cellulose, carbohydrates, proteins, pectin, vitamins and minerals [10]. Opuntia *ficus-indica* (*O. ficus-indica*) fruits are rich source of flavonoids, terpenoids, steroids and carotenes [11]. These molecules have major functional groups such as amine (proteins), carboxylic acid (pectin) and hydroxyl group (cellulose) [12]. These functional groups are believed to play a major role in bio-reduction reaction and they readily bond with inorganic materials. For example, recently 3–5 nm scaled CdS QDs synthesis was reported using tea-leaf extract which plays a key role in size reducing and as capping agent [13]. *O. ficus-indica* sap contains 80–90% of water, 10–20% of macronutrients and organic capping molecules like vitamins (12–81 mg) and antioxidants (10–60 mg) [14]. These chemical compositions of *O. ficus-indica* fruits sap play a main role in the synthesis of CdS QDs. This work highlights the synthesis of lower dimensional semiconductor CdS QDs via biocompatible materials.

The present novel research work reports an one-pot simple approach for the synthesis of CdS QDs using a *O. ficus-indica* fruit sap. We have made an attempt to synthesis CdS QDs using eco-friendly and naturally renewable source such as *O. ficus-indica* fruit sap as green template. The effect of sap concentration on the particle size, morphology, crystalline behavior, elements distribution of the as-synthesized CdS QDs has been reported.

2. Experimental section

Cadmium sulfate ($CdSO_4$, HiMedia and 99% purity) and sodium sulfide (Na_2S, Molychem and 98% purity) were purchased.

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https://doi.org/10.1016/j.matpr.2019.06.401
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Selection and peer-review under responsibility of the scientific committee of the International Conference on Emerging Materials and Modeling.

Applied Physics A (2020) 126:186
https://doi.org/10.1007/s00339-020-3378-6

Applied Physics A
Materials Science & Processing

Photocatalytic degradation of organophosphorus pesticide using semiconductor-sensitized composite in natural water: effect of oxidants

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Received: 18 May 2019 / Accepted: 25 January 2020
© Springer-Verlag GmbH Germany, part of Springer Nature 2020

Abstract
In this work, dichlorvos was degraded with photocatalytically active n-type semiconductors and p–n junction-type semiconductors. The p–n junction-type semiconductors such as GO–TiO_2 (GO = graphene oxide) and GO–WO_3 were synthesized by photodeposition method using commercial TiO_2 and WO_3. GO-doped nano-TiO_2 was synthesized through sol–gel technique from titanium(IV) isopropoxide by hydrothermal treatment. The synthesized materials were characterized by different techniques such as XRD, UV, FTIR, SEM and TEM. In order to find out the photocatalytic ability towards degradation of dichlorvos, the experiment was carried out in an aqueous suspension under UV light in the presence of oxygen and oxidants such as H_2O_2 and $K_2S_2O_8$. From the evaluation, GO–nano-TiO_2 with H_2O_2 was found to be highly active that showed complete degradation of dichlorvos within 15 min under UV light.

Keywords Photocatalysis · Degradation · Dichlorvos · Graphene oxide · TiO_2 · H_2O_2

1 Introduction

Pesticides are poisonous organic compounds used to control unwanted and perilous species of plants and animals [1]. Pesticides can be classified as insecticides, rodenticides, nematicides, molluscicides and piscicides [2]. Dichlorvos is one of the classes of insecticides referred to as organophosphates. Organophosphates act by interfering with the activities of cholinesterase, an enzyme that is essential for the proper working of the nervous systems of both human beings and insects [3]. The US Environmental Protection Agency has classified dichlorvos as a Group B2 (probable human carcinogen) chemical [4]. For several decades, the concentrations of organophosphorus pesticides have been increasing in surface water and groundwater. These contaminants are usually non-biodegradable, toxic and persistent in the environment [5]. This study examined the photocatalytic degradation of dichlorvos using TiO_2, WO_3, GO–commercial TiO_2, GO–WO_3 and GO–nano-TiO_2 as catalysts in the presence and absence of oxygen and with oxidants like H_2O_2 and $K_2S_2O_8$. The aim of the present work is (1) to identify the various structural changes and chemical changes in graphene oxide owing to the introduction of commercial TiO_2, WO_3 and nano-TiO_2 catalysts; (2) to compare the photocatalytic efficiency of the above catalysts; and (3) to evaluate the percentage of degradation with the influence of oxygen and also by adding the oxidants such as H_2O_2 and $K_2S_2O_8$. The photocatalytic degradation of dichlorvos using TiO_2 has already been studied by other researchers. Harada et al. examined the rate of the photocatalytic oxidation of dichlorvos using rutile TiO_2 and TiO_2/Pt catalysts [6]. Tongwei Wu et al. studied electrochemical properties of nano-TiO_2 by Fe and V doping [7, 8]. Li Yang et al. conducted electrochemical reduction of defective TiO_2 [9]. Rong Zhang et al. studied electrocatalytic studies using TiO_2 nano-sheets [10]. Naman et al. [11], Lu et al. [12] and Balkaya [13] examined the effect of various parameters like initial concentration of dichlorvos, addition of salts, addition of various sensitizers, etc. Reeti Kumar et al. conducted degradation studies using GO–nano-TiO_2 composite under UV and visible light and found 75% removal of dichlorvos in 140 min [14]. Sleiman et al. conducted the degradation studies with indoor air supply and studied reaction parameters, intermediates and mineralization [15]. The effect of the addition of oxidants on the photocatalytic oxidation has already been studied

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Published online: 13 February 2020

International Journal of Future Generation Communication and Networking
Vol. 13, No. 2, 2020 pp.1139-1146

A Secured Framework For Face Recognition System

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Abstract
This paper provides a detailed-description of secured framework for 'Face Recognition System'. The work done in this paper is to represent the face image in better form and to extricate the highlights which convey the significant data of the face image and to classify it. In Face Representation how to present a clear face image is done, by removing the noise. Face image is represented in the better way. In Feature Extraction: the uniqueness in the face image is taken in to consideration. After this the face image is classified by comparing with the face image in the database. This technique represents a novel face recognition system. The face picture is secured by Cryptographic technique using Symmetric, Asymmetric and Hybrid.

Keywords: *Face Representation, Feature Extraction, Classification, Cryptography, Symmetric, Asymmetric.*

INTRODUCTION

Face Recognition begins from when machine begin to take over in every one of the territories. Machine has the scope of recognition, which utilizes the things like Fingerprints, Iris Scans. The recognition consistently stays a significant spotlight on individual's ID. The face is a significant piece of the human to recognize what your identity is and how the individuals additionally distinguish an individual. With the exception of on account of indistinguishable twins the face is unquestionably an individual's most one of a kind physical attributes. While people can possibly perceive and arrange various appearances for a long time, PCs are a few seconds ago carrying out the responsibility. It is here the system surveys the image carefully with what the person says who he/she is. Followed by verification, in this phase it identifies the person by taking up a call whether it is the authorized person or not. Face recognition is a fascinating and testing region for distinguishing proof. The verified Face acknowledgment framework impacts a number of applications in varied zones, for instance, validation for Banking, security framework get to, Companies, Hospitals, Pass port, ATM and so on.

FACE RECOGNITION

The face of every individual possesses much data in every aspect. Face Recognition is an appealing topic as well as a challenging issue.

The maximum part of 'Face Recognition' consists of 'Face Representation', 'Feature Extraction' and 'Classification'. Face Representation aims at revealing and improving a 'Face Image'. It further fixes on the progressive estimation of revealing and identification. In the next phase, 'Feature Extraction' the highlights of the 'Face Image' are separated.
While in 'Classification' the requested 'Face Image' is judged against the registered 'Face Image' in the database. Though there are a lot of viable 'Face Recognition' systems are in the practice yet it is a fascinating topic for researchers.

It is due to the fact that today's systems perform better uncomplicatedly as well as in controlled settings. For instance, current systems become worse if differences in various factors are present like pose, position, facial outlook and so on. This procedure will curtail the authority of these variables as well as make strong 'Face Recognition' framework. Since supervised learning is absurd, individual learning technique is desirable that traces to ascertain

ISSN: 2233-7857 IJFGCN
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Solid State Technology
Volume: 63 Issue: 6
Publication Year: 2020

Privacy Preserving Secure Communication in VANETS Using VN-AODV Protocol with ECC Cryptography

R. Hemalatha, Dr. J. Abdul Samath

Abstract-Vehicular Ad-hoc Network (VANET) is a piece of Mobile Ad-hoc Network (MANET) that encourages correspondence between gathering of vehicles to give driver wellbeing, traffic refreshes, diversion, information sharing and so forth. Clustering is a productive technique to deal with the continuous change in the geography of VANET by methods for nearby co-appointment. A few similar investigations have proposed AODV (Ad hoc On-Demand Distance Vector); a notable VANET protocol that is adaptive to dynamic changes in network and makes proficient usage of network assets, to be the best contender for managing VANETs. Nonetheless, verbatim adoption of AODV isn't a proficient steering answer for VANETs. In this paper, we propose VN-AODV (Virtual Node AODV), a protocol that utilizes data from the AODV directing table to limit blockage in VANETs, yet supports other execution measurements at satisfactory levels. The curiosity and style in VN-AODV originates from the way that it doesn't need the execution of any additional rationale; it is adequate to know just the size of the directing table at every node. And furthermore we propose a VANET based security protecting correspondence plot, which meets the prerequisites for content and relevant protection with ECC Cryptography.

Keywords: VN-AODV, ECC Cryptography, VANET, Cluster Head (CH), Communication

1. INTRODUCTION

The Intelligent Transportation System (ITS) that incorporates a wide range of communications between vehicles is a significant cutting edge transportation system. ITS gives numerous offices to the travelers, for example, wellbeing applications, partner to the drivers, crisis cautioning, and so on. Vehicular Ad Hoc NETwork (VANET) is an inferred type of selforganized Mobile Ad Hoc Network (MANET) [1].

The huge explanation behind familiarizing VANET is with improve driver prosperity and avoid crash by sending hazard zone and incident information. It in like manner supports entertainment applications, traffic the board, internet services, atmosphere information, etc. It involves RSU additionally, vehicles with web as genuinely steady organization. In VANET design information scattering occurs between vehicles (Vehicle to Vehicle), among RSU and vehicle and cross breed Communication [3].

The fundamental purpose driving proposed function is to describe stable group subject to automobile speed as well as neighbor listing. Here all of us use flexible and stationary programming specialists to

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Advancement on Breast Cancer Detection Using Medio-Lateral-Oblique (MLO) and Cranio-Caudal (CC) Features

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ABSTRACT

The purpose of this paper is to diagnose accurately the breast cancer for which a a computer aided diagnostic system(CAD) is being proposed. In this paper two types of views are used to enhance diagnostic efficiency, such as cranio-caudal (CC) and medio-lateral-oblique (MLO). This paper involves segmentation, feature extraction and classification of images. Adaptive K means clustering method is used in segmentation to segment the two views from a mammogram image. The combination of conventional k-means clustering method and Gabor filter is employed in the feature extraction stage to extract the features of CC and MLO views. Finally, Knn classifier is used to classify the mammogram image into four ways, such as CC-Normal, CC-Malignant, MLO-Normal and MLO-malignant.

Keywords— Segmentation, Adaptive K-means clustering, Feature extraction, conventional K-means clustering, Gabor filter, Classification, Knn classifier

I. INTRODUCTION

In recent years, cancer is considered as a factor for causing death. According to WHO, the number will reach 12 million in the year of 2030. The breast cancer is the common cancer for women worldwide and approximately 2.1 million women are affecting. It is estimated that 627,000 women died due to breast cancer in the year 2018. Breast research is conducted by mammography using low-dose x-rays. For radiologists, this method is easily accessible and effective for breast cancer detection. From this study, a total of four images are obtained in which two images refer to the right breast and the other two correspond to the left breast of the medio-lateral oblique(MLO) and cranio-caudal(CC) projections. The visualization of breast tissue is improved by image acquisition method and it also increases the chances of identifying symptoms that describe the occurrence of non-palpable lesions such calcification, nodules, signs of bilateral asymmetry and distortion of architecture (Rangayyan et al., 2007). The false positive is reduced by these two views like overlapping of dense tissue shows like mass. Radiological analysis combines the challenging requirements of human vision and intelligence, such as geometry, texture and morphological location of lesions in breast image, combined knowledge of two views, variations of two breasts, and the search for changes between previous and current mammograms where appropriate. The detection of lesions in two view mammogram provides better results than one view given by clinical studies (Linsman, 1987, Thurfjell, 1994 and Blanks et al, 1999). The sensitivity of mammography screening is improved in the case of double reading by a radiologist is also shown by clinical studies (Anderson et al., 1994 and Thurfjell et al., 1994). But this double reading technique is more complicated, as time consuming increases as a result of reading a vast number of mammographic images (Mencattini et al., 2010). The computerized method such as computer aided diagnosis (CAD) method is introduced as a second option for radiologist to visualize the mammographic image. The mammographic image is applied to this method to analyze or detect the mammographic image as normal or abnormal, such as mass, microcalcification or some distortion. This method reduces the error rate and increases the detection rate accuracy (Chan et al., 1990, Kegelmeyer et al., 1994 and Warren et al., 2000). The mass detection from MLO and CC view information was detected using CAD system is developed by (Zheng et al., 2006). In this approach false positive rate is reduced as 23.7% and obtain sensitivity accuracy as 74.4%. In the year of 2007, Qian et al., proposed a

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-8 Issue-12, October 2019

Mathematical Morphology and Optimum Principal Curvature Based Segmentation of Blood Vessels in Human Retinal Fundus Images

K.Geethalakshmi, V.S.Meenakshi

Abstract: The retinal abnormalities and diagnosis of Diabetic Retinopathy (DR), Glaucoma are accomplished by extraction of vessel network in human retinal images. An accurate segmentation is required for the pathological analysis. Various researchers proposed many automated systems for vessel segmentation, still this process needs an improvement due to the presence of abnormalities, different magnitude, dimension of the vessels, non-uniform lighting and variable structure of the retina. The proposed work is a new method for retinal vessel segmentation, which consists of three phases, (i) The vessels network is enhanced by using Contrast Limited Adaptive Histogram Equalization(CLAHE) and Median filtering techniques (ii) the smoothened image is segmented based on mathematical morphology and maximum principal curvature followed by cleaning operation to remove the small objects, (iii) the segmented image is compared with hand labeled Ground Truth image and is evaluated with the True Positive, False Positive , True Negative and False Negative parameters. The performance of this work is tested with the images existing in DRIVE database. This work achieves 0.965 Accuracy, 0.753 Sensitivity and 0.989 Specificity.

Index Terms: : Diabetic Retinopathy, Mathematical Morphology, Maximum Principal Curvature

I.INTRODUCTION

The quantity of digital images are increasing day by day, which provides many research ideas for researchers in the computer vision field [1]. Segmenting the image into constituent regions named as Image segmentation, this is an important step to response various computer vision problems and the results of many of these complications rely on the quality of the segmentation. The main focus of medical informatics is to integrate computer technology with medical analysis, diagnosis and treatment [2]

Image segmentation is therefore an important research topic that has attracted main researcher's attention during the past few years leading to many new approaches towards segmentation [3]. The main focus of segmentation is to partition the image into a many different region and locate objects and boundaries which further simplify examination of the image more efficiently. It helps in identifying the similar pixels of the image with respect to some feature such as colour,

shape, intensity or texture. Image Segmentation includes various practical applications such as Medical image analysis and diagnosis, Anatomical structure, tracing the objects in satellite images, facial recognition, fingerprint recognition, traffic control systems, image retrieval, image annotation and object recognition [4]

The ophthalmologist can detect and diagnosis various eye diseases using retinal images. The Automated blood vessel segmentation process predict many eye diseases like hypertension retinopathy, Diabetic Retinopathy (DR), retinopathy of prematurity or glaucoma based on the feature extraction. The latest report states that there will be an epidemic rise of 4.4% in the global prevalence of diabetes [6]. Diabetic Retinopathy (DR) is a key factor of eye disease that occurs due to the existence of diabetes mellitus, and it leads to blindness. During the screening process, the retinal fundus images are taken for identifying DR. The presence of Hard Exudates (HE) and Microaneurysm (MA) in retinal image is the primary detection of DR. The early diagnosis of DR is required for constant monitoring of diabetic patient for treatment. Many methods have proposed by the researchers for retinal vessel segmentation by using different databases like STARE, DRIVE, CHASE_DB1.

II. RELATED WORKS

Sohini Roychowdry et al[7] applied high pass filtering technique to produces the two banary image followed by morphological reconstruction method. The general area of two binary images are identified as blood vessels. A group of eight features are extracted using Geussian mixture model (GMM) from the binary images with the neighbourhood gradient values. The final process linked the major vessels with classified vessel pixel. The morphological process generates the structuring element to filter the required object from the background.

Jyotiprava Dash et.al [8], presents three phases for retinal vessel segmentation: the pre-processing phase uses the CLAHE technique to enhances the retinal images and

Revised Manuscript Received on October 05, 2019.
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Retrieval Number: K24420981119/2019©BEIESP
DOI: 10.35940/ijitee.K2443.1081219

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

Latency Aware Reliable Intrusion Detection System for Ensuring Network Security

L. Sheeba and V. S. Meenakshi

Abstract In network communication based applications, Intrusion detection system plays a vital role. In these applications, so as to collapse the system, the malevolent nodes may create enormous amount of traffic. In order to identify and prevent the intrusion activities, there are numerous researches that are presented by diverse researchers. LEoNIDS: architecture solves the energy-latency tradeoff by giving minimum power utilization as well as minimum detection latency all at once. However LEoNIDS architecture focus on the latency but not the precise detection of intrusion. This work resolves these issues by presenting the technique called Attack Feature based Fast and Accurate Intrusion Detection System (AF-FAIDS). This work presents a solution that enables intrusion detection in an effective way with enhanced delay and latency parameter. This also track and eliminate the intrusion attack existing in the system in an effective way with guaranteed energy saving. By using Machine learning, methods like Support Vector Machine, attack detection ratio is enhanced that would learn the attacks features in an effective way. Those features, which are taken in this presented technique, are Average Length of IP Flow, One-Way Connection Density, Incoming and Outgoing Ratio of IP Packets, Entropy of Protocols as well as Length in IP Flow. This technique provides the precise and quicker identification of intrusion attacks that will decrease the latency. The technical work is carried out in the NS2 environment under numerous performance measures and it is confirmed that the presented technique gives improved outcome when compared with the previous research methodologies.

Keywords Intrusion detection system · High throughput · Low latency
Attack feature · Learning method

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© Springer Nature Singapore Pte Ltd. 2019
J. D. Peter et al. (eds.), *Advances in Big Data and Cloud Computing*,
Advances in Intelligent Systems and Computing 750,
https://doi.org/10.1007/978-981-13-1882-5_33

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International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-8 Issue-3, September 2019

Selection of Best Test Cases using Support Vector Machine for ARPT

K. Devika Rani Dhivya, V. S. Meenakshi

Abstract: Software testing is an essential activity in software industries for quality assurance; subsequently, it can be effectively removing defects before software deployment. Mostly good software testing strategy is to accomplish the fundamental testing objective while solving the trade-offs between effectiveness and efficiency testing issues. Adaptive and Random Partition software Testing (ARPT) approach was a combination of Adaptive Testing (AT) and Random Partition Approach (RPT) used to test software effectively. It has two variants they are ARPT-1 and ARPT-2. In ARPT-1, AT was used to select a certain number of test cases and then RPT was used to select a number of test cases before returning to AT. In ARPT-2, AT was used to select the first m test cases and then switch to RPT for the remaining tests. The computational complexity for random partitioning in ARPT was solved by cluster the test cases using a different clustering algorithm. The parameters of ARPT-1 and ARPT-2 needs to be estimated for different software, it leads to high computation overhead and time consumption. It was solved by Improvised BAT optimization algorithms and this approach is named as Optimized ARPT1 (OARPT1) and OARPT2. By using all test cases in OARPT will leads to high time consumption and computational overhead. In order to avoid this problem, OARPT1 with Support Vector Machine (OARPT1-SVM) and OARPT2-SVM are introduced in this paper. The SVM is used for selection of best test cases for OARPT-1 and OARPT-2 testing strategy. The SVM constructs hyper plane in a multi-dimensional space which is used to separate test cases which have high code and branch coverage and test cases which have low code and branch coverage. Thus, the SVM selects the best test cases for OARPT-1 and OARPT-2. The selected test cases are used in OARPT-1 and OARPT-2 to test software. In the experiment, three different software is used to prove the effectiveness of proposed OARPT1-SVM and OARPT2-SVM testing strategies in terms of time consumption, defect detection efficiency, branch coverage and code coverage.

Keywords : Adaptive and Random Partitioning Testing, Adaptive Testing, Random Partitioning Testing, Software testing, Support Vector Machine.

I. INTRODUCTION

Software testing [6] can be conducted either manually or in an automated manner. In manual testing, a human tester takes over the role of an end-user interacting with and executing the software under test to verify its behavior and to find any observable defects. On the other hand, in automated testing, test code scripts are developed using certain test tools and are then executed without human tester intervention to test the behavior of the software under test. If the automated testing is implemented properly, it could yield various benefits over manual testing such as reduction of test efforts and repeatability. Otherwise, automated testing will lead to extra costs and effort and could even less effective than manual testing in detecting faults [4].So it is more important to develop a testing strategy to test software effectively. Adaptive and Random Partitioning Testing (ARPT) [8] is a software testing strategy used to test software. It has two viable options are ARPT-1 and ARPT-2 to combine Adaptive Testing (AT) and Random Partitioning Testing (RPT) in a testing process. However, the computation complexity is high for random partitioning of ARPT.

In order to improve the random partitioning in ARPT, test cases were clustered [2] by using Expectation Maximization (EM), K-means, Non Negative Matrix Factorization (NMF) and Self-Organizing Map (SOM) algorithms. Moreover, the ARPT-1 and ARPT-2 consist of various parameters it needs to be estimated over and over for different software.

It may lead to time consumption and computational overhead for ARPT testing strategy. So, Optimized ARPT1 (OARPT1) and OART2 were introduced which used Improvised BAT (IBAT) [3] for automatic parameter selection of ARPT-1 and ARPT-2 for different software. A huge number of test cases are collected for OARPT testing strategy. If all the test cases are used in OARPT testing strategies, it may lead to high computational overhead and time consumption.

So in this paper, best test cases are selected by using an efficient machine learning algorithm called Support Vector Machine (SVM). It selects the best test cases based on the code coverage and branch coverage of test cases. The test case which has high code coverage and high branch coverage is selected as best test cases. This methodology is applied for both ARPT-1 and ARPT-2 testing strategy and it is named as OARPT1-SVM and OARPT2-SVM respectively. It reduces the time consumption and computational overhead of OARPT testing strategy.

The remaining section of the article is scheduled as follows: Section II investigates about the different test case selection approaches which are related to the proposed system. Section III explains the methodology of the proposed software testing strategy. Section IV illustrates the experimental results by using the software. Section V concludes and discusses the proposed work.

Revised Manuscript Received on September 15, 2019

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Retrieval Number: C5166098319/2019©BEIESP
DOI: 10.35940/ijrte.C5166.098319

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-8, Issue-2S11, September 2019

Latency and Power Aware Reliable Intrusion Detection System for Ensuring Network Security in Military Applications

L. Sheeba, V.S. Meenakshi

Abstract— Intrusion detection system is a most concerned research area which needs to be detected earlier to avoid the unwanted network errors and problems. The accurate and reliable intrusion detection is a most focused research problem in various domains which is found to be more difficult issue. This is focused and resolved in the previous research work namely Prioritization Based Delay Avoided Secured and Reliable Data Transmission Method (PBDASRDT). However, this research method doesn't focus on the energy conservation parameters. And also previous work doesn't discuss about the security provisioning methods. This is focused and resolved in this research method by introducing the method namely Latency and Power aware Reliable Intrusion Detection System (LP-RIDS). In this research method latency and power consumption of servers in which intrusion detection is performed is reduced considerably by introducing the secondary cluster head selection process. This secondary cluster head can perform the energy management of IDS servers optimally between the nodes and gateway. And then security of the intrusion detection system is enhanced by introducing the dynamic key based encryption technique. Here the dynamic key generation process is done in the secondary cluster head and the encryption is done by using AES technique. This methodology can improve the network performance considerably by detecting the attacks more accurately with reduced latency and delay. The overall evaluation of the research method is done in the NS2 simulation environment from which it is proved that the proposed research method leads to ensure the enhanced outcome than the existing research methods. This method proved to provide the protection from the denial of service attacks in the efficient way, thus ensuring security with reduced computational cost.

Keywords— Secured Data Transmission, Intrusion Detection, Latency and Power Reduction, Secondary Cluster Head, Dynamic Key Generation, Encryption.

I. INTRODUCTION

Intrusion is any set of actions that attempt to compromise the integrity, confidentiality, or availability of a resource and an Intrusion Detection System (IDS) is a system for the detection of such intrusions [1]. Since prevention techniques cannot be sufficient and new intrusions continually emerge, IDS is an indispensable part of a security system [2]. An IDS is introduced to detect possible violations of a security policy by monitoring system activities and responding to those that seem intrusive [3]. If we detect the attack once it comes into the network, a response can be initiated to prevent or minimize the damage to the system. An IDS also helps prevention techniques improve by providing information about intrusion techniques [4].

There have been many approaches proposed for intrusion detection. Intrusion detection methods are classified into three main techniques: anomaly-based, misuse-based, and specification-based [5].

An anomaly-based technique profiles the symptoms of normal behaviors of the system such as usage frequency of commands, CPU usage for programs and so on. It detects intrusions as anomalies, i.e. deviations from the normal behaviors [6]. In the literature, various techniques have been applied for anomaly detection, e.g. statistical approaches, and artificial intelligence techniques like data mining and neural networks. Misuse-based detection compares known attack signatures with current system activities. It is generally preferred by commercial IDSs since it is efficient and has a low false positive rate [7]. Both anomaly-based and misuse-based approaches have their strengths and weaknesses. Therefore, these techniques are generally employed together for effective intrusion detection. Specification-based technique is introduced as a promising alternative that combines the strengths of anomaly-based and misuse-based detection techniques, providing detection of known and unknown attacks with lower false positive rate [8]. In this technique, a set of constraints of a program or a protocol are specified and intrusions are detected as runtime violations of these specifications. Most host-based Intrusion Detection Prevention Systems (IDPS) can detect several types of malicious activity [9]. They often use a combination of signature-based detection techniques to identify known attacks, and anomaly based detection techniques with policies or rule sets to identify previously unknown attacks. The types of events detected by host-based IDPSs vary considerably based primarily on the detection techniques that they use. Some host-based IDPS products offer several of these detection techniques, while others focus on a few or one [10]. In this research method latency and power consumption of servers in which intrusion detection is performed is reduced considerably by introducing the secondary cluster head selection process.

II. RELATED WORKS

Panda et. al. [11], compares different data mining techniques for intrusion detection system and found that accuracy & performance of Naïve bayes classifier for all classes is better than the accuracy obtained in the case of

Manuscript received September 16, 2019.
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International Journal of Advanced Science and Technology
Vol. 29, No. 3, (2020), pp. 14629 - 14639

Detecting and Preventing Selfish Node Presence in Mobile ADHOC Network Using Watchdog with Fuzzy Bayesian Filter Approach

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ABSTRACT

Secured data transmission in mobile network is most concerned research issue focused by various researchers. Particularly network with the presence of selfish nodes would lead to tremendous degradation in network performance. Selfish node uses the resource only for its own purpose not for their neighbours so it is very important to detect the selfish node to improve the network performance of MANET. This is rectified in the proposed research work by introducing the method namely Authentication and Monitoring based Cooperative Attack Detection (AMCAD). In this work, initially selection of cluster head is done by considering the various factors such as node degree and trust level of nodes along with the energy and bandwidth. Here cluster head selection is done by using Improved ACO algorithm where VIKOR method is introduced for the pheromone update process and authentication is performed by introducing the modified group signature algorithm. Here initially random values generated by both cluster head and the cluster members will be exchanged with each other. By using that random number, signature generation will be done. This method enables all nodes involved in the environment to perform authentication by using those random values based generated signatures. After node authentication, data communication is initialized where optimal route path selection is performed with the concern of selfish node presence. Here the selfish nodes are avoided by integrating the fuzzy logic based Bayesian watchdog. The overall implementation of the These techniques are applied in a wide range with respect to the IDS which is centrally deployed or distributed in nature. This IDS is called as Distributed IDS (DIDS) when it is used in distributed environment like distributed WSN or any ad-hoc type network security level.

Keywords: *MANET, watchdog, modified group signature, fuzzy logic, selfish nodes detection, optimal route path selection*

1. INTRODUCTION

Mobile ad hoc Wireless Sensor Networks (WSNs) is a set of limited nodes used to gather data from the environmental objects. Each sensor node computes collected inputs as a formatted data [1].Then, the node transfers it to the destination path through a wireless region. MANET is a collection of numerous sensor nodes which performs environmental object sensing, data gathering, processing and data delivering tasks [2]. The sensor node continuously senses the environmental objects in the analog form and then analog data is converted into digital format. The sensor node contains the hardware components like power unit, microcontroller unit with inbuilt memory or external flash memory, analog to digital converter unit, communication unit and one or many sensors with interfaces [3]. In addition to these units, the node holds necessary software modules including a mini operating system with necessary utility programs, routing protocol and algorithms used for many functions.

ISSN: 2005-4238 IJAST
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International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-9 Issue-4, February 2020

Enhanced Performance of Adaptive Random Partitioning Testing by Unifying the ARPT-1 and ARPT-2 Strategies

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Abstract: The software testing is considered as the most powerful and important phase. Effective testing process will leads to more accurate and reliable results and high quality software products. Random testing (RT) is a major software testing strategy and their effortlessness makes them conceivable as the most efficient testing strategies concerning the time required for experiment determination, its significant drawback of RT is defect detection efficacy. This draw back has been beat by Adaptive Testing (AT), however AT is enclosed of computational complexity. One most important method for improving RT is Adaptive random testing (ART). Another class of testing strategies is partition testing is one of the standard software program checking out strategies, which involves dividing the enter domain up into a set number of disjoint partitions, and selecting take a look at cases from inside every partition. The hybrid approach is a combination of AT and RPT that is already existing called as ARPT strategy. In ARPT the random partitioning is improved by introducing different clustering algorithms solves the parameter space of problem between the target method and objective function of the test data. In this way random partitioning is improved to reduce the time conception and complexity in ARPT testing strategies. The parameters of enhanced ARPT testing approaches are optimized by utilizing different optimization algorithms. The computational complexity of Optimized Improved ARPT (OIARPT) testing strategies is reduced by selecting the best test cases using Support Vector Machine (SVM). In this paper the testing strategies of Optimized Improved ARPT with SVM are unified and named as Unified ARPT (UARPT) which enhances the testing performance and reduces the time complexity to test software.

Keywords: Adaptive Testing, Random Partitioning Testing, Adaptive and Random Partitioning Testing.

I. INTRODUCTION

Software testing [10] has been widely recognized as a standard software quality access and enhancement technique. The random generation of test cases from the set of all possible program inputs is a basic approach to testing. The main aim of the software testing is to evaluate the quality of an application and to detect software failures. In order to develop high quality software, it is essential to use software testing methods. There are various software testing strategies [3][2] that available to test a software. Some of them are Random Testing, Partition Testing (PT), Random Partitioning Testing (RPT) and Adaptive Testing. RT is one of the software testing methods wherever the programs are tested by producing random, autonomous inputs. RT is broadly used in the area of software testing due to its benefits such as simplicity and easy implementation [15]. Partition Testing (PT) is one of the testing mechanisms which divides the input domains into various sum of sub-domains [4]. RPT technique is the grouping of Random and Partition Testing techniques.

The AT technique uses the history of testing to improve the effectiveness of RPT testing. AT provides the effective test selection criterion with reduced test cases, the complexity and cost of its application is higher than random and partition testing [13]. However, these testing techniques have issues such as poor effectiveness for defect detection, high time Complexity and computational cost for test case selection. These issues were resolved by using a hybrid approach called as Adaptive and Random Partition Testing (ARPT). It consists of two strategies namely ARPT-1 and ARPT-2. ARPT was already proposed to test software which utilized AT and RT in an alternative manner [11].

However, the random partitioning in ARPT has high computation complexity problem and parameters of ARPT strategies needs to be estimated for different software with different number of test cases and programs. It consumes more time and it leads to overhead process to estimate parameters of ARPT.

Hence in this research, the clustering algorithms such as Expectation Maximization (EM), K-means, Non Negative Matrix Factorization (NMF) and Self-Organizing Map (SOM) are effectively utilized in random partitioning which reduce the computational complexity of ARPT which is called Improved Adaptive Random Partition Testing (IARPT) [6]. Then, the parameters of ARPT are optimized by using Bacterial Foraging Algorithm (BFA), Artificial Bee Colony (ABC), Firefly and Improvised BAT (IBAT) optimization algorithms which reduce the number of test cases then that is said to be Optimized Improved Adaptive Random Partition Testing (OIARPT) [7]. After this, the best test cases are selected by using Support Vector Machine (SVM) machine learning algorithm called OIARPT-SVM [8]. Finally, the two testing strategies are combined as Unified ARPT (UARPT) to improve the ARPT defect detection efficiency.

Revised Manuscript Received on February 06, 2020.
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Retrieval Number: B7399129219/2020©BEIESP
DOI: 10.35940/ijitee.B7399.029420

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

March-April 2020
ISSN: 0193-4120 Page No. 17929 - 17937

A Taxonomy on DDoS Attack in Cloud Environment and its Combating Techniques

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Article Info
Volume 83
Page Number: 17929 - 17937
Publication Issue:
March - April 2020

Article History
Article Received: 24 July 2019
Revised: 12 September 2019
Accepted: 15 February 2020
Publication: 30 April 2020

Abstract:
As Cloud computing is ubiquitous, utility computing model has become popular among the individual users and organizations. The secured cloud system provides confidentiality, integrity, and availability. Cloud offers software and scalable hardware platform to cater the needs of IT industry and leverage the management of its resources by the cloud vendor. Despite the numerous benefits, cloud services are victimized by Distributed Denial of Service (DDoS) attack, which consumes the computational resources in order to disturb the availability of service and incurs financial burden to the user. The DDoS attack is stealthy nature easy to implement and targets elasticity feature of cloud. This paper, presents a survey on DDoS attack detection, prevention and mitigation solutions in cloud environment.

Keywords: Distributed Denial-of-Service (DDoS), virtual machine, Economic Denial of Sustainability (EDoS), hypervisor, Cloud Service Provider, Combating

I. INTRODUCTION

Cloud computing became integral ,inevitable and modern paradigm of IT industry that provides scalable, economical, pooled resources, "pay-as-you-go" model of measured services to its customers with "on-demand" basis. Cloud offers a spectrum of features to the users at various levels like software-as-a-service (SaaS), Platforms-as-a-service (PaaS) and Infrastructure-as-a-service (IaaS). Cloud paradigm offers range of deployment models such as private cloud for organizations which requires sophisticated infrastructure with high security, public cloud which offers co-located cost effective service, and the hybrid cloud which covers the features of public and private cloud to offer distinct and customized services to user. Therefore, the business enterprises have adapted and deployed their business process to the cloud environment in a rapid manner. Besides these, the dynamically scalable nature of cloud services is easily subjected to attack vulnerabilities. Cloud computing facing most common security vulnerabilities such as Phishing and Social Engineering Attacks, Distributed-Denial-of-Service Attacks ,Malicious insiders, Data breaches, Exploited system vulnerabilities, Side Channel Attacks, Co-resident Attacks etc. Among these attacks, DDoS attack is non-intrusive and demolishes the availability of data and service which violates main characteristic of cloud computing that ensures 99.99[..] % guaranteed high-availability. In the year 2018 , Github a familiar version control hosting server was downed for 20 minutes due to exhausted network of traffic of 1.35 TB per second [1] and in the year 2019, Amazon's cloud computing division AWS experienced severe DDoS attack that hits Router 53 DNS web service and customers were outages of service for up to eight hours [2]. The paper is structured as follow. First, Section II introduces Distributed Denial-of-Service (DDoS) attack and its taxonomy and Section III describes Impacts of DDoS attack in cloud computing. Section IV narrates DDoS Defense, Section V, VI presents and compares attack prevention and detection respectively, Section VII elaborates DDoS attack Mitigation and Recovery. Finally, Section VIII concludes this paper

European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 07, Issue 09, 2020

PRIVACY CONCERNED ANONYMOUS AUTHENTICATION METHOD FOR SYBIL ATTACK DETECTION IN WSN

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ABSTRACT

Sybil attack is the most threatened issues found in the network which will cause consumption of more network spaces. Preventing the Sybil attack is difficult task where every fake identity generated by the attacker will looks like genuine id to the other nodes. In our previous work Sybil attack detection is performed through presenting an approach named Latency and Power aware Reliable Intrusion Detection System (LP-RIDS). However, this methodology failed in preventing Sybil attack occurrence which is focused in this work. In this work, Sybil attack prevention is ensured by introducing Privacy concerned Anonymous Authentication Method (PAAM). In this work, secondary cluster head selection is accomplished through Hybrid genetic with ACO algorithm. Here the secondary cluster head selection is done with the concern of higher energy value. The node that have energy lesser than threshold will not be considered for the Sybil node attack detection. And then anonymous authentication is performed to detect the Sybil attack. This is done by initializing the registration phase where all cluster members will share their temporal identity with the cluster head. Here temporal identity is generated randomly by each cluster member which is not possible to guess by other nodes. By using this temporal identity cluster head will generate the secret key which will be divided into two shares. Here first share will be given to the corresponding cluster member and second share will be given to the secondary cluster head. Thus no node can identify the privacy information of other users. This secret information will be utilized for the authentication process. Secondary cluster head will verify the cluster members at the time of data communication with the help of first share of secret key. This research method avoids the Sybil attack presence accurately. NS2 is greatly utilized in this research for validating the proposed techniques which offers better result when compared with prevailing work.

The overall implementation of the research work is done in the NS2 from which it is proved that the proposed techniques tends to provide better outcome than existing work.

Keywords: Intrusion detection, Sybil attack, secondary server, temporal identity, secret key share

I. INTRODUCTION

Wireless Sensor Network is greatly necessitated in various applications such as environmental monitoring, target tracking, health monitoring, and several maintenance operations [1]. Recent research work also demands two key activities namely Implementation and topology creation. Security is the key factor in wireless sensor network usage in variety of applications [2]. However, malicious attacks prevention and detection might be high or low in wireless sensor network [3]. Several attacks such as wormholes [4], sinkhole [5], Sybil [6], sleep [7], and selective forward attacks [8] exist so far in Wireless

DOI: 10.21917/ijsc.2020.0339

HYBRID NODE WATCHING TECHNIQUE BASED DOS FLOODING ATTACK DETECTION IN WIRELESS SENSOR NETWORK

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Abstract

Intrusion detection is the most concentrated research issue in the wireless sensor network where presence of intrusion activities are most difficult to find where there is no centralized architecture to monitor. One of the most frequently found intrusion activities in wireless sensor network are Denial of Service (DoS) Flooding attacks. DoS flood attacks would send large volume of chunk messages to the end node in order to corrupt the functioning of the particular node. Some of the most important DoS flooding attacks that are found in the network are ICMP flood attack, Synchronous Flood attack, UDP Flood attack, and Web attacks. All these networks would send enormous amount of messages such internet control message packets, synchronous messages, UDO messages correspondingly to the web servers to collapse the normal functioning of them by consuming energy resources and so on. In the previous research works, Sybil attacks and DDoS attacks are detected and avoided by introducing the method namely Privacy Concerned Anonymous Authentication Method (PAAM). However these research methods reduced in its attack detection rate with the presence of DoS Flooding attacks. This is focused and resolved in this work by introducing a method namely Hybrid Node Watching Technique (HNWT). This research technique attempt to find the variation in the data's and control messages transmitted between the end nodes to find the flooding attack presence. This is done through the trust nodes which are selected optimally by using cat swarm algorithm. These optimally selected nodes will monitor data transmission behaviour to predict malicious node presence. The overall implementation of this research work is done in NS2 simulation environment from which it is proved that proposed research technique tends to have increased attack detection rate.

Keywords:

Intrusion Attacks, DoS Flooding Attacks, Node Monitoring, ICMP Flood Attacks, Syn Flood Attack, UDP Flood Attack, Web Attacks

1. INTRODUCTION

H. Most ascending as well as demanding area of research in recent days is wireless sensor networking. A collection of autonomous nodes forms a Wireless Sensor Network (WSN). With small frequency and bandwidth consumption in wireless channel, they transmit a data [1]. For various applications like military applications, scientific examination, data collection monitoring, wireless sensor networks gives a low cost solutions, which makes them as a most popular one [2]. In network, every node can find its neighbouring nodes and in collection, for forming routes, these data can be used. Wireless Sensor Networks are most commonly vulnerable to Denial of Service attacks due to some weakness like broadcast transmission medium, limited processing capability and memory [3]. The WSN's capability are reduced due to this kind of attacks and it makes the lifetime of a WSN as a smaller one. In network, consumption resources are affected by this very often and energy consumption is enhanced and throughput is minimized [4].

A type of attack which restricts the users to utilize some specific network resources is called Denial of Service (DoS) attack and the resource may include entire system and/or website [5].A synchronized attack called Distributed Denial of Service (DDoS) attack, which is performed on some specific network's available services via compromised computing systems, which makes tracking of this DDoS control packets as a highly difficult one [6]. A type of Denial of Service (DoS) type of attack is flooding attack. The vital problem of flooding attack is that the flooder node is flooding the full network [7]. The flooding attack is where attacker generates route request messages and floods request simply by not even monitoring routing table for route. Once legitimate node receives RREQ, nodes in-between in their routing table will attempt to focus on destination route and eventually flood request to their respective neighbors as nodes have a route to destination.

The flooding attack's major objective is to take power by consuming a huge amount of battery and network bandwidth [8]. It will ultimately lead to small number of network performance - related issues. Flooding attack results in a breakdown in terms of output, battery power exhaustion and bandwidth inefficiency. AODV routing protocol is vulnerable to malicious attacks due its flexibility (on demand) in route discovery method. Due to the on-demand path discovery nature of AODV, it uses various metrics such as RREQ packets. A malicious node easily changes the contents of these packets to launch the attack. The AODV motivates WSN nodes to quickly acquire routes for new destinations, which do not need nodes to keep routes to non - networked destinations. RREQ message is the message that is sent to sink from the source to connect and send data to sink from the source

Major objective of this research work is for protecting Wireless Sensor Network from a type of DoS attack called flooding. All network resources like computing power, energy and bandwidth may be exhausted by folding. A new detection technique called early detection of DoS attack via distributed technique is proposed in this work. According to the transmission count based on neighbouring node's count, attackers are identified in this scheme. A threshold value is used in this scheme for comparing transmissions and other node's PDR in network.

2. RELATED WORKS

Hassanzadeh et al. [9] proposed an efficient flooding with neighborhood keys in WSN secured. The research paper involves checking whether a flooding packet can achieve 100% network coverage when every node clearly selects one of its keys to unicast the message. It results in NP - hard, proposing an application development version of it, and implementing a MAX-SFN approximation algorithm. It exhibits the 100 percent network

DOI : 10.5958/2349-2104.2020.00015.7

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A reliable, fast and accurate intrusion detection system for wireless sensor network

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ABSTRACT

Wireless Sensor Network (WSN) being one of the most demanding and ascending research area remain mostly vulnerable to Denial of Service (DOS) and Distributed Denial of Service (DDoS). These attacks significantly affect the performance of the network and eventually lead to complete compromise of all sensor nodes of the network. Many researchers have studied the identification and prevention of intrusion activities. LEoNIDS architecture solved the energy-latency tradeoff by giving minimum power utilization as well as minimum detection latency all at once. However, LEoNIDS architecture focused on the latency but not the precise detection of intrusion. The present work resolved these issues by presenting the technique called Attack Feature based fast and Accurate Intrusion Detection System (AF-FAIDS). The presented method enabled the intrusion detection in an effective way with enhanced delay and latency parameter. By using machine learning methods like Weighted Gaussian RBF kernel based Support Vector Machine (WGRBFK based SVM), attack detection ratio was enhanced which learnt the attacks features in an effective way. The technique provided precise and quicker identification of intrusion attacks which decreased the latency

Keywords: WGRBFK, RBF, DDoS, IDS).

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INTRODUCTION

Intrusion Detection (ID), one of the security management systems for computers and networks, collects and analyzes info from numerous fields within a computer or a network for finding probable security holes that comprised intrusions (the assaults that come from outside of the organization) as well as misuse (the assaults that come from the inside of the organization) (Kumar *et al.*, 2017). It utilized the susceptibility valuation, a technology implemented for examining the computer system or network security. Intrusion Detection System (IDS) may be a hardware system or software system, which systematized the procedure of observing and examining the events that happen in a network of computers for the purpose of detection of the malevolent activity (Muthukarpagam *et al.*, 2010). The ID system has turned out to be an essential inclusion to security infrastructure of numerous organizations, as the criticality of attacks that take place in the network has augmented radically (Villalba *et al.*, 2009). This system provided security to the organization to safeguard their systems from the dangers that arose with increase in network connectivity as well as dependency on information systems.

Security attacks against WSNs have been classified as active and passive (Sidra Aslam *et al.*, 2009), with passive attacks being silent in nature and conducted to extract important information from the network. Passive attacks do not harm the network or network resources. Active attacks have been used to misdirect, temper, or drop packets (Nandini and Patil, 2010). The unique characteristics such as wireless medium, contention-based medium access, multi hop nature, decentralized architecture, and random deployment of such networks made them more vulnerable to security attacks at various layers (Darabkh *et al.*, 2018). Nowadays, Distributed Denial of Service (DDoS) attacks posed one of the most serious security threats, due to the high congestion and denial of services to the users, with the traffic jammed in this case. Hence users may not get the resources they require and the performance degrades in terms of cost and energy consumption. The various existing methods introduced

International Journal of Advanced Science and Technology
Vol. 29, No. 3, (2020), pp. 14348 - 14364

Ensemble Feature Selection Method and Combining Classifier Approach for DDoS Detection in Cloud

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Abstract

Through the substantial growth of cloud computing, exchanging critical computing resources online is generating new business models. Distributed Denial of Service (DDoS) attacks threaten-cloud infrastructure. Cost-effective and company losses are the direct ripple impact of service failure, which can be offset by identifying DDoS attacks early. This paper introduces a tree-based classification model combination with an Ensemble-based Feature Selection Framework (EBFM) inthe process of detecting DDoS attacks. The proposed methodology tested the NSL-KDD dataset. EBFM selects 12 key features from the dataset and the detection accuracy was achieved by integrating random tree and NBTree algorithms using the scheme named as sum rule to 99.82%, which increases the accuracy rate to 99.79% compared to the other approaches. The proposed method, like other classification methods, requires high detection rates and accuracy.

Keywords: *Cloud Computing, Cloud Security, DDoS attacks.Tree-based classifiers, NSL-KDD dataset, Combined classification approach*

I. INTRODUCTION

Cloud computing is a prominent, complex, fault-tolerant and heterogeneous architecture that makes on-demand infrastructure, platform and application as a customer service and "pay as you go" model[1]. As a high-level theoretical concept, cloud leases a wide variety of configurable computing tools and facilities that can be customized to consumer needs. Cloud functions in a virtualized environment, removing vendor lock issues. This model is economic and reduces initial investment and maintenance costs. Cloud, being the highest, start-up and well-established IT companies, began to adopt features such as limitless observable shared computing and storage capacity, service efficiency, multi-tenancy elasticity, and so on.

Alongside all possible benefits, combining cloud storage with SDN can also pose potential risks , especially in connection with network security. Let's first look at Denial-of-Service (DoS) for all network security problems. The DoS attack and its high impact disseminated version, the Distributed Denial-of - Service Attack (DDoS), aims in bypassing the device or network infrastructure and make it inaccessible to its intended users. Eventhough the security

ISSN: 2005-4238 IJAST
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Title: Secure communication process in IoT using media gate network transmit protocol with reliable data transport protocol

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Abstract: Internet of things (IoT) is the important concept for making the effective and secure communication between networks. During the communication process the security and intermediate attack is one of the main issues because the communication may be used in various applications such as energy management, infrastructure analysis and environmental monitoring process, and so on. This issue has been overcome by applying the effective transmission protocol along with the secure encryption method. Initially, communication process is enhanced and making reliable with the help of the media gate network transmit protocol along with the reliable data transport protocol. In addition, the intermediate attacks present in the network communication process have been resolved by using the fuzzy soft multi-set blowfish encryption method. The application layer transmission protocol with the encryption method ensures the secured communication when compared to the other protocol based communication. Then the efficiency of the system is evaluated with the help of the experimental results in terms of the energy consumption and throughput metrics.

Keywords: internet of things; IoT; fuzzy soft multi-set blowfish encryption; energy consumption; throughput metrics.

DOI: 10.1504/IJITST.2019.098165

International Journal of Internet Technology and Secured Transactions, 2019 Vol.9 No.1/2, pp.136 - 146

Received: 01 Sep 2017
Accepted: 23 Oct 2017
Published online: 28 Feb 2019

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International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-8 Issue-2, July 2019

Artificial Immune System Based Improved Secure-Aware Wormhole Attack Detection in MANET

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Abstract: Typically, the most significant challenge in Mobile Adhoc Network (MANET) is detecting the wormhole attacks in the network during communication that degrades the overall network performance. Many routing protocols have been developed to detect and prevent the wormhole attacks based on the requirements of hardware, synchronization clocks, etc. To avoid those requirements, Improved Secure-aware Wormhole Attack Detection (ISWAD) technique was proposed by considering the maximum end-to-end delay and path length from source to the destination node. However, it requires more parameters to further increase the detection accuracy. Therefore in this article, an Artificial Immune System (AIS) based ISWAD is proposed to detect the wormhole attacks efficiently. Initially, a scalable and distributed scheme is applied to avoid single point failures and high mobility by using the sequential probability ratio test. In this scheme, system parameters are also considered with the maximum end-to-end delay and path length. To further improve the detection rate, these parameters are learned by the AIS to detect the wormhole attacks through the network precisely. After the wormhole links/nodes are detected, an alternative path is chosen from the routing table to transmit the data from source to the destination without any packet loss. Finally, the simulation results demonstrate that the proposed technique achieves better detection rate than the other wormhole attack detection techniques.

Index Terms: MANET, Wormhole attack detection, ISWAD, Scalable and distributed scheme, Artificial immune system

I. INTRODUCTION

A Mobile Adhoc Network also known as MANET is a type of wireless network that consists of self-configuring mobile nodes which are moving independently in any direction within their communication range. This independent movement of the nodes causes frequent changes in network topology. The changes in net-work topology area complex challenge for several problems in MANET such as routing protocol, scalability and performance degradation [1]. Moreover, highly susceptible to different types of attacks like blackhole, grayhole, wormhole attacks, etc [2]. Among several attacks, wormhole attack detection is very difficult since the attacker does not require any break to launch this type of attack [3].

Wormhole attack [4] is the most dangerous attack against routing protocols in MANET where nodes attract the data packets from source at a particular location and retransmits them to the destination which locates at the other location by using a long range of link within the network. It is a relay-based attack that can disrupt the routing protocol and so network is disrupted or failed due to the reason of this attack. An attacker consists of two trusted nodes in two different locations of a network through a direct link between two nodes. The attacker records the packets at one location of a network and then tunnels the recorded packets to the different location. The attacker retransmits those packets back into the network location where it is coming from. As a result, the entire routing is troubled. So, detection of wormhole attacks is very essential in MANET.

In previous researches, a novel Secure Wormhole Attack Detection (SWAD) technique [5] was proposed by computing the maximum end-to-end delay between any two nodes within the communication range without any requirements to detect the wormhole attacks in the network. However, this technique has many limitations like it does not consider the length of paths passing through the wormhole attackers. Since, the path length can be reduced significantly while the attackers are presented in the selected routing path. As a result, an Improved Secure Wormhole Attack Detection (ISWAD) [6] technique was proposed that considers both path length and the maximum end-to-end delay to detect the wormhole attacks in the network. However, it requires more parameters to further improve the detection accuracy.

Hence in this article, AIS-based wormhole attack detection is proposed in MANET. In this technique, a scalable and distributed analysis is introduced that uses sequential probability ratio test to detect single point failure and control high mobility of the nodes. Here, the system parameters such as false positive, false negative, detection time variation, node density, system overhead, storage aspects and wormhole range on attacker's risk are determined to improve the detection accuracy. Further, the obtained parameters are learned by using AIS algorithm to detect the wormhole attacks through the network. Based on this learning-based wormhole attack detection, the detection speed and accuracy are improved significantly.

Revised Manuscript Received on July 9, 2019

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UGC Approved only till 2019 | Impact Factor: 3.802 | Notice: CFP: Vol.9, Issue.3, March 2021

IJCSE
ISSN: 2347-2693 (E)
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An overview of Mobile Ad-hoc Simulation tools

S. Menaka[1], S. Duraisamy[2]

Section:Research Paper, Product Type: Journal Paper
Volume-07, Issue-02, Page no. 14-18, Jan-2019

Online published on Jan 31, 2019

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IEEE Style Citation: S. Menaka, S. Duraisamy, "An overview of Mobile Ad-hoc Simulation tools," *International Journal of Computer Sciences and Engineering*, Vol.07, Issue.02, pp.14-18, 2019.

Abstract

Mobile Ad hoc NETworks (MANETs) are dynamic networks, which is populated by mobile stations. Stations in MANETs includes laptops, PDAs or mobile phones. Current types of Wireless Networks are Cellular Networks, Mobile Ad Hoc Network, Wireless Sensor Networks, Vehicle Ad-hoc Networks, and Wireless Mesh Networks. Due to advance in technologies made possibility tremendous usage of small-size and high-performance computing and communication devices like commercial laptops and personal digital assistants. Success of second generation mobile system made more interest in wireless communication. Which led more interest to two types of wireless networks: infrastructured wireless network and infrastructureless wireless network, which is also called Mobile Ad-Hoc Network (MANET). The Infrastructureless wireless network consists of a network with mobile nodes with fixed wired base stations. Simulation tools are used by researchers to debug and test the reliability and Quality of Service of network protocols and also for hardware equipment. This made simulation a very prominent step towards the deployment of wireless communication networks. Hence this paper is very useful to researchers and engineers to propose and bring out new routing protocols using simulator in Mobile Ad Hoc Networks.

Key-Words / Index Term

MANET, Routing, Mobility Models, Simulators, NS2

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ISSN : 2347-2693

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Received: April 5, 2019

International Journal of
Intelligent Engineering & Systems

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A Parallel Rough Set Theory for Nonlinear Dimension-Reduction in Big Data Analysis

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Abstract: Attribute reduction for big data is an important preprocessing step in the area of data mining. A multi-step dimension reduction approach was proposed for attribute reduction in big data. It addressed the non-linear relationships within the attributes. The data dimension was reduced through a parametric mapping. The mapping parameters were estimated using low-rank Singular Value Decomposition (SVD). However, the user-defined criterion in multi-step dimension reduction approach has greatly influenced the efficiency of attribute reduction. This approach was proposed for a single machine that means the entire big data must fit in the main memory and the parallelism was limited. So, in this paper, parallel rough set theory based attribute reduction approach is proposed for attribute reduction in big data. Based on two descriptions of lower approximation and upper approximation, a rough set is constructed. Then a reduct is detected using inner importance measure and outer importance measure. The rough set theory is used in MapReduce framework to achieve the parallelism for attribute reduction in big data. Hence, the computation time is reduced by using parallel rough set theory based attribute reduction approach. Finally, the experiments are carried out in Amazon customer review, REUTERS-21578 and International Cancer Genome Consortium (ICGC) on AWS datasets to prove the effectiveness of parallel rough set theory based attribute reduction in terms of accuracy, precision, recall and computation time.

Keywords: Big data, Attribute reduction, Rough set theory, MapReduce, Singular value decomposition.

1. Introduction

With an increasing amount of industrial and scientific datasets, mining useful information from big data is growing today for business intelligence. The classical data mining techniques are becoming more challenging from both the perspectives of data and computational intensives. Because the sizes of the datasets are too massive to fit the main memory and the search space sizes are too large to explore using a single machine. It is known that all the attributes in datasets are not necessary for the decision-making process. It increases the search space and makes the generalization more difficult. Hence attribute reduction process is carried out as a preprocessing step in knowledge acquisition to find a minimal subset without compromising the classification accuracy.

Attribute reduction [1] can reduce data dimensions, reduce unnecessary storage and irrelevant input and significantly improve the efficiency of data processing. It is also known as feature selection in machine learning and pattern recognition [2], it reduces the complexity of handling big data. It also helps people better understand the data by telling them which are key features, and has been attracted much attention in recent years. Attribute reduction from large data is an expensive preprocessing step. Most of the attribute reduction algorithms were proposed for a single machine that means the entire data must fit in the main memory and the parallelism was limited.

A multi-step dimension reduction approach [3] was proposed for attribute reduction in big data. In this approach, the number of dimensions in the data was divided into groups. Using the low dimension of Singular Value Decomposition (SVD) the data

 DOI: 10.22266/ijies2019.1031.17

Global Journal of Computer Science and Technology: D
Neural & Artificial Intelligence
Volume 19 Issue 3 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

A Survey on Nature-Inspired Computing (NIC): Algorithms and Challenges

By A.Krishnaveni, R. Shankar & S. Duraisamy
Bharathiar University

Abstract- Nature employs interactive images to incorporate end users' awareness and implication aptitude form inspirations into statistical/algorithmic information investigation procedures. Nature-inspired Computing (NIC) is an energetic research exploration field that has appliances in various areas, like as optimization, computational intelligence, evolutionary computation, multi-objective optimization, data mining, resource management, robotics, transportation and vehicle routing. The promising playing field of NIC focal point on managing substantial, assorted and self-motivated dimensions of information all the way through the incorporation of individual opinion by means of inspiration as well as communication methods in the study practices. In addition, it is the permutation of correlated study parts together with Bio-inspired computing, Artificial Intelligence and Machine learning that revolves efficient diagnostics interested in a competent pasture of study. This article intend at given that a summary of Nature-inspired Computing, its capacity and concepts and particulars the most significant scientific study algorithms in the field.

Keywords: bio-inspired computing (BIC), inspiration, nature-inspired computing (NIC), nature-inspired optimization algorithms (NIOA), optimization, swarm intelligence (SI).

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A Survey on Load Balancing in Cloud Computing

R. Prakash, R. Shankar, S. Duraisamy · Published 18 October 2019 · Computer Science
Global journal of computer science and technology

Cloud computing is a biggest technology. It is different cloud services are SaaS, PaaS, aaS. loud users are able to access software and applications from whenever they need while it is being host by an outside party in cloud. Cloud services are bought on a pay-as-user-go or subscription basis. The cloud users getting into increased day by day. In this paper mainly focused on Load balancing within the cloud computing surroundings has a crucial impact on the performance. Smart load balancing... Expand

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Abstract

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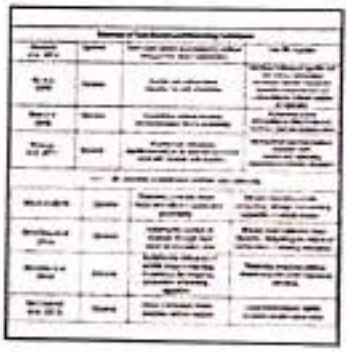

Table 2

- Cloud computing
- Load balancing (computing)

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Prediction of software fault-prone classes using an unsupervised hybrid SOM algorithm

C. Viji ✉, N. Rajkumar & S. Duraisamy.

Cluster Computing **22**, 133–143 (2019)

267 Accesses | **2** Citations | Metrics

Abstract

In software engineering fault proneness prediction is one of the important fields for quality measurement using multiple code metrics. The metrics thresholds are very practical in measuring the code quality for fault proneness prediction. It helps to improvise the software quality in short time with very low cost. Many researchers are in the race to develop a measuring attribute for the software quality using various methodologies. Currently so many fault proneness prediction models are available. Among that most of the methods are used to identify the faults either by data history or by special supervising algorithms. In most of the real time cases the fault data bases may not be available so that the process becomes tedious. This article proposes a hybrid model for identifying the faults in the software models and also we proposed coupling model along with the algorithm so that the metrics are used to identify

IJCSE International Journal of Computer Sciences and Engineering Open Access
Research Paper Vol.-7, Issue-5, May 2019 E-ISSN: 2347-2693

Identifying Oversampling and under sampling of Data-A Practical Approach Using R

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DOI: https://doi.org/10.26438/ijcse/v7i5.890896 | Available online at: www.ijcseonline.org

Accepted: 09/May/2019, Published: 31/May/2019

Abstract: The stimulation of thyroid hormones has a greater impact in maintaining the metabolism our body. If there is any misbehavior in the hormones it will affect the functioning of other organs too. It is such an important gland and proper clinical advices should be taken if there is a misbehavior. The machine learning algorithms plays a major role in the early detection of thyroid disorder. This work focuses on applying random forest algorithm in prediction of thyroid disorder. The random forest algorithm classifies the class attribute and predicts the occurrence of hypo or hyper or normal scenario of thyroid. The algorithm predicts the result with maximum accuracy. The work is implemented in R. R is a statistical tool and it very much handles large volumes of data compared to other traditional mining tools. The algorithm predicts more accurately and the various performance metrics has been analysed.The data set has been taken from UCI Machine repository.

Keywords: Thyroid, random forest, big data, R studio, Confusion Matrix.

I. Introduction

A thyroid gland or simply thyroid which is the endocrine gland found in the neck contains two lobes connected by isthmus. The gland is found in the front portion of the neck, produces thyroid hormones. These hormones are produced and released by thyroid gland and are represented as T3 (Triiodothyronine) and T4 (thyroxine).These hormones are needed for the normal working of the body and regulates metabolism. These hormones travels through the blood and elevates all other organs of our body.There are three cases of thyroid which affects our regular body routine.

1. Hypothyroid also known as low function of thyroid caused because of not having enough thyroid hormones.

2. Hyperthyroid also known as high functioning of thyroid caused because of segregation of too much thyroid hormones.

3. Normal thyroid which is the effective function of thyroid hormone.

The function which measures functioning of thyroid gland is TSH, where TSH stands for the Thyroid Stimulating Hormone. The test shows how much of this hormone is contained in blood. TSH is produced by the pituitary gland of the brain. This gland tells the thyroid to make and release the thyroid hormones in blood.

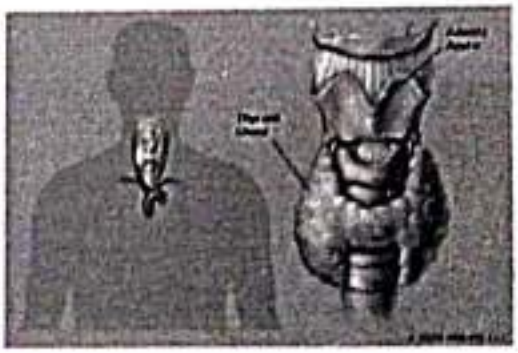

Fig.1.Thyroid Gland

1.1 History of thyroid

The first description of thyroid diseases as they are known today was that of Graves' disease by Caleb Parry in 1786, but the pathogenesis of thyroid disease was not discovered until 1882-86. Thyroidectomy for hyperthyroidism was first performed in 1880, and ant thyroid drugs and radioiodine therapy were developed in the early 1940s. Thomas Curling first described hypothyroidism (myxedema) in 1850 and the cause and suitable treatment

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ISSN 2321 3361 © 2019 IJESC

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Research Article Volume 9 Issue No. 7

Survey: Understanding Soil Structure and its Characteristics for Agricultural Data Mining

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Abstract:
Agriculture is one of the most important components for the survival of the society and all living being. Farmers and ranchers produce the food and fibre for every day usage. Soil is a critical part of successful agriculture and it supplies the nutrients for crops to grow. The nutrients move from the soil into plants. Nutrients are also a region of the food. The healthiest soils build the healthiest and most plentiful food provides. Agricultural viability depends upon a healthy soil. A healthy soil is obtained through knowledge of the soil and the application of acceptable management practices. Poor management practices can lead to soil degradation, which can reduce productivity. The analysis of soils plays an imperative role for resolution making on many issues associated with agricultural data mining.

Keywords: Agriculture, Soil, Nutrients, Food, Productivity, Agricultural Data Mining.

I. INTRODUCTION

Soil is a crucial layer of earth's crust (outermost layer). It is the mixture of organic matter, minerals, gases, water and air and alternatives organisms. It is the anchor for vegetation that is the key to a organic phenomenon on Earth. Since the healthiest soils produce the most food, they have also been at the center of the best communities in history. Soils in dry climates are more likely to see a decline in nutrients, especially if irrigated [6]. The small amounts of salts and other chemicals found in water can build up in the soil over time if not carefully managed. This process is called salinization. Much like freshwater fish are not able to live in the saline ocean, many land plants, including most crops, are not able to grow in saline soil. The most winning civilizations in history have lived on healthy soils and brought excellent care of the soil in order that food production was sustainable. The analysis of a soil is to determine nutrient content, composition and other characteristics [3].

II. TYPES OF SOILS

The soils of India has been classified depending on the how they are formed, their colour, composition. The types of the soil are following.

2.1. Alluvial Soil

These soils cover more than 40% of the total land area of the country.

Figure.2.1. Alluvial Soil

a. ***Structure:*** Alluvial soils are rich in phosphoric acid and organic matter but poor in potash. Alluviums are mainly loams, i.e. mixtures of sand and clay.
b. ***Location***: Mainly found in the northern plains and river valleys where the rivers deposit the sediments. In peninsular region, they are found in the coastal areas.
c. There are two types of alluvial soils
*i. **Khadar Soils:*** This type is moisture retentive and sticky when wet. It is new soil and is very fertile. Khadar areas are susceptible to flooding that become on the market for agriculture once a water course changes its course.
*ii. **Bangar Soils:*** It is old soil and it is sandier and less fertile. Bangar areas are less prone to flooding.
d. ***Major crops:*** If proper irrigation is done, the alluvial soils yield good crops of sugarcane, tobacco, cotton, rice, wheat, jute, maize, oilseeds, vegetables and fruits.

2.2. Black Soil

These soils are black in colour and are also known as 'Regur'. These soils cover around 16% of the total land area of the country.

Figure.2.2.Black Soil

a. ***Structure:*** These contain Lime, Potash, Magnesium, and Alumina but lack Phosphorous, Organic Matter etc. These are

IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 6 Issue 8, August 2019
ISSN (Online) 2348 – 7968
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Application of Multiclass DNeupper Classifier Using Sample Soil Dataset of Tirupur District for Predicting Multiple Crop Yields

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Abstract—In agricultural applications, the most important process is crop yield prediction that predicts the yield productivity over a definite period of harvesting. Many data mining algorithms have been developed to predict the yield of multiple crops simultaneously which consumes more time and also creates a multi-class classification problem. The Krill-Herd (KH)-based feature selection with Dynamic Multi-Class Neupper (KHDMCNeupper) classifier is used to predict the quality of yield for three different crops, namely rice, wheat and maize. Since it achieves better accuracy for those crops it is used to predict the yield of three different crops such as coconut, sorghum and groundnut of Tirupur districts. The soil parameters P, K, Cu and Fe etc., of the identified crops of Tirupur districts are collected and the most optimum of these parameters are selected using KH algorithm. The rough set theory determines the relative weights of each selected soil parameters and it is being added with the actual soil parameter values. The calculated weight of the parameter values are used by the Artificial Neural Network (ANN) to build a decision tree in the DNeupper classifier. The classification rules for are generated for all the crops together within a single classifier. As a result the quality of crop yield is predicted with the reduced training time. The results demonstrate the efficiency of KHDMCNeupper classifier for the considered crops and compared to the other classification algorithms.

Keywords—Crop yield prediction, ANN, KH, KHDMCNeupper, Soil parameters, Rough set theory.

I. INTRODUCTION

Agriculture plays a major role in most of the Asian countries where the demand of food has been increased due to unconditional growth of population. In earliest years, individuals cultivate the crops in their own land and conjointly natural crops harvested that are used by totally different individuals, animals and birds since such crops will offer healthy life. The individual doesn't have the information concerning the cultivation of the crops in an exceedingly right time and at an acceptable location. By victimization the smart techniques, the seasonal atmospheric condition are being modified against fundamental properties like soil, water and air which give to insecurity of food. There is no correct resolution and technologies by analyzing the problems like climate, temperature, etc., to avoid the agricultural degradation.

Several data mining techniques [1] are projected on the premise of historical data concerning climate, water level, and crop growth level to extend the yield productivity. Most of the crop yield prediction systems helpful for cultivators to form decisions concerning the soil type, irrigation level and type of crop to be yielded. Also, it uses to predict the specified knowledge from a raw dataset for predicting the yield productivity problems and creating an applicable solution.

In this article, Tirupur district soil dataset for three different types of crops such as coconut (ct), sorghum (sm) and groundnut (gt) is collected from Soil Testing Laboratories. The soil dataset are taken from thirteen blocks which are listed in Table 1. Tirupur region which is located 430Km south west of Chennai city and 56Km from Coimbatore city. This study area lies within the latitude 11°10'N to 11°22'N and longitudes 77°21'E to 77°50'E. Mainly, this region is an agricultural region with different types of crops. The major goal of this study is to analyze the quality of coconut, sorghum and groundnut yields in the Tirupur region of Tamilnadu.

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-8 Issue-12, October 2019

Multiclass Data Imbalance Oversampling Techniques (Mudiot) and Random Selection of Features

V.Shobana,K.Nandhini

Abstract: Class imbalance is a serious issue in classification problem. If a class is unevenly distributed the classification algorithm unable to classify the response variable, which will result in inaccuracy. The technique Multiclass Data Imbalance Oversampling Techniques (MuDIOT) is to find out the factors which have a hidden negative impact on classification. To alleviate the negative impact the technique MuDIOT concentrates on balancing the data and the result minimizes the problems raised due to uneven distribution of classes. The dataset chosen has a multiclass distribution problem and it is handled to produce better results of classification.

Keywords: Imbalanced data, data preprocessing, big data, MuDIOT, SMOTE, RFE, random forest

I. INTRODUCTION

Classification coined as most common factor in machine learning. It is referred as the process of classifying an unpredicted, unordered value.[1]. It contains algorithms applied to the data and build the model that can be classified and discovers the dependencies behind class attributes. After that, new labels are tested and classified to the predicted groups. The data produced so far has its unique characteristics. Based on the characteristics alone we cannot build the perfect model. Most of the real world applications, particularly in healthcare, retrieving and calculating the required parameters is expensive and may not be done at all. Gathering samples from each of the above mentioned classes is difficult because of the above factors. When one class samples is more in number than that of other class, it is known as class imbalance problem. It is a common thing in medical databases when a large number of patient data is taken into consideration.[1]Multiclass Data Imbalance Oversampling Techniques (MuDIOT) deals with this problem by random sampling of minority classes. It deals with multiple classes wherein a particular class or group of classes lies under minority values. Health care data analytics requires much importance since a large amount of data is generated. There are many analysis carried out in the medical domain to improve the classification techniques and results are analyzed to increase predictor accuracy [4]–[6], especially when it is the case of uneven distribution of datasets. Thus machine learning algorithms have been applied to dataset that are not evenly distributed or incomplete, are discussed in this paper.

Revised Manuscript Received on September 05, 2019.

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The classes which are not evenly distributed is the major issue which is in attention until 1990s [7]. In the year 2005 dealing with imbalanced cost effective data was a major issue and it occupies the top ten 10 challenging issues in data mining.[8] Another problem in medical dataset is which attributes to choose for classification. It results in Feature Selection and a variety of methods available for selecting the top features.

II. BACKGROUND

2.1 Imbalanced Data Identification

The imbalanced class distribution defined as the relation between more numbers in majority class than that of minority class.[9].This lack of equality occurs in most of the medical databases, where different patients are diagnosed for different illness. These types of patients require special treatment. In specific cases, the datasets are fairly imbalanced with a imbalance ratio of, 1:10000 [7]. The classification and prediction algorithm shows improper classifiers and predictors on applying imbalanced dataset. The figure 1 shows the uneven distribution of classes.

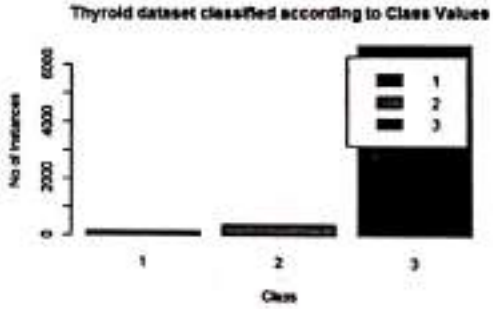

Fig.1. Imbalanced Data.

The uneven distribution of classes is given in terms of a table and is shown in Table.1.

Table.1. Imbalanced Instance Values

Class	1	2	3
No.Of Instances	166	368	6665

The main idea to resolve data imbalance is to resample the data as many times to obtain better class and even class distribution. Once it is evenly scattered it becomes easy for the classifiers to work on standard conditions. It will improve the classifier performance rapidly.

ISSN (Print) : 0974-6846
ISSN (Online) : 0974-5645

Indian Journal of Science and Technology, Vol 12(23), DOI: 10.17485/ijst/2019/v12i23/145370, June 2019

Performance of Data Mining Classifiers on Kolb's Learning Style Inventory (KLSI)

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Abstract

Objectives: This study is intended to examine the effectiveness of predicting the learning style of college students. To understand experiential learning, many have reiterated the need to be able to identify students' learning styles. Kolb's Learning Style Model is the most widely accepted learning style model and has received a substantial amount of empirical support. Kolb's Learning Style Inventory (LSI), although one of the most widely utilized instruments to measure individual learning styles, possesses serious weaknesses. **Methods/Statistical Analysis:** The proposed work introduces the study of efficiency in Kolb's learning style. Classification algorithms used in this research include J48, BayesNet, and Naïve Bayes and Random forest classifier. The data was collected from 30 students in Department of Information Technology, Dr. N.G.P. Arts and Science College in the final semester of academic year 2018. The 10-fold Cross Validation was used to create and test the model and the data was analysed by the WEKA program. Questionnaires were distributed to participants in class and then collected by the researcher after participants had finished them. **Findings:** After all the questionnaires were collected, data was then input in the computer and then statistically analysed. The J48, BayesNet, Naïve Bayes and Random forest classifiers are used to measure the classification accuracy. In order to measure the learner style results the metrics like precision, recall, accuracy and Kappa values are used in this work. **Application/Improvements:** The result shows that random forest algorithm has more capability in predicting learning style of the students. Understanding the learning style of students is the first step and it may give a fruitful result when it is embedded with learning environment.

Keywords: Kolb's Learning Style Inventory (LSI), J48, NB Tree and Naïve Bayes

1. Introduction

The cognitive psychology based measure of a person through processing of information, mode of active learning and pattern of information are referred to as learning styles. It means that a person may prefer specific learning style while learning a subject. Sometimes the learners may use mixed learning style. The progression of information technology such as internet surged the growth of online educational programs which change the traditional system of education. The emergence of technology has become a competitive advantage for higher education institutions as it can provide an alternative approach in providing better quality of learning. Many institutions are responding to the pressures by embracing the new technologies. Technology has a vital role to play in building up 21st century skills, broadening access to education and personalizing the learning experience to adapt teaching to the unique needs of each learner.

One important aspect of learning style is to recognize the learning style of the student and measure the impact on their academic achievement. According to the knowledge of learning styles can be used to increase students' self-awareness and meta-cognition of their strengths and weaknesses. In argues that most of the students are unaware of their learning style and they are mostly unlikely to start learning in new ways.

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THINK INDIA (Quarterly Journal)

ISSN:0971-1260

Vol-22-Issue-4-October-December-2019

Multicast Data Communication Based On Dynamic Clusteringinwsn Using Diffie-Hellman Algorithm

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Abstract: A Wireless Sensor Network (WSN) contains large number of Sensor nodes. Privacy of the user may loss because of unauthorized access of third party. For this issue this paper proposes a Diffie-Hellman Algorithm of public key encryption method to provide more security to the data also here included the multicast method of communication with dynamic node discovery technique to solve the security issues.

Keywords: *Wireless Sensor Network, Security, Sending Message and Multicast Communication.*

I.INTRODUCTION

A Wireless Sensor Network (WSN) contains huge amounts of Sensor nodes. Through the base-station (BS), the sensors nodes were communicating each other in a network. A bigger assortment of sensors licenses for detecting over bigger countries with bigger exactness. Wireless Sensor Networks provide a lot of Sensor nodes that outline the networks for recognition the unfurl of technique and advance learning with respect to the objectives of result back to the end-clients. To exchanging the information, network should give higher correspondence strategy among WSN and will give detecting the node between the networks. In WSN, detecting the node might be a pivotal issue to exchange the information among the nodes [1]. While detecting the node inclusion might be a noteworthy drawback on account of disappointment, power, or commotion precariousness. The significance of this difficulty emerges once a WSN must be set up in inaccessible and commonly unclean space. In those regions, there are a few sections like temperature that must be recorded extremely precisely to evade a blast [2]. Each explosion will build the contamination inside the atmosphere that may be more regrettable in an exceedingly blustery climate. In such zones, a sensor is expected to be sent all over. In any case, there's no assurance that the nodes a consistently disseminated when irregular preparing. the possibility of covering the detecting field while they're not covered and being inside correspondence differ of each choice to be completely associated are diminished [3]..First, we think about the use of existing and proposed security

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ISSN XXXX XXXX © 2019 IJESC

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Research Article

Volume 9 Issue No.3

A Survey on Data Security in CSP using Cryptographic Key

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Abstract:
Cloud Computing turned into the most predominant innovation in recent years. Cloud facilitates its users by providing virtu resources via internet. The amount of users using this technology has exploded. Therefore, cloud users expect more safe and securi for their data. One can secure the data from being accessed illegally by encrypting it with a key with various methods of Advance and data encryption standard. Cryptography is basic for the security and honesty of the information that is put away in the cloud. few cryptographic techniques are utilized to ensure the respectability of information for different applications. A specific securi strategy makes utilization of various cryptographic strategies to encode information and make it into an un-meaningful structur which would then be able to be decoded just with the assistance of a key. Cryptographic systems are fundamental for the classificatic of the information spared. For this reason this paper give a survey on different cryptographic system utilized for the encryptic technique for giving security by putting away the encoded information in the cloud.

Keywords: Cloud Computing, Security, Cryptographic, Symmetric, Asymmetric

I. INTRODUCTION

Cloud computing gives a common pool of assets, including information storage room, systems, PC preparing power. The cloud is a virtualization of assets that keep up and oversees itself [1]. Cloud computing is Pay per-Use-On-Demand display that can helpfully get to shared IT assets through the Internet Where the IT assets incorporate long range informal communication destinations, webmail, online business applications and system Services. Cloud Service Provider (CSP) can improve the accessibility of IT assets and along these lines give in this manner give the possibility to cost decrease through advanced and productive figuring. Cloud additionally incorporates the significant hazard, for example, security, informatic respectability, organize reliance and centralization. As tl security isn't given in cloud numerous organizations receiv their one of a kind security structure [2]. Security is the centr point of any advancement amid which unapproved gatecrash can't get to your record or information in the cloud. The Clou Security Alliance is a non-benefit association shaped to advan the utilization of best practices for giving security confirmatic inside distributed computing. In fig.1 its shows the architectur principles which constitute cloud computing data storag devices. It describes a cloud data storage environment whe user can store the data on cloud.

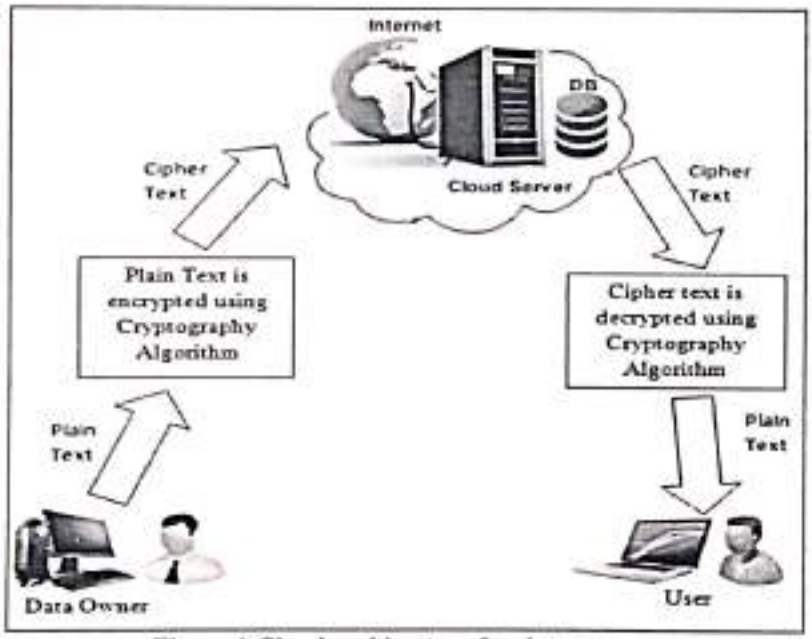

Figure.1.Cloud architecture for data storage

IJETIE

International Journal of Emerging Technology and Innovative Engineering
Volume 5, Issue 10, October 2019 (ISSN: 2394 – 6598)

HYBRID CRYPTOGRAPHIC SECURIT SYSTEM IN HEROKU CLOUD

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Abstract: *Cloud computing offers the possibility of on-request, flexible registering, gave as a utility administration, and it is reforming numerous areas of figuring. It makes it simpler to meet the objectives of the authoritative to the cloud administrations. Cloud computing has curved out to be dynamically increasingly well known in light of the fact that it offers clients the dream of having boundless registering assets, of which they can use as much as they need, selective of worried about how those records are given. Numerous security models have been given respect to Cloud figuring however the majority of them had their attention on a specific security risk as opposed to taking into account the whole framework. Anyway, Cloud Security keeps on being the greatest obstruction in Heroku Cloud and in this manner keeps clients from getting to its administrations. In this paper we have propose a Hybrid Cryptographic System (HCS) that joins the advantages of both symmetric and hilter kilter encryption consequently bringing about a safe Heroku Cloud condition with the assistance of AES and RSA calculation.*

Keywords: *Cloud computing, security, HEROKU cloud, Hybrid method and Cryptographic System*

I. INTRODUCTION

Today user may spend lot of time with a computer to collect lot of data over network and store it where it as portable. While roaming time user of the cloud may need their data from their PC (Personal Computer) it is very unfair to take the large dataset as a portable manner. So they may issue happened while their meandering time. Therefore, putting away an enough in system can take care of this issue [1]. Cloud storage is utilized to dodge this issue. Cloud storage alludes to putting away a lot of information which as pay-per-use plot which is alluded to distributed computing. It is utilized to off-site stockpiling plan kept up by an outsider for example cloud supplier. Cloud computing is a standout between the most expanding one with the expansion no. of cloud clients. It is most well known one to store the information in geological condition with vast processing assets and access the information where the client need without stress over the information misfortune [2]. Henceforth it gives more noteworthy accessibility, adaptability, and unwavering quality to the clients. These highlights are given by the cloud supplier as an administration of Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Database as a Service (DaaS).

This service provides a client-based system and the administrations are carried by outsider supplier who owns the cloud. The information is put away in remote division [3]. Cloud computing is the blend of an innovation, stage that gives facilitating and capacity administration on the Internet. Cloud assets contain

IJSRCSEIT International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2019 IJSRCSEIT | Volume 5 | Issue 3 | ISSN : 2456-3307
DOI : https://doi.org/10.32628/CSEIT1953114

Fruits, Vegetable and Plants Category Recognition Systems Using Convolutional Neural Networks : A Review

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ABSTRACT
This paper reviews the systems and methods that have been employed in the recognition of the fruits, vegetables and other plant parts or the entire plant itself .Deep learning algorithms are the current trend in computer vision applications and are broadly employed in agricultural domains for identification of plants and its parts, soil type classification, water resources, harvesting prediction and in fertilizer and pest management. The deep learning algorithm CNN and its types are used widely in current research fields. Higher accuracies are obtained for the detection of plants parts such as leaves and fruits. This can be applied in the field of robotics, agriculture and in some medicinal industries where identification of plants, its parts and where weed detection is necessary. Plant identification is of great value to the agriculturists and medical industries which wants to automate.

Keywords: CNN, Agriculture, Fruits and Vegetable Classification, Deep Learning

I. INTRODUCTION

Deep learning, a part of machine learning, is based on deep neural networks. It is used in many fields like computer vision, speech and text processing, medical field, agricultural field, chemical sciences and almost in every field it's been started to get deployed. Neural networks, also known as artificial neural network, are based on how the neurons work in human brain, in fact it's a simulation of the working principle of human brain's neurons.

Agriculture is the source of our major food wants. Agriculture is also turning slowly into deploying artificial intelligence in various fields like prediction of yields, soil type classification, disease and pest control and weeds detection. Recently deep learning, the current state-of-the-art is used in agriculture for computer vision. Using agricultural image data, it is possible to use deep learning in classification of plant parts such as fruits and leaves. And used in robotic harvesting too.

This paper does a thorough literature review on plant, fruits and vegetable image classification. This can be applied in the field of robotics, agriculture and in some medicinal industries where identification of plants, its parts and where weed detection is necessary. Plant identification is of great value to the agriculturists and medical industries which wants to automate.

The organization of this document is as follows. (Section-2)Previous work,(Section-3)a table consisting of the datasets and algorithms on which the datasets are run and (Section-4)a conclusion.

II. PREVIOUS WORK

REVIEW ON OUTLIER DETECTION USING CLUSTERING ALGORITHM

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Abstract

Clustering and outlier detection is important task in data mining. Cluster can easily destroyed some of outliers. It requires outlier detection techniques for detect the abnormal objects. Outlier detection is the process of detecting the outliers, these are several terms like anomalies, outliers, noise or inconsistent data, detecting and analyzing the outlier is a broad research area and its applications. Finding and selecting detection is important technique used for classify the problems in outlier detection method. First apply clustering algorithm and to find outlier, the goal is to detect the outlier and remove the outlier to make the clustering more efficient for the cluster based outlier detection, This review implement in agriculture area.

Key words: Data Mining, Clustering, Outliers, anomaly detection.

1. Introduction

Clustering is a process of detecting the similar object in some sense and make a cluster or group. This is very useful techniques in data mining. The objects in same cluster are similar than the other object[1]. Detecting outlier is a significant part of data analysis, this process of detecting outlier should be done prior to analysis and modeling outlier detection is widely used in several research areas[2]. An outlier is an observation in a dataset which appears to be in consistant with the remainder of that set of data[3]. A bunch of points are separated into different groups so that similar points are assigned into the same cluster and for detecting outlier, the point with derivating charecters are identified as outlier[4]. An outlier is a study point that is distant from other study. An outlier is due to variability in the measurement or it may indicate experimental error the later are sometiming excluded from the dataset[5]. Anomaly detection is the process of identify those patterns in data which do not conform to expected behavior. These patterns are called as anomalies or outliers[7].

2. Outlier detection techniques using Clustering

Outlier detection technique has been widely used in many fields, such as clustering classification, medical health care, stock analysis, network intrusion detection, credit card fraud prevention [8]. Outliers being the most

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-9 Issue-3, January 2020

Challenge Faced in K-Means Clustering for the Choice of Automatic K-Value for Segmentation of Black Sigatoka Disease in Banana Leaves

Srivalli Devi S., A. Geetha

Abstract: Clustering is defined as grouping similar items . The three types of machine learning techniques are supervised, unsupervised and semi-supervised. In unsupervised technique, there are no class labels given to the input data. Clustering is a type of unsupervised learning technique. Recently clustering is applied in many fields such as medicine, agriculture, biology, computers, finance and robotics. Black sigatoka is a bacterial disease occuring commonly in banana plants .The research currently focuses on segmenting the disease area from non-diseased area.The segmentation class training is done via Trainable Weka Segmentation and we also do segmentation using k-means algorithm. In this paper we propose a novel approach for extraction of the black sigatoka diseased area on banana leaves from images using pixel color values and grouping them into their respective clusters accordingly. This is a segmentation cum clustering algorithm. The novel approach has been proposed to overcome the shortfall of k-means clustering when segmenting using automatic value selection for k-means by using silhouette values. Using this novel approach its easy to cluster and segment at the same time. The segmented image from this algorithm can be used in disease classification tasks.

Keywords: Black sigatoka,K-means clustering, Trainable Weka segmentation, silhouette score, pixel color values.

I. INTRODUCTION

Agriculture is the major source of food for humans. But when disease occurs in the cultivated plants, these plants tends to be a waste for consuming purposes. Hence there comes the role of identification of disease during even early stages using modern technology. Farmers can access the disease detection software directly using their mobile phone by taking a picture and upload it on the software. Then the diseased areas can be segmented and classified using data mining techniques K-means clustering algorithm is the popular algorithm that is used for unsupervised image segmentation. For image mining , there are different kinds of steps such as image acquisition, image processing , classification, color processing, clustering and feature extraction[1].

II. LITERATURE REVIEW

The k-means algorithm is widely used algorithm for segmentation using clustering techniques. K-means was used as primary segmentation algorithm for segmenting medical images along with improved watershed algorithm was used[2] Using k-means has reduced the over-segmentation in MRI images.In [3] authors used a method for k-means in which the mean square error is reduced in generating the cluster center. Execution time was not affected too. They determined that *dense* dataset achieves higher accuracy. In [4] authors suggested for brain tumor segmentation to use k-means and fuzzy C-means algorithm for calculating the area of the tumor in the brain. They used MRI images. A novel method for discovering the initial centroid was proposed in [5] and authors of that paper states a better way for data point assignment with time complexity lesser than that of others for suitable clusters.Initial centroid was computed using subtractive clustering technique and it was then applied to k-means algorithm for segmentation and partial contrast stretching used for image quality improvisation and median filter for improvisation of segmented image. This idea was used in [6] for medical image segmentation.In [7] the authors had masked the green pixels and used colour co-occurrence method and suggested that for the accuracy improvement neural networks may be used.In [8] authors had used the clustering technique k-means clustering and also they used it with neural networks for leave disease detection.In [9] authors had used co-occurrence matrix and k-means for segmentation of texture. They also suggest that k-means , Bayes classifier and principal component analysis can be used to classify various plant diseases.Genetic algorithms with k-means clustering technique was used in [10]. The green pixels are masked and the diseased portion is then obtained and they pass the clusters from k-means to genetic algorithm for better accuracy in diagnosing the plant leaf diseases.

III. PROPOSED METHODOLOGY

In the existing systems, k-means is used by giving the default value for k done by predetermining the number of initial clusters. But this method of k-value default assignment deducing the number of clusters required beforehand may sometimes lead to unexpected results where there may be more actual number of clusters than predetermined. In this paper we discuss on using automated k value selection and the challenge faced when we take the automatic assignment of k-value in k-means.

A.Dataset used

The dataset used here contains 42 banana leaves images[11] that are affected with black sigatoka disease. Black sigatoka is a fungal disease commonly affecting the banana and plantain plants. The pathogen that causes this disease is Mycosphaerella fijiensis.

Revised Manuscript Received on January 05, 2020.
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International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-9 Issue-3, January 2020

Prediction of Black Sigatoka Disease in Banana Plants By Data Mining Classification Techniques using Scikit for Python

Srivalli Devi S, A Geetha

Abstract: Agriculture has been evolving since humans started cultivating plants for food consumption. As the agriculture field evolves, the disease control measures too have evolved. Now in this modern era, disease in plants can be easily identified using computers. Data mining is the process of obtaining the useful information from the data. Before the electronic era, diseases in plants are identified just by seeing the symptoms of the plants. Similarly, we can identify the diseases in plants using data mining by supplying the disease symptoms data and classify them accordingly. The purpose of this paper is focusing on the prediction of the diseases from images of black sigatoka disease and uses the following methods: MultilayerPerceptron, SVM,KNeighborsClassifier,K-NeighborsRegressor, Gaussian Process Regressor, Gaussian Process Classifier, GaussianNB, Decision Tree Classifier, Decision Tree Regressor, linear models such as Linear Regression, RidgeCV, Lasso, ElasticNet, Logistic RegressionCV, SGD Classifier, Perceptron and Passive Aggressive Classifier and ensemble models of the above classifiers. The results are compared, and multilayer perceptron model is seen to give better results for individual classifiers and ensemble of week classifiers gives better results when ensembled. In future, a new hybrid algorithm would be used from the above algorithms for attaining better accuracy. The scikit is a library used for classification, clustering, regression, dimensionality reduction,model selection and preprocessing. Our paper discusses various classifiers used in scikit-learn library for Python and their ensembling is done. This can be applied to all the classification tasks. Classification is done for classifying the black sigatoka disease in banana from healthy leaves.This disease is the most vulnerable one among banana plants.

Keywords : agriculture, black sigatoka, classification, data mining, scikit.

I. INTRODUCTION

Data mining is the study of gathering, cleansing, handling, exploring, and getting beneficial perceptions from data [1]. Such analysis can be used for research purposes and may lead to obtaining new knowledge. Agricultural applications such as seed and crop growth analysis and crop yield prediction with various other factors soil condition, temperature, rainfall, fertilizer, pesticides, irrigation. Two important factors helping agriculturist and government in decision making are providing the historical crop yield record for farmers and making crop insurance policies for government [2]. Data mining techniques can be categorized predictive, descriptive and prescriptive [3]. Descriptive analytics gives insight into the past, predictive analytics helps in understanding the future and prescriptive analytics advises on possible outcomes.

Common challenges faced in agriculture are disease occurrence in cultivated plants, poor water management, improper use of fertilizers, pesticides and fungicides. Diseases can be identified only after the visible symptoms occur. The reasons of disease attacks are abiotic, mesobiotic and biotic factors. Plant diseases can be categorized as endemic, epidemic and sporadic. The different modes of spreading are through seed, soil, air and insects [4].

Pseudocercospora fijiensis is the fungus that causes the black sigatoka disease (black streak leaf disease) is a disease that occurs in banana plants. This occurs on the leaves of the banana plant. India, Pakistan, South Africa, Israel and mainland Australia are free of this disease [5]. The initial symptoms of this diseases are very small chlorotic spots on bottom of 3rd or 4th open leaf which then grows into brown streaks running parallel to leaf veins. The streaks forms clusters and spots merge forming a chlorotic halo and streak's colour becomes darker visible on the top side of the leaf. This lesion then becomes big and darken giving black streaks [6].

Black Sigatoka disease is a threat for global exports and food consumption [25]. And therefore, it's better to identify the disease as early as possible to avoid the fast spreading of the diseases.is is an International reputed journal that published research articles globally.

II. RELATED WORK

Decision Trees, Random Forest, Gaussian Naive Bayes, Support Vector Machine, Neural Networks, K-Nearest Neighbours, ensemble models of the above algorithms are used for the grass grub damage prediction. Combination of Decision Trees, Random forest and Support Vector Machine has produced better results [8]. The metrics considered are accuracy, mean accuracy, precision, recall and F-1 score. Data mining techniques such as Naive Bayes, Logistic Regression, Random forest, Support Vector Machine, Adaboost, 348 are used [9].

Revised Manuscript Received on January 5, 2020
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Retrieval Number: C8714019S120/2020©BEIESP
DOI: 10.35940/ijitee.C8714.019S120

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

Global Journal of Computer Science and Technology: D
Neural & Artificial Intelligence
Volume 19 Issue 3 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

A Survey on Nature-Inspired Computing (NIC): Algorithms and Challenges

By A.Krishnaveni, R. Shankar & S. Duraisamy
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Abstract- Nature employs interactive images to incorporate end users' awareness and implication aptitude form inspirations into statistical/algorithmic information investigation procedures. Nature-inspired Computing (NIC) is an energetic research exploration field that has appliances in various areas, like as optimization, computational intelligence, evolutionary computation, multi-objective optimization, data mining, resource management, robotics, transportation and vehicle routing. The promising playing field of NIC focal point on managing substantial, assorted and self-motivated dimensions of information all the way through the incorporation of individual opinion by means of inspiration as well as communication methods in the study practices. In addition, it is the permutation of correlated study parts together with Bio-inspired computing, Artificial Intelligence and Machine learning that revolves efficient diagnostics interested in a competent pasture of study. This article intend at given that a summary of Nature-inspired Computing, its capacity and concepts and particulars the most significant scientific study algorithms in the field.

Keywords: bio-inspired computing (BIC), inspiration, nature-inspired computing (NIC), nature-inspired optimization algorithms (NIOA), optimization, swarm intelligence (SI).

GJCST-D Classification: I.1.2

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Global Journal of Computer Science and Technology: B
Cloud and Distributed
Volume 19 Issue 2 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

Survey on Load Balancing in Cloud Computing

By R.Gowri Prakash R. Shankar & S. Duraisamy
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Abstract- Cloud computing is a biggest technology. It is different cloud services are SaaS, PaaS, aaS. loud users are able to access software and applications from whenever they need while it is being host by an outside party in cloud. Cloud services are bought on a pay-as-user-go or subscription basis. The cloud users getting into increased day by day. In this paper mainly focused on Load balancing within the cloud computing surroundings has a crucial impact on the performance. Smart load balancing makes cloud computing additional economical and improves user satisfaction. Load balancing may be a pc networking technique to distribute work load across multiple computer or a multiple cluster, networks, links, central processing unit, diskdrive and alternative resources. Aload balancing technique transfer or migrates a task for over loaded machine to below loaded machine while not effecting current user running tasks.

Keywords: cloud computing, load balancing, virtual machine, cloudsim.

GJCST-B Classification: C.2.4

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A Perspective Study on Acute Lymphoblastic Leukemia Detection using Various Image Processing Techniques

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Abstract: **This paper discusses about Childhood acute lymphoblastic leukemia (ALL) is a kind of cancer in which the bone marrow makes too many immature lymphocytes. Leukemia may affect red blood cells, white blood cells, and platelets. Past treatment for cancer and certain genetic conditions affect the risk of having childhood ALL. It should be treated at earlier stage, and leads to death if left untreated. Therefore, the main intention of this work is to study about various image-processing techniques, which are used for detection of red blood cells and immature while blood cells, counting of leukemia affected cells more accurately with less time and cost. It also discusses about various image enhancement, feature extraction and classification techniques to improve the accuracy and proficiency of detection process.**

Keywords: Leukemia, Lymphocytes, White blood cells, image processing, feature extraction, classification

I. INTRODUCTION

The microscopic images of the blood cells are observer to find out many diseases. Changes in the blood condition show the development of disease in an individual. Leukemia can lead to death if it is left untreated. Leukemia originates in the bone marrow. The components of the blood are Red Blood Cells, White blood Cells, platelets and plasma.

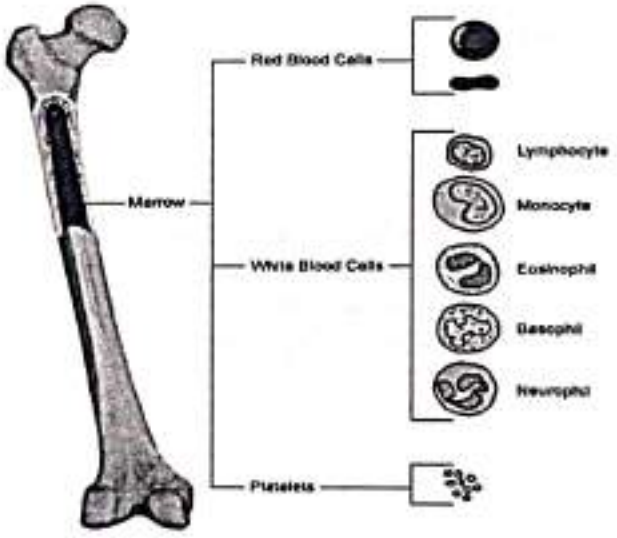

Fig.1 Bone Marrow

There are different types of white cells in our body. Leukemia is detected only by analyzing the while blood cells, so this research work is focused only on white blood Cells (WBCs). Leukemia is nothing but cancer of blood cells in which number of white cells is increasing and those are immature cells that destroy other cells. Leukemia was the most prevalent childhood (0-14 years) cancer. Around 40-50% of total childhood cancers were leukemia and 15-20% were lymphoma. There was a male preponderance for both the cancers in present review in almost all the registries.

Today laboratory test takes longer interval of time to diagnose the disease of leukemia and it is also time consuming, prone to human error and also tedious. The ratio of white blood cell in our body is 1000:1. It means that 1 white blood cell is

Oxidation Communications 42, No 2, 138–150 (2019)

Medical image processing

LUNG CANCER DIAGNOSIS USING HYBRID DRAGONFLY OPTIMISATION AND RADIAL BASIS NEURAL NETWORK CLASSIFICATION

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ABSTRACT

Recent medical research has common challenges and issues based on lung cancer diagnosis. Reasons for lung cancer strongly correlated with using tobacco and cigarettes in regular days. This research is concentrated on the data set consisting of five normal and five abnormal patients for lung cancer prognosis. The data set is padded with data to facilitate the classification of gene expression. The statistical calculations were performed on the gene expression to extract the features. The feature with the highest score is one of the features for training the network. The feature, which gives the least error rate for training the network, is the second feature of the network. In the present work the radial basis neural network is used. The features from PCA (Principal component analysis) and dragonfly are used for training. The data set is classified as testing and training using cross-fold validation. Proposed research provides an improved performance metrics estimation. Performance metrics are classified as accuracy, sensitivity and specificity and are utilised in medical treatment and prognosis application.

Keywords: radial basis neural network, lung cancer diagnosis, PCA, gene expression data set, dragonfly, performance evaluation.

AIMS AND BACKGROUND

Lung cancer is one of the common cancer type and based on calculating results of the 2019 survey list presents 250 000 deaths, 325 000 cases and $13 billion in health care. The major objectives of this research work are lung cancer diagnosis, tissue and abnormal cell growths identification. This is occurring from using tobacco and cigarette habits to kill people survival life time. Clinical report is based on five normal and five

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Microarray based Cancer Classification using Clustering Algorithm for Feature Selection Approach

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Abstract

Feature selection has in recent times attracted burly interest in knowledge discovery from high-dimensional data. Classification is a data mining technique used to predict group membership for data instances; microarray is the technology which allows researchers to congregate information on various gene expressions. Gene selection for cancer classification is one of the mainly important topics in biomedical field. In this paper, we compare different clustering algorithm for microarray cancer classification techniques based on data mining methodology for perform both accuracy and stability measurement.

Keywords: Feature selection, micro array, stability, clustering algorithms.

I. INTRODUCTION

Mining biological data is an emerging area of intersection between bioinformatics and data mining .bioinformatics have taken a computational approach to understanding biological phenomena. Because these phenomena are typically characterized by large and increasing amount of data, diver and unusual data type, and complex relationship, interpreting biological data requires novel approaches that include multiple tools, new algorithms, resources, etc. in an integrated fashion. Data mining has focused on extracting useful information from large data base, focusing on scalable, robust algorithms and their implementations.[23] At the end of the 1980's a new discipline, named data mining, emerged. The introduction of new technologies such as computers, satellites, new mass storage media and many others have lead to an exponential growth of collected data. Traditional data analysis techniques often fail to process large amounts of -often noisy- data efficiently, in an exploratory fashion. Recently, the collection of biological data has been increasing at explosive rates due to improvements of existing technologies and the introduction of new ones such as the microarrays. These technological advances have assisted the conduct of large scale experiments and research programs. An important issue in data analysis is feature selection. In gene expression analysis the features are the genes. Gene selection is a process of finding the genes most strongly related to a particular class. One benefit provided by this process is the reduction of the foresaid dimensionality of dataset. Moreover, a large number of genes are irrelevant when classification is applied. The danger of overshadowing the contribution of relevant genes is reduced when gene selection is applied. Clustering is the far most used method in gene expression analysis. Tibshirani et al. (1999) and Aas (2001) provide a classification of clustering methods in two categories: one-way clustering and two-way clustering. Methods of the first category are used to group either genes with similar behavior or samples with similar gene expressions. Two-way clustering methods are used to simultaneously cluster genes and samples. Hierarchical clustering is currently the most frequently applied method in gene expression analysis. An important issue concerning the application of clustering methods in microarray data is the assessment of cluster quality. Many techniques such as bootstrap, repeated measurements, mixture model-based approaches, sub-sampling and others have been proposed to deal with the cluster reliability assessment.

II. RELATED WORKS

In[1] Anjan Goswami, Ruoming Jin, Gagan Agrawal present a new algorithm which typically requires only one or a small number of passes on the entire dataset, and provably produces the same cluster centers as reported by the original k-means algorithm. The algorithm uses sampling to create initial cluster centers, and then takes one or more passes over the entire dataset to adjust these cluster centers and provide theoretical analysis that the cluster centers thus reported are the same as the ones computed by the original k-means algorithm. Experimental results from a number of real and synthetic datasets as compared to k-means. In[3] Greg Hamerly propose a new acceleration for exact k-means that gives the same answer, but is much faster in practice. Like Elkan's accelerated

A REVIEW ON KNOWLEDGE MINING APPROCHES IN DETECTING LUNG CANCER USING DATASETS

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ABSTRACT

Detection of lung cancer is very tough since its symptoms come into light at the final stage. Therefore, compared with all other types of cancer, the mortality rate is very high for lung cancer. For providing proper treatment to the patients, the identification of a disease in the primitive phase is the most mandatory requirement. Consequently, the need for techniques to identify the existence of a primary lung cancer nodule is rising. In the medical world, error in finding the disease is the most worrying condition. Efficient techniques have been proposed to reduce the errors in finding the lung cancer disease. Data mining techniques such as pre-processing feature extraction, feature selection and classification played an important role in lung cancer detection process. This article presents a detailed survey of various techniques proposed for lung cancer detection. Initially, different techniques developed by previous researchers are studied in detail. Then, a comparative analysis is carried out to know the limitations of each technique and provide a suggestion for further improvement in lung cancer detection effectively.

Keywords: Lung cancer detection, Data mining, feature selection, classification.

Indian Journal of Natural Sciences www.tnsroindia.org.in ©IJONS

Vol.12 / Issue 65 / April / 2021 *International Bimonthly* *ISSN: 0976 – 0997*

RESEARCH ARTICLE

Boosted Weighted Optimized Neural Network Ensemble Classification Based Lung Cancer Prediction

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Received: 19 Feb 2021 Revised: 22 Feb 2021 Accepted: 28 Feb 2021

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ABSTRACT

Lung cancer is one of the world's leading cancer related diseases. The early prediction of lung cancer is critical as it can dramatically decrease mortality rates. Molecular biology presents an attractive method in microarray technology to use gene profiles for prediction of lung cancer. But the gene expression data has high dimensionality problem which is solved by using Dragonfly optimization algorithm (DA). It is inspired from the natural behavior of dragonflies in which they are flying randomly based on the model developed by using the Levy Flight Mechanism (LFM). LFM has some drawbacks such as overflowing of the search area and interruption of arbitrary flights due to its huge searching steps. So, an Improved Dragonfly optimization Algorithm (IDA) was proposed for dimensionality reduction of gene expression data. IDA used a Brownian motion to solve the issues of LFM. The particle best and global best concept of Particle Swarm Optimization (PSO) was used in IDA to avoid the premature convergence. The selected features by IDA were given as input to Random Subspace (RS), Artificial Neural Network (ANN) and Sequential Minimal Optimization (SMO) to predict the lung cancer. In this paper, a Boosted Weighted Optimized Neural Network Ensemble Classification (BWONNEC) algorithm is introduced to further refine the prediction accuracy and reduce the prediction error. At first in BWONNEC algorithm, weights are initialized to the selected features and then a weighted sum is calculated. Additionally, a conditional checking is made to check the weighted sum with the optimal weight. If the weighted sum is greater than optimal weight, the weighted sum value with the initialized various weight is attained. After that, a neural network classifier with minimum weighted error (weak classifier) is determined and combines the weak classifier with the optimal weight to predict the lung cancer. Thus, the accuracy for

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-9 Issue-8, June 2020

An Improved Dragonfly Optimization Algorithm based Feature Selection in High Dimensional Gene Expression Analysis for Lung Cancer Recognition

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Abstract: *A microarray gene expression data is an efficient dataset for analyzing expression of thousands of genes and related disease. The more accurate analysis can be obtained by comparing Gene expression of disease tissues with normal tissues which helps to recognize the type of cancer. The processing of microarray datasets such as feature selection, sampling and classification is highly challenged due to its high dimensionality. Many recent researchers used various feature selection techniques for dimensionality reduction. Dragonfly optimization Algorithm (DA) was a feature selection technique used to reduce the dimensionality of lung cancer gene expression dataset. The dragonflies in DA are flying randomly based on the model developed by using the Levy Flight Mechanism (LFM). Because of huge searching steps, LFM has some drawbacks like interruption of arbitrary flights and overflowing of the search area. In fact, DA lacks an internal resemblance that record past potential solutions that can lead to its premature convergence into local optima. So, in this paper an Improved Dragonfly optimization Algorithm (IDA) is introduced which effectively reduces the dimensionality of the lung cancer gene expression dataset. In IDA, Brownian motion method is used to solve the issues of LFM and pbest and gbest idea of Particle Swarm Optimization (PSO) is used to direct the search method for finding potential candidate solutions to further refine the search space for avoiding premature convergence. The wrapper feature selection approach is followed by IDA to select optimal subset of features. The Random Sub space (RS), Artificial Neural Network (ANN) and Sequential Minimal Optimization (SMO) classifiers are utilized for feature selection of IDA and recognize Lung cancer subtypes. The accuracy of the classifier for selected features of Dragon flies in training instances is used as fitness value of Dragon flies in each iteration. Finally, the experimental results prove the effectiveness of the IDA in terms of accuracy, precision, recall and F-measure.*

Keywords: *Lung cancer recognition; gene expression data; Dragonfly optimization Algorithm; Improved Dragonfly optimization Algorithm; Brownian motion method.*

I. INTRODUCTION

Uncontrolled cell growth in tissues of the lung is called lung cancer disease. The origin of lung cancer has some unexplained causes for being a hereditary disease. Globally, the mortality rate due to lung cancer disease has risen approximately 25%. It is higher than the other rising cancers. Effective treatment of lung cancer helps keep other cells from becoming metastatic. Normally, lung cancer is categorized as Small Cell Lung Cancer (SCLC) and Non-SCLC (NSCLC).

Revised Manuscript Received on June 05, 2020.

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The successful detection of lung cancer type is highly critical for the health of patients and for reducing patients' toxicity.

The breakthrough in molecular biology provides a positive approach to the use of gene profiles for the detection of lung cancer [2]. From the microarray technology, the information of DeoxyriboNucleic Acid (DNA) RiboNucleic Acid (RNA) and proteins are acquired to diagnosis the tumors in earlier stages. It will improve the probability of survival of cancer patients, particularly for patients with lung cancer. The classification of lung cancer must be precise and consistent to ensure the correct diagnosis and appropriate care for lung cancer cases. It can be achieved by using machine learning techniques [3], those examine the gene expression in cancer cells and identify the genes that are most likely to cause cancer. The application of enormous gene expression data in machine learning algorithm that generate the most effective candidate genes, which have a greater predictive value individually or as a part of complex method to evaluate the susceptibility of someone to cancer.

Gene expression data is a high dimensional data that contain vast numbers of duplicate genes in the retrieval of information related to the disease [4]. In order to cope this issue, the most significant features are selected, that eliminates irrelevant and redundant genes. A Nested Genetic Algorithm (NGA) [5] was selecting the most discriminative features for lung cancer diagnosis. It consisted of two genetic algorithms are Outer Genetic Algorithm (OGA) and Inner Genetic Algorithm (IGA). The OGA and IGA were worked on microarray gene expression dataset and DNA methylation datasets respectively. The selected features were processed in Random Sub space (RS), Artificial Neural Network (ANN) and Sequential Minimal Optimization (SMO) algorithms for lung cancer diagnosis. However, NGA has time complexity and random motion problems which can affect the lung cancer diagnosis accuracy.

In this paper, an Improved Dragonfly optimization Algorithm (IDA) is introduced for feature selection which solves time complexity and random motion problem in NGA-based feature selection for lung cancer diagnosis. The IDA is an improved version of DA which is influenced by the dynamic and static activities of dragonflies in nature. DA is developed with the Levy Flight Mechanism (LFM). When there is no neighborhood solution, the LFM models the search method for the best solution of dragonflies. LFM has internal memory problem and sometimes it leads to premature convergence. So, in IDA a Brownian motion is used instead of LFM. In Brownian motion, the movement of dragonflies takes the form of normal distribution. In order to solve this problem and to improve the efficiency of feature selection, some theory of PSO is introduced in DA. The selected features by IDA are given as input to RS, ANN and SMO classifiers to predict the lung cancer effectively.

Prediction of Lung Cancer using Data Mining Techniques

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Abstract:- **Cancer is very dangerous and common disease that causes death worldwide. Early diagnosis of cancer provide more possibility of getting cured. Cancer disease generates abnormal growth of cells which spreads to all parts of body. In this paper we discuss, the early prediction of lung cancer with help of data mining techniques. Lung are spongy organs that affected by cancer cells that leads to loss of life. The common reasons of lung cancer are smoking habits, working in smoke environment or breathing of industrial pollutions, air pollutions and genetic. In this paper we have proposed a genetic algorithm based dataset classification for prediction of multiple models. The usage of genetic algorithm (GA) have shown better performance when compared with Particle swarm optimization and differential evolutions.**

Keywords- Data mining, Classification, Weighted Average, Genetic Algorithm.

I. INTRODUCTION

Early prediction of lung cancer helps to prevent the lung to be affected more by the dangerous cells. Any cancer identified in the early stages is very significant to provide better treatment and gives a huge positive progress to get ride from cancer. Especially the lung cancer are caused due to smoking and pollution, so early detection can help the patients to stop from smoking or from other factor that causes the cancer. Data mining is a part of Artificial Intelligence that uses a variety of data sets, probabilistic and mining models which provides a technique to predictive results using past results. One of the very famous and optimized method in the data mining is Genetic Algorithms (GA) that uses the collections of selections, recombination and a model to evolve a solution to a problem. In this paper we have used genetic algorithm to early predict the lung cancer diseases.

In recent years, lung cancer prediction done by using methods like ensemble classification approaches by using Decision Tree, Naive Bayes, and Classification based on Multiple Association Rule (CMAR) method on the basis of the voting method [16]. A method like the ensemble method of Multilayer Perceptron, Random Forest and Random Tree are used for lung cancer prediction [10]. Support vector machine
(SVM), Naive Bayes, KNN and C4.5 method used for lung cancer prediction out of which SVM outperforms [4] . Principle component analysis based ANN hybrid model is used for lung cancer prediction [9]. A method like interpretable models [6] used for lung cancer prediction. SVM and K-nearest neighbour approach proposed for lung cancer prediction [8]. A method like image processing in the first phase and Back Propagation Neural-Network and logistic regression method used for lung cancer prediction [2]. Bayesian Network and SVM used for lung cancer prediction carried out using Weka tool [3]. Deep learning SVM
(D-SVM) approach is used for lung cancer prediction [19]. K-means clustering and decision tree method used for lung cancer prediction [7]. Method like Random Forest (RF), Radial Basis Function Network
(RBF) and Neural Network (NN) is used as a base learner and for ensemble AdaBoostM1, Real Ada Boost, and Multi Boost AB were used [1]. Ensemble method using the random forest for lung cancer prediction [11].

C4.5 Decision SVM and Naive Bayes with effective feature selection techniques used for lung cancer prediction [15]. A method like Random Forest and Naive Bayes gives better result in lung cancer prediction [20]. Decision tree used in lung cancer prediction [18]. For increasing the accuracy of the model ensemble method is to be used. Preferably assigning weights manually is not a good strategy. So, in recent years, iDHS-EL and iDNA-KACC-EI methods with ensemble approach are used to a find weight for the fusion process [12]. iRSpot-EL method of ensemble used for fusion calculates the distance by utilizing the affinity propagation algorithm [13].

II. DATASETS AND MODEL

In this work we have used the dataset from UC Irvine Machine Learning repository, the sample data set and its attributes are shown below

Dataset and Description Table 1.

Data ID	Data Identificatioa No.
Age	(Age between 13 – 80)
Gender	(Male -1/ Female -2/Others-3)
Air Pollution	(Range 1 -10)
Alcohol use	(Range 1 -10)
Occupational	(Range 1 -10)
Hazards	(Range 1 -10)
Genetic Risk	(Range 1 -10)
chronic Lung Disease	(Range 1 -10)
Balanced Diet	(Range 1 -10)
Obesity	(Range 1 -10)
Smoking	(Range 1 -10)
Passive Smoker	(Range 1 -10)
Chest Pain	(Range 1 -10)
Coughing of Blood	(Range 1 -10)
Weight Loss	(Range 1 -10)
Snoring	(Range 1 -10)

IRJMETS

e-ISSN: 2582-5208

International Research Journal of Modernization in Engineering Technology and Science

Volume:02/Issue:11/November -2020 Impact Factor- 5.354 www.irjmets.com

A MORPHOLOGICAL AND HYBRID MOTH FLAME OPTIMIZATION BASED FEED FORWARD NEURAL NETWORK FOR SKIN CANCER DETECTION

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ABSTRACT

Melanoma is less common than some other types of skin cancer, but it is more likely to grow and spread. If you have melanoma or are close to someone who does, knowing what to expect can help you cope. Here you can find out all about melanoma, including risk factors, symptoms, how it is found, and how it is treated. In this paper we are taken the images of the skins which is affected by the cancer and not affected. And then it is compared and classified with the help of Feedforward Neural Networks (FFNN).Here Moth Flames algorithm is applied for the calculation for the error rate. And then it is compared with the Wavelet & Curvelet method so that we can easily get compared which is better or not.

Keywords: Skin Cancer, Melanoma, Feedforward Neural Networks (FFNN), Wavelet & Curvelet method.

I. INTRODUCTION

Melanoma is one of the most hazardous cancers. An evaluated 2– 3 million individuals experience the ill effects of non-melanoma, and around 132,000 of melanoma cases are analysed all inclusive each year. Skin cancer speaks to ~1.6% of the aggregate number of cancer worldwide. Its treatment needs chemotherapy and radiotherapy, for example, different cancers composes, for example, breast cancer, blood cancer, brain tumour or lung cancer when come to in metastasis state. To keep away from these excruciating methodologies, and for the best treatment, early location is a standout amongst the most dependable arrangements.

The most risky type of this disease, these carcinogenic developments create when unrepaired DNA harm to skin cells (regularly caused by bright radiation from daylight or tanning beds) triggers changes (hereditary deformities) that lead the skin cells to increase quickly and shape dangerous tumours. These tumour begin in the shade creating melanocytes in the basal layer of the epidermis. Melanomas frequently look like moles; some create from moles. The greater part of melanomas are dark or darker, however they can likewise be skin-hued, pink, red, purple, blue or white. Melanoma is caused fundamentally by intense, occasional UV exposure (frequently leading to sunburn), particularly in the individuals who are hereditarily inclined to the illness.

Skin cancer detection has been a challenging point to specialists since 1984 in computerized investigation of pigment skin lesions (PSLs). It condenses the issues in dermoscopic and clinical images of PSL. Their work gives great foundation data on the idea of skin injuries, imaging modalities and systems, procedures for clinical diagnosis and automated melanoma diagnosis frameworks. Over the a long time, numerous analysts have proposed different strategies/systems in computer-aided diagnosis (CAD) frameworks to enhance the execution measurements, for example, accuracy, sensitivity and specificity, area under curve and/or receiver operator curve (ROC) as clarified and point by point. Like all other CAD frameworks in medical image examination, the steps for the detection of skin cancer for skin images is image acquisition, pre-processing, segmentation, feature extraction and finally, classification step.

We investigate another methodology for separation of melanoma sores utilizing multi resolution examination for example, wavelet and curvelet coefficients, joined with local binary pattern (LBP) operator connected on dermoscopic images. The created approach utilizes the combination of various

Feature Selection for Micro Array Cancer Classification using Clustering Algorithms

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Abstract— **Feature selection has in recent times attracted burly interest in knowledge discovery from high-dimensional data. Classification is a data mining technique used to predict group membership for data instances; microarray is the technology which allows researchers to congregate information on various gene expressions. Gene selection for cancer classification is one of the mainly important topics in biomedical field. In this paper, we compare different clustering algorithm for microarray cancer classification techniques based on data mining methodology for perform both accuracy and stability measurement.**

Keywords — *Feature selection, micro array, stability, clustering algorithms..*

I. INTRODUCTION

Mining biological data is an emerging area of intersection between bioinformatics and data mining .bioinformatics have taken a computational approach to understanding biological phenomena. Because these phenomena are typically characterized by large and increasing amount of data, diver and unusual data type, and complex relationship, interpreting biological data requires novel approaches that include multiple tools, new algorithms, resources, etc. in an integrated fashion. Data mining has focused on extracting useful information from large data base, focusing on scalable, robust algorithms and their implementations.[23] At the end of the 1980's a new discipline, named data mining, emerged. The introduction of new technologies such as computers, satellites, new mass storage media and many others have lead to an exponential growth of collected data. Traditional data analysis techniques often fail to process large amounts of - often noisy- data efficiently, in an exploratory fashion. Recently, the collection of biological data has been increasing at explosive rates due to improvements of existing technologies and the introduction of new ones such as the microarrays. These technological advances have assisted the conduct of large scale experiments and research programs. An important issue in data analysis is feature selection. In gene expression analysis the features are the genes. Gene selection is a process of finding the genes most strongly related to a particular class. One benefit provided by this process is the reduction of the foresaid dimensionality of dataset. Moreover, a large number of genes are irrelevant when classification is applied. The danger of overshadowing the contribution of relevant genes is reduced when gene selection is applied. Clustering is the far most used method in gene expression analysis. Tibshirani et al. (1999) and Aas (2001) provide a classification of clustering methods in two categories: one-way clustering and two-way clustering. Methods of the first category are used to group either genes with similar behavior or samples with similar gene expressions. Two-way clustering methods are used to simultaneously cluster genes and samples. Hierarchical clustering is currently the most frequently applied method in gene expression analysis. An important issue concerning the application of clustering methods in microarray data is the assessment of cluster quality. Many techniques such as bootstrap, repeated measurements, mixture model-based approaches, sub-sampling and others have been proposed to deal with the cluster reliability assessment.

II. RELATED WORKS

In[1] Anjan Goswami, Ruoming Jin, Gagan Agrawal present a new algorithm which typically requires only one or a small number of passes on the entire dataset, and provably produces the same cluster centers as reported by the original k-means algorithm. The algorithm uses sampling to create initial cluster centers, and then takes one or more passes over the entire dataset to adjust these cluster centers and provide theoretical analysis that the cluster centers thus reported are the same as the ones computed by the original k-means algorithm. Experimental results from a number of real and synthetic datasets as compared to k-means. In[3] Greg Hamerly propose a new acceleration for exact k-means that gives the same answer, but is much faster in practice. Like Elkan's accelerated algorithm, The algorithm avoids distance computations using distance bounds and the triangle inequality and the algorithm uses one novel lower bound for point-center distances, which allows it to eliminate the innermost k-means loop 80% of the time or more in our experiments. On datasets of low and medium dimension (e.g. up to 50 dimensions), the algorithm is much faster than other methods, including methods based on low-dimensional indexes, such as k-d trees. Other advantages are that it is very simple to implement and it has a very small memory overhead, much smaller than other accelerated algorithms.

Journal of Xi'an University of Architecture & Technology

ISSN No : 1006-79

Feature Selection for Gene Expression Using Gaussian Kernel Density Estimation based HPCA-ML Algorithm for Cancer Classification

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Abstract- Data mining is often defined as finding hidden information in a database. Clustering is a data mining (machine learning) technique used to predict group membership for data instances. The clustering gene expression data contains noisy data, irrelevant data, missing data. So, proper preprocessing is made by some dimensional reduction technique. In this research, a Gaussian Kernel Density Estimation method is presented to select the best features for the recognition of the cancer, and then the Hybrid PCA with Machine learning method is applied for clustering the tumor samples into meaningful clusters. The performance of the proposed system is evaluated and compared with existing approaches. The experimental result shows that using Gaussian Kernel Density Estimation with Hybrid PCA Machine learning algorithm works better than the Feature selection based Existing algorithm. This proposed work which has given more accuracy and less computing time when compared with the existing work. For the validation of proposed approach, Accuracy, Precision, Recall, F-measure, Time complexity, Error rate and Rand Index measurement is used to compute the accuracy between the class label and clustered samples.

Index Terms- Unsupervised Feature Selection, Micro array, Cancer Classification, Machine Learning Algorithm.

I. INTRODUCTION

DNA microarray technique can monitor thousands of genes in parallel, dramatically accelerate molecular biology experiments and provide a huge amount of data to find co-regulated genes, functions of genes, genetic networks, for instance. There are two types of microarray data: gene-sample data sets, which compile the expression levels of various genes over a set of biological samples; and gene-time data sets, which record the expression levels of various genes over a series of time-points. Both types of data are represented by a two dimensional (2D) gene expression matrix. Machine learning methods are used to analyze microarray data [11].

Analysis methods encompass feature extraction and classification in the application of disease prediction, gene selection to find discriminative genes and biomarkers, clustering in the application of finding co-regulated gene patterns, statistical methods to model gene regulatory networks. For example, including too many variables may decrease the accuracy in clustering the samples, and make the cluster rules difficult to set [09]. The inclusion of irrelevant or noisy variables may also degrade the overall performances of the estimated cluster rules.

Feature reduction refers to the problem of reducing the dimension by which the data is described [09]. The general purpose of these methods is to represent data with fewer featur to reduce the computational complexity whereas preserving even improving the discriminative capability [09] Since featu reduction can brings a lot of advantages to learning algorithm such as avoiding over-fitting and robustness in the presence noise as well as higher accuracy, it has attracted a lot of attentic in the three last decades. Therefore, vast variety of featu reduction methods was suggested which are totally divided in two major categories including feature extraction and featu subset selection. Feature extraction techniques projects data in a new reduced subspace in which the initial meaning of tl features are not kept any more. Some of the well-known state-c the-art feature extraction methods are principal compone analysis (PCA) [02], non-linear PCA and linear discrimina analysis (LDA). In comparison, feature selection metho preserve the primary information and meaning of features in tl selected subset. The purpose of these schemas is to remove noi and redundant features from the original feature subspac Feature selection methods can be broadly divided into tv categories: filter and wrapper approaches [07]. Filter approach choose features from the original feature space according to pr specified evaluation criterions, which are independent specified learning algorithms. Conversely, wrapper approach selects features with higher prediction performances estimat according to specified learning algorithms. Thus wrappers ca achieve better performance than filters. However, wrapp approaches are less common than filter ones because they ne higher computational resources and are often intractable for lar scale problems [08]. Due to its computational efficiency a independency to any specified learning algorithm, filt approaches are more popular and common for high dimension datasets [07]. In this study, we present a new filter unsupervise feature selection algorithm which has the benefits of filt approaches. The proposed approach chooses more informati features according to their Gaussian Kernel Density Estimatic (GKDE) relations. The main idea of the proposed scheme firstly approximating the Probability Density functions of ea feature independently in an unsupervised manner and th removing those features which their pdfs have higher coveri areas with the pdfs of other features which are known redundant features.

In this paper, we are interested in unsupervised clusterin based cancer class discovery, instead of supervised classificatio Clustering does not require knowing a priori the classes training datasets, which are required by the supervised learnir methods. To date, many well-known unsupervised methods, su as hierarchical clustering (HC), self-organizing maps (SOMs nonnegative matrix factorization (NMF), and its extensions ha been used successfully for cancer clustering [04]. Brunet et a

IJSRCSEIT

International Journal of Scientific Research in Computer Science, Engineering and Information Technology
ISSN : 2456-3307 UGC Journal No : 64718 | Impact Factor = 6.135

Manuscript Number : CSEIT206535

Literature Review of Using DWHBI Approaches to Predict and Reduce Customer Churn in Telecommunications Industry

Authors(2) :-K. Prakash Krishnan, Dr. A. Kumar Kombaiya

In recent days, telecom industry plays a vital role in our daily life. During corona period entire world depends on the telecom services domain. But telecome industry has been facing many surivival problems in the global market since last 10 years due to heavy competition between competitors. To stand in this field, service providers have to understand the complete customer requirements and provide the efficient services to stop the customer movement from one network to another network. Customer churn is one of the most critical problem faced by the telecom industry. In this industry, it is more expensive to bring the new customers as compared to retain the existing customers. The objective of customer churn prediction is to find the subscribers that are ready to move from the current service provider in advance. Churn prediction allows the service providers to offer new benefits and campaign offers to retain the existing customer in the same network. Technically this term would be call it as 'Win back Situation' in telecom industry. The high volume of data generated by telecom industry , with the help of data warehousing

Enhanced Data Sharing and Profile Matching Scheme for Mobile Healthcare Social Networks

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Abstract— Mobile Healthcare Social Networks (MHSNs) are becoming more and more important to provide a successful and effective electronic healthcare platform. Movable people with the same illness or in the region of the same health care provider constitute a network for the sharing of knowledge on the patient's health information. In MHSNs, it is more challenging to provide data sharing services without violating these security requirements. Secure Identity-based data sharing and profile matching scheme (SIDS-PM) was proposed for secure data sharing in MHSNs. SIDS-PM also found similar patients based on Identity Based Encryption with Equality Test (IBBET) without leaking any sensitivity information of patients. In this paper, Elliptic Curve Cryptography for SIDS and Enhanced Profile Matching (ECCSIDS-EPM) is proposed to improve the trustworthiness and security of healthcare data in MHSNs. In ECCSIDS-EPM, IBBE using ECC is introduced to encrypt the data which enhance the trustworthiness of data in MHSN. Moreover, the secret keys of the patients are stored in different servers. It helps to restore the secret keys even when there is an attack occurred in Cloud Service Provider (CSP). The trapdoors are generated by CSP for patients and it is used along with their corresponding secret keys for profile matching. In profile matching, the patients can find friends and interacts about their illness symptoms and mediations. Thus, by using IBBE with ECC and storing secret keys in different servers the security and privacy of sensitive data in MHSN is preserved.

Keywords— Elliptic Curve Cryptography, Identity based Encryption with Equality Test, Mobile Healthcare Social Networks, Profile Matching.

I. Introduction

Mobile healthcare [1, 2] is focused on two main aims such as e-health services and health information accessible in every location and at every moment and digital invisibility. The implementation of mobile device health information systems also poses other problems such as data storage and maintenance, interoperability and heterogeneous infrastructure accessibility, privacy and security, centralized and simplified connectivity. The implementation of the cloud computing [3, 4] concept of electronic health systems is a possible solution for all of the issues mentioned above. Cloud Computing provides universal and robust network services that can leverage shared resources and popular networks in a manner that addresses evolving demands in the electronic health application on demand.

Mobile Healthcare Social Networks (MHSNs) [5, 6] is designed to assist patients and exchange medical data with them using their mobile devices and link physicians and healthcare professionals. But, data protection issues are the biggest barriers to MHSNs application. Various encryption techniques have been used to provide security and privacy for data in MHSNs. Simultaneously, the encrypted data will be exchanged and accessed delicately.

MHSN also has important mechanisms for social interconnection as patients may communicate. In addition, patients may find similar patients with a matching profile to interact about their treatments and signs. Nonetheless, patients can reveal their private health information, even those that benefit others, to other people. Consequently, it is important to ensure that patients' personal information is secured during the matching process otherwise it is quickly captured and used by unauthorized users.

A SIDS-PM [7] scheme was proposed for MHSN to securely share the e-healthcare data in cloud environment. Initially, e-healthcare data was encrypted by using Identity-Based Broadcast Encryption (IBBE) technique and the encrypted data was supplied to cloud storage. After that, a re-encryption scheme was presented to permit the cloud platform. Also, a profile matching scheme was introduced to discover friends in a privacy-preserving manner. In the profile matching, trapdoor was generated using single secret key and ciphertext key of patients for authorization process.

DOI 10.5373/JARDCS/V12SP7/20202109
ISSN 1943-023X
Received: 04 May 2020/Accepted: 05 June 2020

An Evolving Model of Voice Disorder Detection using Deep Belief Network

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Abstract - *In recent years, automatic diagnose of larynx pathological voice disorders are a challenging task in the medical filed. The researchers started focusing on working with voice signals to discover voice disorder related diseases. Machine learning plays a vital role in automatic detection of voice disorder using spectral information of recorded voice. Among several approaches deep playing has been in a prominent place for achieving significant results in the voice recognition field, where there has been less research work in the field of pathological voice detection. This paper introduces the deep belief network for discovering healthy and unhealthy voice detection. The stack of Restricted Boltzmann Machine is used to pretrain the deep neural networks. Simulation analysis is done to prove the proficiency of the deep belief network-based voice disorder detection using the real data from the Saarbrucken Voice database.*

Keywords — *Voice disorder, deep learning, deep belief network, Restricted Boltzmann Machine, pathological voice, machine learning*

I. INTRODUCTION

Voice pathologies affect the larynx and result in irregular vibrations of the vocal folds. Poor voice can impact on individual's ability to communicate both socially as well as in the work place, thus reducing quality of life, and it has a significant impact on economy considering the costs of medical diagnosis and treatment[1]. Traditional diagnostic method of voice pathologies relies on clinician's experiences and on expensive devices such as laryngoscope, endoscope etc. However, computer-aided medical systems for diagnosis of voice pathologies have been popular due to major advance in signal processing techniques. These complementary tools are usually non-invasive and nonsubjective, which generally are an advantage in medical field. A lot of research related to automatic detection of voice pathologies has been carried out in the past few decades. In this context, features are extracted from the speech recordings and they are then processed by classifiers to distinguish normal voice instances from pathological voice recordings. These features are mainly derived from two research fields. One is from speech recognition applications, with signal processing tools used to automatically detect features such as MelFrequency cepstral coefficients (MFCC), linear prediction cepstral coefficients (LPCC) and energy and entropy of discrete wavelet packets[2-4]. Other features come from voice quality measurement according to physiological and etiological research.

While pitch, jitter and shimmer are used to detect the roughness of the speech, other characteristics such as harmonicto-noise ratio (HNR), normalized noise energy (NNE), glottalto-noise ratio (GNR) and cepstral peak prominence (CPP) represent the breathiness of the speech[5]. Most of the research works use the Massachusetts Eye and Ear Infirmary (MEEI) database. However, healthy voice recordings and pathological voice recordings in this database are recorded in two different environments[6], which make it hard to distinguish whether it is discriminating environments or voice features. The Saarbruecken Voice Database is a downloadable database with all recordings sampled at 50 kHz and with 16-bit resolution. This database is relatively new so that little research has been carried out through it. However, the audio samples are recorded in the same environment so that it is an ideal database for this work.

Related Work

In this section few of the existing works on pathological voice disorder detection is discussed.

In [9] the authors explored the information collected form acoustic and modulation frequency representation are used to detect and classify the discrimination of voice disorders. The input is converted to a low dimensional domain by adapting higher order singular value decomposition. Using Mutual Information, the feature selection is achieved.

In [10] the authors have developed a vocal fold paralysis recognition method using amplitude modulation and features are extracted using MFCC integrated with GMM. The equal error rate is reduced in this method.

Markaki et al. [11] explored the information provided by a joint acoustic and modulation frequency representation, referred to as modulation spectrum, for detection and discrimination of voice disorders. The initial representation is first transformed to a lower dimensional domain using higher order singular value decomposition

Uncertainty handling using Improvised Intuitionistic fuzzy ANN based Voice Disorder Detection

P. Kokila, G. M. Nasira

Abstract: The voice pathology detection is one of the essential process which has to be determined in the earlier stages because it is a sign for raising health related problems. The aim of this paper is to handle the uncertainty in voice dataset due to inconsistency in extracting potential features and vagueness in dealing voice signals. The raw voice signals are preprocessed by feature extraction using meyer wavelet and potential features involved in voice disorder detection are done using sequential forward feature selection methods as voice preprocessing. This research work introduced an improvised intuitionistic fuzzy artificial neural network which enhances the process of voice disorder detection in SVD database by using analytical hierarchical processing for assigning weights and thus the complete neural network performance was fine tuned instead of assigning the weights randomly. The simulation results proved the performance of the proposed model as best by producing more promising result while comparing with ANN, PANN and Fuzzy ANN models.

Keywords: Voice pathology, Artificial Neural Network, Feature extraction, Classification, Fuzzy, Intuitionistic Fuzzy, uncertainty

I. INTRODUCTION

In recent days 25 percentage of world population are under the risk of pathological voice issues, specifically persons whose profession lies on speech, they are excessively louder than normal level at the victims of voice disorder. For example, teachers, instructors, lawyers, actors and singers are also considered to create substantial difficulties in voice. As a result, in speech signals using digital processing has been determined to offer a noninvasive investigative method that is taken in to the account as a prominent assisting tool to medical experts during discovery of voice disorders in earlier stages. Voice pathologies create issues on vocal folds during the process of phonation. It makes vocal folds generating abnormal vibrations owing to faultyresults of various factors offering to vocal ambiances. Vocal folds are invariantly exaggerated by vocal fold abnormal consequences in different vocal folds vibratory series, this is due to the capability to be lockedcorrectly is reduced. The shape of the vocal tract is also affected by voice disorders and yieldindiscretions in spectral characteristic [1]. It is also recognized that there is no intralaryngeal affect on vocal tract through generation of vowel which is considered that foundation of voice has immeasurable confrontation.

As indicated about, voice pathologic is a sign of health-related issues. However, discovering dysphonic voice at earlier stages is not an easy process. Generally, a trained expert is needed and a serious of speech exercise is essential. Automatic speech assessment can permit for cost effective and time consumption for analyzing speech and used for screening of large volume of population. The foremostunbiased realization of this exploration work is utilizing machine learning for the diagenesis of voice disorder persons. The definitive goal is to devise an improvised intuitionistic fuzzy back prorogation enabled neural network for classification of pathological voice and normal voice.

II. RELATED WORK

There are many existing works on speech pathology detection, researchers are mainly focusing in deploying methods on feature extraction and classification of pattern by developing models.

The capability of acoustic features such as formants, pitch, jitter and shimmer in the discernment of normal voices from the pathological voices are conversed by Srinivasan et al [2]. The recognition of voice pathology from voice database is deployed using support vector machine and prior to that feature selection is done using genetic algorithm which produces best feature subset in order to progress the accuracy of classification.

Pravena et al [3] in their work introduced feature extraction using Mel frequency cepstral coefficient (MFCC) and Gaussian Mixture Model (GMM). The acoustic features of speech signals are greatly involved in discovery of vocal fold pathology using the help of speech signals recorded from the voice disorder and normal peoples.

Vikram and Umarani [4] investigated an approach which integrates the MFCC based feature extraction and classification 0f voice disorders using SVM for diagnosing neurological disorders in the speech signals.

Vahid Majidnezhad and Igor Kheidorov [5] developed a voice disorder detection model using Hidden Markov Model which categorizes speeches into two different classes namely normal voice and pathological voice. Two hidden markov models were involved in training the two different classes of speech and then using the trained models the testing dataset of voice is applied to classify them.

Cheolwoo Jo [6] analyzed the vocal quality of a particular group of women and men with presence or absence of voice disorders. It is done based on the assessment of a group of experts who are experienced in the area of vocal rehabilitation.

Revised Manuscript Received on July 06, 2019.

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International Journal of Advanced Science and Technology
Vol. 28, No. 16, (2019), pp. 1122-1126

Enhanced Audio Signal Noise Removal using Five Level Fuzzy Haar Wavelet Transform

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Abstract

This paper develops a novel idea on noise removal for audio signals specifically while performing voice pathology detection. Existing noise removal methods have commonly proven to be effective, so far these methods characteristically revels convinced unwanted features. Elimination or modification of the original audio feature of principal audio sound is a major issue. In case of voice pathology detection, it is very essential to perform denoising which will highly improve the classification accuracy. This work proposed a fuzzy enhanced approach which not only reduces the presence of noise but also used to recognize and preserve the richness of the audio spectrum. The proposed method using fuzzy wavelet noise reduction in audio signals is compare with ordinary wavelet denoising. Simulation results illustrates that the proposed work removes noise significantly and increases the classification of voice disorder with more accuracy.

Keywords: *audio signals, noise removal, pathology detection, fuzzy, wavelet, denoising*

1. Introduction

In recent years, there has been increasing interest in noise removal in audio signals. For audio signals, noise may be introduced by recording medium or transmission medium. The method used in a noise elimination scheme should have two main features they are complementary which performs audio compression and non- complementary is a single ended type used to remove the level of noise, these types eliminates most of the noise elements in voice disorder detection. Audio noise decrease system is that substantial of system which is supportive to eliminate the unsolicited noise from voice signals.

2. Different types of Noise in Audio signals

There are many kinds and foundations of noise or misrepresentations and they comprise:

- The noise which is produced due to electronic signals like shot and thermal noise
- Acoustic noise deriving from moving, effervescent or striking sources such as turning Machines, affecting keyboard clicks, rain and wind.

ISSN: 2005-4238 IJAST

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Survey Paper Vol.-7, Issue-5, May 2019 E-ISSN: 2347-2693

IJCSE International Journal of Computer Sciences and Engineering Open Access

Efficient Security Framework for Sensitive Data sharing On Big Data Platform in Cloud Computing

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DOI: https://doi.org/10.26438/ijcse/v7i5.277280 | Available online at: www.ijcseonline.org

Accepted: 13/May/2019, Published: 31/May/2019

***Abstract*— Big data contains enormous number of semi structured and unstructured data. It is hard to process these data** utilizing traditional databases and programming technologies. The association acquire substantial data storage data delivery on big data sharing platform. It expands the use. An organisation and enterprise can acquire huge amount of sensitive data by putting away, breaking down, handling these information. They utilized logging, vulnerability and encryption to keep sensitive data secure in advanced world. It offers some benefit included data administrations. Clients are looking at encryption, tokenization advancements to secure the information. The major objective of the work is to examine security issues comprising the entire sensitive data sharing and clarify a security mode created to guarantee secure sensitive data sharing on a big data platform. It also assures secure capacity on the big data platform. This abstract presents a framework to share the secure sensitive data on a big data platform using Identity based Conditional Proxy Re-encryption (IBCPRE) algorithm. It is based on heterogeneous cipher text transformation technique to gives the end-to-end security of big data in the cloud It provides the security when sharing the sensitive data.

***Keywords*— Secure Data, Sensitive, and Identity Based Conditional Proxy Re-Encryption (IBCPRE), Encryption.**

I. INTRODUCTION

Massive amounts of structured, semi-structured, and unstructured data are generated quickly in the fast development. An enterprise can get the huge amount of individual user's sensitive data by storing and collecting data from different types of data. These data provide services to their enterprises and other businesses on a big data platform. Traditional cloud storage stores plain text or encrypted data. These types of data are considered as —deadl, because they are not active and also they are not involving in calculation. However, a big data platform allows data transmission a including sensitive data. It provides huge number of data storage and computational services in the organisation [1]. However, data sharing increases enterprise assets, insecurity and sensitive data leakage also produce the security issues for sharing the sensitive data.

In this work, a proposed productive structure for secure sharing of sensitive data is possible [3]. This work guarantees safe submission and limits sensitive data dependent based on the proxy re-encryption algorithm. It also guarantees secure utilization of evident data in the cloud organized by the private space of customer process which is

Potential Feature Extraction using Meyer Wavelet Transform and Dimensionality Reduction using Sequential Forward Feature Selection for Voice Pathology Detection

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Abstract - To assess the voice disorder, automatic voice pathology identification contributes more to diagnose them in earlier stages from which patients suffer and they indicate health-related complications. This paper addresses the feature extraction and feature selection process of voice data when they are voluminous features available in speech signals. This work aims at developing a precise and strong feature extraction using Meyer Wavelet Transform for detection of voice pathology by exploring different frequency band. In addition, from the extracted features, the potential features which contributes more in detection of voice pathology is determined by applying sequential forward feature selection approach which handles the voluminous dataset more accurately and overcomes certain weaknesses in existing methods. The simulation results are also proved the performance of these proposed approaches with voice dataset of sustained vowel a/o/u for both normal and pathological voices and produces better results in detection of voice disorders.

Keywords - voice disorder, Meyer Wavelet Transform, feature extraction, Sequential Forward Feature Selection and pathology

I. INTRODUCTION

An important tool for humans to communicate with other is voice. Any troubles in voice quality has great influence on an individual's social and personal life [1]. Generally, voice disorders are termed as any time the voice does not perform, work or sound as it normally does, or delays during communication and quality of life [2,3]. Voice disorder is considered as most common language and speech disorders, troubling nearly 6% of children below 14 years of age, and 3–9% of the adult people [4]. Complete prevalence of hoarseness in studies in India ranges from 0.51–0.7% [5, 6, 7].

As a result, working on digital processing of signal on speech has been found to offer a noninvasive diagnostic method that is measured to be an active supplementary tool to doctors when recognizing voice disorders, precisely in their initial stages. Voice pathologies distress the vocal folds in the phonation course. They make vocal folds making asymmetrical vibrations due to the faulty of diverse influences paying to vocal vibrations. Vocal folds are inversely exaggerated by vocal fold pathologies ensuing in disparity in the vibratory cycle of vocal folds since their aptitude to be closed appropriately is reduced. Voice disorders also disturb the form of the vocal tract (supra-glottal) and yield indiscretions in spectral possessions [8]. It is well known that there is no intralaryngeal consequence on the vocal tract throughout the making of a vowel if consider that the voicing source has immeasurable confrontation.

Though medicine and invasive interference can grip back the development of the voice disorder disease and improve some of the indications, there is no obtainable treatment. Thus, primary diagnosis is serious in order to progress the patient's eminence of life and extend it.

This paper aims at developing a potential feature extraction and feature selection approach which assist in the process of voice disorder detection in earlier stages more precisely. The detailed description of the proposed work is explained in the following sections.

II. RELATED WORK

Earlier, a substantial number of researchers had functioned on categorizing of voice disorders using data mining techniques. Maximum of those works were intended to rise the accurateness and recognize the finest approaches by applying a numeral of classification systems and statistical approaches.

Martinez et al. [9] presented a set of experiments on detection of voice pathology with SVD database using multifocal toolkit for discriminative standardization and synthesis. Outcomes were

related with the MEEI database. Meanwhile they used the data from the SVD dataset, continued vowel recordings of /a/, /i/, and /u/ were examined.

Little et al. [10,11] intensive on handling discerning healthy subjects from subjects with Parkinson's disease by perceiving dysphonia. They offered a new measure of dysphonia: pitch period entropy (PPE). The exploited data contained of 195 continued vowels from 31 subjects, of which 23 were diagnosed with Parkinson's disease. The mined features encompassed pitch period entropy, shimmer, jitter, fundamental frequency, pitch marks, HNR, etc.

Zuzana et al [12] aims to develop a machine learning approach to detect pathological speech, specifically dysphonia. They extracted 1560 speech features and performed training on the classification model. The three-

(2) - publication - June 2019 - May 2020

Malaya Journal of Matematik, Vol. 8, No. 2, 608-615, 2020

https://doi.org/10.26637/MJM0802/0049

H_∞ feedback sampled-data control of T-S fuzzy systems via a novel integral inequality approach

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Abstract

This work addresses the result of sampled-data-based H_∞ control of Takagi-Sugeno (T-S) fuzzy systems. The sampling period is assumed to be varying within an interval. In order to construct a less delay dependent stability condition, a Lyapunov-Krasovskii functional (LKF) containing new integral terms is imported. Approach of convex is applied to determine a less stability conditions in the form of linear matrix inequalities (LMIs) without any free-weighting matrices approach which increase badly the computational anxiety of the stability analysis. Through the use of the derived inequality and by constructing a suitable LKF, improved stability criteria are shown in the form of LMIs. Two simulation examples are carried out to demonstrate that the results out perform the state of the art in the literature.

Keywords

T-S fuzzy system; Feedback control, Sampled-data scheme, H_∞ performance, Time-delay.

AMS Subject Classification

54C05, 54C08, 54C10.

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Article History: Received 24 January 2020; Accepted 19 April 2020

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1. Introduction

In real-world, nonlinearities exist in most of the physical systems which make it complex. To represent these complex nonlinear systems, Takagi-Sugeno fuzzy systems have emerged to be an effective and conceptually simple tool. This class of systems is described by a set of if-then rules which gives a local representation of the considered system which is then easy to analyze [1, 13]. Hence the fuzzy representation has turned out to be a significant way to approach the complex nonlinear systems. The study of T-S fuzzy systems has received considerable attention and many pronounced advances have been achieved ([4, 7–9]). Besides, the rate of change of physical models depends not only on current time but also on the previous time instants. Hence the system stability explicitly depends on the time delay also. At the same time, the existence of time delay may result in instability and undesirable performance of the system. Hence the time delay in dynamical systems has received substantial attention and popularity. In addition to this, external disturbances and nonlinearities make the modelling and formulation of dynamical systems sophisticated. As a consequence, the study on the stability and stabilization of dynamical systems subject to time delay, uncertainties, disturbances and nonlinearities is exceptionally demanding and worth of further research ([9, 14]).

The concept of sampled-data feedback control is a practical and useful tool to implement some complicated control schemes and it has been applied in many areas of science and engineering. A sampled-data scheme is driven by a periodic clock and on each clock edge, it samples its inputs, changes state and updates its outputs. Moreover, it's technologies has been constructed relatively well in control theory, especially sampled-data scheme result for complex dynamical control systems has paid small attention according to the mathematical complexity. Hence, under the rapid con-

C.Loganathan ,Journal of Engineering Research and Application
ISSN : 2248-9622 Vol. 9,Issue 6 (Series -I) June 2019, pp 08-11

RESEARCH ARTICLE OPEN ACCESS

Mean Field Game Linear Quadratic-Gaussian Control in Leader-Follower Stochatic Dynamic Game Model and Its Apllication

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ABSTRACT
In this paper we consider large population Leader -follower (L-F) stochastic multi-agent systems where the agents have linear stochastic dynamics and are coupled via their quadratic cost functions. The cost of each leader is based on a trade-off between moving toward a certain reference trajectory which is unknown to the followers and staying near the centroid. On the other hand, followers react by tracking convex combinations of centroid and the centroid of the leaders. Here, as in most practical leader-follower modelling of multi-agent systems, the leaders ignore the followers, but the followers' behaviours are influenced by the leaders. The article is generalised that the cost of collective and the case of collective dynamics which include leaders, followers and an unknown (to the followers) reference trajectory for the leaders.

Key words: Mean field game, Leader- Follower, Linear Quadratic Gaussian (LQG) stochastic dynamic game, Likelihood ratio, Nash equilibrium for infinite population system.

Date Of Submission: 25-05-2019 Date Of Acceptance: 07-06-2019

I. INTRODUCTION

Decision making and collective behaviour often involve some forms of leader-follower behaviours. These behaviours are observed in humans [4] and many other species in nature [3, 6] and are studied in variety of disciplines such as game theory [9], distributed networks [10], crowd flow dynamics [2] and biology among others. Such behaviours in nature are often attributed to the fact that there exist some individuals in the group which have more information than others, for instance the location of resources or migratory routes.

We approach the large population L-F model by mean field linear quadratic Gaussian (MF LQG) stochastic control theory. In this frame work, the computation of the followers control laws requires knowledge of the complete reference trajectory of the leaders which is generally not known to the followers, hence a likelihood ratio based adaptation scheme is proposed. The main contributions of this chapter are as follows:

(i) A likelihood ratio based adaptation algorithm (on a simple population of the leader's trajectories) is employed by the adaptive followers to the member of a given finite class of models which is generating the reference trajectory of the leaders. Under appropriate conditions, it is shown that the true reference trajectory model is identified by finite time with probability 1 for each follower as the leaders population goes to infinity.

(ii) (ii) A demonstration that the use of the resulting mean field control laws yields a set of leaders and adaptive followers, the control laws possessing an almost sure (a.s) ϵ_N-Nash equilibrium property, where ϵ_N goes to zero as the population size N goes to infinity.

The implementation of the overall MF control laws for the leaders and followers assumes the following forms:

(i) Each leader enacts an adaptive MF control law which consists of the feedback of its own local stochastic state and the pre-computed leaders' deterministic mass effects.

(ii) Each follower enacts an adaptive MF control law which consists of the feedback of its own local stochastic state and the estimation based mass effects of the leaders and followers.

We first developed a non-adaptive but general model with weighed couplings in the leaders and the followers cost functions (which depended on the locality parameters of the agents). As is shown in [9] main adaptation result of the uniform cost coupling model in the case that followers' only track the centroid of the leaders. Subsequently, it is evident [8], the optimality properties of the adaptive followers MF control laws are studied. Here we complete the analysis of a more general (and realistic) scenario where the followers are tracking convex combinations of their own centroid and the centroid of their leaders [7].

ADV MATH SCI JOURNAL
Advances in Mathematics: Scientific Journal 8 (2019), no.3, 324–332
(Special issue on ICRAPAM)
ISSN 1857-8365 printed version
ISSN 1857-8438 electronic version

INTUITIONISTIC FUZZY STRONG IMPLICATIVE FILTERS OF LATTICE WAJSBERG ALGEBRAS

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Abstract: In this paper, we introduce the notion of an intuitionistic fuzzy strong implicative filter of lattice Wajsberg algebra. Also, we investigate some properties with illustrations. Further, we obtain the relation between an intuitionistic fuzzy implicative filter and anti intuitionistic fuzzy strong implicative filter in lattice Wajsberg algebra. Finally, we establish the equivalent condition of an intuitionistic fuzzy strong implicative filter.

Keywords: Wajsberg algebra; Lattice Wajsberg algebra; Implicative filter; Strong Implicative filter; Fuzzy implicative filter; Fuzzy Strong implicative filter; Intuitionistic fuzzy implicative filter; Intuitionistic fuzzy strong implicative filter.

Mathematical Subject Classification 2010: 03E70, 03E72, 03G10.

1. Introduction

The concept of the fuzzy set was introduced by Zadeh [10] in 1965. After the introduction of the concept of fuzzy sets by Zadeh, several researches were conducted on the generalizations of the notion of fuzzy sets. The concept of intuitionistic fuzzy sets was first introduced by Atanassov [1, 2] in 1986 which is a generalization of the fuzzy sets. Mordchaj Wajsberg [9] introduced the concept of Wajsberg algebras in 1935 and studied by Font, Rodriguez and Torrens in [5]. They [5] defined lattice structure of Wajsberg algebras and also, they introduced the notion of an implicative filter of lattice Wajsberg algebras and discussed some of their properties. Basheer Ahamed and Ibrahim [3, 4] introduced the definitions of fuzzy implicative filter and an anti fuzzy implicative filter of lattice Wajsberg algebras and obtained

INTUITIONISTIC FUZZY PRIME IMPLICATIVE FILTERS OF LATTICE WAJSBERG ALGEBRAS

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Abstract- In this paper, we introduce the notion of an intuitionistic fuzzy prime implicative filter(IFPIF) of lattice Wajsberg algebra. Also, we investigate some properties with illustrations. Further, we obtain the relation between an IFPIF and fuzzy prime implicative filter(FPIF) in lattice Wajsberg algebra. Finally, we establish the equivalent conditions of an IFPIF.

Keywords- Wajsberg algebra; Lattice Wajsberg algebra; Implicative filter; Fuzzy implicative filter; Prime implicative filter; Fuzzy prime implicative filter.

Mathematical Subject classification 2010: 03G25, 03E72, 06F35.

1. INTRODUCTION

The concept of fuzzy set was introduced by Zadeh [10].The idea of intuitionistic fuzzy subset was introduced by Atanassov [1, 2], as generalization of the notion of fuzzy set. The concept of Wajsberg algebras was introduced by Mordchaj Wajsbreg[9] in 1935, and studied by Font, Rodriguez and Torrens[5]. They[5], defined lattice structure of Wajsberg algebras and the notion of an implicative filter of lattice Wajsberg algebras and discussed some of their properties. Basheer Ahamed and Ibrahim [3, 4] introduced the definitions of fuzzy implicative filter, an anti fuzzy implicative filter of lattice Wajsberg algebras and obtained some properties with illustrations. The authors [6, 7, 8] introduced the notions of strong implicative, fuzzy strong implicative, an anti fuzzy strong implicative, an intuitionistic fuzzy implicative and an intuitionistic anti fuzzy implicative filters of lattice Wajsberg algebra, and investigated some properties of them. We considered some basic definitions and properties of Wajsberg Algebra, fuzzy subset and an intuitionistic fuzzy set in [5, 6, 7].

In this paper, we introduce the notion of an IFPIF of lattice Wajsberg algebra. We investigate properties of an IFPIF with examples. We establish the relation between an IFPIF and FPIF.

2. PRELIMINARIES

In this section, we recall some basic definitions of implicative filter, fuzzy implicative filter, intuitionistic fuzzy implicative filter, which are helpful to our main results.

IOSR Journal of Engineering (IOSRJEN)
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 09, Issue 8, August. 2019. ||Series -II || PP 54-58

Fuzzy Partial Isometry Operator and Its Characteristics

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Received 15 August 2019; Accepted 30 August 2019

Abstract: In this paper, the definition of Fuzzy Partial Isometry operator on a FuzzyHilbert space(FH-space) is introduced. We have given many definitions, theorems and discuss in detail, some characteristics of Fuzzy Partial Isometry operator in FH-space.

Keywords: Fuzzy Unitary operator,Fuzzy Normal operator, Self-Adjoint Fuzzy operator, Fuzzy Partial Isometry operator (FPI - operator), FuzzyProjection operator.

I. INTRODUCTION

In 1984, first Katsaras[5] wasintroduced theconcept of Fuzzy norm on a linear space. Then after Felbin[7],Cheng and Mordeson[14], Samanta[17]etc.,have been given different dimensions in definition of fuzzy normed spaces. The definition of Fuzzy Inner Product space(FIP-space) first introduced by Biswas[12] and after that according the annals in [8],[9],[13],[6],[11]. Goudarzi and Vaezpour in [10],and Yongfusu[16] have beenmodified and included the definition of Fuzzy Inner Product space (FIP-space).Goudarzi and Vaezpour[9] has been introduced the definition of Fuzzy Hilbert space in 2009.Also,the implication of Fuzzy Hilbert space(FH-space) was given in [10]and [15].

Noori FAI- Mayahi and Abbas MAbbas[19] have given some properties of Spectral Theory of Linear Operator defined on fuzzy normed spaces which was considered as an expansion for the spectral theory of linear operator defined on normed spaces in 2016.SudadMRasheed [4]was introduced the concept and some properties of Adjoint Fuzzy Linear operators, self - adjoint Fuzzy Linear operators in 2017.Radharamani etal [1] defined concept of fuzzy normal operator and their properties. Whereas the definition of fuzzy unitary operators and their properties has been given byRadharamani et al. [2] in 2018.

In this paper, we consider self-adjoint operator in FH-space and introduce the definitions of Fuzzy Partial Isometry operator, we establish some characteristics ofFuzzy Partial Isometry from Fuzzy operator in FH-space.

The arrangementof this paper is as follows:
Section 2 provides some preliminary definitions, resultsand theorems are used in this paper.
In section 3, we introduced the idea of FuzzyPartial Isometry operator, several theorems.
We discussedsuch Fuzzy operators.

II. PRELIMINARIES

Definition 2.1:[10]FIP-Space

A fuzzy inner product space (FIP-Space) is a triplet (V,F,*),where X is a real vector space,* is a continuous t-norm, F is a fuzzy set on $V^2 \times R$ satisfying the following conditions for every $x,y,z \in V$ and $s,t \in R$.

F1-1:F(x,x,0)=0 and F(x,x,t) > 0, for each t > 0.

F1-2:F(x,x,t)≠ H(t) for some $t \in R$ if ans only if $x \neq 0$,

where $H(t) = \begin{cases} 1, if\ t > 0 \\ 0, if\ t \leq 0 \end{cases}$

F1-3:F(x,y,t) = F(y,x,t)

F1-4:For any $\alpha \in R$,$F(\alpha x, y, t) = \begin{cases} F\left(x, y, \frac{t}{\alpha}\right) \alpha > 0 \\ H(t) \alpha = 0 \\ 1 - F\left(x, y, \frac{t}{-\alpha}\right) \alpha < 0 \end{cases}$

F1-5:F(x, x,t)* F(y,y, s) ≤ F(x+y,x+y, t+s)

F1-6:$SUP_{t+s=r}$ [F(x,z,s)* F(y,z,r)] = F (x+y,z, t)

F1-7:F(x,y,.): R → [0,1] is continuous on R\ {0}

F1-8: $\lim_{t \to \infty} F(x, y, t) = 1$.

Malaya Journal of Matematik, Vol. 7, No. 4, 607-611, 2019

https://doi.org/10.26637/MJM0704/0001

On some fuzzy hyponormal operators

A. Radharamani[1] and A. Brindha[2]*

Abstract

In this work,we focus our study on Fuzzy hyponormal operators acting on a fuzzy Hilbert space(FH space).we have given some properties of Fuzzy hyponormal operators on a FH space.And also we introduced the definition of Fuzzy class (N) operator acting on a Fuzzy Banach space (FB-space) and some definitions. theorems are discussed in detail.

Keywords

Fuzzy Banach Space, Fuzzy Hilbert Space, Fuzzy Normal Operator, Fuzzy Hyponormal Operator, Fuzzy class (N).

AMS Subject Classification

26A33, 30E25, 34A12, 34A34, 34A37, 37C25, 45J05.

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Article History: Received 24 June 2019; Accepted 15 September 2019

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1. Introduction

In 1984, Katsaras[4] is first introduced the notion of Fuzzy Norm on a linear space. Then any other mathematicians have studied fuzzy normed space from several points of view [6, 13, 16]. The definition of fuzzy inner product space(FIP-space) headmost started by Biswas[11] and after that according the chronological in [5, 7, 8, 10, 12]. Modulate the definition of fuzzy inner product space (FIP-space) has been inserted by Goudarzi and Vaezpour in [9, 15]. In 2009, Goudarzi and Vaezpour[9] has been introduced the definition of a fuzzy Hilbert space. Noori F.Al- Mayahi and Abbas M.Abbas[19] gave some properties of spectral theory of linear operator defined on a fuzzy normed spaces which is considered as an expansion for the spectral theory of linear operator defined on normed spaces in 2016. The concept of adjoint fuzzy linear operators, self - adjoint fuzzy linear operators was introduced by Sudad.M.Rasheed [3]. In 2017, A.Radharamani et all [2] defined concept of fuzzy normal operator and their properties.The definition of fuzzy unitary operators and their properties has been given by Radharamani et all [21]in 2018.Whereas, the definition of fuzzy hyponormal operator has been given by Radhamani et all [1] in 2019.

In this paper, we consider fuzzy hyponormal operators in FH-space and introduce the definition of fuzzy class (N) operators and we establish some theorems from fuzzy hyponormal operator in FH-space and also from Fuzzy class (N) in FB-space. The classification of this paper is as follows.

In section 2 we provide some preliminary definitions, theorems and results, which are used in this paper. In section 3 we establish some theorems on fuzzy hyponormal operators and we introduce the concept of fuzzy class (N) operator and some properties of fuzzy class operators have been studied.

2. Preliminaries

Definition 2.1. *[FIP-Space][9] A fuzzy inner product space (FIP-Space) is a triplet $(X, F, *)$,where X is a real vector space, $*$ is a continuous t-norm, F is a fuzzy set on $X^2 \times R$ satisfying the following conditions for every $x, y, z \in X$ and $s, t \in R$.*

FI-1: $F(x, x, 0) = 0$ *and* $F(x, x, t) > 0$, *for each* $t > 0$

FI-2: $F(x, x, t) \neq H(t)$ *for some* $t \in R$ *if and only if* $x \neq 0$,*where*

$$H(t) = \begin{cases} 1 & \text{if } t > 0 \\ 0 & \text{if } t \leq 0 \end{cases}$$

Fuzzy Paranormal Operators

A.Radharamani, A.Brindha

Abstract: In this paper, we introduced and discussed about fuzzy paranormal operators. A fuzzy bounded linear operator $\mathbb{T}$ on a fuzzy Hilbert space $\mathcal{H}$ is fuzzy paranormal if $\|\mathbb{T}^2 a\| \geq \|\mathbb{T}a\|^2$, for every unit vector a in $\mathcal{H}$. It is easily known that this class includes fuzzy hyponormal operators.

Keywords:Fuzzy Hilbert space, Self-adjoint fuzzy operator, Fuzzy Normal operator,Fuzzy Hyponormal operator, Fuzzy Paranormal operator.

I. INTRODUCTION

Let $\mathcal{H}$ be a fuzzy Hilbert space and FB $(\mathcal{H})$ is the set of all fuzzy bounded linear operators on $\mathcal{H}$. Biswas [10] first introduced the definition of fuzzy inner product space. In 2009, Goudarzi and Vaezpour [8] has been introduced the definition of a fuzzy Hilbert space.Sudad M Rasheed [4] was first introduced the concept and properties of adjoint fuzzy operator using the triplet $(\mathcal{H}, \mathcal{F}, *)$ and which is a fuzzy Hilbert space. An operator $\mathbb{T} \in FB(\mathcal{H})$ is a $\mathcal{T}_F$ continuous linear functional, there exist $\mathbb{T}^* \in FB(\mathcal{H})$ such that$\langle \mathbb{T}a, b\rangle = \langle a, \mathbb{T}^* b\rangle \forall\, a, b \in \mathcal{H}$. Also $\mathbb{T}$ is a self – adjoint fuzzy operator if $\mathbb{T} = \mathbb{T}^*$ and also it commutes with its adjoint fuzzy operator i.e. $\mathbb{T}^*\mathbb{T} = \mathbb{T}\mathbb{T}^*$with this $\mathbb{T}$ is said to be fuzzy normal operator which was introduced by Radharamani et al. [1].

If $\mathbb{T} \in FB(\mathcal{H})$ is said to be fuzzy unitary operator if $\mathbb{T}^*\mathbb{T} = I = \mathbb{T}\mathbb{T}^*$.It is also a fuzzy isometry operator from $\mathcal{H}$ onto $\mathcal{H}$. In 2019, Fuzzy hyponormal operators and their properties are studied by Radharamani et al.[3] and investigated many interesting properties of Fuzzy hyponormal operators similar to these of fuzzy normal operators.An operator $\mathbb{T}$ is said to be fuzzy hyponormal if $\mathbb{T}^*\mathbb{T} \geq \mathbb{T}\mathbb{T}^*$.Also fuzzy class of N operators were defined if $\|\mathbb{T}^2 a\| \geq \|\mathbb{T}a\|^2\ \forall\, a \in \mathcal{H}, \|a\| = 1$.

Now we introduced fuzzy paranormal operator if $\|\mathbb{T}^2 a\|\|a\| \geq \|\mathbb{T}a\|^2\ \forall\, a \in \mathcal{H}$ which is equivalent to$\|\mathbb{T}^2 a\| \geq \|\mathbb{T}a\|^2$,for every unit vector a in $\mathcal{H}$. We have given an example, some lemmas for fuzzy paranormal operator and some properties like,sum and product of fuzzy paranormal operators are also fuzzy paranormal.An operator $\mathbb{T}$ is invertible and fuzzy paranormal, then $\mathbb{T}^{-1}$ also fuzzy paranormal.An operator $\mathbb{T}$ is fuzzy paranormal then its powers also fuzzy paranormal, also an operator $\mathbb{T}$ is fuzzy normal then $\mathbb{T}$ and $\mathbb{T}^*$ are also fuzzy paranormal.We will discuss these in detail.

II. PRELIMINARIES

Definition 2.1: [9] Fuzzy Hilbert space (FH-space)

Let $(\mathcal{H}, \mathcal{F}, *)$be a FH – space with IP: $\langle a, b\rangle = Sup\{u \in R: \mathcal{F}(a, b, u) < 1\}\ \forall\, a, b \in \mathcal{H}$.If $\mathbb{T}$is complete in the $\|.\|$,then $\mathcal{H}$ is called Fuzzy Hilbert space(FH-space).

Definition 2.2: [4] Adjoint Fuzzy operator

Let $(\mathcal{H}, \mathcal{F}, *)$ be a FH – space and let $\mathbb{T} \in FB(\mathcal{H})$ be $\mathcal{T}_F$ continuous linear functional. Then $\exists$ unique $\mathbb{T}^* \in FB(\mathcal{H})$ such that $(\mathbb{T}a, b) = \langle a, \mathbb{T}^* b\rangle \forall$ a, b $\in \mathcal{H}$.

Definition2.3: [4] Self-Adjoint Fuzzy operator

Let $(\mathcal{H}, \mathcal{F}, *)$ be a FH – space with IP: $\langle a, b\rangle = Sup\{u \in R: \mathcal{F}(a, b, u) < 1\}\ \forall\, a, b \in \mathcal{H}$ and let $\mathbb{T} \in FB(\mathcal{H})$ Then $\mathbb{T}$ is self-adjoint Fuzzy operator,if $\mathbb{T} = \mathbb{T}^*$,where $\mathbb{T}^*$ is adjoint Fuzzy operator of $\mathbb{T}$.

Theorem 2.4: [4]

Let $(\mathcal{H}, \mathcal{F}, *)$ be a FH – space with IP: $\langle a, b\rangle = Sup\{u \in R: \mathcal{F}(a, b, u) < 1\}\ \forall\, a, b \in \mathcal{H}$ and let $\mathbb{T} \in FB(\mathcal{H})$*then*,$\|\mathbb{T}a\| = \|\mathbb{T}^* a\|$for all $a, b \in \mathcal{H}$.

Theorem 2.5:[4]

Let $(\mathcal{H}, \mathcal{F}, *)$ be a FH – space with IP: $\langle a, b\rangle = Sup\{u \in R: \mathcal{F}(a, b, u) < 1\}\ \forall\, a, b \in \mathcal{H}$ and let $\mathbb{T} \in FB(\mathcal{H})$, then $\mathbb{T}$ is self –adjoint Fuzzy operator.

Definition 2.6: [1] Fuzzy Normal operator

Let $(\mathcal{H}, \mathcal{F}, *)$be a FH – space with IP: $\langle a, b\rangle = Sup\{u \in R: \mathcal{F}(a, b, u) < 1\}\ \forall\, a, b \in \mathcal{H}$ and let $\mathbb{T} \in FB(\mathcal{H})$,then $\mathbb{T}$ is said to be an Fuzzy Normal operator if it commutes with its (fuzzy) adjoint i.e $\mathbb{T}\mathbb{T}^* = \mathbb{T}^*\mathbb{T}$.

Definition 2.7: [2] Fuzzy isometry operator

Let $(\mathcal{H}, \mathcal{F}, *)$ be an FH-space with IP: $\langle a, b\rangle = Sup\{u \in R: \mathcal{F}(a, b, u) < 1\}\ \forall\, a, b \in \mathcal{H}$ and let an operator $\mathbb{T}$ on a Fuzzy Hilbert space $\mathcal{H}$ i.e., $\mathbb{T} \in FB(\mathcal{H})$,then $\mathbb{T}$ is said to be a Fuzzy isometry operator if $\|\mathbb{T}a\| = \|a\|$ for any $a \in \mathcal{H}$.i.e.,$\langle \mathbb{T}a, \mathbb{T}b\rangle = \langle a, b\rangle$.

Remark 2.8: [1]

Let $FB(\mathcal{H})$,the set of all fuzzy linear operators on $\mathcal{H}$.

Definition 2.8: [2] Fuzzy Unitary operator

Let $\mathbb{T} \in FB(\mathcal{H})$ is said to be a fuzzy unitary operator if $\mathbb{T}$ is a Fuzzy isometry operator from $\mathcal{H}$ onto $\mathcal{H}$.

Definition 2.9: [1] Fuzzy Hyponormal Operator

Let $(\mathcal{H}, \mathcal{F}, *)$ be a FH – space with IP: $\langle a, b\rangle = Sup\{u \in R: \mathcal{F}(a, b, u) < 1\}\ \forall\, a, b \in \mathcal{H}$ and let $\mathbb{T} \in FB(\mathcal{H})$Then $\mathbb{T}$ is a fuzzy hyponormal operator if $\|\mathbb{T}^* a\| \leq \|\mathbb{T}a\| \forall\, a \in \mathcal{H}$and or equivalently $\mathbb{T}^*\mathbb{T} - \mathbb{T}\mathbb{T}^* \geq 0$.

Revised Manuscript Received on October 05, 2019

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Some Expansion of Fuzzy Paranormal Operators

A.Radharamani, A.Brindha

Abstract: *Let $\mathbb{H}$ be a Fuzzy Hilbert space over the fields of $\mathbb{R}/\mathbb{C}$ and $FB(\mathbb{H})$ is the set of all fuzzy continuous linear operator on $\mathbb{H}$ .In this paper we introduce the expansion of different fuzzy paranormal operators like n- fuzzy paranormal operator, *- fuzzy paranormal operator and n^{th} -fuzzy paranormal operator, which all are developed from paranormal operators and their characteristics. The study resulted the properties of an n- fuzzy paranormal operator, * fuzzy paranormal operator and n^{th} -fuzzy paranormal operator and their relationship between them. To investigate the nature of these operators, all it needs the nature of the n- fuzzy paranormal operator.*

Keywords: *Adjoint Fuzzy operator, Fuzzy Hilbert space (FH-space), Self adjoint fuzzy operator, Fuzzy paranormal operator, n - fuzzy paranormal operator, * - fuzzy paranormal operator and n^{th} -fuzzy paranormal operator.*

I.INTRODUCTION

The notion of fuzzy norm on a linear space is first introduced by Katsaras[5]. In 1991, the definition of fuzzy inner product space is first introduced by Biswas[7]. Riesz theorem was given by Youngfsu[9] using fuzzy concept in 2007. In 2009 Goudarzi and Vaezpour [6] have been introduced the definition of fuzzy Hilbert space. They introduced triplet $(\mathbb{H},\mathbb{F},*)$, where $\mathbb{H}$ is the Fuzzy Hilbert space, $\mathbb{F}$ is the Fuzzy set on $\mathbb{H}^2\times\mathbb{R}$, and * is continuous t - norm. Sudad M.Rasheed [4] introduced the concept of adjoint fuzzy operator. That is $<\mathbb{U}a,b>=<a,\mathbb{U}^*b>$. Also self adjoint fuzzy operator if $\mathbb{U}=\mathbb{U}^*$ where $\mathbb{U}^*$ is adjoint fuzzy operator of $\mathbb{U}$. Radharamani et al.[1] introduced fuzzy normal operator if $\mathbb{U}\mathbb{U}^*=\mathbb{U}^*\mathbb{U}$ in 2018. And also fuzzy unitary operator and fuzzy hyponormal operator was introduced. An operator $\mathbb{U}\in FB(\mathbb{H})$ which has the property of $\|\mathbb{U}a\|^2\le\|\mathbb{U}^2a\|$ for every unit vector $a\in\mathbb{H}$ is named as fuzzy paranormal operator and introduced by Radharamani et al.[3] in 2019. Then the fuzzy paranormal operator definition is expanded into positive integer n, $\|\mathbb{U}^{2n}a\|\ge\|\mathbb{U}^na\|^2$ for some unit vector $a\in\mathbb{H}$.

In this paper, we introduce an operator $\mathbb{U}$ with the property of $\|\mathbb{U}^{2n}a\|\ge\|\mathbb{U}^na\|^2$ is called n^{th} -fuzzy paranormal operator and we explained some characteristics of n^{th} -fuzzy paranormal operator. Before that requires to defining and explaining the theory of n- fuzzy paranormal operator. We give different properties of n -fuzzy paranormal operator and also give important result about it. An operator $\mathbb{U}\in FB(\mathbb{H})$ with the characteristics of $\|\mathbb{U}^2a\|\|a\|\ge\|\mathbb{U}^*a\|^2$ is said to be * - fuzzy paranormal operator with $\mathbb{U}^*$ is Adjoint fuzzy operator of $\mathbb{U}$.

In this study, the consolation of the n^{th}- Fuzzy paranormal operator and * - fuzzy paranormal operator and is more emphasized on the characteristics and relationships of the n^{th} -Fuzzy paranormal operator and * - fuzzy paranormal operator on FH- space. Therefore it necessary to study more about the properties of the n^{th} -Fuzzy paranormal operator and * - fuzzy paranormal operator on FH- space.

Revised Manuscript Received on November 15, 2019
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II.PRELIMINARIES

Definition 2.1: [4] Fuzzy Hilbert space (FH-space)

Let $(\mathbb{H},\mathbb{F},*)$ be a fuzzy Hilbert space with IP: $\langle a,b\rangle=\sup\{u\in\mathbb{R}:\mathbb{F}(a,b,u)<1\}\ \forall a,b\in\mathbb{H}$ If $\mathbb{H}$ is complete in the $\|.\|$,then $\mathbb{H}$ is called Fuzzy Hilbert space(FH-space).

Definition 2.2: [4] Adjoint Fuzzy operator

Let $(\mathbb{H},\mathbb{F},*)$ be a Fuzzy Hilbert space and let $\mathbb{U}\in FB(\mathbb{H})$ be $\mathcal{T}_F$ continuous linear functional.Then $\exists$ unique $\mathbb{U}^*\in FB(\mathbb{H})$ such that $\langle\mathbb{U}a,b\rangle=\langle a,\mathbb{U}^*b\rangle\forall\ a,b\in\mathbb{H}$.

Note:

Let $FB(\mathbb{H})$ be the set of all fuzzy continuous linear operator on $\mathbb{H}$.

Definition2.3: [4] Self-Adjoint Fuzzy operator

Let $(\mathbb{H},\mathbb{F},*)$ be a FH – space with IP. $\langle a,b\rangle=Sup\{u\in\mathbb{R}:\mathbb{F}a,b,u<1\ \forall\ a,b\in\mathbb{H}$ and let $\mathbb{U}\in FB\mathbb{H}$Then $\mathbb{U}$ is self-adjoint Fuzzy operator, if $\mathbb{U}=\mathbb{U}^*$, where $\mathbb{U}^*$ is adjoint Fuzzy operator of $\mathbb{T}$.

Theorem 2.4: [4]

Let $(\mathbb{H},\mathbb{F},*)$ be a Fuzzy Hilbert space with IP. $\langle a,b\rangle=Sup\{u\in\mathbb{R}:\mathbb{F}(a,b,u)<1\}\forall\ a,b\in\mathbb{H}$. Let $\mathbb{U}\in FB(\mathbb{H})$ then $\|\mathbb{U}a\|=\|\mathbb{U}^*a\|\ \forall\ a,b\in\mathbb{H}$.

Theorem 2.5: [4]

Let $(\mathbb{H},\mathbb{F},*)$ be a FH – space with IP. $\langle a,b\rangle=Sup\{u\in\mathbb{R}:\mathbb{F}a,b,u<1\ \forall\ a,b\in\mathbb{H}$ and let $\mathbb{U}\in FB\mathbb{H}$ then $\mathbb{U}$ is self- adjoint Fuzzy operator.

Definition 2.6: [2] Fuzzy Unitary operator

Let $(\mathbb{H},\mathbb{F},*)$ be a Fuzzy Hilbert space with IP $\langle a,b\rangle=Sup\{u\in\mathbb{R}:\mathbb{F}(a,b,u)<1\}\forall\ a,b\in\mathbb{H}$ and let$\mathbb{U}\in FB(\mathbb{H})$ Then $\mathbb{U}$ is a fuzzy unitary operator if it satisfies $\mathbb{U}\mathbb{U}^*=I=\mathbb{U}^*\mathbb{U}$

Definition 2.7: [1] Fuzzy Normal Operator

Let $(\mathbb{H},\mathbb{F},*)$ be a Fuzzy Hilbert space with IP. $\langle a,b\rangle=Sup\{u\in\mathbb{R}:\mathbb{F}(a,b,u)<1\}\forall\ a,b\in\mathbb{H}$and let $\mathbb{U}\in FB(\mathbb{H})$ Then $\mathbb{U}$ is a fuzzy normal operator if it commutes with its adjoint fuzzy operator of $\mathbb{U}$,i.e $\mathbb{U}\mathbb{U}^*=\mathbb{U}^*\mathbb{U}$.

Definition 2.8: [4] Fuzzy paranormal operator

Let $(\mathbb{H},\mathbb{F},*)$ be a Fuzzy Hilbert space with IP. $\langle a,b\rangle=Sup\{u\in\mathbb{R}:\mathbb{F}(a,b,u)<1\}\forall\ a,b\in\mathbb{H}$ and let $\mathbb{U}\in FB(\mathbb{H})$Then $\mathbb{U}$ is a Fuzzy paranormal operator if $\|\mathbb{U}^2a\|\|a\|\ge\|\mathbb{U}a\|^2\ \forall\ a\in\mathbb{H}$

Note:

Let $\mathbb{U}\in FB(\mathbb{H})$. Then $\mathbb{U}$ is a fuzzy paranormal operator if $\|\mathbb{U}^2a\|\ge\|\mathbb{U}a\|^2\ \forall$ unit vector $a\in\mathbb{H}$

Retrieval Number: D9584118419/2019©BEIESP
DOI: 10.35940/ijrte.D9584.118419

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

Malaya Journal of Matematik, Vol. 8, No. 3, 815-821, 2020

https://doi.org/10.26637/MJM0803/0014

M-Fuzzy hyponormal operators

A. Radharamani[1] and A. Brindha[2*]

Abstract

In this paper, We introduce the definition of M-fuzzy hyponormal operator and also explored about some important properties of M-Fuzzy hyponormal operator from Fuzzy hyponormal operators in fuzzy Hilbert space. For a fuzzy continuous linear operator $\mathcal{T}$ on a Fuzzy Hilbert space $\mathcal{H}$ there exists a real number $M \geq$ if $\|(\mathcal{T}-z\mathcal{I})^* u\| \leq M\|(\mathcal{T}-z\mathcal{I})u\|$ for all $u \in \mathcal{H}$ and for all $z \in C$ (field of complex numbers).We have given some definitions which are related to M-fuzzy hyponormal operator in fuzzy Hilbert space.

Keywords

Adjoint fuzzy operator, Fuzzy Hilbert space(FH-space), Fuzzy Hyponormal operator, Fuzzy Normal operator, M-Fuzzy Hyponormal operator (MFHO), Self-Adjoint fuzzy operator.

AMS Subject Classification

26A33, 30E25, 34A12, 34A34, 34A37, 37C25, 45J05.

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Article History: Received **24** January **2020**; Accepted **21** April **2020**

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1. Introduction

In very first, Katsaras[4] introduced the notation of Fuzzy Norm on a linear space in 1984. In 1991, First Biswas[10] introduced the definition of Fuzzy Inner Product space[FIP space].Some other mathematicians like Kohli and Kumar also gave an alternate definitions of Fuzzy Inner Product space[FIP-space] in[6][8][9][10]. Youngfusu[13] gave Riesz theorem using fuzzy concept in 2007.The definition of a Fuzzy Hilbert space has been first introduced by Goudarzi and Vaezpour [8] in 2009. The concept and properties of Adjoint Fuzzy operator and Self-adjoint fuzzy operators using the triplet , $(\mathcal{H}, \mathcal{T}, *)$ where $\mathcal{H}$ is a real vector space, $\mathcal{T}$ is the Fuzzy Set on $\mathcal{H}^2 \times R$ and $*$ is continuous t- norm in a Fuzzy Hilbert space which was first introduced by Sudad M Rasheed [3].

An operator $\mathcal{T} \in FB_f(\mathcal{H})$ be a τ_f Continuous linear functional $\exists\ \mathcal{T}^* \in FB(\mathcal{H})$ such that $(\mathcal{T}u, v) = (\mathcal{T}^*u, v)\ \forall u, v \in \mathcal{T}$ Also $\mathcal{T}$ is a Self - Adjoint Fuzzy operator if $\mathcal{T} = \mathcal{T}^*$.Fuzzy Normal operator (FN operator) was introduced by Radharamani et al [2] in 2008 . If $\mathcal{T}$ is said to be Fuzzy Normal operator then it commutes with its Ajoint Fuzzy operator , i.e $\mathcal{T}^*\mathcal{T} = \mathcal{T}\mathcal{T}^*$.

In 2019, Fuzzy Hyponormal operators and their properties were studied by A Radharamani et al [1, 18] and investigate many interesting properties of some Fuzzy Hyponormal operators similar to these of Fuzzy Normal operators.An operator $\mathcal{T} \in FB_f(\mathcal{H})$ is said to be Fuzzy Hyponormal if $\mathcal{T}^*\mathcal{T} \geq \mathcal{T}\mathcal{T}^*$.Also Fuzzy class of N operators were defined if $\|\mathcal{T}^2 u\| \geq \|\mathcal{T}u\|^2\ \forall u \in \mathcal{H}, \|u\| = 1$.

Here we introduced M-Fuzzy hyponormal operator if

$$\|(\mathcal{T}-z\mathcal{I})^* u\| \leq M\|(\mathcal{T}-z\mathcal{I})u\|$$

for all $u \in \mathcal{H}$ and for all $z \in C$ (field of complex numbers).We have given some lemmas and properties of M-Fuzzy Hyponormal operator. An operator $\mathcal{T} \in FB_f(\mathcal{H})$ is M-Fuzzy Hyponormal operator then $\|(\mathcal{T}-z\mathcal{I})^* u\| \leq M\|(\mathcal{T}-z\mathcal{I})^* u\|$ for each $u \in \mathcal{H}$.An operator $\mathcal{T} \in FB_f(\mathcal{H})$ is M-Fuzzy hyponormal operator then their powers also M-Fuzzy hyponormal operator.We will also discuss these in detail. If an operator $\mathcal{T}$ is a M-Fuzzy hyponormal operator then $M \geq 1$ and $\mathcal{T}$ is fuzzy hyponormal operator iff $M = 1$.

2. Preliminaries

In this section , we recollect some basic definitions and theorems of fuzzy operators which will be used in this paper.

Malaya Journal of Matematik, Vol. 8, No. 3, 782-786, 2020

https://doi.org/10.26637/MJM0803/0008

Intuitionistic fuzzy unitary operator on intuitionistic fuzzy Hilbert space

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Abstract

In this paper, we define Intuitionistic fuzzy unitary operator (IFU-operator) on an intuitionistic fuzzy Hilbert space (IFH-space). An operator $\mathfrak{U} \in IFB(\mathbb{H})$ is intuitionistic fuzzy unitary operator if $\mathfrak{U}\mathfrak{U}^* = I = \mathfrak{U}^*\mathfrak{U}$ i.e. it is an isomorphism of $\mathbb{H}$ onto itself. By virtue of this definition, a few theorems on IFU-operator are introduced and some of its properties are discussed.

Keywords

Intuitionistic fuzzy adjoint operator (IFA-operator), intuitionistic fuzzy Hilbert space (IFH-space), intuitionistic fuzzy normal operator (IFN-operator), intuitionistic fuzzy self-adjoint operator (IFSA-operator), intuitionistic fuzzy unitary operator (IFU-operator).

AMS Subject Classification

26A33, 30E25, 34A12, 34A34, 34A37, 37C25, 45J05.

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Article History: Received 09 February 2020, Accepted 21 April 2020

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1. Introduction

Initially, Atanossov [9] in 1986, introduced the concept of intuitionistic fuzzy set. In 2004, Park [6] defined the notion of intuitionistic fuzzy metric space $(X, M, N, *, \diamond)$ with the help of continuous t-norm $*$ and continuous t-conorm $\diamond$ as a generalization of fuzzy metric space. Later in 2005 Saadati and Park [10], using the idea of intuitionistic fuzzy metric spaces, introduced intuitionistic fuzzy normed spaces. In 2009, Goudarzi et al. [5] presented the new notion of intuitionistic fuzzy normed spaces and introduced intuitionistic fuzzy inner product space (IFIP-space) with the help of continuous t-representable $(\mathcal{T})$ as a 3-tuple $(V, \mathcal{F}_{\mu,\nu}, \mathcal{T})$. Majumdar and Samanta [12] given the definition of IFIP (μ, μ') in a linear space, an IFIP-space (V, μ, μ^*) and some of their properties. In 2018, Radharamani et al. [1, 2] introduced the definition and properties of IFH-space and also the concept of IFA and IFSA operators in IFH-space. $S^* = IFB(V)$ is an IF-adjoint of an operator $S \in IFB(V)$, if $\langle Sx, y\rangle = \langle x, S^*y\rangle, \forall x, y \in V$, where $IFB(V)$ means the set of all Intuitionistic Fuzzy Bounded (continuous) linear operators on V. Also, if $S = S^*$, then S is an IFSA-operator. Radharamani et al. [3] defined the concept of Intuitionistic Fuzzy Normal operator on IFH-space and their properties. An operator $S \in IFB(V)$ is called an IFN-operator iff $SS^* = S^*S$.

In this paper, we introduce definition of Intuitionistic Fuzzy Unitary operator (IFU-operator) on $\mathbb{H}$, if $\mathfrak{U}\mathfrak{U}^* = I = \mathfrak{U}^*\mathfrak{U}$. Here we give some properties of IFU-operator in IFH-space like, $\mathfrak{U}$ is an IFU-operator $\Leftrightarrow \mathcal{P}_{\mu,\nu}(\mathfrak{U}x, t) = \mathcal{P}_{\mu,\nu}(x, t)\ \forall x \in \mathbb{H}$. Sum of two IFU-operators is IFU iff it is surjective and $\mathrm{Re}\langle \mathfrak{U}_1 x, \mathfrak{U}_2 x\rangle = -\frac{1}{2}\|x\|^2 \forall x \in \mathbb{H}$ with $\mathcal{P}_{\mu,\nu}(\mathfrak{U}, t) = 1, \mathfrak{U} \in IFB(\mathbb{H})$ is IFU-operator iff it is an isometric isomorphism of $\mathbb{H}$ on to itself. We will discuss these in detail.

2. Preliminaries

In this section, we recall some definitions and basic results which will be used throughout the paper.

Definition 2.1. ***[IFIP-Space]*** *[5] Let $\mu : V^2 \times (0, -\infty) \to [0, 1]$ and $\nu : V^2 \times (0, -\infty) \to [0, 1]$ be Fuzzy sets, such that $\mu(x, y, t) + \nu(x, y, t) \leq 1\ \forall x, y \in V \& t > 0$. An Intuitionistic*

International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-9 Issue-1, May 2020

Intuitionistic Fuzzy Normal Operator on IFH - Space

A. Radharamani, S. Maheswari

Abstract: *In this article, we define Intuitionistic Fuzzy Normal Operator operating on an IFH-Space. An operator S is an intuitionistic fuzzy normal operator if $SS^* = S^*S$ i.e. S commutes with its intuitionistic fuzzy adjoint.*

Keywords: *IFH-space, Intuitionistic fuzzy Adjoint operator (IFA-Operator), Intuitionistic Fuzzy Self-Adjoint operator (IFSA-Operator), Intuitionistic Fuzzy Normal operator (IFN-Operator).*

I. INTRODUCTION

Let IFB($\mathcal{H}$) be the set of all IF-Bounded Linear Operators on IFH-Space $\mathcal{H}$. Park [5] first studied the concept of Intuitionistic Fuzzy Metric Spaces. Later on, Intuitionistic Fuzzy Metric and Norm have been defined by Saadati [6]. Then Goudarzi et al. [4] in 2009, introduced Intuitionistic Fuzzy Inner Product Space (IFIP-space). Majumdhar and Samanta [9] defined IFIP-space in 2011. In 2018, Radharamani et al. [1], [2] have given the definition and properties of Intuitionistic Fuzzy Hilbert Space (IFH-Space) $\mathcal{H}$ as a triplet $(\mathcal{H}, \mathcal{F}_{\mu,\nu}, \mathcal{T})$ and also the concept of intuitionistic fuzzy adjoint and self-adjoint operators (IFA and IFSA-operators) in IFH-space. If $S \in$ IFB($\mathcal{H}$), $\exists$ $\langle Sx, y\rangle = \langle x, S^*y\rangle, \forall\, x, y \in \mathcal{H}$. Also S is an IFSA-operator if $S = S^*$.

Now we introduced intuitionistic fuzzy normal operator on $\mathcal{H}$, if $SS^* = S^*S$. Here we establish some theorems and an example for intuitionistic fuzzy normal operator like addition and multiplication of intuitionistic fuzzy normal operator. S is intuitionistic fuzzy normal $\Leftrightarrow \|S^*u\| = \|Su\|$. S is intuitionistic fuzzy normal $\Leftrightarrow$ its real and imaginary parts commute. We will discuss these in detail.

II. PRELIMINARIES

Definition 2.1: [4]

A continuous t – norm $\mathcal{T}$ is called continuous t – representable iff $\exists$ a continuous t – norm $*$ and a continuous t – conorm $\diamond$ on the interval [0,1] such that for all $x = (x_1, x_2)$, $y = (y_1, y_2) \in L^*$, $\mathcal{T}(x, y) = (x_1 * y_1, x_2 \diamond y_2)$

Definition 2.2: [4]

Let $\mu: \mathcal{V}^2 \times (0, +\infty) \to [0,1]$ and $\vartheta: \mathcal{V}^2 \times (0, +\infty) \to [0,1]$ be Fuzzy sets, such that $\mu(x, y, t) + \vartheta(x, y, t) \le 1, \forall\, x, y \in \mathcal{V}$ & $t > 0$.

An Intuitionistic Fuzzy Inner Product Space (IFIP-Space) is a triplet $(\mathcal{V}, \mathcal{F}_{\mu,\nu}, \mathcal{T})$, where $\mathcal{V}$ is a real Vector Space, $\mathcal{T}$ is a continuous t -representable and $\mathcal{F}_{\mu,\nu}$ is an Intuitionistic Fuzzy set on $\mathcal{V}^2 \times \mathbb{R}$ satisfying the following conditions for all $x, y, z \in \mathcal{V}$ and $s, r, t \in \mathbb{R}$:

(IFI - 1) $\mathcal{F}_{\mu,\nu}(x, y, 0) = 0$ and $\mathcal{F}_{\mu,\nu}(x, x, t) > 0$, for every $t > 0$.

(IFI - 2) $\mathcal{F}_{\mu,\nu}(x, y, t) = \mathcal{F}_{\mu,\nu}(y, x, t)$.

(IFI - 3) $\mathcal{F}_{\mu,\nu}(x, x, t) \ne H(t)$ for some $t \in \mathbb{R}$ iff $x \ne 0$,

where $H(t) = \begin{cases} 1, & \text{if } t > 0 \\ 0, & \text{if } t \le 0 \end{cases}$

(IFI - 4) For any $\alpha \in \mathbb{R}$,

$$\mathcal{F}_{\mu,\nu}(\alpha x, y, t) = \begin{cases} \mathcal{F}_{\mu,\nu}\left(x, y, \frac{t}{\alpha}\right), & \alpha > 0 \\ H(t), & \alpha = 0 \\ \mathcal{N}_s\left(\mathcal{F}_{\mu,\nu}\left(x, y, \frac{t}{\alpha}\right)\right), & \alpha < 0 \end{cases}$$

(IFI - 5) $\sup\left\{\mathcal{T}\left(\mathcal{F}_{\mu,\nu}(x, z, s), \mathcal{F}_{\mu,\nu}(y, z, r)\right)\right\} = \mathcal{F}_{\mu,\nu}(x + y, z, t)$

(IFI - 6) $\mathcal{F}_{\mu,\nu}(x, y, \cdot): \mathbb{R} \to [0,1]$ is Continuous on $\mathbb{R} \setminus \{0\}$.

(IFI - 7) $\lim_{t\to 0} \mathcal{F}_{\mu,\nu}(x, y, t) = 1$.

Note 2.3: [4]

(i) Here the standard negator

$$\mathcal{N}_s(x) = 1 - x, \qquad \forall\, x \in [0,1]$$

(ii) By putting $\langle x, y\rangle = \mathcal{F}_{\mu,\nu}(x, y, \cdot)$, it is very simple to show that the Intuitionistic Fuzzy Inner Product acts quite similarly as the Ordinary Inner Product.

(iii) Schwarz inequality:

$\mathcal{F}_{\mu,\nu}(x, y, ts) \ge \mathcal{T}(\mathcal{F}_{\mu,\nu}(x, x, t^2)\, \mathcal{F}_{\mu,\nu}(y, y, s^2))$,

for $x, y \in \mathcal{V}$ and $s, t > 0$.

(iv) A sequence $\{x_n\} \in \mathcal{V}$ is called τ-convergent to $x \in \mathcal{V}$, if for any given $\epsilon > 0$ and $\lambda > 0$, $\exists\, N^0 \in \mathbb{Z}^+$, $N^0 = N^0(\epsilon, \lambda)$, $\exists$ $\mathcal{P}(x_n - x, \epsilon) > \mathcal{N}_s(\lambda)$, whenever $n > N^0$.

(v) Let $f(x)$ be a continuous linear functional on $\mathcal{V}$. Then it is said to be $\tau_{\mathcal{F}_{\mu,\nu}}$ - continuous, if $x_n \xrightarrow{\tau_{\mathcal{F}_{\mu,\nu}}} x \Rightarrow f(x_n) \xrightarrow{\tau_{\mathcal{F}_{\mu,\nu}}} f(x)$, for any $\{x_n\}$, $x \in \mathcal{V}$.

Theorem 2.4: [2]

Let $(\mathcal{V}, \mathcal{F}_{\mu,\nu}, \mathcal{T})$ be an IFIP-Space, where $\mathcal{T}$ is a continuous t - representable for every $x, y \in \mathcal{V}$, $\sup\{t \in \mathbb{R}: \mathcal{F}_{\mu,\nu}(x, y, t) < 1\} < \infty$. Define $\langle \cdot, \cdot \rangle: \mathcal{V} \times \mathcal{V} \to \mathbb{R}$ by $\langle x, y\rangle = \sup\{t \in \mathbb{R}: \mathcal{F}_{\mu,\nu}(x, y, t) < 1\}$. Then $(\mathcal{V}, \langle \cdot, \cdot \rangle)$ is an IFIP-space, so that $(\mathcal{V}, \mathcal{P}_{\mu,\nu})$ is a normed space, where $\mathcal{P}_{\mu,\nu}(x, t) = \langle x, x\rangle^{1/2}$ $\forall\, x \in \mathcal{V}$.

Revised Manuscript Received on May 15, 2020.

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International Journal of Mathematical Archive-11(6), 2020, 1-6
IJMA Available online through www.ijma.info ISSN 2229 – 5046

INTUITIONISTIC FUZZY PARTIAL ISOMETRY OPERATOR

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(Received On: 03-04-20; Revised & Accepted On: 10-05-20)

ABSTRACT

In this paper, we focus our discuss on Intuitionistic Fuzzy Partial Isometry Operator (IF-Partial Isometry operator) on an intuitionistic fuzzy Hilbert space (IFH-space). In this discuss, the definition of IF-Partial Isometry operator acting on an IFH-space is discussed and some important characteristics are examined. An Intuitionistic fuzzy continuous linear operator $\mathbb{P}$ on an IFH-space $\mathbb{H}$ is said to be IF-Partial Isometry operator if there exists closed subspace M such that $\mathcal{P}_{\rho,\vartheta}(\mathbb{P}u,t) = \mathcal{P}_{\mu,\nu}(u,t)$ for any $u \in M$ and $\mathbb{P}u = 0$ for any $u \in M^{\perp}$, where M is said to be the initial space of $\mathbb{P}$ and $N = \mathcal{R}(\mathbb{P})$ is said to be the final space of $\mathbb{P}$, which are related to IFU-operator.

Keywords: *Intuitionistic Fuzzy Partial Isometry operator (IF-Partial Isometry operator), Intuitionistic Fuzzy Normal operator (IFN-operator), Intuitionistic Fuzzy Self-Adjoint operator (IFSA-operator), Intuitionistic Fuzzy Unitary operator (IFU-operator), Intuitionistic Fuzzy Adjoint operator (IFA-operator), Intuitionistic Fuzzy Projection operator (IF-Projection operator).*

I. INTRODUCTION

In very first, the concept of intuitionistic fuzzy set was introduced by Atanassov [11] in 1986. The notion of intuitionistic fuzzy metric space $(\mathbb{H}, M, N, *, \diamond)$ with the use of continuous t-norm $*$ and continuous t-conorm $\diamond$ was introduced by Park [10], in 2004. From this, using the intuitionistic fuzzy metric space in IFH-space was introduced by Saadati and Park [18] in 2005 Majumdar and Samanta [15] in 2007, gave the definition of IFIP-space and some of their properties using $(\mathbb{H}, \mu, \mu^*)$. Goudarzi *et al.* [12] introduced the new idea of the notion of intuitionistic fuzzy normed spaces and introduced the modified definition of intuitionistic fuzzy inner product space (IFIP-space) with the help of continuous t-representable (T) in 2009, as a triplet $(\mathbb{H}, \mathcal{F}_{\rho,\vartheta}, T)$ where $\mathbb{H}$ is a real Vector Space, T is a continuous t-representable and $\mathcal{F}_{\rho,\vartheta}$ is an Intuitionistic Fuzzy set on $\mathbb{H}^2 \times \mathbb{R}$.

The definition of IFH-space first introduced by Radharamani *et al.* [1], [2] in 2018, and also discussed some properties of IFA & IFSA operators in IFH-space. An operator $\mathbb{P} \in IFB(\mathbb{H})$ is said to be IFA-operator, if there exists unique $\mathbb{P}^* \in IFB(\mathbb{H})$ such that $\langle \mathbb{P}x, y\rangle = \langle x, \mathbb{P}^* y\rangle \; \forall x, y \in \mathbb{H}$, where $IFB(\mathbb{H})$ denotes the set of all Intuitionistic Fuzzy Bounded (continuous) linear operators on $\mathbb{H}$. Also, $\mathbb{P}$ is an IFSA-operator, if $\mathbb{P} = \mathbb{P}^*$.

In 2020, Radharamani et al. [3] introduced the concept of Intuitionistic Fuzzy Normal operator. If $\mathbb{P} \in IFB(\mathbb{H})$ is called IFN-operator, if it commutes with its Intuitionistic fuzzy adjoint, i.e. $\mathbb{P}\mathbb{P}^* = \mathbb{P}^*\mathbb{P}$. In 2020, Radharamani *et al.* [4] introduced the definition of Intuitionistic Fuzzy Unitary operator (IFU-operator) on IFH-space $\mathbb{H}$, if $\mathbb{P}\mathbb{P}^* = I = \mathbb{P}^*\mathbb{P}$ and gave some important properties of IFU-operator in IFH-space and also the relation with isometric isomorphism of $\mathbb{H}$ on to itself.

In this paper, we consider an Intuitionistic fuzzy self-adjoint operator in IFH- space and introduced the definition of Intuitionistic Fuzzy Partial isometry operator (IF-Partial Isometry operator) and we provided some characteristics of IF-Partial Isometry operator on IFH-space. And also introduce Intuitionistic Fuzzy Projection operator (IF-Projection operator) which is using in IF-Partial Isometry operator and also the relation between them, which all are discuss in detail.

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ORDERING OCTAGONAL FUZZY NUMBERS USING RANK,MODE,DIVERGENCE AND SPREAD

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ABSTRACT

In this paper we introduce Octagonal fuzzy numbers with its membership functions. A new method is proposed for finding Rank , Mode, Divergence and spread using Octagonal fuzzy numbers. The procedure is illustrated with a numerical example.

KEYWORDS

Octagonal fuzzy numbers, alpha Rank , Mode, Divergence and spread.

1. INTRODUCTION

The concept of "Fuzzy Sets and Fuzzy Logic", proposed by Klir .G and B. Yuan in [1] , has been found to be highly useful to deal with vagueness. Many authors discussed the solutions of Octagonal Fuzzy Problem (OFP) using various techniques. In New Operation On Hexagonal Fuzzy Number proposed by P.Rajarajeswari and A.Sahaya Sudha and R.karthika [2] . Dr.Chandrasekaran,G.Gokila, Juno Saju, " Ranking of Octagonal Fuzzy Numbers for Solving Multi Objective Fuzzy Linear Programming Problem with Simplex Method and Graphical Method [5] A New Algorithm for Finding a Fuzzy Optimal Solution.K. Prasanna Devi, M. Devi Durga and G. Gokila, Juno Saju is introduced Octagonal Fuzzy Number.

The paper is organized as follows, In section 2, introduction with some basic concepts of Octagonal fuzzy numbers, In section 3, introduce Octagonal Fuzzy Numbers in ranking function of the Generalized Octagonal Fuzzy Numbers and proposed algorithm followed by a Numerical example using Rank , Mode, Divergence and spread and In section 4, finally the paper is concluded.

NEW ALPHA CUT ARITHMETIC OPERATIONS USING OCTAGONAL FUZZY NUMBERS

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ABSTRACT

In this paper we introduce Octagonal fuzzy numbers with its membership functions. A new method is proposed for finding a new alpha cut arithmetic operations using Octagonal fuzzy numbers. The procedure is illustrated with a numerical example.

KEYWORDS

Octagonal fuzzy numbers, alpha cut arithmetic operations, addition, subtraction, multiplication and division methods.

1. INTRODUCTION

The concept of "Fuzzy Sets and Fuzzy Logic", proposed by Klir .G and B. Yuan in [6] , has been found to be highly useful to deal with vagueness. Many authors discussed the solutions of Octagonal Fuzzy Problem (OFP) using various techniques. Bansal.A.,Some non linear arithmetic operations on triangular fuzzy numbers [1].In New Operation On Hexagonal Fuzzy Number proposed by P.Rajarajeswari and A.Sahaya Sudha and R.karthika [2] . Dr.Chandrasekaran,G.Gokila, Juno Saju, " Ranking of Octagonal Fuzzy Numbers for Solving Multi Objective Fuzzy Linear Programming Problem with Simplex Method and Graphical Method . A New Algorithm for Finding a Fuzzy Optimal Solution K. Prasanna Devi, M. Devi Durga and G. Gokila, Juno Saju is introduced Octagonal Fuzzy Number.

The paper is organized as follows. In section 2, introduction with some basic concept Octagonal fuzzy numbers. In section 3, introduce Octagonal Fuzzy Definition and proposed algorithm followed by a Numerical example using arithmetic operations, addition, subtraction, multiplication and division method and In section 4, Numerical example using alpha cut arithmetic operations, addition, subtraction, multiplication and division method finally the paper is concluded.

2. PRELIMINARIES

2.1. FUZZY SET [9]:

Let X be a nonempty set. A fuzzy set $\tilde{A}$ of Xis defined as$\tilde{A}$={< x, $\mu_{\tilde{A}}(x)$ >/$x \in X$}. Where $\mu_{\tilde{A}}(x)$ is called membership function, which maps each element of X to a value between 0 and 1.

2.2. FUZZY NUMBER [9]:

A fuzzy number is a generalization of a regular real number and which does not refer to a single value but rather to a connected a set of possible values, where each possible value has its weight between 0 and 1. The weight is called the membership function.

A fuzzy number $\tilde{A}$ is a convex normalized fuzzy set on the real line R such that

- There exist at least one x ∈R with $\mu_{\tilde{A}}(x) = 1$.
- $\mu_{\tilde{A}}(x)$ is piecewise continuous.

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IJASRM

International Journal of Advanced Scientific Research and Management, Volume 4 Issue 2, Feb 2019

www.ijasrm.com

ISSN 2455-6378

A New Approach to Solve Fuzzy Travelling Salesman Problem

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Abstract

A fuzzy number can be used to solve many real-life problems like Travelling Salesman, Assignment Problems and so on. In this paper, a new method is proposed for solving Travelling Salesman problems using Transitive Fuzzy Numbers. We use Haar Hungarian algorithm approach to solve a Fuzzy Travelling Salesman Problem (FTSP) and Numerical examples are given to validate the proposed algorithm.

Keywords: Fuzzy numbers, transitive trapezoidal fuzzy numbers, Haar ranking, Hungarian method.

1. Introduction

Traveling salesman problem is a classical problem in combinatorial optimization. The objective of the problem is to find the shortest route of salesman starting from a given city, visiting all other cities only once and finally come to the same city where he started. There are different approaches for solving traveling salesman problems. Linear programming method, heuristic methods like cutting plan algorithms and branch and bound method, Markov chain, simulated annealing and so on.

In real life situation, it may not be possible to get the cost or time as a certain quantity. To overcome this Zadeh [1] introduce fuzzy set concepts to deal with imprecision and vagueness. Since then significant advantages have been made in developing numerous methodologies and their applications to various decision problems. If the cost or time or distance is not crisp values, then it becomes a fuzzy TSP. The Fuzzy TSP has been solved for LR-fuzzy parameters by Amit Kumar and Anil Gupta [2]. In this paper, a new algorithm which is similar to the classical assignment method is introduced to solve fuzzy TSP. First, Fuzzy Hungarian method is applied and then modifications are done to satisfy the route conditions by considering element-wise subtraction and Yager's [3] ranking method of fuzzy numbers. Dhanasekar et al., [4] solved fuzzy TSP by using the Hungarian algorithm with element-wise subtraction of fuzzy numbers. Since fuzzy TSP is an NP-hard problem, more numbers of algorithms are still proposed to solve the fuzzy TSP. In this paper, the ordering of fuzzy numbers based on Haar wavelet is used [5], to order the fuzzy numbers. The advantage of using this ranking technique is that it converts a given fuzzy number into average and detailed coefficients using downsampling. The uniqueness of the Haar ranking method [5] is that the fuzzification from the defuzzified value is very easy to obtain through upsampling. In this paper, the Hungarian method using Haar tuples [6] is proposed for solving traveling salesman problem with fuzzy parameters.

2. Preliminaries

Definition 2.1

A Fuzzy set can be obtained by allocating all the elements in the universe of discourse to value lies in [0, 1] by using a membership function.

Definition 2.2

A Fuzzy number $\tilde{A}$ with membership function $\mu_{\tilde{A}}(x)$ satisfies piece wise continuity, convexity and normality.

Definition 2.3

A fuzzy number $\tilde{A}$ = (a,b,c,d) with membership function of the form is called a trapezoidal fuzzy numb

$$\mu_{\tilde{A}}(x) = \begin{cases} \dfrac{x-a}{b-a} & a \le x \le b \quad \text{et.,} \\ 1 & b \le x \le c \\ \dfrac{d-x}{d-c} & c \le x \le d \\ 0 & otherwise \end{cases}$$

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Finding Optimal Solution of Transportation Problem Using Different Solving Techniques

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Abstract: In this paper a fuzzy transportation problem is taken in such a way that the transportation cost and the supply and demand are interval numbers and solved in two stages. In the first stage the interval numbers are converted into hexagonal numbers. In the second stage by using ranking technique hexagonal numbers are converted into crisp numbers. Then by applying different methods optimum solution is obtained and the results are compared. This is illustrated by means of numerical examples.

Keywords: Interval numbers, Hexagonal fuzzy numbers, ranking technique.

Date of Submission: 28-03-2020 Date of Acceptance: 12-04-2020

I. Introduction

The transportation problem is a special class of the Linear Programming Problems in which the objective is to transport various quantities that are sources (origins) to different destinations in such a way that the total transportation cost will be minimized. To achieve the objective the amount of available supplies and the quantities demanded should be known. Transportation models have wide applications in logistics and supply chain for reducing cost efficiency. The origin of the transportation methods dates back to 1941 by F.L. Hitchcock. Several algorithms have been developed for solving the transportation problem when the cost, profits, etc of the supply and demand quantities are known exactly.

A fuzzy transportation problem is a transportation problem in which the transportation costs, supply, and demand quantities are fuzzy quantities. The objective of the fuzzy transportation problem is to determine the optimum schedule that minimizes the total fuzzy transportation cost. Many authors discussed the solutions of fuzzy transportation problem using various techniques. Chanas et al [3] developed a method for solving transportation problems by the parametric programming technique. Chanes and Kuchta [4] introduced a new method by transforming the problem to a bicriteria transportation problem which provides only a crisp solution to the given transportation problem. Zero-point method was introduced by Pandian and Natarajan [11] to find the fuzzy optimal solution of fuzzy transportation problem.

In this paper the interval numbers are converted into hexagonal numbers. In order to solve the transportation problem with hexagonal numbers it is converted into a crisp problem by using the ranking method. Now different solving techniques are applied to find the optimum solution to the transportation problem. This is illustrated by means of an example and comparative study is made.

II. Preliminaries

Definition:2.1 (Fuzzy number)

A fuzzy set $\tilde{A}$ defined on the set of real numbers R is said to be fuzzy number if it has the following characteristics i) $\tilde{A}$ is normal ii). $\tilde{A}$ is convex set iii). The support of $\tilde{A}$ is closed and bounded.

Definition:2.2

An interval number A is defined as $A = [a, b] = \{x / a \le x \le b, x \in R\}$. Here $a, b \in R$ are the lower and upper bound of the intervals.

Definition: 2.3 (Hexagonal fuzzy number)

A fuzzy number $\widetilde{H_F}$ is a hexagonal fuzzy number denoted by $\widetilde{H_F} = (a_1, a_2, a_3, a_4, a_5, a_6)$ where $a_1, a_2, a_3, a_4, a_5, a_6$ are real numbers and its membership function $\mu_{\widetilde{H_F}}(x)$ is given by

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ALGORITHM TO SOLVE INTERVAL INTEGER TRANSPORTATION PROBLEM

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Abstract

In this paper, a new idea is proposed for finding an optimal solution for interval integer transportation problem. Zero suffix technique is applied to solve IITP where transportation cost, supply, and demand all are in the form of intervals. The solution procedure is explained with a numerical example.

Keywords: Interval Fuzzy number, Interval ranking techniques, Zero suffix algorithm.

1. Introduction

A very few researchers have worked in interval integer number transportation problems. Das et al. [2] by considering the interval as right bound and as the midpoint, solved the interval transportation problem. Pandian et al., [8] solved fully interval integer transportation problems by separation method. Safi et al., [9] by converting the interval fuzzy constraints into multi - objective fuzzy constraints & solved the fixed charge transportation problems. Sengupta et al., [11] proposed a method to solve interval transportation problem by taking into consideration the midpoint and width of the interval in the objective function. S.Purushothkumar et al... [14] Developed a diagonal optimal algorithm to solve the interval integer transportation problems. Many authors [3] [5] [10][12] applied a zero suffix method to solve the transportation problem with crisp values & fuzzy values. All these authors convert the given problem into crisp problem then zero suffix algorithm is applied. The proposed method is based on a zero suffix algorithm. A new ranking technique is employed to rank the fuzzy numbers. The algorithm is illustrated through an example.

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ALGORITHM FOR SHORTEST PATH PROBLEM UNDER INTERVAL-VALUED PYTHAGOREAN FUZZY ENVIRONMENT

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Abstract

In this work, we study the task of finding the shortest path (SP) problem in an interval-valued Pythagorean fuzzy environment. Here, the costs related to arcs are taken in the form of interval-valued Pythagorean fuzzy numbers (IVPFNs). A numerical example has been provided and the results are compared.

Keywords: Shortest path problem, Pythagorean fuzzy numbers, Score function, Improved Score function.

1. Introduction:

The shortest path problem aims to find a path from the source node to the destination node with the least cost. Usually, traversal costs of arcs are expressed in terms of crisp numbers. But, these values are generally imprecise or vague in nature for this, Zadeh [15] proposed the fuzzy set theory to solve SP problems. Deng et al. [3] extended the Dijkstra algorithm for solving fuzzy SP problems by representing the fuzzy numbers as the graded mean integration Moreover, some authors [4, 5] focused on computing the shortest path based on heuristic algorithms. Atanassov[1] introduced intuitionistic FS (IFS) to incorporate the non-membership degree during the analysis. Mukherjee [12] considered the SP problem in an intuitionistic fuzzy environment. Geetharamani and Jayagowri [6] deal with IFSP length procedure and similarity measure. Biswas et al. [2] developed a method to search for an IFSP. Kumar et al.[11]proposed an algorithm to find the shortest path and shortest distance using interval-valued fuzzy intuitionistic are weights. Zhang[14]extended the concept of PFS to interval-valued PF (IVPF) sets where the values of membership and non-membership are expressed in terms of intervals rather than crisp numbers.

In this paper, we propose a method for solving SP problems under the IVPF environment. Here the costs of arcs are represented in terms of interval-valued Pythagorean fuzzy numbers(IVPFNs). To reach the optimality conditions, both score function &an improved score function is used to compare the costs between different paths with their arc costs

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PERFORMANCE TEXTILES TO CONTROL INFECTION AND ODOUR CAUSING ORGANISMS IN SPORTSWEAR MATERIALS

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ABSTRACT

The fabrics used for active sportswear are specially constructed in terms of the geometry, packing density and structure of the constituent fibres in yarn as well as their construction in order to achieve the necessary dissipation of heat and moisture. Performance of player can be enhanced by specialised sportswear like compression athletic wear and other innovative products like biomimetic swimwear. Specialised products are continuously being innovated where usually performance, quality, design and not the price seem to be determining factor. This paper reports the functional requirement of high active sportswear, various aspects of sportswear comfort, their evaluation methods, effects of fibre parameters like shape and geometry, yarn constructional parameters, fabric structural parameters, finishes, performance enhancement and innovative material for sportswear.

Keywords: Performance textile, sports fabrics, synergism, odour, olfactory.

INTRODUCTION

As per the market demand, sportswear can be categorized into four groups, viz performance sportswear, basic sportswear, sports leisurewear and sports- fashion clothing. Performance sportswear is highly technical-oriented clothing which enhances the performance with special functionality. Performance textiles are textiles that provide additional functions such as repellency, resistance, or protection from a specified element including fabrics that resist wrinkles, soils, or odors, and/or protect from an environmental condition. Performance sports are classified as one which is being played for short duration of time with maximum physical activity like tennis, soccer, running, jumping, etc. Wear comfort of high active sportswear may affect the performance of player and hence it becomes one of the most important quality criterion (Manshahia and Das., 2014).

One such problem is odour in fabrics due to different sports activities. The odour may be due to different biological reasons, the most being the metabolic actions of the microorganisms and microbial enzymes. Smells are built up when sweat and other excretions are metabolised by bacteria. When such odour causing bacteria are killed or inhibited, they cannot metabolise anymore and the garment or other article does not smell. There is an increasing demand for antibacterial materials in many application areas including sport owing to the importance of public health awareness. Sweating during sport activities provides suitable environment for bacteria to grow and generate bad odor. Staphylococcus aureus is a common bacterium in athletic teams causing infectious diseases (Iqbal *et al.* 2012).

Textiles, particularly sports textiles, inner soles of shoes or other textiles which are prone to bad smell, are treated with antibacterial substances to avoid unpleasant odours. Producers of anti-odour treated articles sometimes even claim an advantage for the environment, because such textiles need less washing, according to them.

19-20

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-9 Issue-1, November, 2019

Influence of Fabric Parameters on Wicking Behaviour of Polyester/Lycra Knitted Fabrics

Rajesh Kumar K, Karpagam Chinnammal S

Abstract: Wicking is one of the important properties of fabrics which decide its utility. The sweat generated in the body should be absorbed by the fabric as otherwise it may lead to skin diseases. It is advised that cotton fabrics should be worn net to the skin in order to get comfort to the wearer. This article is concerned with wicking which plays a vital role in determining comfort and moisture transport behavior of fabric and also into find out the effect of four parameters of single jersey, rib and pique knitted structures on the wickability. Parameters taken for the study were polyester cross-section, lycra denier used, plated structure and loop length.

Keywords: Loop length, Lycra, Plated, Polyester, Wicking.

I. INTRODUCTION

Liquid on the body surface or inner layer of clothing should be transferred to the outer layer in order to keep the skin dry and it must be evaporated from the outer layer to the environment; otherwise, it creates a sense of dampness and clamminess and can even reduce body heat, making people tired. Wear comfort is influenced by the ability of the clothing material to transport moisture vapour and to dry quickly, especially when sweating conditions are considered. The movement or wicking of water in fabrics is of current interest because of the recent introduction of fibres, yarns and fabrics which manufacturer claim impart great personal comfort to the wearer. This comfort is said to be due to the fibre, yarn or fabric's ability to wick perspiration away from the skin, leaving the wearer dry and warm. As part of an on-going study on the movement of water in and through textile materials, this paper examines the vertical wicking of water along a strip of textile material, a common method of evaluating the wicking behavior of fabrics [1-4].

Synthetic fibres, especially the polyester staple fibre, have made a tremendous growth in clothing applications. 100% polyester staple fibres are rarely used for clothing purpose but in many cases when these are blended with other fibres like cotton and viscose fibres, they are widely used [5-7]. This article is concerned with wicking which plays a vital role in determining comfort and moisture transport behavior of fabric and also into find out the effect of four parameters of single jersey, rib and pique knitted structures on the wickability. Parameters taken for the study were polyester cross-section, lycra denier used, plated structure and loop length.

Revised Manuscript Received on November 10, 2019.

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II. DESIGN OF EXPERIMENTS

In this study, four independent factors and two levels of each factors were chosen to conduct the experiments. The parameters selected as independent factors were as follows

(i) Polyester circular and trilobal Cross section fabric
(ii) Lycra denier with 40 denier and 20 denier
(iii) Polyester fabric with half plated structure and full plated structure
(iv) Variation in Loop length of 2.9 mm, 3.1 mm and 3.3 mm

Table 1: Sample details with respect to polyester cross-section

Sample Code	Polyester cross section	Lycra denier	Loop length (mm)
SJ 1	Circular	40 D	2.9
SJ 2	Trilobal		
R 1	Circular		
R 2	Trilobal		
P 1	Circular		
P 2	Trilobal		

Table 2: Sample details with respect to Lycra denier

Sample Code	Lycra denier	Polyester cross section	Loop length (mm)
SJ 1	40 D	Circular	2.9
SJ 3	20 D		
R 1	40 D		
R 4	20 D		
P 1	40 D		
P 3	20 D		

Table 3: Sample details with respect to Plated structure

Sample Code	Plated structure	Polyester cross section	Loop length (mm)
SJ 4	Full plated	Circular	2.9
SJ 5	Half plated		
R 4	Full plated		
R 5	Half plated		
P 4	Full plated		
P 5	Half plated		

19-20 Original

DEVELOPMENT OF ANTIMICROBIAL AND AROMA FINISH SPORTSWEAR MATERIALS TO CONTROL THE ODOUR AND BACTERIAL INFECTION

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Abstract

One major problem is odour in fabrics due to different sports activities. Sweating during sport activities provides suitable environment for bacteria to grow and generate bad odour. Textiles, particularly sports textiles, inner soles of shoes or other textiles which are prone to bad smell, are treated with antibacterial substances to avoid unpleasant odours. The problem with straight forward antimicrobial loading into the material leads to antimicrobial resistance. To avoid the antibiotic resistance two different groups of synergistic drugs were used as combinations. The study concentrates on the development of antibacterial and aroma finished sportswear material. Preliminarily, a survey was conducted among a group of 50 players and 10 shopkeepers to understand the needs and demands in the current sportswear materials. Total of six fabrics,were selected for the study and various methods were carried out for the selection of best two fabrics from six different fabrics. The best fabrics were found to be Lycra - Single Jersey and Cotton - Single Jersey. The selected fabrics were finished with synergistic drug (Piperacillin – Tazobactum). Best aroma oil was selected using the fragrance test for the finishing on the fabric. The finished fabrics were found to be durable at 2nd and 10thwash. From the analysis of fragrance test, the grades given for the finished fabric were found to be 1andpleasant smelling for both the finished fabrics. Sportswear T shirts were developed using the finished Cotton and Lycra Single jersey materials. The developed products showed significant absorbency values. Hence the developed synergistic drugs and aroma finished T – shirts can act as an effective antimicrobial and odour reducing sportswear materials.

Keywords: Sportswear materials, Odour, Synergistic drugs, Antiodour, antibacterial finish

Introduction

The types of sportswear available in the market are performance sportswear, basic sportswear, sports leisurewear and sports fashion clothing. Performance sportswear is highly technical-oriented clothing which enhances the performance with special functionality. Performance sports are classified as one which is being played for short duration of time with maximum physical activity. Wear comfort of high active sportswear may affect the performance of player and hence it becomes one of the most important quality criterions (Manshahia and Das 2014).

One major problem is odour in fabrics due to diffetent sports activities. Sweating during sport activities provides suitable environment for bacteria to grow and generate bad odour. The odour may be due to the metabolic actions of microorganisms. When such odour causing bacteria are killed or inhibited, they cannot metabolise anymore and the garment or other article does not smell. Micrococcus luteus Staphylococcus aureus is a common bacterium in

19-20 Original Peer reviewed

Research Journal of Textile and Leather (RJTL)

RJTL

Available online at https://www.rjtl.org
Volume: 1, Issue: 1, 23-27, 2020
ISSN: 2708-3632
DOI: https://doi.org/10.46590/rjtl.2020.010104

Development of Therapeutic Cushion Using *Chrysopogon Zizanioides* (Vetiver) and Bamboo Fabric

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Paper Status

Received : March 2020
Accepted : April 2020
Published : May 2020

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Abstract: Textile is the key component of every human life from birth to last rights. In the recent decade, textile sectors have shown tremendous growth through improved technology from raw materials to product design and manufacturing process. These extraordinary developments provide a path to find an innovative solution to the medical sector especially in the field of therapeutic textiles. This project is a small initiative to confer a solution for particular workforce such as truck drivers who are suffering from hemorrhoids disease. The main aim was to find an innovative therapeutic textile solution for this ailment based on ancient method of herbal treatment.

Keywords: *Bamboo Fabric, Chrysopogon Zizanioides Cushion, Hemmorrhoids, Herbal cushion, Therapeutic Textiles*

Citation: *B.Jeyanthy, S.Karpagam Chinnammal , R.Karthikselvam. Development of Therapeutic Cushion Using Vetiver and Bamboo Fabric , Research Journal of Textile and Leather, 1(1), 23-27, 2020*

1. INTRODUCTION

In the modern decade, people are more conscious about their health. They want to take preventive measures to lead ailment free life. This scenario has made them to search for herbal based therapeutic solution for all sorts of problems.

This is the stimulating factor for technicians to provide innovative products and thus meet out the requirements of the society. This project is a kind of therapeutic solution for particular working force, the truck drivers to diminish the impact of hemorrhoids health issue, without any adverse side effects.

For this research work, 10 truck drivers aged between 45-55, commuting from Tirupur to Bangalore and vice versa twice a week covering a distance of about 800 kilometers was selected. After a brief discussion with them, it was obvious that they had a common health issue called hemorrhoids. According to Medical world, one of the key risks caused by heat wave is dehydration and it leads to hemorrhoids. When a person sits in one place for a prolonged period of time it can rise his body heat and that is a major cause for hemorrhoids. Further, the drivers where of the opinion that allopathic treatment controlled their problem, but had side effects. Hence, the main aim of this research work was to find an innovative therapeutic textile solution for this ailment based on our ancient method of herbal treatment.

For this purpose exclusive therapeutic cushion was prepared by the combination of Chrysopogon zizanioides commonly known as Vetiver, Bambusa vulgaris commonly known as bamboo and Abutilon Indicum commonly known as thuthi. Finally, these cushions were given to the selected truck drivers to evaluate the performance properties. Each driver reverted with their personal experience about the product and it is discussed under the results heading.

Research Article

Creation of Ultra-Long Pure Magnetization Needle Bycircularly Polarized Beam with a Ternary Optical Element

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ABSTRACT

The light-induced magnetization needle is made by tightly focusing a circularly polarised beam and modulating it using a self-designed ternary hybrid (phase/amplitude) filter based on vector diffraction theory and the Inverse Faraday Effect (IHF). The adaptable particle swarm optimization (PSO) searching technique prudently optimises the phase and amplitude patterns of IHF. It is noted that optimizing produces an ultra-long pure magnetization needle with a lateral sub-wavelength scale and a super-long spherical magnetization chain with three-dimensional super-resolution. The present research on super-resolution magnetization patterns is very valuable in high density all-optical magnetic recording, atomic trapping, and confocal and magnetic resonance imaging.

Keywords: Azimuthally polarized beam, Diffractive Optical Element, Super-Resolution.

1. INTRODUCTION

Due to its potential applications in all-optical magnetic recording (AOMR) (Stanciu *et al.* 2007; Khorsand *et al.* 2012; Mangin *et al.* 2014), confocal and magnetic resonance microscopy (Grinolds *et al.* 2014), atom trapping (Vetsch *et al.* 2010; Schneeweiss *et al.* 2014), and multi-dimensional magneto-optical data storage (Zijlstra *et al.* 2009; Gu *et al.* 2014), the ultra-fast response of the light-induced magnetization field in the magneto-optical film has piqued the interest of researchers in the last year. All of these applications require a pure longitudinal magnetization focus structure that allows for a well-defined magnetization direction in the material on an ultra-small 3D volume beyond the diffraction limit ($\sim\lambda^3/8$). For applications such as high-density magnetic-optical data storage and high-resolution magnetic resonance imaging, a magnetization focused structure of this sort is essential. Furthermore, multiple magnetic particle trapping and manipulation need spherical 3D super-resolution spot multiple into an array, which is necessary to enhance the processing speed and power efficiency of magneto-optical recording. Many attempts have been made to modify the magnetization structure by controlling the mutual interaction between the polarisation singularities of a cylindrical polarisation beam and an optical vortex (Jiang *et al.* 2013; Qin *et al.* 2015; Gong *et al.* 2016; Yan *et al.* 2017; Sicong Wang *et al.* 2018), in conjunction with amplitude/phase modulation (Wang *et al.* 2014; Nie *et al.* 2015; Ma *et al.* 2015; Yan *et al.* 2017a, 2017b; Udhayakumar *et al.* 2018a; 2018b). A tightly focused circularly polarised beam with a high numerical aperture objective has been suggested as an effective way to induce and reverse longitudinal magnetization in the magnetic material when the handedness of a circularly polarised beam is modified (Savoini *et al.* 2012; El Hadri *et al.* 2016a, 2016b, 2017; Pierre Vallobra *et al.* 2017; Quessab *et al.* 2018). Recently, the Particle swarm optimization (PSO) algorithm, which is inspired by the emergent motion of a flock of birds hunting for food, has become a powerful tool to determine the parameters of DOEs for improving the performances of optical fields (Jie Lin *et al.* 2016; Mohamed Ahmed Mohandes, 2012). It is manifested that the PSO performs well in finding a good solution to optimize the objective function. In contrast to other optimization techniques, the PSO has better search performance with faster and more stable convergence rates (Ioan Cristian Trelea, 2003). Although this novel optimization scheme has several merits, such as global optimization, fast convergence, and reduced iteration number, combining both the generic algorithm and PSO one will make the whole optimization system more complex (Jie Lin *et al.* 2016; Mohamed Ahmed Mohandes, 2012). Based on VDT and IFE, we numerically demonstrate the ability of producing a highly contained magnetic field reaching up to 10.2 with no side lobes and an extremely low transverse magnetization component. We also showed magnetization spots that were stretched axially by a self-designed ternary hybrid (phase/amplitude) filter

Research Article

Journal of
Environmental
Nanotechnology

Generating a Multiple Focal Hole using a Phase-modulated Azimuthally Polarized Laguerre-Bessel-Gaussian Beam

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ABSTRACT

A technique has been suggested for creating many sub-wavelength focal hole segments by tightly focusing a phase-modulated Azimuthally Polarized Laguerre-Bessel-Gaussian Beam (APLBGB). Vector diffraction theory was used to explore the focusing properties. It has been found that by properly controlling the phase of the incident azimuthally polarized light, a focal hole segment with several focal structures separated by varying axial distances can be constructed. Such focused patterns are expected to be beneficial in atom optics, optical manipulations and multiple optical traps.

Keywords: Fluorescence microscopy.

1. INTRODUCTION

The three-dimensional gradient force optical tweezers demonstrated by Ashkin *et al.* in 1986 have proven to be useful tools for manipulating microscopic objects with a refractive index higher than that of the surrounding medium (high index particle) (Sasaki *et al.* 1992). Such tweezers, however, cannot be used for trapping microscopic particles of refractive index lower than that of the surrounding medium (low index particles) because these get repelled away from the regions of the highest intensity. The ability to trap and manipulate such low-index Particles would allow for the trapping of bubbles and droplets to investigate their evolution in different liquid media since low index particles such as bubbles are of considerable interest for their potential application in the field of biology, medicine and environmental science. For example, recently, enhancement of cell permeability caused by localized cell damage induced by the asymmetric collapse of a bubble has been used for drug delivery and transfection of genes into the living cells (Gahagan and Swartzlander, 1996). Since the cavitation damage by a collapsing bubble depends on its relative to trap and manipulate low index particles (Ashkinn and Dziedzic, 1989) may enhance the understanding of bubble dynamics and optimize the extent of the cell damage caused by bubbles. Similarly, low index particles are also finding use as contrast agents (Wright *et al.* 1990) and for selective destruction of cancer cells (Tadir *et al.* 1990) separation from the surface. Moreover, the conventional gradient-force trap based on the design of Ashkin *et al.* has some limitations, such as the trapped particles are susceptible to optical damage by absorptive heating because the centre of the trap is located in the high-intensity focal region of the beam. This hinders the earlier suggestion of biomedical and related applications involving micromanipulation of living cells (Block *et al.* 1990) chromosomes (Swoboda *et al.* 1993), spermatozoa (Tacgubana *et al.* 1999) and motor proteins. (Ye *et al.* 2004; Prentice *et al.* 2005). One basic approach for trapping low index particles is to generate a region of lower intensity, surrounded by a higher intensity region. Optical bottle fields also have applications in stimulated emission depletion (STED) fluorescence microscopy (De Jong *et al.* 2002), in which the three-dimensional nature of the bottle provides enhanced resolution along the longitudinal direction (Hell and Wichmann, 1994; Lenz *et al.* 1994). Various techniques have been proposed to generate bottle fields (Suyama and Zhang, 2013; Shvedov *et al.* 2008; Chen *et al.* 2004; Zhang *et al.* 2011). Many of these involve vortices generated by phase masks, spiral phase plates, or spatial light modulators (Loiko *et al.* 2013; Gbur and Visser, 2003). These methods typically rely on interference between two fundamental Gaussian modes, making them sensitive to alignment errors (Mahou *et al.* 2015). Tovar presented novel Laguerre–Bessel–Gaussian (LBG) beam as a solution to the paraxial wave equation in cylindrical dimensions in the year 2000. (Tovar, 2000). The LBG beams can reduce to the BG modes and LG modes by properly tuning the initial parameters. Subsequently, the non-paraxial propagation properties of vectorial LBG beams were researched based on vectorial Rayleigh–Somerfield formulae (Mei and Zhao, 2007). Recently, the Vector Diffraction theory was used to investigate the tight focusing properties of radially polarised

Optica Applicata, Vol. XLIX, No. 4, 2019
DOI: 10.37190/oa190407

Manipulating the magnetization focal patterns using complex phase filters

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Based on vector diffraction theory and inverse Faraday effect, the light induced magnetization distribution of a tightly focused azimuthally polarized Bessel–Gauss beam superimposed with a helical phase and modulated by an optimized multi belt complex phase filter (MBCPF) is analyzed numerically. It is noted that by adjusting the radii of different rings of the complex phase filter, one can achieve many novel magnetization focal distributions, such as sub-wavelength scale (0.29λ) and super-long (71λ) pure longitudinal magnetic probe and magnetization chain composed of nine, six and four magnetic spots of sub-wavelength scale. The authors expect that these results pave the path for fabricating magnetic lattices for spin wave operation, multiple atoms or magnetic particle trapping and transportation, confocal and magnetic resonance microscopy, as well as multilayer ultrahigh density magnetic storage.

Keywords: inverse Faraday effect, high NA lens, multi belt complex phase filter, azimuthally polarized Bessel–Gauss beam

1. Introduction

In the past two decades, controlling the magnetic state of a medium with the help of femtosecond laser pulses is an emerging and rapidly developing research area in the field of modern magnetism. Recent research has shown that it is possible to realize deterministic and controllable switching of magnetic orders by ultrafast light pulses [1–7]. Excitation of ultrafast magnetic oscillations through non-thermal optical processes has

Optics and Laser Technology 111 (2019) 623–630

Contents lists available at ScienceDirect

Optics and Laser Technology

journal homepage: www.elsevier.com/locate/optlastec

Full length article

Focusing properties of spirally polarized sinh Gaussian beam

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HIGHLIGHTS

- The tight focusing properties of spirally polarized sinh Gaussian beam is studied.
- Focusing properties are investigated theoretically by vector diffraction theory.
- Optical intensity in focal region can be altered considerably by the spiral parameter.
- Focal patterns including flattop profile, focal hole, axially separated focal spots are generated.

ARTICLE INFO

Keywords:
Focusing property
spirally polarized sinh Gaussian beam
Vector diffraction theory

ABSTRACT

The tight focusing properties of spirally polarized sinh-Gaussian beam is investigated numerically by vector diffraction theory. Results show that the optical intensity in focal region of spirally polarized sinh Gaussian beam can be altered considerably by the beam order, relative waist width and the spiral parameter that indicates the polarization spiral degree of the spirally polarized sinh Gaussian beam. Many novel focal patterns including flattop profile, focal hole axially separated focal spots and focal spot with long focal depth are evolved considerably for the suitable beam parameters. We expect such a tunable focal patterns are useful for optical manipulation of micro particles.

1. Introduction

Creating suitable focal patterns with precise structure and polarization in a focal region of high NA lens system plays an important role in applications including super-resolution imaging [1–3], particle trapping and manipulating [4–6], laser micromachining [7], optical lithography [8,9] and so on. A variety of peculiar optical field distributions in the focal region such as optical needle [10–14], optical chain [15–20], optical bubble or cage [21–23], spherical spot [24–26], and super long dark channel [27,28], etc. have been generated based on amplitude, phase and polarization Engineering. Beam shaping using spatially variant polarization has been a topic of much interest in the recent years owing to its advantages of achieving the desired focal structures and polarization in the focal region without using amplitude or phase filters. Recently, there is an increasing interest in laser beams with cylindrical symmetry in polarization. These so-called cylindrical vector beams can be generated by active or passive methods [29–32] and have been the topic of numerous recent theoretical and experimental investigations [33–36]. Radial and azimuthal polarizations are two basic components of cylindrical polarization. Achieving desired focal patterns using amplitude, phase and polarization within the pupil to generate many novel focal pattern have been studied [10–28]. However, the presence of phase filters or Amplitude filters makes some applications more difficult or even impossible. Bing Hao and James Leger have recently investigated the numerical aperture (NA) invariant focus shaping using spirally polarized beams. They proposed that spirally polarization is another kind of spatially variant polarization bearing radial symmetry [37]. The spirally polarized beam possess axially symmetric polarization patterns, with linear polarization at any point of the transverse profile and with the electric field lines being logarithmic spiral. Recent investigation of the tight focusing properties of spirally polarized beam suggested several possible applications such as as optical tweezers, particle trapping, laser cutting, material processing, microscopy, etc. [38–41]. Recently, Sun et al. introduce a new class of sinh-Gaussian beam called hollow sinh-Gaussian beams which is characterized by single ringed transverse intensity

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https://doi.org/10.1016/j.optlastec.2018.10.048
Received 27 July 2018; Received in revised form 3 October 2018; Accepted 22 October 2018
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RESEARCH ARTICLE

Focal Shifting of Double Ring Shaped Radially Polarized Multi Gaussian Beam

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ABSTRACT: Tight focusing of double ring shaped radially polarized multi gaussian beam with cosine phase plate is studied numerically based on vector diffraction theory. For higher-order, radially polarized mode beams as well as a fundamental mode (R-TEM$_{01}$*) beam, the strong longitudinal component forms a sharper spot at the focal point under a high-NA focusing condition. In particular, double-ring-shaped radially polarized mode (R-TEM$_{11}$*) beams can effectively reduce the focal spot size because of destructive interference between the inner and the outer rings. The mathematical expressions for the focused fields are derived. Simulation results show that the focused fields and phase distributions at focus are largely influenced by both the cosine parameter and beam diameter of the incident beams. Moreover, focal spot with flat-topped, two focal spots patterns can be flexibly achieved by carefully choosing the cosine parameter (C) and the ratios of the pupil diameter to the beam diameter (β) which confirms the potential of such beams in wide applications, such as optical tweezers, lithography, and material processing.

KEYWORDS: Vector diffraction theory, High NA Lens, Multi Gaussian beam, Optical trapping.

https://doi.org/10.29294/IJASE.6.1.2019.1193-1199

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1. INTRODUCTION

Tight focusing of radially polarized light is a very topical area of research [1-3]. It has been shown that, in many circumstances, focusing of radially polarized light results in a smaller focal spot than focusing linearly polarized light. Applications are in microscopy, lithography, metrology, nonlinear optics, optical manipulation, and optical micromachining. Gaussian beams are very similar to researchers and have found wide applications in many optical systems; however, this kind of beam is only one solution of the Helmholtz equation. In fact, Gaussian beam is one special case of Hermite-sinusoidal-Gaussian beams that are more general solution and were introduced by Casperson et.al. [4-6]. Hyperolic-cosine-Gaussian (cosh-Gaussian) beams are regarded as the special case of Hermite-sinusoidal Gaussian beams, and Gaussian beams are still base cases of cosh-Gaussian beams. The cosh-Gaussian beams have attracted much attention because their profiles can be altered by choosing the suitable decentered parameters in cosh parts [7-9], and propagation and focusing properties of cosh-Gaussian beams have become object of many works [10]. Zhang et al proposed the virtual sources for a cosh-Gaussian beam [11]. Zhang et al proposed the virtual sources for a multi Gaussian beam [12]. However, most of the studies on the radially polarized beam and its applications have concerned the so-called doughnut-shaped beam, which is represented as (TM$_{01}$ mode) [13, 14]. Recently, Kozawa *et al* report that the radially polarized higher-order Laguerre-Gaussian beam (LG) has higher a fundamental radially polarized mode performance than the low-order one and can generate the focal spot beyond the Abbe's diffraction limit 0.5λ. This kind of higher-order LG beam has concentric multi ring-shaped intensity pattern with π phase shift between the rings[15-17].

In the optical trapping system, it is usually deemed that the forces exerted on the particles in light field include two kinds of forces; one is the gradient force, which is proportional to the intensity gradient, and the other is the scattering force, which is proportional to the optical intensity [18, 19]. Therefore, the tunable focal shift predicts that the position of optical trap may be controllable. In fact, tracing the movement of the point of absolute maximum intensity along the axis has become the subject of a number of publications for several decades [20-23]. It was found that the point of absolute maximum intensity does not coincide with the geometrical focus but shifts along the axis towards the aperture of the optical system [22-24]. More interestingly, the focal shift may be in continuous in certain optical focusing systems. It was found that the focal shift may be accompanied by an effective permutation of the focal point, and this effect is referred to as focal switch [25,26]. Focal shifts have taken an important part in design and optimization of various optical systems and extremely important for

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Received: 15.06.2019 Accepted: 18.07.2019 Published on: 28.08.2019

Investigation on Hollow Beam Propagation through Turbulence Conditions in Free Space Optical Communication

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Received April 8, 2019; revised September 2, 2019; accepted September 2, 2019

Abstract— In Free Space Optical Communication (FSO), the optical signal from the laser source severely affects while travelling through free space atmospheric channel due to scattering, absorption and other effects of atmospheric turbulence conditions. This degrades the performance of FSO communication. In this article, we have generated the hollow beam from the laser output by the inverse axicon lens called inverted axicon beam. An artificial controlled turbulence chamber is created and the test signal has been transmitted through the turbulence conditions by employing various modulation schemes such as PAM, PWM, PPM, ASK, BPSK and QPSK separately. In all cases, we measured parameters phase jitter and Time jitter experimentally and the results are compared. Two types of wavelength laser sources such as red and green lasers are used for the analysis. In which, ASK provides a better withstand ability to jitter than other modulation techniques with atmospheric turbulence.

Keywords: Free Space Optical communication, hollow beam, ASK, BPSK, QPSK, PPM, PAM, PWM, phase jitter, time jitter

DOI: 10.3103/S1060992X19040027

I. INTRODUCTION

In recent years free space optical communication received the interest of optical community because of its un-measurable advantages [6]. It provides large scale data transformation over un-licensed spectrum [7], with faster data rate, large bandwidth, extremely narrow beam size, easy to deploy and redeploy [8], zero electromagnetic interference [9, 10]. The data transmission capacity of free space optical link is found to be larger than any other data transmission technique. Optical communication permits an increased information capacity than radio frequency based communication [11]. However several challenges underneath the performance of free space communication which are claimed as different environmental turbulence factors [3, 12]. Laser source preferred as a better data transmission source in FSO, but the transmitted signal over atmosphere get distorted due to turbulence. The major sources of the signal distortion are smoke, fog, aerosols, etc [15]. To transmit the confidentiality of the signal being transmitted, a suitable modulation scheme should be used. A better modulation scheme give decreased signal distortion and fluctuations their by achieving a better transmission efficiency [6]. It is observed that turbulence conditions produce considerable amount of error in the data reception [12]. The need for high-speed communications infrastructure is driving strong demand for high-frequency reference signal sources that provide stable output signals. One of the indicators used to evaluate the stability of these output signal waveforms is called "jitter". Jitter indicates a deviation or variation in the period of waveforms for a digital signal during transmission. In this experimental FSO analysis, the measuring parameters such as phase jitter and time jitter are used.

In this article discussed the experimental generation of hollow beam and it propagate to turbulence conditions. Researchers used several methods to generate the hollow beam experimentally. Generated the thin and hollow beams by using axicon lens with a large open angle by Yaoju [14]. Here large open-angle

J Opt
https://doi.org/10.1007/s12596-019-00571-9

RESEARCH ARTICLE

Generation of sub-wavelength longitudinal magnetic probe and multiple spots using circularly polarized annular multi-Gaussian beam

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Received: 28 March 2019 / Accepted: 1 November 2019
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Abstract Based on vector diffraction theory and inverse Faraday effect, we numerically studied the magnetization induced by a tightly focused circularly polarized annular multi-Gaussian beam. Numerical result shows that the magnetization spot as small as 0.4 λ which extends up to 8 λ can be induced for incident circularly polarized annular multi-Gaussian beam (CPAMGB). We also noted that the depth of focus of the generated magnetization spot can be very well improved up to 48 λ through suitable phase modulation to the incident CPAMGB by means of specially designed complex phase filter. Moreover, we also noted that one can generate a chain of magnetization spots of different numbers and sizes upon suitably changing the beam order of CPAMGB and radii of complex phase filter. We expect that such a study will be fruitful for experimental realization of all-optical magnetic recording, multiple magnetic particle trapping and transportation, confocal and magnetic resonance microscopy, as well as multilayer ultra-high-density magnetic storage.

Keywords Inverse Faraday effect · High NA lens · Multi-belt complex phase filter · Circularly polarized annular multi-Gaussian beam

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Introduction

The ultra-fast response of the light-induced magnetization field in the magneto-optical film is of great interest in recent years owing to its potential application in all-optical magnetic recording (AOMR) [1–3], confocal and magnetic resonance microscopy [4], atom trapping [5, 6], and multi-dimensional magneto-optical data storage [7, 8]. All these applications demand a pure longitudinal magnetization focal structure, which allows a well-defined magnetization direction in a material on an ultra-small 3D volume beyond the diffraction limit ($\sim \lambda^3/8$). Such a magnetization focal structure is vital for applications including high-density magneto-optical data storage and high-resolution magnetic resonance microscopy. Apart from this, spherical 3D super-resolution spot multiple into an array is a strategy demand to enhance the processing speed and power efficiency of the magneto-optical recording. Such a chain of magnetization spot is also essential for multiple magnetic particle trapping and manipulation. In this respect, numerous endeavors have been devoted to tailor the magnetization structure through manipulating the mutual interaction between the polarization singularities of cylindrical polarization beam and optical vortex [9–13], in conjunction with amplitude/phase modulation [14–20]. The tightly focused circularly polarized beam with a high-numerical aperture objective has been considered as an effective method to generate and reverse the longitudinal magnetization in the magnetic material upon changing the handedness of a circularly polarized beam [21–26]. It has been reported that deterministically switching the orientations of magnetization of certain materials [27–30], including rare-earth transition metal alloys [1, 31], CoPt [32–35], and their multilayer films [3], is done by changing the helicity of a tightly focused circularly polarized femtosecond laser pulse. However, the

Published online: 13 November 2019

Contents lists available at

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

Tight focusing properties of phase modulated azimuthally polarized doughnut Gaussian vortex beam by high NA parabolic mirror

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ARTICLE INFO

Article history:
Received 23 April 2019
Received in revised form 5 July 2019
Accepted 5 July 2019
Available online xxxx

Keywords:
Azimuthally polarized
Doughnut Gaussian vortex beam
Vector diffraction theory
Multi belt complex phase filter
High NA parabolic mirror

ABSTRACT

The intensity distribution in the focal region of a high NA parabolic mirror for the incident azimuthally polarized doughnut Gaussian vortex beam (DGVB) transmitted through a multi belt complex phase filter (MBCF) is studied using vector diffraction theory. By properly designing the phase of the incident beam using MBCF and by tuning the beam parameters of a DGVB, it is possible to switch the focal spot with sub wavelength dimension and long focal depth in to multiple focal spots suitable for particle acceleration, atom optical experiments, and near-field scanning optical microscopy.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Emerging Materials and Modeling.

1. Introduction

Polarization, as a vector nature of light, attracts considerable number of researchers. It has been utilized in various applications, such as data storage, optical lithography, optical measurement and optical microscopy [1–3]. Owing to the unique focal patterns the tight focusing of radial and azimuthally polarized beams are of great interest [4–7]. Tight focusing of a radially polarized beam generates a focal spot with strong longitudinal component [8]. Whereas tightly focused azimuthally polarized beam with a high NA objective generates a focal hole [9]. Such a focal hole can be modified into a significantly sharper focal spot when a vectorial phase encoded on the azimuthally polarized beam, which is purely transverse electric field [10]. Such a pure transversely polarized beam is essential for applications such as imaging of silicon integrated circuits and in optical recording which involves tight focusing of laser beam through a dielectric interface [11–13]. In such applications, the longitudinal focal field generated by a tightly focused radially polarized beam suffers discontinuity at the interface of two neighboring media and enlarges the focal spot in high NA medium. However, the transverse field generated by the azimuthally polarized vortex beam generates immunity to the presence of medium interface and maintained its spot size for several wavelengths after passing through the interface [11]. Since such applications also demands diffraction free focal segment with long focal depth, many methods are recently adopted to improve the focal depth of the transversely polarized focal field. Yuan et al. recently demonstrated that transmitting azimuthally polarized beam through a multibelt spiral phase hologram and a high-NA lens generates transversely polarized focal spot with FWHM of 0.53λ and focal depth around 4.84λ [14]. Similarly, the generation of transversely polarized focal spot with FWHM of 0.587λ with increased depth of focus of 7.23λ was demonstrated by tightly focused non-diffracting quasi-circularly polarized beams [15]. Nie et al. recently demonstrated the generation of transversally polarized optical needle with focal spot size of 0.465λ and focal depth of 5.76λ, using a specially designed complex filter (CPF) illuminated by a double ring shaped azimuthally polarized beam [16]. In comparison with previous work, a much reduced spot size of 0.259λ was generated by tight focusing of azimuthally polarized light beam with a combination of five belt binary optical element and vortex phase plate [17]. An exceptionally transversely polarized optical needle of 5.83λ with suppressed side lobes is generated by tight focusing a hybrid polarized beam [18]. Sundaram et al. theoretically demonstrated a method to generate transversely

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https://doi.org/10.1016/j.matpr.2019.07.389
2214-7853/© 2019 Elsevier Ltd. All rights reserved.
Selection and peer-review under responsibility of the scientific committee of the International Conference on Emerging Materials and Modeling.

Please cite this article as: N. Umamageswari, M. Lavanya, M. Udhayakumar et al., Tight focusing properties of phase modulated azimuthally polarized doughnut Gaussian vortex beam by high NA parabolic mirror, Materials Today: Proceedings, https://doi.org/10.1016/j.matpr.2019.07.389

RESEARCH ARTICLE

Focal Hole Shifting of Azimuthally Polarized Sinh Gaussian Beam using Cosine Phase Filter

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ABSTRACT: Optical intensity distributions in the focal region play an important role in many optical systems. In this paper, the tunable focusing properties of azimuthally polarized sinh Gaussian beams induced by cosine phase masks are investigated theoretically by vector diffraction theory. Results show that when the azimuthally polarized sinh Gaussian beam with cosine phase plate is focused, the focal pattern differs considerably with frequency parameter (C) in the cosine function term. Increasing the value of frequency parameter in the cosine part of the phase mask, focal shift may occur, including multiple-peak focal pattern were also given to show that the focusing properties of this kind of sinh beams may be used to construct tunable optical traps.

KEYWORDS: Azimuthally polarized beam,Vector diffraction theory, Sinh Gaussian beams, High NA lens, Optical Trapping.

https://doi.org/10.29294/IJASE.6.4.2020.1476-1481

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1. INTRODUCTION

Radially and azimuthally polarized vector beams are now among the more well-known cylindrical vector beam categories. Cylindrical vector beams demonstrating cylindrically symmetric polarization have attracted considerable interest because of their potential applications in electron acceleration [1], optical trapping and manipulating [2], and material processing [3], high resolution microscopy [4] surface plasmon excitation[5], atomic spin analysis [6],and spectroscopy [7]. Two procedures, known as the passive and active methods, generate radially and azimuthally polarized beams [8]. Among these applications, particular interest has been given to the high numerical aperture (NA) focusing property of these beams and their application as a high-resolution probe. Due to the symmetry of the polarization, the electric field at the focus of a cylindrical vector beam has unique polarization properties. For example, it has been shown that the longitudinal component of the focus from such a cylindrical beam is much stronger than the transversal component, and the size of the longitudinal focus is much smaller than the transversal focus [9, 10]. Recently, one kind of Hermite-sinusoidal-Gaussian beams, which named sinh-Gaussian beam, has been received intensive attentions [11]. The similarity of hollow sinh-Gaussian (HsG) beam and higher-order Laguerre-Gaussian beam is the intensity null at center. Therefore, a radially polarized HsG beam will show similar focusing characteristics comparing with higher order Laguerre-Gaussian beam. The more general solution is Hermite-Sinusoidal-Gaussian beams, which was introduced by Casperson and coworkers [12,13]. Hyperbolic-cosine- Gaussian beams are regarded as the special case of Hermite-sinusoidal-Gaussian beams, and are of practical interest because their profiles can be altered by choosing suitable beam parameters in cosh parts [14].Among the variety of types of gaussian beams, e.g.Laguerre- Gaussian (LG) beam [15], the high order hollow sinh-Gaussian beam [16], Multigaussian beam [17], Hollow gaussian beam are discussed in depth [18].On the other hand, research on optical vortices has grown rapidly, because optical vortices have some interesting properties and applications [19-20]. Evolution of the optical vortex was found in stochastic vortex fields [21]. Vortex array laser beams have attracted much interest due to their special mesh field distributions, which show great

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Received: 15.02.2020 **Accepted**: 21.03.2020 **Published on**: 27.03.2020

Contents lists available at ScienceDirect

Optics Communications

journal homepage: www.elsevier.com/locate/optcom

Sensitivity enhancement of surface plasmon resonance sensor using hybrid configuration of 2D materials over bimetallic layer of Cu–Ni

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ARTICLE INFO

Keywords:
Surface plasmon resonance
Biosensor
Sensitivity
Copper
Nickel
Transition metal dichalcogenides

ABSTRACT

This Theoretical study aims at improving the sensitivity of surface plasmon resonance biosensor under angular interrogation. We observed that the sensor configuration composed of bimetallic layer of Cu-Ni attached with 2D materials MoS_2/WS_2/$MoSe_2$/WSe_2/graphene enhanced the sensitivity of the sensor to a great extends. The thickness of the bimetallic layers and the number of layers of 2D materials are optimized to achieve maximum sensitivity. Numerical results shows that sensitivity as high as 480°/RIU is achieved for the well optimized bimetallic configuration consist of 35 nm of Cu and 20 nm of Ni thickness for the analyte refractive indices ranging from 1.33–1.335. Up on functionalizing the metal layers with bimolecular recognizing 2D materials, we noted that configuration with 35 nm of Cu, 15 nm of Ni with monolayer of 2D material WS_2 enhanced the sensitivity as high as 426°/RIU. We expect that such a simple structure and promising results will lead the proposed sensor as a suitable and potential candidate for detecting biomolecules organic elements and other analytes.

1. Introduction

Surface plasmon resonance (SPR) biosensors, as a very effective sensing technology possess high accuracy, high sensitivity and rapid detection which finds numerous applications in many areas including drug discovery [1], medical diagnostics [2], enzyme detection [3] and immune sensor [4]. The SPR sensors are of many type and the Kretschmann configuration based on angular interrogation method is regularly used. This is due to the advantages of directly incorporated the metal layer over prism and usage of monochromatic light source to attain the high single-to-noise [5]. Generally, Gold (Au) and silver (Ag) are widely used plasmonic material for SPR sensor [6,7]. Since oxidation tendency, material loss and corrosion of the metals are subjected to weak the plasmonic property [6]. Gold is usually considered as the most suitable material as it possesses good resistance to oxidation and corrosion, better chemical stability and superior optical performance [8]. However, Au possess broad resonance peak that reduce the accuracy of analyte detection. Moreover Au is lossy and shows poor biomolecular binding capacity [9–11]. On Contrary, the SPR sensor based on Ag film shows highest resolution, but relatively poor sensitivity when compared to Au [12]. However Ag is chemically not stable and could be oxidized easily [13,14]. Recently many materials including graphene coating over silver and utilization of bimetallic combination of (Au–Ag) are suggested to overcome the oxidation problem of Ag [10,15–19]. However those methods are found not suitable for long-term plasmonic applications and have limited sensitivity [12,15]. Copper (Cu) on the other hand is much cheaper than Au and Ag and it is the second most conductive material other than silver. Since Cu oxidizes much easily, it has not receive much attention as a plasmonic material [6,20]. Recently Singh et al. suggested that the oxidization problem of Cu can be avoided by suitable oxide coatings [21]. Sharma et al. suggested that utilizing a thin layer of Pt over copper can enhance the sensitivity of the SPR sensor apart from preventing the cu being oxidized [22]. Recently, Rifat et al. suggested that graphene coating over Cu protects the Cu being oxidized and improved durability of the sensor, and its plasmonic performance is more stable [23]. Also, ferromagnetic metal nickel (Ni) receives interesting attention owing to its remarkable magneto optical properties and magnetic properties [24–26]. Shukla et al. suggested that utilizing such inert magnetic metals not only reduces the cost of the SPR sensor but improve its performance greatly [27].

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https://doi.org/10.1016/j.optcom.2020.125337
Received 26 April 2019; Received in revised form 14 January 2020; Accepted 16 January 2020
Available online 18 January 2020
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J. Environ. Nanotechnol.
Volume 8, No. 3(2019) pp. 30-33
ISSN (Print): 2279-0748
ISSN (Online): 2319-5541
doi:10.13074/jent.2019.09.193373

Synthesis and Characterization of Poly Ortho Toluidine Doped with Commercial TiO_2 Nanoparticle

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Received: 21.08.2019 Accepted: 25.09.2019

Abstract

The aim of this work was to study the changed properties of commercial TiO_2 with conducting polymer such as poly ortho toluidine were synthesized by chemical oxidative polymerization. The metastable anatase phase of TiO_2 and POT+ TiO_2 composites were characterized by using X-Ray Diffraction analysis (XRD), Scanning Electron Microscopy (SEM-EDX) and Fourier Infrared Spectroscopy (FTIR). The bandgap of samples find out by UV-Visible spectroscopy.

Keywords: *Commercial TiO_2, FT-IR, Polyortho toluidine (POT), SRD, UV-Vis.*

1. INTRODUCTION

Conducting polymer such as poly aniline is considered to be unique due to its excellent electrical and optical properties. Poly aniline have been used in variety of applications such as corrosion protection, catalysis, sensors because of its non-redox doping, good environmental and thermal stability, high conductivity and economic feasibility. The properties of conducting polymer composites depends upon the doping concentration of nanoparticles (Tieli Zhou *et al.* 2015; Kiran Kumari *et al.* 2011). Among conducting polymers poly ortho toluidine is highly attracted and it has better solubility and higher processability by steric hinderence π-electron effects (Gigliola Lusvardi *et al.* 2017). TiO_2 is a semi conducting nanoparticles play an important role in wide range of applications due to its good photo catalytic activity and used for large scale production, cosmetics and air purification. The three types of crystallographic structures of TiO_2 are anatase, rutile and brookite. Among all these phases rutile is the most stable one where anatase and brookite corresponds to metastable and unstable states (Bin-Wang *et al.* 2015).

The aim of this work was to study the changed properties of TiO_2 due to the presence of poly ortho toluidine in the composites. Chemical oxidative polymerization method is used to synthesize poly ortho toluidine. Here we report the synthesis as well as structural and optical properties of poly ortho toluidine doped with TiO_2 nanoparticles. The functional groups of materials were determined by Fourier infra red spectroscopy (FTIR).The functional groups of samples were examined by FTIR spectroscopy. The morphology, structural and band gap of TiO_2 and Poly ortho toluidine/TiO_2 composites can be carried out by SEM-EDX, XRD and UV spectroscopy.

2. EXPERIMENTAL DETAILS

2.1 Materials & method

O-toluidine (99% AR grade, Lobal chemie laboratory reagents & fine chemicals), H_2SO_4, Ammonium peroxo disulfate (>98%, Merck), Commercial TiO_2 (98%,Fisher scientific), Millipore – Q water were used as received.

Poly ortho toluidine- TiO_2 composites has been synthesized by chemical oxidative polymerisation at room temperature. In this process, an appropriate amount of size reduced TiO_2 is dispersed in 0.2 M of H_2SO_4 by ultrasonication. After that this dispersed TiO_2 solution is added slowly to 0.1 M aqueous solution of O-toluidine with continuous stirring for 30 minutes.0.1 M aqueous solution of ammonium peroxo disulfate was added dropwise to polymerisation bath to initiate the polymerization and the solution was left for 4 hr with continuous stirring. Later the solution was allowed to kept for overnight. The resultant precipitate was filtered and washed several times with acetone followed by

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INTERNATIONAL JOURNAL OF ENGLISH LANGUAGE, LITERATURE AND TRANSLATION STUDIES (IJELR)
A QUARTERLY, INDEXED, REFEREED AND PEER REVIEWED OPEN ACCESS INTERNATIONAL JOURNAL
http://www.ijelr.in (Impact Factor : 5.9745 (ICI)

RESEARCH ARTICLE

Vol. 5. Issue.3. 2018 (July-Sept)

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA
2395-2628(Print):2349-9451(online)

ATTRIBUTES OF SIGNS IN SHANGHAI GIRLS: AN OVERTONE OF CHINESE ZODIAC

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KARUNASHREE.V.S

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ABSTRACT

Lisa See is a contemporary writer from Los Angeles and has written novels such as *Dragon Bones*, *The Interior*, *Peony in Love*, a memoir *On Gold Mountain*. Her first book, *On Gold Mountain: The One Hundred Year Odyssey of My Chinese-American Family* (1995), is a national bestseller and a New York Times Notable Book. The organization of Chinese American Women has named the 2001 National Woman of the year. Her writings deal with stories that have been lost, forgotten, or deliberately hidden, both in the past and in the contemporary social milieu. *Shanghai Girls* (2009) is a story of two loving sisters who experience the challenges that life force on them. They give up their western tradition in order to become ideal wives and daughters-in-law after their marriage to the Louis family in America. See has designed her characters in a unique way by implying their Chinese birth signs. It is believed in Chinese mythology that the years represented by the zodiac animals affect the characters of people. The Chinese believe that there is correlation between humans and the twelve zodiacal animals.

Keywords: Chinese calendar, Zodiac Signs, Myths, Characterization, Animal attributes.

INTRODUCTION

Culture of a nation is well established by its myths. Myths are pivotal part of the cultural backdrop as they enlighten people about culture and values by highlighting moral issues. "Chinese Mythology is a collection of cultural history, folktales, and religious tradition that has been passed down for centuries in oral or written form"(1). Chinese myths and legends were in the form of oral tradition for nearly thousands of years initially.

These later found their places in books and novels which serve as a source of authentication today. Books such as *Fengshen Yanyi*, *Shui Jing Zhu* and *Shan Hai Jing* provide details about the Chinese myths. *Fengshen Yanyi* or Anointing of the Gods is a mythological fiction that deals with the founding of Zhou dynasty. *Shui Jing Zhu* deals with history and geography of China. *Shan Hai Jing* gives an account of ancient China, its sea, mountain, customs and medicines. 'Zhiguai' is a literary genre that deals with supernatural events and stories in China.

Shanghai Girls (2009) is set in 1937 which carves the lives of two beautiful young sisters Pearl and May. The two girls lead a very happy life by adopting their ever-cherishing western modern life. They are

Vol.3 Special Issue 1 March 2019 E-ISSN: 2456-5571

WHO AM 'I'? – TRAUMATIC EXPERIENCES OF TRANSGENDERS: A COMPARATIVE STUDY OF DAVID EBERSHOFF'S THE DANISH GIRL AND LIVING SMILE VIDYA'S I AM VIDYA: A TRANSGENDER'S JOURNEY

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Abstract

Do transgenders understand gender identity? Are they able to tell the story of their gender to others?In social identity, the transgender refers to "neither just male nor just female". Mostly biological male or female possess masculine or feminine gender respectively.However, for transgender their biological sex does not match with their masculine gender or feminine gender.The transgender struggles to reveal their identity to the society.They are unable to inform their pronouns (either he or she) that are used to address them.They would always have the feeling that they are trapped in a wrong body.The transgender becomes transphobic to reveal their identity to the society.The transgender face many problems such as discrimination, violence, neglection and harassment in this society.This paper is an attempt to compare the lives of transgender as portrayed in David Ebershoff's The Danish Girl and Living Smile Vidya's I am Vidya: A Trangender's Journey.In the American Novel, The Danish Girl, the protagonist Einar Wegener struggles to find his identity and becomes Lili Elbe.She tears between loyalty to her marriage and her own desires.In the autobiography of Indian writer, Living Smile Vidya's I am Vidya: A Transgender's Journey, the author who born as Saravanan declares herself as Vidya to claim her identity.

Keywords: *Transgender, Identity, Gender, Nation, Trauma, Literature.*

Introduction

"Who am I?" This may be the question that arises in the minds of transgender people. The term transgender is explained by examining the concept of sex and gender. Sex is a term that is referred and labeled at the time of birth. It refers to physical and biological traits that are linked to label a person as male or female. The term gender is complicated because it differs across time and culture. Gender identity is assumed to be congruent with biological sex. Male is identified as masculine and female is identified as feminine. However this may not be true for everyone because some people who are biologically male feel strongly feminine and some people who are biologically female may feel strongly masculine. These people are neither male nor female. They are blend of both. These people have existed in every culture through out every era.

The term transgender is an umbrella term, dating to mid-1990s. Transgender people feel that they are born in wrong body. Therefore, they decide to undergo surgery to take the physical part of their desired sex. Like Lesbian, Gay and Bisexual, Transgender do experience discrimination, oppression, fear, shame, violence and harassment in the society.

Hinduism has the concept of a third sex or third gender. "Tritiya-Prakriti" which literally means third nature. Lord Vishnu took the avatar of Mohini and procreated with Lord Shiva to give birth to Ayyappa. Lord Krishna in Mahabharatha becomes Mohini to marry Aravan who is the son of Arjun. Lord Shiva's embodiment of Ardhanarishvara is an and rogynous composite of Shiva and Parvati. The Greek and Roman mythologies often have gay, bisexual or transgender as symbols for sacred or mythic experiences. LGBT topics have long been a part of all religions and mythologies. This paper compares and analyses the traumatic experiences of transgenders in David Ebershoff's *The Danish Girl* and Living Smile Vidya's *I am Vidya: A Trangender's Journey.*

The Danish Girl is written by American writer David Ebershoff. This novel narrates the true story of Einar

2018 - 19

Language in India www.languageinindia.com **ISSN 1930-2940 18:10 October 2018**
R. Rajalakshmi, Editor: Select Papers Presented in the Conference
Reading the Nation – The Global Perspective
St. Joseph's College for Women, Tirupur, Tamilnadu

Gita Mehta's *A River Sutra*: A Silent Symphony of Indian Culture and Heritage

P.M.S. Renuga, Guest Lecturer

Abstract

Culture can be referred to beliefs, customs, values and practices of a particular group of people of a country. Greenblatt quotes the anthropologist Edward B. Taylor as defining culture as, "that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society". India is a secular nation and possesses cultural amalgamation of various religions. Indian culture and heritage becomes an inseparable features in the life of people who lives in India. This paper examines Gita Mehta's perspectives on Indian culture and heritage.

Gita Mehta is an Indian writer and director of Television documentaries. Her novel *A River Sutra* portrays the mythological time, historical time and contemporary time that knits the lives of various characters who encounter the river Narmada. The novel emphasizes Indian culture and heritage. The story begins with a nameless bureaucrat who follows Hindu convictions of life. His conversation with various characters brings out the importance of culture and heritage in their lives. The writer fabricates the practices of different religions in India, nature's role in Indians and the souls thirst of salvation. The novel is a series of stories of Hindus, the Jain, the Muslims, the bandits, the sages, the tribal and the anthropologist who form a gallery on the river banks of Narmada. The river becomes a sutra in the lives of these characters.

Keywords: Indian culture and heritage, feminine principle, metaphysical, Jainism, Islam and Hinduism.

Indian culture is an amalgamation of various religions. The culture and heritage play an inevitable role in the life of Indians. The Indians follow different systems, practices and convictions. However, there is Unity in Diversity. Indian culture is found to be the first and the supreme culture in the world. India's dynamic culture begins with a mysterious culture along the river Indus. Indian Civilization begins with Indus Valley Civilization and it is also influenced by Aryan Civilization. Other Westerners like Greek, Europeans and Romans have left their impressions on this civilization. However, this civilization has its own uniqueness. The religions like Hinduism, Buddhism, Sikhism and Jainism play a major role in the culture and heritage of Indians. Nevertheless, religions like Islam, Christianity and Judaism are respected equally. The present culture of India reflects a collective heritage of the past. It is indeed that Indian culture is varied, rich and diversified with its own uniqueness.

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Portrayal of Psychic Trauma and Challenges in an Ordinary Individual's Life in Indian Society in Rohinton Mistry's: A Fine Balance

Introduction: Rohinton Mistry as a postcolonial diasporic writer born in Bombay 1952, as he belong to parsi religious community in India, he moved Canada in 1975. To overcome stigma of marginality, he has portrait the struggle of Parsi community in all his writings. Parsi community can be called as a minority both in India as well as in the space of international literature.

A Fine Balance – the novel is set in the mid 1970s in India. It tells the story of urbulent times of the country's partition in 1947 due the state of emergency in 1975. The ovel highlights the real history of the nation to the declaration of emergency by Indira iandhi in 1975. Throughout his work he narrates the nation and about the people suffering om the current political situation in India. The human spirit is crushed during the nergency.

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INDIAN SOCIAL REALISM IN ROHINTON MISTRY'S: A FINE BALANCE

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Abstract:

A Fine Balance is Rohintons Mistry's second novel published in 1995 in an unnamed city called Bombay. It is the year in India that Prime Minister Indira Gandhi has declared a 'State of Internal Emergency'. The novel has received Los Angeles Times Book Prize and the Commonwealth Writers Prize and has shortlisted for the prestigious Booker Prize. Rohinton Mistry has captured the textures of India well and creates large than life characters with compassion, humour and the social reality of life. They are suffering from poverty, despair and violence. The author has reflected his area of interest on Parsi ife to set a record of how they lived and how they are coming to terms with their new lives in the West. In this novel- A Fine Balance, Mistry portray's the story of a middle-class Parsi family living through a domestic crisis. The novel focuses on two historical events: the partition due to Indian Independence in 1947 and the State of Internal Emergency occurred between 1975-1977. It also concerns of four characters from varied backgrounds, which come together and develop a bond of looking after each other though they are from other communities. It transforms our understanding of life. That is life can be lived in any way but there are certain rules and regulations, and has to be followed to live in the society.

Introduction

Rohinton Mistry, born and brought up in Mumbai in 1952. He did his undergraduate in Mathematics and Economics from St.Xavier College, Mumbai. He emigrated to Toronto in 1975. He is a renowed author of three novels- Such a long journey (1991), A Fine Balance(1995), and Family Matters(2002). He is also the author of one collection of short stories Tales from Firozsha Bhaag. He is an Indian born writer belonging to the Parsi community, settled in Canada to represent the multicultural facts of the country. A Fine Balance- set in the mid of 1970's in India. It was first published in 1995. The plot is an unnamed city that the audience can clearly guess is Bombay. It tells the story of four characters- Dina Dalaa, Omprakash, Ishwar Darji and Maneck, whose lives come together during a time of political turmoil soon after the Government declares a State Internal Emergency-19975- 1977, underlying the most hideous aspects of life such as poverty, despair and violence and their fates-which become inectricably linked in ways no one could have foreseen.

Fine Balance is Rohintons Mistry's second novel published in 1995 in an unnamed city called Bombay. It is the year in India that Prime Minister Indira Gandhi has declared a 'State of Internal Emergency'. The novel has received Los Angeles Times Book Prize and the Commonwealth Writers Prize and has shortlisted for the prestigious Booker Prize. Rohinton Mistry has captured the textures of India well and creates large than life characters with compassion, humour and the social reality of life. They are suffering from poverty, despair and violence. The author has reflected his area of interest on Parsi ife to set a record of how they lived and how they are coming to terms with their new lives in the West. In this novel- A Fine Balance, Mistry portray's the story of a middle-class Parsi family living through a domestic crisis. The novel focuses on two historical events: the partition due to Indian Independence in 1947 and the State of Internal Emergency occurred between 1975-1977. It also concerns of four characters from varied backgrounds, which come together and develop a bond of

IMPACT FACTOR – 4.23

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ISSN 2349-5189

An International Peer-Reviewed Open Access Journal

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CULTURAL HEGEMONY AND MYTHICAL ALLUSION IN GITA HARIHARAN'S NOVEL *THE THOUSAND FACES OF NIGHT*

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ABSTRACT

Cultural hegemony refers to domination or rule maintained through ideological or cultural means. Cultural hegemony functions on the basis of views framed by the ruling class, and the social and economic structures may only benefit of the ruling class. The Italian philosopher Antonio Gramsci developed the concept of cultural hegemony out of Karl Marx's theory that the dominant ideology of society reflects the beliefs and interests of the ruling class. As such as, the group that controls these institutions and controls the rest of the society. This paper examines how the versatile writer Gita Hariharan uses the genre of fiction as a tool to convey the culture to readers showing the Indian myth extensively. The novel depicts the reality of women who struggle to survival even ordinary circumstances of their life. These women and their struggling strategy can be compared to mythical women who also struggled similarly for their survival. It also depicts the reality for considerable part of womanhood and focuses the marital bond and shows the disturbance and turbulence in the minds of the characters, because of the spread of the social cultural terms. The novel revolves around women's dilemma in contemporary India. The author portrays the position of women in the tradition and culture of male dominated society. She explores which focuses her to struggle for self-realization. It is about the journey of Indian women through tradition to modernity in search of self-identity.

Key words: Cultural Hegemony, Myth, Women, Survival, Self-Identity.

In Marxist Philosophy, the word Cultural Hegemony is the domination of a culturally diverse society by the ruling class who manipulate the culture hegemony are perceptible at the personal level, although each person lives a meaningful life in their social classes in a society. The social classes might appear in cases might in every individual person's life. Yet, when understood as a whole society, the life of each person des commit to the greater social hegemony. The cultural hegemony is revealed and maintained by an existenve of minor, different circumstances are not fully observed by the men and the women living culture.

BBA - A 18-19 (3)

RESEARCH REVIEW JOURNALS
Volume: 03
Issue: 11
November -2018

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC listed Journal]

Influence of Organizational Climate on Employee Behaviour and Performance in Spinning Mills at Dindigul District

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ARTICLE DETAILS

Article History
Published Online: 10 November 2018

Keywords
Organisational climate, Working Atmosphere, Welfare Facilities, Employee Behaviour, Employees' Performance

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ABSTRACT

This paper explores the influence of organizational climate on employee behavior and subsequently their performance in spinning mills at Dindigul district. Two components of organizational climate viz. working atmosphere and welfare activities are considered important. It is assumed that a positive organizational climate will have an impact on employees' behavior which will in a row enhance their performance. This paper reflects the outcome of a study conducted on fifty employees of spinning mills in Dindigul district to know the sequential influence of organizational climate on employees' behavior and performance. These employees were selected to the researcher' s convenience. Data were collected through questionnaires which recorded the selected employees' responses on a 5 point scale in the continuum of agreeing. Reliability of this tool was found at 0.72 and 0.88. Path analysis was used for data analysis. The analysis revealed that working atmosphere and welfare facilities have an influence on employee behavior and further the employees' behavior has an impact on their productivity. The outcome of the study strongly suggests that the management of spinning mills in Dindigul district should ensure better working atmosphere and welfare facilities to its employees for ensuring positive work behavior and increasing employees' performance.

1. Introduction

Organizational climate is a widely spoken topic within the manufacturing industry. It has been a crucial area of focus in textile industry. Organizational climate has even greater scope in spinning mills at Dindigul district which attracts labour from various walks of life. Organisational climate has a strong connection with leadership in management functions. Climate exists in several levels, together with work surroundings and welfare facilities provided to the workers in an organization. Organisational climate contributes in terms of many positive inputs to the overall productivity of the organization including employee behaviour, morale and performance. Work climate in organization is an integral part of the functioning as it reflects in its employee' s behaviour.

Behaviour and performance of the employees are the key result areas of the climate prevailing in an organization. Work atmosphere and welfare facilities are the two major contributors to organizational climate and stands as the key units in measuring organizational climate among various other factors. The aim of organizational climate is to boost commonness and cohesion, and to stimulate employees' enthusiasm and power to boost the organization' s economic potency. Additionally, organizational climate greatly influences worker behavior and eventually employee' s performance. The aim of this study is to search out the relationship between organizational climate, employees' behaviour and employees' performance.

2. Review of Literature

Fritzsch (2009) explored that various configurations of organizational climate and organizational strategy lead to strategic employee behavior which is crucial for organizations to reach their goals and also found that strategic employee behavior is related to the fit between the organizational strategy as perceived by all employees and the organizational climate within an organization. The results reveal that fit is negatively related to innovative work behavior and the customer-oriented behavior; knowledge sharing and affective commitment are not significantly related to fit.

Riggle (2007) investigated that organizational climate variables such as perceived organizational support, ethical climate, and trust do positively impact employees psychological and behavioral outcomes. However, Parker, et al. (2003) explained that work attitudes also mediate the effects of climate on employee performance and motivation. Whereas Glisson and James (2002) viewed that the organizational culture influences work attitudes like job satisfaction, commitment, service quality and staff turnover etc.

Nanda and Panda (2013) stated that Rourkela Steel Plant has adopted a better kind of welfare activities which create an effective working environment and thus better productivity. The different kinds of welfare schemes like medical allowance, death relief fund, insurance, housing, transport, recreation club facilities, etc., are provided by the company to the employees to maintain better industrial relations. Walking in the similar path Rajkuar (2014) opined that Employees are highly perishable, which need constant welfare measures for their upgradation and performance in this field, the social and economic aspects of life of the workers have direct influence on the social and economic development of nation. Lalitha and Priyanka (2014) stated that the welfare measures need not be in monetary terms only, but in any kind/forms. Employee welfare includes monitoring of working conditions, creation of

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BBA A-18-19

RESEARCH REVIEW JOURNALS
ICIMP-2018
SEP- 2018
Special Issue

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC Listed Journal]

Problems of Textile Industry in Karur Town

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ARTICLE DETAILS

Article History
Published Online: 03 Oct 2018

Keywords
Determinants, Motivation, Organisational Pattern, Production and Productivity

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ABSTRACT

Textile Industry in India is the second largest employment generator after agriculture. It holds significant status in India as it provides one of the most fundamental necessities of the people. The textile sector in Tamil Nadu has been growing fast due to the competitive advantages developed by the sector. However, the balanced development of this industry in "Karur," a major textile hub and a town of Tamil Nadu is not that much significant due to various problems. Analyzing the problems of manufacturers would be very much useful to take preventive measures. Identifying the own production problems, managerial problems, marketing problems and financial problems would also help the textile authorities to provide valuable suggestions to the manufacturers and exporters of this industry. Further, studying the problems related to the individual companies is much essential for raising their standard and would also help the textile units to reduce their ravages and earn more profit. With a view to address these needs, a study on the problems of textile companies located in Karur was conducted by the authors of this paper during the year 2017. Some of the major issues and basic problems affecting this sector's balanced development in this town are explained in this paper.

1. Introduction

The Indian Textile industry has a significant presence in the economy as well as in the international textile economy. Its contribution to the Indian economy is manifested in terms of its contribution to the industrial production, employment generation and foreign exchange earnings. It contributes 20 percent of industrial production, nine percent of excise collections, 18 percent of employment in the industrial sector, nearly 20 percent to the countries total export earnings and four percent to the Gross Domestic Product.

The textile industry occupies a vital place in Indian economy and contributes substantially to its exports earnings. Textiles exports represent nearly 30 percent of the country's total exports. It has a high weight age of over 20 percent in the National Production It provides direct employment to over 15 million persons in the mill, power loom and handloom sectors. India is the world's second producer of textiles after china. It is the world's third largest producer of cotton-after China and the USA and the second largest cotton consumer after China.

2. Textile Industry in Tamil Nadu

Textile industry is one of the traditionally well-developed industries in Tamil Nadu. Tamil Nadu has a strong production base and accounts for about 1/3rd of Textile production in the country. The net value addition in Textile industry in Tamil Nadu is about 37.5 percent, the highest in the country. The Textile mills are concentrated in Coimbatore, Tirupur, Salem, Palladam, Karur and Erode. Tamil Nadu has around 3,50,000 power looms manufacturing cotton fabrics and accounts for about 30 percent of India's export of textiles products. The Erode district in Tamil Nadu is well known for marketing of textile products of handloom, power loom and readymade garments.

The Textile Industry of Tamil Nadu has a significant presence in the national and state economy. It is the forerunner in industrial development and in providing massive employment in the State. Hand loom, power loom, spinning, processing, garment and hosiery are the various sectors of the Textile Industry in Tamil Nadu. It is the largest economic activity next to agriculture in providing direct and indirect employment. Handloom sector occupies a place of pride in preserving the country's heritage and culture and plays a vital role in the economy of the country. It has a long traditional par excellence it its craftsmanship. The power loom sector in Tamil Nadu has also been playing an important role in meeting the clothing needs of the people. The power Loom Sector in Tamil Nadu is next only to Maharastra in terms of number of looms. The textile sector in Tamil Nadu is predominantly in the private sector, spinning oriented and labour-intensive because of the preponderance of the decentralized sector in most of the segment of the industry.

3. Textile Industry in Karur

Karur is famous for its home textiles. Karur has a niche in five major product groups bed linens, Kitchen linens, toilet linens, table linens and wall hangings. Overall Karur generates around $300 million dollars a year in foreign exchange through direct and indirect exports. Allied industries like ginning and spinning mills, dyeing factories, weaving etc employs around 200000 people in and around Karur.

An industrial promotion council, under the guidance of the district administration, has been formed for the textile industry in Karur. This will initiate co-ordinated measures aimed at the industry development. The forum, Karur Textiles promotional council, comprising representatives of different textile trade bodies and local officials of the state and central Government

PROFITABILITY STATUS OF SBI AND ICICI BANK DUE TO THE IMPLEMENTATION OF ELECTRONIC SERVICES (E-BANKING)

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Abstract

The banking industry in India has been around since the first currencies were minted, from the time of Britishers, from nationalization to privatization of banks and entry of foreign banks into India. The financial reforms that were initiated in the early 90s and the globalization and liberalization measures brought completely new operating environment to the banks. Services and products like "Anywhere Banking," "Tele-Banking," "Internet Banking," "Web Banking," "E-Banking" etc., have become the buzzwords of the day and the banks are trying to cope with the competition by offering innovative and attractive packaged technology based services to their customers. Today, e-banking services have a considerable impact on banking business in India, because it creates innovative services. The present study aimed to measure the profitability status of SBI and ICICI banks due to the implementation of Electronic services (e-banking).

Introduction

The banking industry in India has been around since the first currencies were minted, from the time of Britishers, from nationalization to privatization of banks and entry of foreign banks into India. In short, banking in India has been through a long journey over the period[1]. The financial reforms that were initiated in the early 90s and the globalization and liberalization measures brought completely new operating environment to the banks. Services and products like "Anywhere Banking," "Tele-Banking," "Internet Banking," "Web Banking," "E-Banking" etc., have become the buzzwords of the day and the banks are trying to cope with the competition by offering innovative and attractive packaged technology based services to their customers.

Today, E-banking services have a considerable impact on banking business in India, because it creates innovative services. Online banking has been more convenient for consumers because the internet is open for 24 hours and can be accessed from anywhere in the world. Banking activities such as; account inquiries, depositing or transferring funds and ordering cheques, can now be done remotely, 24 hours a day and seven days a week[2]. The e-banking is transforming the banking and financial industry in India, in terms of the nature of core products /services and the way these are packaged, proposed, delivered and consumed. The e-banking offers huge opportunities in every spheres of business as the competitive advantage,

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Ajay Thakare, SanketMunde and Deepak Pachpande (2014), Technological Innovations in Banking Sector, ASM's International E-Journal on Ongoing Research in Management and IT, E-ISSN-2320-0065.

Geetanjalijangale (2014), Analyze the E-Banking Branches and ATMs of India, Sai Om Journal of Commerce & Management- A Peer Reviewed National Journal, Volume.No. 1, Issue.No. 5, Online ISSN-2347-7563, PP:22-26, May.

IMPACT OF ... SERVICES - AN INDIA AND CUSTOMERS' PERCEPTION ... EMPIRICAL STUDY WITH SPECIAL REFERENCE TO TIRUPUR DISTRICT

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KEYWORDS :

1.Introduction

The banking industry in India has been around since the first currencies were minted from the time of Britishers, from nationalization to privatization of banks and entry of foreign banks into India In short banking in India has been through a long journey over the period. The financial reforms that were initiated in the early 90s and the globalization and liberalization measures brought completely new operating environment to the banks. Services and products like "Anywhere Banking," "Tele-Banking," "Internet Banking" "Web Banking," "E-Banking"etc., have become the buzzwords of the day and the banks are trying to cope with the competition by offering innovative and attractive packaged technology based services to their customers.

In the early 80s,a high level committee has been formed by RBI (Reserve bank of India) under the chairmanship of Dr. C. RangaraJan, the Governor of RBI, to draw up a phased plan for computerization and mechanization in the banking industry over a five year time frame of 1985-89. The focus by this time has been on customer service and two models of branch automation have been developed and implemented. Having gained experience in the earlier mode of computerization, the second RangaraJan committee constituted in 1988 had drawn up a detailed perspective plan for computerization of banks and for extension of automation to other areas like funds transfer, e-mail, BANKNET, SWIFT, ATMs, Internet banking etc.

The Government of India had enacted the Information Technology Act, 2000, generally known as IT Act, 2000, with effect from the 17th October 2000 to provide legal recognition to electronic transactions and other means of Electronic Commerce. Reserve bank of India had set up a 'Working Group on Internet Banking' to examine different aspects of Internet banking (I-banking). The Group had focused on three major areas of I-banking i.e., (i) technology and security issues, (ii) legal issues and (iii) regulatory and supervisory issues. RBI had accepted the recommendations of the Working Group and accordingly issued guidelines on "Internet banking in India" for implementation by banks. Considerable progress has been made in consolidating the existing payment systems and in upgrading technology with a view to establishing an efficient, integrated and secure system functioning in a real-time environment.

In the initial stage of IT adoption, only a handful of foreign banks operating in India first offered e-banking services to their customers such as ATMs, computerized monthly statements, secure online operations, etc. In later years domestic private sector bank like ICICI Bank and HDFC Bank have taken a lead in introducing e-banking in India in 1996. The State Bank of India (public sector bank) had also pioneered in introduction of e-banking service in India. After ICICI, Citibank, IndusInd Bank and HDFC Bank have been the early ones to adopt the technology in 1999.The evolution of banking technology has been driven by changes in distribution channels as evidenced by Automated Teller Machine (ATM), Phone- banking, Tele-banking, PC-banking and most recently Internet banking, Mobile banking and Core banking transaction through NEFT and RTGS (National Electronic Fund Transfer and Real Time Gross Systems).

... in banking operations in India. For the banks, ... emerged as a strategic resource for achieving higher ... control of operations, productivity and profitability for ... it is the realization of their "anywhere, anytime, any way" ... dream. This has prompted the banks to embrace ... meet the increasing customers' expectation and ... competition that is growing day by day among the ... of banks and even among the intra-group banks in ... trend in technology has put forth the competitive ... banks. This has led to increasing total banking ... Indian banking industry.

Today, E-banking services have a considerable ... business in India, because it creates innovative ... banking has been more convenient for consumers ... Internet is open for 24 hours and can be accessed from ... the world. Banking activities such as, account ..., or transferring funds and ordering cheques, can now be ... remotely, 24 hours a day and seven days a week. The e-banking is transforming the banking and financial industry in India ... the nature of core products /services and the way they ... packaged, proposed, delivered and consumed. The e-banking offers huge opportunities in every spheres of business ... competitive advantage, member/client retention, ... revenues and reduced costs. Understanding clients, ..., elasticity, availability of resources, system security, reputable ... name, having multiple integrated channels, e-channel ... marketing, support from top management and good client ... are the vital factors for the success of e-banking services in ... Based on the above drawn detailed discussion the present ... had aimed to analyse the trend in E-Banking adoption ... scheduled commercial banks in India and the impact of e-banking adoption on the performances of pioneer e-banking ... adopters in the public and private sector category i.e., SBI (State bank of India) and ICICI bank(Industrial Credit and Investment Corporation of India).Similarly, the study has also portrayed customers' perception towards e-banking services offered by the SBI and ICICI bank.

1.2 Statement of the Problem

In recent past, banks are challenged by technological up ... led to innovative products which stiffed up competition ... share. There is a shift from paper-based to electronic payments ... reliance on ATMs rather than costly branch offices to serve ... and other depositor related services. Both banks and customers ... increasingly migrating from traditional banking channel to ... banking channel for the benefits or advantages of e-banking ... both the sides. The main advantages of E-banking is that ... cost per unit services is lower for the banks and offers convenience to customers as they are not required to go to the bank premises ... also the customer can easily transfer the funds from one part ... another place electronically. Online banking is a technological ... advancement that has brought about such drastic change ... banking industry has adopted virtual banking to improve ... process, infrastructure, and customer relationships. These changes ... have had a ... impact on the banking business ... the ...

The International Journal of Analytical and Experimental Modal

ISSN NO: 0886-9367

A STUDY ON THE AWARENESS ABOUT GREEN SKILL DEVELOPMENT PROGRAMME AMONG COLLEGE STUDENTS IN TIRUPUR TALUK

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Abstract

"To protect the environmental right of our future generations, all of us have a green social responsibility. The fast evolving and emerging technologies in dynamic world to combat the menace of environmental degradation need to be complemented by specially trained and skilled manpower in various field at all levels. Imparting skill sets for greener transformation will generate employment opportunities and strengthen our resolve to conserve and preserve the priceless environment." - Dr. Harsh Vardhan, Minister, Environment, Forest and Climate Change. The Green Skill Development Programme (GSDP) of the Ministry of Environment Forest and Climate Change is an initiative for skill development in the environment and forest sector to enable India's youth to get gainful employment and/or self-employment. The programme endeavours to develop green skilled workers having technical knowledge and commitment to sustainable development. It will help in the attainment of the Nationally Determined Contributions, Sustainable Development Goals, National Biodiversity Targets as well as Waste Management Rules (2016). The pilot project of GSDP was launched in June, 2017. The Hon'ble Minister Dr. Harsh Vardhan has launched the full fledged Programme on 14th May, 2018. Every programme of the government requires citizen participation which may be fulfilled through awareness. In this context, the present study has been carried out to find out the level of awareness about Green Skill Development Programme among college students in Tirupur Taluk.

Keywords:- Skill India, Skill development, Green skill, Environmental degradation, Sustainable development.

[illegible] | IC Value : 83.78

[illegible] Commerce

FINANCIAL PERFORMANCE OF SELECTED SCHEDULED COMMERCIAL BANKS IN INDIA

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KEYWORDS

1. INTRODUCTION

The banking industry in India is sufficiently capitalized and regulated. The economic and financial conditions here are better than in any other country. liquidity credit, and market studies have proven Indian banks to be resilient. They have negotiated the downturn in the global economy well. The Reserve Bank of India (RBI) is the topmost body monitoring the banking industry. Any shortcomings or discrepancies are dealt with by the RBI.

The banking industry in India is divided into scheduled and non-scheduled banks. 67,000 scheduled bank branches are in India. They consist of co operative banks and commercial banks. The PSBs (Public Sector banks) from the base of this sector in India. The account for 78% of assets in the banking sector. The Private Sector Bank is making headway. They are leading in mobile banking, phone banking, ATMs, and Internet Banking sectors.

The Public Sector Banking and Private Sector Banking of the industry include investment banking, retail, and private banking. Investment banking is a growing sector with more Indians looking to invest funds in mutual funds and stocks rather than the traditional fixed deposits and schemes. Hence, the study is an attempt to focus on the financial performance of selected scheduled commercial Banks in India.

2. LITERATURE REVIEW

Gopal and Dev (2006)[1] empirically analyzed the productivity and profitability of selected public and private sector banks in India. They evaluated the effect of globalization and liberalization on the productivity and profitability of Indian banks during the period 1996-97 to 2003-04. Interest spread emerged as the only strong factor influencing the profitability. A high degree of positive association between productivity and profitability during the study period speaks about the efficiency of the banks in utilizing their resources.

Pal and Malik (2007)[2] in their research examined the modifications in the financial individualities of public sector banks, private sector banks and foreign banks in India based on features, such as liquidity, risk, profitability, and efficiency. To find the changes, the multiple regression analysis was used on the sample of 74 Indian commercial banks comprising 23 foreign banks, 27 public sector banks and 24 private sector banks for the period 2000-05. The conclusions propose that foreign banks were better performers, as compared with the other two sets of banks, in general and in terms of application of resources in particular during the period decided for the study.

Dangwal and Kapoor (2010)[3] evaluated the "Financial Performance of Nationalized Banks in India" and assessed the growth index value of various parameters through overall profitability indices. The data for 19 nationalized banks, for the post – reform period from 2002-2003 to 2006-2007, was used to calculate the index of spread ratios, burden ratios, and profitability ratios. They found that while four banks had excellent performance, four attained fair performance, and six had poor performance.

Jha and Sarangi (2011)[4] analyzed the performance of seven public sector and private sectors bank for the year 2009-2010. They used ratio for analyzing the data. They found that Axis bank took the first position, followed by ICICI bank, BOA, SBI, IOBI and HDFC, in that order.

B.Divyapriya and M. Revathibala (2012)[5] in their article entitled "Profitability Performance of SBI and HDFC – A Comparative Study" in this paper, an attempt was made to evaluate the financial performance of selected two banks namely, state bank of India (SBI) and HDFC Bank, through profitability ratios. The study found that the profitability of HDFC bank was higher as compared to SBI.

Dr. YogeshMaheswari (2013)[6] focused his study through his book titled "Banking Sector – Financial Analysis during Post Reform Era." In this paper an attempt has been made to review the performance of banking sector in India during post reform period. For this purpose, banks have been broadly categorized into four categories, foreign sector bank, private sector bank, nationalized banks, SBI and associates. A comparative appraisal of banks has been undertaken on the basis of four key indicators of financial performance namely return on investment, capital asset risk weighed ratio, business per employee, net profitability ratio. The analysis of the time will be from 1994 to 2005. It is found that through public sector banks have improved considerably and their performance is comparable with banks in other sector, yet they are lagging in trust areas such as business per employee, profitability and asset quality.

Radhanagasal and DR.Syedtabassumsultana (2013)[7] in the their study entitled "Financial Performance Analysis in Banking Sector – A Pre & Post Merger Perspective", evaluates the performance of the selected two banks based on the financial ratios from perspective of pre and post-merger. To analyze the impact of merger paired t-test was applied to the various financial ratios for before and after merger data. Based on the analysis of Indian overseas bank data, it can be concluded that net profit margin, operating profit margin, return on capital employed, return on equity and Debt. equity ratio there is significant difference but no significant difference with respect to gross profit margin. Based on the analysis of HDFC bank data it can be concluded that net profit margin, operating profit margin, return on capital employed, return on equity and dept. equity ratio there is no significant difference in these ratios before after merger. But significant difference is with respect with to Gross profit margin.

Dr. Partibha Garg and SurabhiKumari (2015)[8] in his research study "An Empirical Analysis of Profitability Position of Selected Private Sector Banks in India" found out that profitability is the ability of a venture to be financially successful. This paper represents an empirical study which examines the profitability from different perspective of private banks in India with a data of 10 years from 2004 to 2014 and five major private banks have been considered as sample units. For this analytical study, the ratio of technique has been used for analysis and to test hypothesis single factor ANOVA (F-test) has been applied. The study reveals that HDFC bank remained an outperforming player over the last decade in the banking sector

FINANCIAL PERFORMANCE OF SELECTED CEMENT INDUSTRY IN TAMIL NADU

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ABSTRACT: Profitability is the ability of a venture to be financially successful. The perpetual existence of the firms depends on the profit earning capacity of the industry. Which is also considered to be the main factor in influencing the reputation of the industry. This paper represents a performance study which examines the profitability from different perspective of cement industry in Tamil Nadu with a data of 5 years from 2013 to 2017 and five major cement industries have been considered as sample units. For this analytical study, the ratio technique has been used for analysis and to test hypothesis single factor ANOVA (f-test) has been applied. The study found that the profitability position of Shree cement is satisfactory when compare to other companies.

Key words: cement industry, profitability, analysis, single factor ANOVA (F-TEST)

1. INTRODUCTION:

Profit is difference between revenues generated and cost incurred an activity over a period of time. It is also called earnings or income or margins. Profit is necessary for the survival and growth of any business. Profits are like engine which drive the business as well as nation towards economic progress. Every organization should try to maximize its profit not only for their survival and growth but also for the welfare of other segments of the society. Profitability ratios reveal the company's ability to earn a satisfactory profit and return on investment. The ratio's are an indicator of good financial health and how effectively the company managing its assets.

2. Review of Literature:

Hajihassani (2012) presented A Comparison of Financial Performance in cement industry in Iran. This study presents comparison of financial performance for the period 2006-2009 by using financial ratios and measures of cement companies working in Iran. Financial ratios are divided into three main categories and measures including two indicators. This work concludes that the performance of cement companies on the basis of profitability ratio is different than on the basis of liquidity ratio, leverage financial.

- Daniel A. Moses Joshunar (2013) the study has been conducted to indentity the financial strength and weakness of the Tata motors Ltd. Using past five year financial statements. Trend analysis &ratio analysis used to comment of financial status of company. Financial performance of company is satisfactory and also suggested to increase the loan levels of company for the better performance

Nandhini M. & Sivasalthi V. (2015) has studied the impact of both financial leverage as well as operating leverage on the profitability of TVS motor company. The result shows that company suffers from certain weakness & suggested to control fixed cost as well as variable costto gain adequate profits.

Jothi, K. & Geethalakshmi,A. (2016) this study tries to evaluate the profitability & financial position of selected companies of Indian automobile industry using statistical tools like, ratio analysis, mean, standard deviation, correlation. The study reveals the positive relationship between profitability short term and ling term capital.

AN ANALYSIS OF FINANACIAL PERFORMANCE OF COMMERCIAL BANKS IN INDIA – WITH SPECIAL REFERENCE TO SELECTED OLD & NEW PRIVATE SECTOR BANKS

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Abstract

Banks are the arteries of any financial systems. Their performance generally reflects the economic scene of the nation. The consistent performance analysis of these banks given an overview of the current economic circumstances. This study to compare major private sector banks operating in India. Top 6 banks, based on their net profits in financial year 2017-2018, have been taken up for study. Parameters like business indicators such have been considered for performance analysis. Simple average and compound annual growth rate have been used to evaluate these 6 banks and accordingly they have been evaluated their overall performance.

Keywords: Simple Average, Compound Annual Growth Rate, Deposits, Advances, Investments, Total Assets, Net profits.

1. INTRODUCATION

Saving money in India has been overwhelmed by open segment banks (since the 1969) when every single real bank were nationalised by the Indian government. Notwithstanding, since progression in government keeping money strategy during the 1990s, old and new private banks have re – developed. They have quicker and greater over two decades since advancement utilizing the most recent innovation, giving contemporary developments and money related devices and methods. The private sector banks are part into two gatherings by money related controllers in India, the old private sector banks existed before the nationalization in 1968 and kept their freedom since they were either too little or expert to be incorporated in to nationalisation. The new private sector banks are those that have picked up their managing an account permit since the progression during 1990s.

In 1969 all most important banks have been nationalised by the Indian governments. But, seeing that an alternate in authorities' coverage in the 1990s, antique and new private sector banks have re-emerged. The private sector banks are break up into two organizations through economic regulators in India, The old non-public sector banks existed previous to nationalisation in 1968 and stored their independence due to the fact they had been both too small and expert to be included in nationalisation. The new private sector banks are those that have gained their banking license for the reason that exchange of policy in the 1990s.

2. REVIEW OF LITERATURE

1. Shobana V.K(2010) in her paper entitled "Operational Efficiency of Public Sector Banks in India- a Non-Parametric Model" centres around the operational efficiency of open segment banks in India utilizing a non-parametric model, which measures the efficiency as a proportion of yield file to a record of information

SC Journal of Applied Science and Computations ISSN NO: 1076-513

ROBLEM FACED BY ONLINE SHOPPING CONSUMERS IN TIRUPUR DISTRICT

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STRACT

On-line shopping is one of key business activities offered over the Internet.Internet users attitudes t online shopping are not entirely consistent. They are willing to shop online because it is convenient and a e -saver, but they also do not like sending personal or credit card information over the internet. Objectives of study, To study the problems faced by respondents towards online shopping in Tirupur district. thodology of the study, In this present study, descriptive research design has been used. The online shoppers respondents in this study. 125 respondents have been used in this study. Convience sampling method has d in this study. Primary as well as secondary data have been used in this study.conclude this study, chased and after ordering product delivery is feel to very quickly after that service also better service vider to sellers and there is very low level categories respondents only getting a duplications product and un s quality of product and customers service related issues.

ywords: Consumers, product, delivery, etc.,

INTRODUCTION

On-line shopping is one of key business activities offered over the Internet.Internet users attitudes about ine shopping are not entirely consistent. They are willing to shop online because it is convenient and a time - er, but they also do not like sending personal or credit card information over the internet. Knowledge of the ers, their buying motives and buying habits is a fundamental necessity for the marketing man. Such an erstanding of buyer behaviour works to the mutual advantage of the consumer and marketer allowing the keter to become better equipped to satisfy the consumer's need efficiently and to establish a loyal group of omers with positive attitude towards the company's products. The study of consumer behaviour is the erstanding of how individuals or organisations behave in the purchase situation. It is really psychology ed to marketing, specifically to the buy decision. To understand the buyer and to create a customer through understanding is the main purpose of buyer behaviour studies. For marketing to be successful, it is not only icient to merely discover what customers require, but also find out why it is required, only by gaining a deep comprehensive understanding of buyer behaviour can marketers goals be realized.

ISSN NO:2236-6124

VEL OF PERCEPTION TOWARDS ONLINE SHOPPING IN TRUPPUR DISTRCT

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STRACT

Online or Internet Shopping: It's a type of web based business in which customers can purchase chandise or administrations straightforwardly from the vender utilizing a web program. Despite being the nd-largest userbase in world, only behind China (650 million, 48% of population), the penetration of e-merce is low compared to markets like the United States (266 million, 84%), or France (54 M, 81%), but is ing at an unprecedented rate, adding around 6 million new entrants every month.Objectives of the study, analyse the level of perception towards online shopping consumers in Tirupur District. Methodology of the y, Descriptive research design has been used in this study. Tirupur District is Sampling unit. Online ppers are respondents are in this study. 175 respondents are used in this study. Conclude this study, Indian sumers most preferred way to pay for online shopping is COD (Cash on Delivery). Attractive offers from line shopping companies are attracting Indian consumers.

words: Online shopping, Internet users, information etc.,

INTRODUCTION

Online or Internet Shopping: It's a type of web based business in which customers can purchase handise or administrations straightforwardly from the vender utilizing a web program. Different words ed for web based shopping are e-shopping, web shopping. Online Shopping was invented by Michael ich in the year 1979. In 1980, Redfin's Office Transformation was propelled by him, which empowered the hants, suppliers, consumers and operator to interface with the corporate framework over the web and able exchanges electronically [1] .In June 1999, K Vaitheeswaran and five of his friends including V S kar, Vipul Parekh, Hari Menon, V S Ramesh and Sundeep Thakran founded India's first online mental store. The website Fabmart.com was launched in September 1999 which then offered only music for sale. Between February and October 2000, the website introduced additional categories including s, movies, watches, and groceries [2]. Today, online shopping has become the booming industry in India. of market leader's in India are Amazon.com, Flipkart.com, Myntra.com etc. Trends: general direction in h something is developing or changing.

PRIORITY SECTOR LENDING BY FINANCIAL INSTITUTIONS [WITH SPECIAL REFERENCE TO COIMBATORE DISTRICT]

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ABSTRACT

Commercial banks were advised to grant at least 40% of their total advances to borrowers in the priority sectors. This paper analyses and compares the performance of financial institutions in priority sectors lending under Lead bank scheme with special references to Coimbatore District. The analyses was made by the application of Kruskal- Wallis test to find out the significant among the financial institutions during the 11 years annual credit plan from 1st April 2006 to 31st March 2017 in relation to priority sector lending in Coimbatore District. The results of the study is that there was no significant different among the performance of financial institutions in lending to the Agricultural and Service Sector, but there was significant difference in lending to Small Scale Industries Sector and Total Priority Sector. It is concluded that, Public Sector banks is good in lending to Agricultural, Small Scale Industries Sector and Total Priority Sector. The Private Sector banks are good in lending to Service Sector.

Key Words: Financial institutions, Annual Credit Plan, Kruskal-Wallis test, Priority Sector, Null Hypothesis.

I. INTRODUCTION

Banking sector plays an important and active role in the economic development of a country. The contribution of banks to Indian economic growth through priority sector lending is remarkable. The priority sector lending was evolved and commercial banks were advised to grant at least 40% of their total advances to borrowers in the priority sectors.it covers sectors such as agriculture and allied activities (Agricultural sector), Small Scale Industries (SSI Sector), and small business, retail trade, small road transport, profession, self- employment, education, housing and consumption (Service Sector).

The Lead Bank Scheme (LBS) was introduced by Reserve Bank in 1969 when designated banks were made key instruments for local development and entrusted with the responsibility of identifying growth centers, assessing deposit potential and credit gaps and evolving a coordinated approach for credit deployment in each district in concert with other banks and other agencies. The LBS underwent significant transformation in 1989 when the Service Area Approach was match into the scheme. District annual credit

Volume-03
Issue-08
August-2018

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC Listed Journal]

...timer perception towards Online Retailing in Tiruppur District

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E DETAILS

...History
...d Online: 07 August 2018

...rds
...Retailers, Brick and Motor shop, ...economic status, Optimization

ABSTRACT

Online retailing kept on solid development in 2018. The channel is greatly well known with buyers due to the comfort and low pricing online retailers can offer. Online retailers can increment their deals and benefits quicker than a brick and mortar shop as offering online offers the advantage of having an open store, twenty-four hours a day, seven days a week. Today's buyer has changed due to the changing business environment. This alter within the environment, requests increasingly optimization of the time. Buyer buying conduct has changed from comfort to consolation and from buying in stores to buying online. Statistic variables like instruction and socio-economic status of client take the advantage of innovation and incline toward to buy through online retailing. In any case, there are some factors security, unwavering quality & benefit, and references that have got to be considered in the event that the advertiser needs to spur their clients for online buys. This inquire about moreover points to discover out the key components that impact online buying conduct of shoppers and to recognize the determinants of online buy purposeful among clients.

...al Retailing Scenario and Indian Retail trends

...uction

...tail implies products and administrations in little ...s specifically to the Clients. Retailing comprise of all ...es included in promoting of products and ...strations specifically to shopper for their individual, ...and family use. The Indian retailing industry is getting to ...ghtening competitive, as increasingly players are ...ing for the same set of clients. Retailing is one of the ...st divisions and it is seeing a transformation in India. The ...d participant in retailing in India implies the starting of ...ansformation.

...obal Retail Scenario

...tail has played a major part world over in expanding ...cy over a wide run of shopper merchandise and ...strations .The affect can be best seen in nations like ... U.K., Mexico, Thailand and more as of late China. ...mies of nations like Singapore, Malaysia, Hong Kong, Sri ...and Dubai are too intensely helped by the retail division. ...s the second-largest industry within the Joined together ...both in number of foundations and number of workers. It ...tionally one of the biggest world-wide. The retail industry ...s more than 22 million Americans and creates more than ...on in retail deal yearly. Retailing may be a U.S. $7 trillion ...nt. Wal-Mart is the world's biggest retailer. As of now the ...s biggest manager with over 1million partners, Wal-Mart ...ed oil mammoth Exxon Mobil as the world's biggest.

...mpany when it posted $219 billion in deals for monetary ...Wal-Mart has ended up the foremost successful retail ...within the world due its ability to use estimate, showcase ...ce, and proficiency to make advertise dominance.Wal- ...eads Fortune magazine list of best 500 companies within ...ld. Forbes Yearly List of Extremely rich people have the ...number (45/497)

Retailing in India

Retailing in India is one of the columns of its economy and accounts for around 10 percent of its GDP. India is one of the fastest growing retail markets within the world, with 1.2 billion people. As of 2003, India's retailing industry was basically proprietor kept an eye on little shops. In 2010, bigger organize comfort stores and grocery stores accounted for almost 4 percent of the industry, and these were display as it were in expansive urban canters. Until 2011, Indian central government denied remote coordinate speculation (FDI) in multi-brand retail, precluding outside bunches from any proprietorship in general stores, stores or any retail outlets. Single-brand retail was 51% possession and a bureaucratic In January 2012, India endorsed changes for single-brand stores inviting anybody within the world to enhance in Indian retail showcase with 100% proprietorship, but forced the prerequisite that the single brand retailer source 30 percent of its merchandise from India.

The Indian Retail Industry

Retail industry in India contains a colossal development potential and openings existing in different division and portions. For a long time, the corner basic supply stores (kirana stores) were the single choice accessible to the customers. But with the LPG approach in 1991 the worldwide designs of retailing cleared their way in India. To protect the position within the advertise retailers have made an endeavour to draw in clients by advertising more up to date benefit measurements and making interesting shopping encounters for the clients. Discernments approximately these retailers are to a great extent decided by unmistakable characteristics of stores, such as organize or estimate, nearness, assortments accessible as well as intangible variables just like the store environment, complaint taking care of, etc.

The Indian Retail Scene

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INTERCONTINENTAL JOURNAL OF FINANCE RESEARCH REVIEW
ISSN:2321-0354 - ONLINE ISSN:2347-1654 - PRINT - IMPACT FACTOR:3.414
VOLUME 6, ISSUE 1, SPECIAL EDITION - IV FEBRUARY 2018

PASSENGER'S PERCEPTION TOWARDS SERVICE QUALITY IN TAMILNADU STATE TRANSPORT CORPORATION

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ABSTRACT
Roads and highways are considered as veins and arteries of a transported are likened to blood in circulation, enlivening economic activity of the country. Tamil Nadu has a well established transportation system that connects all parts of the state. The Government of Tamil Nadu is one of the first States to take a bold decision of encouraging the public sector co-operation for bolstering the infrastructure of the State. The road network of the Tamil Nadu has been influencing considerably passengers perception, service quality, access to social responsibility and above all the quality of life. Generally, the passengers have various problems in traveling in public sector bus transport service and this study is focused to measure the various problems and suggest ways to reduce problems and to provide higher perception, in addition to identifying the level passengers' perception towards service quality in Tamilnadu .

Key words: Passengers Perception, Service Quality, social responsibility

INTRODUCTION

Today the services of firms are being rendered to the society on a competition basis in every marketing environment and everywhere in the world. The services provided in different economic conditions also differ. In the Indian economy, service is provided by both the public sector and the private sector. Basically, the service of the private sector is comparatively better than the public sector. In such circumstances, the public sector passenger transport corporation services to general public are higher than those of the private passenger transport in Tamilnadu. To what extent is the service provided by an organization quantitative is the sole question among the passengers and, at the same time, is the basic objective of the present study.

The transport is playing an important role in the economic development of the country by creating employment opportunities and performing economic activities. Transport is the channel of social and economic interaction involving the physical movement of people and goods. The question of service quality has been an essential strategic component for service expectations like passenger transports attempting to succeed and survive in the current competitive environment. SERVQUAL model focuses on the difficulty in ensuring high quality service for all passengers in all situations. SERVQUAL methodology is an analytical approach for evaluating the difference between passengers perception and expectations of service quality.

IMPORTANCE OF THE STUDY

The survival of any service industry depends on how well they serve and satisfy their passenger. A satisfied passenger is always the biggest asset of any service industry. Especially, with the advent of private and global players into this market, the competition has become still more shift. Therefore

INTERNATIONAL JOURNAL OF BASIC AND APPLIED RESEARCH
www.pragatipublication.com
ISSN 2249-3352 (P) 2278-0505 (E)

Agricultural Marketing Reforms are the Road Map move towards for One Nation One Market

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Abstract: Agricultural marketing in India is a complex system with a mix of organized and unorganized sector practices, Removal of intermediaries, managing post-harvest wastage, democratization of agriculture produce marketing committees (APMC), transparency in commissions of agents, use of market development fund, emphasis on digitization and emphasis on spot markets to free farmers for opting buyers are few efforts by GOI, An important reason for this dichotomy between agriculture and non agricultural sectors is that the former is a state subject under the Indian Constitution placing the burden of implementation of reform agenda on the states. Some attempts were made by the central government during years 2002 to 2004 to initiate and promote reforms in agriculture through a Model APMC Act, changes in Essential Commodities Act and changes in Milk and Milk Product Order. Subsequently, some of these reforms were rolled back. Reforms related to APMC act were adopted very slowly and partially across different states and UTs. One third of the states and UTs did not adopt any of the APMC reforms. A new Model
Agricultural Produce Marketing (Development and Regulation) Act, which would help them to make uniform and suitable legal framework facilitating reforms in a holistic manner including those required to promote e-NAM. "The State / UT Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017 as a Model Act encompassing entire gamut of reforms. Government has launched a Central Sector scheme "Promotion of National Agriculture Market (e-NAM) through Agra-Tech Infrastructure Fund (ATIF),
The adoption New APMC 2017 will strengthen an Agricultural Marketing system in India , the state governments should follow the proposed provisions recommended by NITI Aayog and Ministry of Agriculture, strengthening Agricultural Marketing systems will help in upliftment of the farmers.

Key words: Agriculture, Agricultural marketing, E- NAM, Marketing Reforms,

INTRODUCTION

Agricultural marketing in India is a complex system with a mix of organized and unorganized sector practices. There are thousands of rural periodic markets (haats) and more than 7,000 government regulated APMC markets, besides initiatives of numerous cooperative, development agencies, and private sector that engage with farmers directly or indirectly. The APMC system was established in the 1960s with the purpose of preventing exploitation of farmers. However, over a period of time, APMC yards turned into *Zameendaars* (landlords) whom the farmers of their respective notified areas are bound sell their produce.

While the total production and productivity have been constantly augmented through consecutive plans, it is essential to provide the farmer better remuneration for their produce by developing

Received: 5 January Revised: 13 January Accepted: 22 January
Index in Cosmos
February 2018 Volume 8 Number 2
UGC APPROVED

IASIN (Print): 2320-5504
IASIN (Online): 2347-4793

Asia Pacific Journal of Research
A peer reviewed international journal
IMPACT FACTOR : 6.58
Print ISSN: 2320 - 5504
Online ISSN: 2347 - 4793
University Grants Commission
Approved Journal U.N 45797

CUSTOMER PERCEPTION OF E-BANKING SERVICES BY THE SCHEDULED COMMERCIAL BANKS IN COIMBATORE CITY

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ABSTRACT

One sector that has undergone fundamental changes as a consequence of the application of Information Technology (IT) is Banking. The new technology has radically altered the traditional ways of doing Banking business. Today, no Banking business or corporate strategy is complete without information technology. Be it customer service, transactions, remittances, audit, marketing, pricing or any other activity in the Banks. Information Technology plays an important role not only to complete the activity with high efficiency but also has the potential to innovate and meet the future requirements. Information Technology has therefore introduced new business paradigms and is increasingly playing a significant role in improving the services in Banking industry. With the adoption of modern tools in day-to-day life the people are coming into realizing the inherence of E-Banking to avoid time and energy being encroached by useless presence in Banks to do transactions. Thus, this study will be presenting, how the perception of customers over E-Banking services offered by scheduled commercial Banks in the Coimbatore city.

Keywords: Banking, Information Technology, Customer Services, E-Banking

INTRODUCTION

Information Technology came into picture as early as in the 1980's in banking industry through the Rangarajan Committee recommendations and banks have given utmost importance to the technology since the last 25 years. The Reserve Bank of India is constantly pursuing the banks from 1980's to introduce computerization at branch level and to improve the quality of customer service through technology. Status quo, banking institutions cannot think of introducing a financial product without information technology support, be it customer service, transactions, remittances, audit, marketing, pricing or any other activity in the banks.

With the expansion of internet usage, E-banking has become one of the most revolutionized components of today's economic growth. E Banking is powerful value added tool to attract new customers and retain the existing ones. With the proliferation of internet and computer usage, the electronic delivery of E-banking service has become ideal for banks to meet customer expectations. Besides it helps in eliminating costly paper handling and teller interaction in the increasingly competitive banking environment. The potential competitive advantage of E-banking lies in the areas of cost reduction and satisfaction of consumer needs.

PROBLEM TO BE FOCUSSED

Over the last decade India has been one of the fastest adopters of information technology, particularly because of its capability to provide software solutions to organizations around the world. This capability has provided a tremendous impetus to the domestic banking industry in India to deploy the latest technology, particularly in the Internet banking and e-commerce arenas. Indian banking has come a long way from being a sleepy business institution to a highly proactive and dynamic entity. This transformation has been largely brought about by large scale liberalization and economic reforms that have allowed banks to explore new business opportunities rather than generating revenues from conventional streams such as borrowing and lending. Economic reforms and the entry of private players have seen nationalized banks revamp their services and product portfolios to incorporate new, innovative customer-centric schemes. The revolution of information technology has influenced almost every facet of life, among them is the banking sector.

The banking scenario in India in the post liberalization and deregulated environment has witnessed sweeping changes. The tremendous advances in technology and the aggressive infusion of information technology had brought in a paradigm shift in banking operations. For the banks, technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability. For customers, it is the realization of their 'Anywhere, Anytime, Anyway' banking dream. This has

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INRN (Print): 2320-5504
INRN (Online): 2347-4793

Asia Pacific Journal of Research
A peer reviewed international journal
IMPACT FACTOR : 6.68
Print ISSN : 2320 - 5504
Online ISSN : 2347 - 4793
University Grants Commission
Approved Journal U.NA5777

STRESS AMONG TNSTC DRIVERS AND CONDUCTORS – A REASONAL STUDY

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ABSTRACT

The present study aims to know the problems of TNSTC drivers and conductors in and its influences on their stress level in Erode district. The TNSTC plays a vital role in the development of our state. Its main objective is to connect the urban and rural areas. Most of the students and office goers are using the buses. India's passenger transport for small and medium distances is bus oriented and many other transport industries the safety of travelers and other road users is of prime importance. Occupational stress and strain induce worsening physical and mental conditions for bus drivers and conductors, while coping resources could promote their health. This study suggests that having adequate coping resources, especially social and top management support in workplaces may be a significant factor for improving drivers and conductors' quality of life. Moreover, psychological interventions should be set up for drivers and conductors, and psychological counseling should be provided to relieve stress and enhance quality of life.

Key Words: TNSTC, Transport, Driver, Conductor, Stress.

INTRODUCTION

In the present complex and competitive environment stress level is increased both in the bus drivers and conductors. Stressed bus drivers and conductors are not good to operating transport. The stress reduces efficiency, productivity and profitability. Stress is physical, mental and chemical reasons to circumstances that frighten confuse and irritate. Stress is the general term applied to the pressures, people feel in life. The presence of stress at work is almost inevitable in many jobs. Health has always been directly linked with occupation of the people. Sound health in relation to career and employment is the most significant aspect of the life of an individual who works and to the society as a whole. Occupational stress among employees include a wide range of health problems ranging from asthma, high blood pressure, stress, heart attack and other psychological disorders, with many more to list. Occupational stress is therefore, an aspect seeking attention at the individual, group and community levels. Occupational stress among drivers and conductors is treated as a condition of tension which occurs when a person senses a divergence between the working environment challenges and their possibilities of handling. A modest amount of occupational stress among drivers and conductors in public transport could be motivating and impelling, but the condition becomes serious if the stress is too high or long-term and there are little solving resources. In a new or anxious situation, and in extremely stressful circumstances, the human body releases the adaption and stress reaction. The transport plays a very important role in the development of nation. Its main objective is to connect the rural and urban areas. Most of the people and office goers are using the buses. The transport system provides the basic infrastructure on which the other economic activities grow and flourish. Neither the process of industrialization nor the modernization of agriculture is possible without a well coordinate, adequate and economic transport system. In the dynamic world, the public bus transport especially TNSTC has played an important role. The TNSTC service is being used by the people for their comfortable and convenient journey. The main features of the TNSTC service are that, it provides an enhanced service to the public. Public transportation is underfunded. Everyone is being forced to make travel with less effort, thus for both the drivers, conductors and the passengers, a bus ride may be a complex experience. Passengers with drivers and conductors may take out their frustration on each other, instead of directing these pressing concerns towards those who are in a position to implement the needed changes. A wide variety of conditions, situations and

Original Research Paper

Commerce

CHALLENGES FACED BY CUSTOMERS OF E-BANKING SERVICES BY THE SCHEDULED COMMERCIAL BANKS IN COIMBATORE CITY

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ABSTRACT E-banking is a major invention that has changed the business of banking. World over banks are reorienting their strategies towards new opportunities offered by e-banking. Banking through internet is considered as a complimentary delivery channel for the services rather than a substitute for the brick and mortar banking branches. E-banking has increased the competition among the banks and both domestic and foreign banks are offering more and more modern ways of e-banking. The new technology has radically altered the traditional ways of doing banking business. Today, no banking business or corporate strategy is complete without information technology, be it customer service, transactions, remittances, audit, marketing, pricing or any other activity in the banks. Thus, this study will be presenting you the challenges faced by customers over E-banking services offered by scheduled commercial banks in the Coimbatore city.

KEYWORDS : Banking, Technology, Customer Services, Scheduled Commercial Banks.

INTRODUCTION

With the expansion of internet usage, E-banking has become one of the most revolutionized components of today's economic growth. E Banking is powerful value added tool to attract new customers and retain the existing ones. With the proliferation of internet and computer usage, the electronic delivery of E-banking service has become ideal for banks to meet customer expectations. Besides it helps in eliminating costly paper handling and teller interaction in the increasingly competitive banking environment. The potential competitive advantage of E-banking lies in the areas of cost reduction and satisfaction of consumer needs.

One sector that has undergone fundamental changes as a consequence of the application of Information Technology (IT) is banking. E-Banking implies performing basic banking transaction by customers round the clock globally through electronic media. Alternatively electronic banking can be defined as "delivery of bank's services to a customer at his office or home by using electronic technology and this has resulted in conceptualization of virtual banking". In traditional banking, the customer has to visit the branch of the bank in person to perform the basic banking operations viz., account enquiry, fund transfer and cash withdrawal. The brick and mortar structure of a bank is essential to perform the banking functions. On the other hand, E-Banking enables the customers to perform the basic banking transactions by sitting at their office or at homes through PC or LAPTOP.

PROBLEM TO BE FOCUSSED

Banking industry worldwide is offering various options, financial products and services to enhance customer satisfaction. Innovative ways for information technology are used to provide services. Undoubtedly e-banking is the technological wonders and is gaining popularity. E-banking is regarded as pulse of the nation. It is important for banks to encourage customers to use e-banking. Banks-trusted business service providers, have the opportunity to leverage their existing relationships to provide full range of high quality trusted internet business services to their customers.

Indian banking has come a long way from being a sleepy business institution to a highly proactive and dynamic entity. This transformation has been largely brought about by large scale liberalization and economic reforms that have allowed banks to explore new business opportunities rather than generating revenues from conventional streams such as borrowing and lending. Economic reforms and the entry of private players have seen nationalized banks revamp their services and product portfolios to incorporate new, innovative customer-centric schemes. The revolution of information technology has influenced almost every facet of life, among them is the banking sector. The introduction of electronic banking has revolutionized and redefined the ways banks were operating. As technology is now considered as the main contribution for the organizations' success and as their core competencies. So the banks, be it domestic or foreign are investing more on providing on the customers with the new technologies through e-banking. Hence, Indian banking has finally woken up to the surging demands of the ever-discerning Indian consumer. With the above settings, the present study has been made to identify the solution for the following research question;

1. What would be the challenges faced by customers while using the various E-banking services provided by public and private sector commercial banks in Coimbatore city?

OBJECTIVES OF THE STUDY

1. To examine the challenges faced by the customers while accessing various E-banking services provided by public and private sector commercial banks in Coimbatore city.

HYPOTHESIS FOR THE STUDY

$H_0$1: There is no significant difference in problems in adopting e-banking services among the groups of respondents based on their demographic classification.

SCOPE OF THE STUDY

The study covers the respondents as the customers of private and public sector commercial banks from the Coimbatore city. The sample was selected from this place and was restricted to 100 respondents. The data has been collected through the structured questionnaires from the respondents. The study covers the examinations on challenges of the customers on availing E-banking services from their respective banks. The study would be helpful to academicians, researchers and industrialists in providing the information as they require.

METHODOLOGY

The research is investigative and qualitative in nature and the methodology adopted for the study is presented below:

Source of data

The research work is mainly based on primary data collected from the sample respondents through a structured questionnaire. Other information relevant for the study's analysis and others was collected from secondary sources such as journals, magazines, published and unpublished research works and websites.

Sample design

The population targeted for this study consisted of 100 samples from the city of Coimbatore who are making use of E-banking services from the 22 public and 13 private commercial banks. The sampling technique adopted for the study was convenient sampling where the sample respondents were selected on the basis of the accessibility.

Statistical tools for analysis

- Simple Percentage

KNITTED GARMENT INDUSTRIES AND ITS EXPORT PERFORMANCE OF TIRUPUR

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ABSTRACT

Knitted garment industries, has made considerable progress to be a sorted out industry from being a negligible local industry. Beginning with the industrial revolution, it has picked up a condition of amazing with time. The worldwide Garment advertises is worth of more than US$400 billion at present. In a more changed condition, the industry is confronting rivalry just as circumstances. It is anticipated that Global Garment creation will grow up to 25 % continuously 2010 and 50 % by 2014. The local knitwear advertise comprises of different classifications, for example, innerwear, shirts, winter-wear, sewed base wear for children, sleepwear, and so forth. The significant supporters of the knitwear showcase are innerwear and shirts representing 34 percent and 28 percent of the market separately. Garment industry in India is one of the major important industries, which contributes more than 6% to the national GDP. with the help of the present study we can ascertain the performance of knitted garments industry. the Indian knitted garments industry has a global reputation for the high quality with low cost. Through the knitted garment industry gained high level Foreign exchange. so this right to context about the Indian knitwear industry. Overall knitted garment export market was growing steady and rapidly. India's exporters also concentrate European Union (EU) and Gulf countries those have good potential, and compare to market size export is very minimum. Quality wise our export products proven various countries that's a one of the greatest strength for us. In the future India's overall performance is positive except few years and also inconsistent.

Keywords: *Knitted, Garments, Export, Performance, Simple Average, Standard deviation, Compound annual growth rate, Trend.*

INTRODUCTION

Knitted garment industries, has made considerable progress to be a sorted out industry from being a negligible local industry. Beginning with the industrial revolution, it has picked up a condition of amazing with time. High generation of fleece, cotton and silk everywhere throughout the world has given a lift to the Garment business in past years. In spite of the fact that the business started in UK, the craft of Garment creation go to Europe and North America after motorization of Garment fabricating process in those regions. Asian nations additionally industrialized their economies and made strides for the development of this area. Japan, India, Hong Kong and China have turned out to be driving makers of Garment in view of the accessibility of modest work which is an essential factor for this industry. Presently the business has sufficiently developed for development outside the conventional western markets. Here this study deals with national level statistics.

GLOBAL SCENARIO

The worldwide Garment advertises is worth of more than US$400 billion at present. In a more changed condition, the industry is confronting rivalry just as circumstances. It is anticipated that Global Garment creation will grow up to 25 % continuously 2010 and 50 % by 2014. The world Garment and clothing industry has gone into a period of change since the disposal of share in the year 2005. Numerous new contenders just as purchasers have entered the worldwide market with their tremendous capacities and

2018-2019

ZENITH International Journal of Multidisciplinary Research ISSN 2231-5780
Vol.8 (4), APRIL (2018), pp. 94-100
Online available at zenithresearch.org.in

BANKING FINANCE IN AGRICULTURAL ACTIVITIES – A BIRD VIEW FROM INDIAN FARMENRS

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ABSTRACT

The present study aimed to know the influence of banking finance in agricultural activities of farmers in Erode District. Agriculture remains the main economic activity and employs the majority of the people in most low income countries. Globally, there are approximately 450 million households whose main activity is agriculture. Agricultural producers in developing countries, particularly those in low income countries, face a number of hurdles including low productivity, limited access to markets for their products, lack of adequate risk management products and services and limited access to finance. Access to financial services, while not a means to an end, is critical to provide funds for farm investments in productivity, improve post harvest practices, smooth household cash flow, enable better access to markets and promote better management of risks. Most rural households lack access to reliable and affordable finance for agriculture and other livelihood activities. Many small farmers live in remote areas where retail banking is limited and production risks are high.

KEY WORDS: Agriculture, Productivity, Harvest, Finance, Banking.

INTRODUCTION

Agricultural finance is the provision of multiple types of services dedicated to supporting both on- and off-farm agricultural activities and businesses including input provision, production, and distribution, wholesale, processing and marketing. The market demand for smallholder agriculture finance is US$450 billion, most of which is unmet. Without access to credit, most smallholders are restricted to farming practices that result in low levels of

INTERCONTINENTAL JOURNAL OF FINANCE RESEARCH REVIEW
ISSN:2321-0354 - ONLINE ISSN:2347-1654 - PRINT - IMPACT FACTOR:5.414
VOLUME 6, ISSUE 1, SPECIAL EDITION - IV FEBRUARY 2018

FARMERS PERCEPTION ON LOAN SPECIALITIES OF SELECTEDBANKING SECTOR AT ERODE DISTRICT

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ABSTRACT

Thiruvalluvar says, those who cultivate their food live in self-sufficiency all others follow him in self made dependence. On Oct 29th 2011 The Hindu on its first page reported, Over a Quarter million farmers committed suicide between 1995 - 2010. It is highly distressing that farmers who feed the nation end their lives due to the burden of debt. Is Thiruvalluvar proved wrong? There are three essential needs the people must have food, cloth and shelter. The above priority also goes wrong. So A study on farmers perception with reference to agricultural finance is taken. Small is beautiful. Since farmers hold small size of land, banks frown upon their loans. They are driven to money lenders and get loans. Consequently they suffer. The data required for the study have been collected from both the primary and secondary sources. Stratified random sampling in selecting banks and purposive sampling for farmers in Erode form the fulcrum of this study. The data have been collected from 480 (60 banks × 8 farmers) respondents. Finally 450 respondents were shortlisted after elimination of 30 respondents. The following statistical tools namely, Chi-square Test, Correlation, Factor Analysis, One-way ANOVA, Turkey Test, Mean Score and Weighted Average methods have been used for analysis. Though majority of the farmers wish to maintain their accounts in Regional Rural Banks, Cooperative Banks, Public Sector Banks and Private Sector Banks etc., they fall in the clutches of Private Money Lenders. Default repayments out do regular repayment of loans. Some prominent suggestions: provision of finance commensurate with operations, post of agricultural field experienced banking officials and in time finance to meet the social conditions of the farmers. People bow low when they think of the farmers in abstract terms. In reality their sufferings know no bounds. To quote, Dr. M. S. Swami Nathan, father of the Green Revolution, Future Belongs to Nations with Grains and not Guns.

Keywords: security, banks, service quality, credit facility

INTRODUCTION

Agriculture is the cornerstone of economy and contributes greatly to the gross domestic product of a country. In developing countries, where about 25 per cent of GDP is derived from the agricultural sector, agriculture plays a pivotal role. Even the governments of various countries are quite aware of this fact and this is the reason why different types of agricultural policies are made at different levels. There are many needs of agricultural sector for the fulfillment of which finance is required. Most of these needs pertain to farmers. Finance is incumbent on the farmers for the purchase of different types of agricultural implements, for the purchase of high quality seeds, for making marketing arrangements and for storing, it is very important to understand that apart from the agricultural activities, finance is also provided to different types of allied agricultural activities like apiculture, horticulture etc. In each country, there is a separate department at the federal level that takes care of all the agricultural development activities in the nation. This department makes all the policies regarding agriculture finance and ensures that all the

FACTORS DETRMINING BANKING FINANCE OF FARMERS IN AGRICULTURAL ACTIVITIES

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ABSTRACT

The farmers need credit for the purpose of seed, manure and fodder, payment of rent, wages, irrigation of crops, hire charges of pumps, purchase of livestocks, repair of agricultural implements, land improvement, for laying of orchard and capital expenditure on agriculture. The present study aimed to know the factors which determine the banking finance of farmers in Erode District. Access to a comprehensive range of financial services is a significant challenge for smallholders, who constitute the vast majority of farmers in developing countries especially in India. Smallholder farmers are quite a heterogeneous group, differing in their resource base and choice of crops and livestock, links to markets, the relative importance of agricultural income, and other dimensions. As such, solutions regarding access to finance need to better understand the various profiles of smallholder families and the conditions and market context where they operate.

KEY WORDS: Farmers, Agriculture, Finance, Land, Access.

INTRODUCTION

Agriculture remains the main economic activity and employs the majority of the people in most low income countries. Globally, there are approximately 450 million households whose main activity is agriculture. Agricultural producers in developing countries, particularly those in low income countries, face a number of hurdles including low productivity, limited access to markets for their products, lack of adequate risk management products and services and limited access to finance. Access to financial services, while not a means to an end, is critical to provide funds for farm investments in productivity, improve post harvest practices, smooth household cash flow, enable better access to markets and promote better management of risks. Access to finance can also play an important role in climate adaptation and increase the resilience of agriculture to climate change, thus contributing to longer term food security. Generally, credit in agricultural sector may be divided into short-term loans to meet the input expenses and average and long-term loans to facilitate the development of fixed farm assets such as land. This gap arises in relation to static or dynamic production function. Under a static functioning, the level of input use per hectare of cropped area being stable, the year to year difference in the amount of credit reflects the changes in input prices. Under a situation of diminishing returns, though, increasing input use is required to continue the same level of output. The supply of credit linked to static production conditions will not contribute to increase in output, though the withdrawal of it might lead to a decline in conditions will not contribute to increase in output, although the withdrawal of it may lead to a decline in output. Under dynamic functions,

IC Value : 85.78 | IF : 5.156 | IC Value : 85.78

VOLUME-7, ISSUE-7, JULY-2018 • ISSN No 2277 - 8160

Original Research Paper

Commerce

ORGANIC FARMING – PROBLEMS AND PROSPECTS

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ABSTRACT

The organic farming ... suffering from a lot of problems such as insignificant growth. Organic Farmers find difficulty in continuing organic farming practices due to various reasons like inadequate support from Government and universities, contaminated soil due to application of chemical fertilizers, pesticides and weed killers, unwanted productivity and production, ... ted in unhealthy food products, shortage of labour, inadequate organic manure due to decreasing livestock population and ... supply chain of organic farming system. The cost of production in Organic Farming is more and customers are not ready to pay by paying more. About production and productivity facts and opinion differs among the experts, farmers and actual. Required quantity of organic pesticides and weed killers are not available. Loss of different type of our age old seeds in all food crops affects productivity and production. Organic farmers found no specific demand for their produce. Traders found difficulties to get the required quantity of products as per demand. Consumers are ... unhappy as they are not getting ... what they want and also due to heavy pricing for available products. Awareness amongst consumers about the perfect of conventional farming produce ... the health advantage of organic food products is missing. There is a gap between organic farmers' expectations from the Government and actual. Due to innumerable unsolved problems, dissatisfied organic farmers are either ... turning over to conventional farming or ... Farming entirely. This paper analyze the problems and prospects of organic farming in India.

KEYWORDS : Organic Farming, Chemicals, Agriculture, Production, Government

1.1 INTRODUCTION

Organic Farming is a production system in which input consists of farm manure, natural pesticides and excludes synthetically compounded fertilizers, pesticides, growth regulators and livestock additives. The organic farming system relies upon crop rotation, crop residues, animal manures, legumes, green manures, off-farm organic wastes, mineral bearing rocks and aspects of biological pest control to maintain soil productivity and to supply plant nutrients and to control Insects, weeds and other pests. The existing farming practice is called conventional farming. Conventional Farming uses chemical fertilizers, pesticides and weed killers, mechanical implements for various processes and modern agricultural science and holds more than 98 percent of shares in farming. Prior to 1965, our country followed 100 percent natural farming or organic farming practice without chemical fertilizers and pesticides. It appears that organic farmers face more problems than conventional farmers and their expectations from the government is high for their survival and sustainability. Government and agricultural scientists are not accepting Organic Farming as a solution to overcome the existing problem of feeding the ever increasing population of our country. Organic farmers and experts of organic farming claim that organic farming is the only remedy for the required quantity and quality of food. As such the present study reveals the problems and prospects of organic farming.

1.2 NEED FOR THE STUDY

Chemical or conventional farming totally spoiled the soil, and output turned to be ill health food products to a considerable extent. Hence lot of scientists from agricultural sector, experts and well wishers of people are claiming that our good old system of natural or organic farming system is to be brought back against the current conventional farming system. But in spite of severe attempts by many stakeholders of organic farming, the growth of organic farming is insignificant with less than one percent practising Organic Farming. Hence, it is needed to study the problems and prospects of organic farming on the whole and bring out those factors which will ease the problems pertaining to the organic agricultural sector.

1.3 SCOPE OF THE STUDY

The present study mainly confined to analyse the issues of Organic farming like management of seed, manure, irrigation, diseases, harvesting, productivity, marketing, profitability and growth of organic farming. The primary data were collected from the organic farmers engaged in Organic Farming in the study area. The study does not cover the issues and problems of farmers engaged in conventional farming.

1.4 OBJECTIVES OF THE STUDY

The overall objectives of the study are to outline the present status of Organic Farming in Tamil Nadu and to identify the various issues and prospects for Organic Farming in Tamil Nadu. The specific objectives of the study are listed as below:

1. To know the profile of organic farmers engaged in Organic Farming.
2. To understand the factors affecting profitability in Organic Farming.
3. To highlight the opportunities available for Organic Farming.

1.5 HYPOTHESES TESTED

The following hypotheses have been drawn up and tested using appropriate statistical tools.

1. There is no significant relationship between the size of the farm and the option of selecting Organic Farming
2. There is no significant relationship between the source of irrigation and capital employed

1.6 RESEARCH METHODOLOGY

'Descriptive research' is considered as the most appropriate for the present study. Hence, the study has been descriptive type. The research problem, hypotheses and interview schedule all have been formulated and framed accordingly.

1.6.1 Data Collection

i) Primary Data

First hand data were collected from the field through interview schedule and observation. Data relating to the issues and challenges of Organic Farming were gathered through interviews from farmers engaged in Organic Farming.

(ii) Secondary Data

The secondary data were collected from leading agricultural

INDIAN AUTOMOTIVE INDUSTRY CURRENT SCENARIO, FUTURE EXPECTATIONS AND RECENT FUEL PRICE CRISIS

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Received: June 28, 2018 Accepted: August 12, 2018

ABSTRACT *This study deals with the current position and future projections on Indian Automotive Industry, and explains the various updated information with statistics related to Indian automotive companies. Further it is discussed about Indian Passenger car segment. More over this paper explains the current industry situation, Major manufacturers and leading countries in passenger car production, latest investment positions and Government of India's initiatives related to automotive and component industry. Recently the petroleum products price is increasing heavily due to the current tax structure. This article analyzes the structure of the fuel price, impact and remedy.*

Keywords: Automotive, Production, Industry, MNC, Government Policy, Fuel Charges, GST, Excise Duty, Value Added Tax -VAT.

Introduction:

The Indian Automotive Industry is one of the biggest Automotive Industry in the world. This Industry manufactured more than four million vehicles in Indian sub continent. This Automotive Industry plays unavoidable role in Indian Economy.

Moreover it is contributing more than 7% for National GDP. Since implementation of new economic policy, the Indian Economy started with top gear. Many MNC's were started to invest their money and ready to provide technology to India, Particularly in the area of Automotive Industry. Along with the Automotive Industry, the sub-sectors were also developed very well. Since 1991 especially after 2000 the automotive industry growth rate is very high. Since the New Economic Policy the people's life style and standard is changing and also the purchasing power is rising day by day. Even the rural areas also developed well after implementation of LPG. But nowadays the citizens of India, facing huge problem due to fuel price hike. The Government of India is considering the fuel price problem.

Global Scenario:

As on now the Indian Automotive Industry is moving to third position worldwide, due to various positive reasons. Now the FDI position is good. After implementation of LPG the nation's export and import developed very much. But still the Balance of Trade is not turned to surplus. Trend is getting change. After Open Economy, the Indian Government encouraged Foreign Direct Investment from other countries. But now the situation is getting change. Nowadays Indian MNC's are also started to invest their funds to other nations. Recently Mahindra & Mahindra started a plant in Detroit city (Michigan –USA). For this particular project Mahindra &Mahindra has invested INR 4600 crore.

Research Methodology:

This paper is based on descriptive type, and the collected information taken from many websites related to automotive sector.

Automotive Industry in India:

The Indian Automotive Industry is the successful market in the world. India manufactured more than 4 million vehicles in the year 2013-20017 (Commercial & Car). This industry will create 14.9 million direct and indirect employments in India by 2022. In India Two wheeler production is much more potential than other vehicles. In the fiscal year 2016 Indian sub-continent produced 18.8 million two wheelers. Similarly passenger car segment export also grown well. The car export has increased 16.2% between the 2015-16 to 2016-17 fiscal year. In India the Maruti Suzuki is the leading No.1 brand in car sales. Similarly Hero Honda two wheelers hold No.1 position past many years.

Original Research Paper

Volume-8 | Issue-1 | January-2018 | ISSN - 2249-555X | IF : 4.894 | IC Value : 86.18

Commerce

THE PERFORMANCE OF THE INDIAN AUTOMOTIVE SECTOR - ACTUAL AND FORECAST A STATISTICAL ANALYSIS

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ABSTRACT The study explains the growth and development of the automotive Industry in Indian sub-continent. The best transport system is much helpful for nation development. The Indian automotive Industry provides more job opportunities to the people. This study, further explain the actual and forecast performance of the automotive Industry in India, and briefly stats some information about Foreign Direct Investment, Government policies, Infrastructures, Technological up gradation, Environmental aspects, Gross Domestic Product, peoples disposable income, current automotive sector statistics, automotive Industry key players, influencing key factors, Clusters and quality aspects.

KEYWORDS : Automotive Industry, Commercial Manufacturers, FDI, Investment, Production, Forecast.

Introduction:

Indian Automotive sector plays an essential role in Economic, Technological & Industrial Development in India. It is one of the very important growing sectors in India. The progressing automotive sector stimulated industrial sector and also the core sector. This sector contributes great volume of employment opportunities in our nation.

India's automotive sector is the most important and largest developing industries in the world. After liberalization, our automotive sector has changed tremendously. Many steps are taken by the Union Government and global automotive manufacturers in Indian market. It is expected to make India a giant in manufacturing of the two wheelers and four wheeler markets in the world by 2020. Now nearly almost every world class automotive leaders has established its counterparts in India.

The Indian automotive sector has undergone rapid changes since open economy. Many global automotive giants have entered in India and replaced the monopoly of very few producers. According to the recent statistics, there are 19 manufactures of Passenger cars and Multi-Utility vehicles, 16 manufactures of Commercial vehicles, 10 manufactures of two wheelers, 7 manufacturers of three wheelers, 14 manufactures of Tractors and also 5 manufactures of Engines.

Confederation of Indian Industry (CII) has presented a valuable information. That is, India is holding position of

- Fifth largest bus & truck sector
- Fifth largest Commercial vehicle market
- Fourth largest Tractor market
- Tenth largest Passenger car market
- Second largest Two wheeler market
- Largest Three wheeler market
- Seventh largest passenger car market

Global Scenario:

In the last few decades, the world automotive industry has changed its location preferences due to various reasons. Earlier, the automotive industry was largely confined to the triad – North America, Europe, and Japan; however with the emergence of some vibrant developing economics, like Brazil, India, and China, the global automotive industry has been considering a different growth perspective, and it has been relocating the operations. These growing economies has been as the manufacturing hub, and also the newfound markets for the global majors like Ford, General Motors, Chrysler, Toyota, Honda, Nissan, Hyundai, Benz, and BMW who are competing to enhance their market share in these markets. Increasing the growth in GDP and the growing disposable income has catapulted these emerging economies as market for automotives, while the low cost of operations and skills in design and R&D made them as destination for investment and manufacturing operations.

History of Indian Automotive Industry:

In 1897, the first car ran on an Indian surface. Through the 1930's cars were imported from western countries but in small numbers. Hindustan Motors was launched in 1942, the long-time competitor Premier in 1944, building Chrysler, Dodge, and Fiat products respectively. Mahindra & Mahindra was established in the year 1945, and began assembly of Jeep CJ-3A utility vehicles. After independence in 1947, the Government of India and the private sector made efforts to produce an automotive components manufacturing industry to supply the automobile industry. In 1953, and import substitution programme was launched, and the import of fully built-up cars began to restrict.

Automotive Industry in India:

The Automotive sector in India is the most competitive markets with low costs, which is an attractive production base for foreign automotive manufacturers. India holds the second fastest growing market in the world next to China. Car is the major segment in the Indian automotive industry with a growth rate of more than 19% in 2015. India is also a prominent auto exporter and has a strong export growth expectations for the near future. In addition, several initiatives by the Government of India and major automobile players in the Indian market are expected to make India as a leader in the two wheelers and four wheelers segment in the world by 2020. The industry provides direct and indirect job offer over 13 million peoples.

India's Progress & Advancement in Automotive Sector:

Since the liberalization Indian automotive sector turned to growth track, receiving FDI and also technical knowhow. This step stimulated production from 5.3 million units in 2001-02 to 10.8 million units in 2007-08. The most important and unavoidable factors in automotive sector is given below.

- Raising Indian per capita income.
- Large number of middle class people.
- Well qualified & trained manpower.
- Low labor cost.
- Strong technical capabilities.
- Better Government Cooperation.

These are the factors present result as "Indian Automotive Sector – Booming Sector" This industry provides direct and indirect employment of more than 12.5 million. According to the statistical report, the whole automotive industry (Original Equipment Manufacturer [OEM], Auto Components, Ancillary and Tyre manufactures) contributes to the nation more than 7% GDP. This industry provides approximately 20% revenue to the Finance Ministry. i.e., Indirect taxes (Customs & Central Excise) to the Government of India.

Due to rapid urbanization and improvement in standard of living, along with active Government support in the form of incentives and stimulated large number of MNC's set up their manufacturing and research development facilities in India. Over the decades, the Indian auto components industry has transitioned from being a supplier for the global aftermarket to becoming a full-scale global Tier-1 supplier to many global giants in automotive industry.

Research Paper
Impact Factor: 5.471
Refereed, Listed & Indexed

IJBARR
E- ISSN -2347-856X
ISSN -2348-0653

PROBLEMS AND PROSPECTS OF ORGANIZED TEXTILE RETAILERS IN ERODE DISTRICT

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Abstract
The retail scenario is one of the fastest growing industries in India over the last couple of years. India retail sector comprises of organized retail and unorganized retail sector. Traditionally the retail market in India was largely unorganized; however with changing retailer preferences, organized retailers are gradually becoming popular. In this research, the researcher mainly focused on problems and prospects of organized textile retailers in Erode district. For this, 100 retailers were selected by using convenience sampling technique in Erode district. For examining the problems of the retailers, weighted average ranking method has employed. The result found that majority of the retailers faced more problems from employee.

Keywords : Organized Textile, Problems, Prospects, Retailer

Introduction

Retailing is the activity of selling goods and services to a final consumer for his own use. It is concerned with getting goods in their finished state into the heads of customers who are prepared to pay for the pleasure of eating, wearing or experiencing particular products items. Retailing is all about distribution of goods and services. Retailers form the link between the manufacturers, wholesalers, agents and the customers. They are the persons who keep in touch with the customers and get an opportunity to understand their needs and preferences.

The retail sector in India is witnessing unparalleled growth. Unmatched demographics, rising income levels, shifting lifestyles and changing aspirations of the burgeoning middleclass has unleashed a retail revolution in the country. Fresh retail geographies are emerging, innovative formats are being introduced and retailers are tapping new customer segments with prolific product offerings.

Statement of the Problem

In this competitive world, we can see many problems in marketing of any product or service. Some problems can be solved, but so many problems may not be solved. India is a developing country and retail marketing is an important one to develop a country's economy. Retailers, who are the connecting link between the producer and consumer, face many problems to market their products from various dimensions and many causes behind this. At present the customers are also more dynamic. The customers have certain expectations from the items they purchase such as its quality, price, good services etc. Hence, there is a need for a research work in the field of problems of textile retail marketing in the point of view of retailers and customers as well.

Review of Literature

Review of previous studies is essential for every research to carry on investigation successfully. Hence, the present study is also based on the following reviews.

Roopam Chandra, (2017) focused in the study on the socio-economic perspective of non stored based retailing formats in India. Also, this research intended to enable the current players to establish a better foothold to beat the increasing competition. In this research, some of the key concepts and frameworks for the differentiation of retail format in India had been summarized. This study covered the non store based retailing formats operational in India and highlighted their advantages, role as a prospective employer and a potential channel of distribution. Non-store retailing was the selling of goods and services outside the confines of a retail facility. It was found that store based retailing and Non-store based retailing were major classification of organized formats in India. Door to door sales, TV Shopping, vending machine, electronic retailing and direct marketing comes under the non store based retail formats. Non store based form of retailing was beneficial for the economy as well as the society. Shweta Tyagi, et al., (2017) analysed in their research that the difference factors on retail sector of India and Australia. The objectives were to make people aware about the self-service checkouts technology, its usage and pros and cons, to know about the effects of this technology on the customers and employees, to study regarding Indian market in terms of acceptance of new technology and increasing demand for the retail stores. The descriptive research method was used in collecting the data from secondary sources and previous studies. The information was compared regarding the implementation and use of self-service checkouts from different sources of data.

ORIGINAL RESEARCH PAPER

Volume-7 | Issue-2 | February-2018 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 93.98

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

BANNING OF HIGH VALUE CURRENCIES, BS-III AND ITS IMPACT ON INDIAN AUTOMOTIVE INDUSTRY

Commerce

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ABSTRACT

The study explains the demonetization in India and its impact on Indian Automotive Industry and explains the Bharat Stage – III to Bharat Stage – IV transformation. The Government of India demonetized the high value currency i.e., 500 and 1,000 currency notes. The withdrawal of the 500's and 1,000's currency notes got significant impact in general, as well as in automotive industry. During the period, the sales volume got reduced very much. Within three months the Supreme Court of India banned the production and sales of BS-III Vehicle for the welfare of environment. As per the automotive manufacturers point of view, it was the next attack on automotive industry. The initial step was taken by the Ministry of Environment and Forest. The Supreme Court of India strictly banned the BS-III automobile production and sales after 1st April 2017.

KEYWORDS

Automotive, BS-III, BS-IV, Demonetization, Environment, Production, Sales

Introduction:

The Government of India has announced the withdrawal of high value currency in the name of 'demonetization' and the Apex court of India banned the BS-III vehicle. Both the statutory policies are implemented within six months. These changes affected the whole economy the result shows adverse effect. Especially the automotive sector affected very badly. But the BS-III ban show positive impact as per the environmentalist point of view. Moreover peoples also understood and accepted the necessity for the environmental change. Here we can analyze the impact of demonetization and BS-III ban with different dimension.

Objectives:

1. To analyze the Demonetization impact on Indian Automotive Industry
2. To find out the impact of Bharat Stage – III ban and implementation of Bharat Stage-IV in Automobile Industry.

Demonetization:

Demonetization is the law related to currency units withdrawal conducted by Government. The existing form of currency is getting back and new currency to be replaced. Some countries had the experience of demonetization. But almost all are failure. Examples are Zimbabwe, Botswana and South Africa.

Demonetization in India:

The Government of India has announced the withdrawal of Rs.500 and Rs.1000 banknotes of father of nation Mahatma Gandhi series on 8th of November 2016. In this situation on 10th January 2017 Reserve Bank circulated new 500 and 2000 currencies. The Government of India already demonetized the currency on two times. First time in 1946 and the next was in 1978. Both the times the government has announced the demonetization in the name of, "***The demonetization is a war against black money***". In 1946, the British Government demonetized the currency. In 1978 the ruling Janata and its coalition party government demonetized the currency of Rs.1,000, Rs.5,000 and Rs.10,000.

Support, Criticism and Opposition for the Demonetization:

In 2012, The Ministry of Finance-Department of Taxation has presented a recommendation against demonetization. In this recommendation, the bureaucratic stated that, "demonetization may not be a solution for tackling black money or shadow economy, which is largely held in the form of benami properties, bullion and jewellery". Based on the Income Tax Department data, "black money holders have just 6% or less of their wealth in cash form. Remaining 94% of the sources are in different pattern like, land, building, jewels, share, investment in other countries and in benami names".

The demonetization announcement got very big criticism by public. It should be addressed by the Reserve Bank Governor. At the time of the demonetization Mr.Urjit Patel is the Governor of the Reserve Bank of India. Instead of that, the demonetization announcement was done by the Honorable Prime Minister of India, Shri Narendra Modi on 8th November 2016. As per Prime Minister Statement, 'the demonetization process took the duration of 10 months'. But the new Governor signed in the currency notes (taken charge on September 2016). This is also a big criticism during that announcement.

Few weeks before demonetization, the official announcement was made by the Hindi daily 'Dainik Jagran' stated about the upcoming 2,000 rupees currency and the withdrawal of 500 and 1000 currencies. Similarly the Hindu 'Business Line' on 21st October 2016 states the upcoming 2000 rupees, and the possibility of withdrawal of 500 and 1000 rupees notes. The chair person of the SBI has also spoken in April 2016 about the possibility of withdrawal of high value currencies.

The demonetization scheme got supported from International Monetary Fund, Chinese state media 'Global Times', Former Prime Minister of Finland, Vice-President of European Commission, BBC's South Asia Correspondent, Forbes Magazine and Swedish Ministers. But many other had criticized and opposed the move. Because most of the demonetization schemes has been failures. The great Indian Nobel laureate economist Amartya Sen severely criticized the withdrawal of high value currency move calling it a "despotic action" Similarly the former Senior Vice-President and Chief Economist of the World Bank, Kaushik Basu calling as "Major Mistake and damage is likely to be much greater than any possible benefits".

In India the citizens are faced very much problem and panic. The Government was not allowed the public, to withdraw their own fund from banks. This is a peculiar case in the world. No Country has announced like this to stop withdrawal of their fund from bank. Almost all peoples are suffered. Very sound debates also held in Indian parliament. But the Government didn't response. Various state governments opposed the demonetization and strikes conducted across the nation. Peoples are in almost distress especially those who belongs to informal sector. The Ex-Prime Minister Dr.Manmohan Singh said "This scheme will hurt small industries, the farming sector. The GDP can decline by about 3% due to this move". Similarly the result shows the nation's industrial production and Gross Domestic Product growth rate was reduced.

Due to inefficient cash supply, the scarcity of cash to withdraw led to confusion and most of the public holding old useless currencies faced huge problems in exchange them in the bank. Almost all ATMs across nation were running out of cash after a few hours of being cash loaded. Peoples are always running between ATM to ATM, but not able to fulfill their needs. As per the Government report there is no death connected to demonetization. But the opposition leaders claimed that more than 100 died due to the demonetization.

General impact on demonetization:

Research Paper
Impact Factor: 5.471
Refereed, Listed & Indexed

IJBARR
E- ISSN -2347-856X
ISSN -2348-0653

A STUDY ON CUSTOMER SATISFACTION TOWARDS ONLINE MARKETING IN ERODE DISTRICT

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Abstract
Online shopping is the process whereby consumers directly buy goods, services etc. from a seller interactively in real-time without an intermediary service over the internet. Online shopping is the process of buying goods and services from merchants who sell on the Internet. In this research, the researcher has mainly focused on to examine the customer satisfaction towards online purchase in Erode district of Tamilnadu. For this, 150 respondents were selected and collect their opinion towards online purchase by convenience sampling method. Then subdued the collected opinion into tables through using simple statistical tools like percentage analysis, mean score analysis, chi-square test and correlation analysis. The results found that between of 26 and 35 years male college level educated employees have perceived high level of satisfaction towards online purchase. Further, the increase of the age of the respondents had identified that their satisfaction comes down.

Keywords : Online Purchase, Customer Satisfaction, Erode, Online Marketing, Online Products.

Introduction

Nowadays, online shopping is a fast growing phenomenon. Growing numbers of consumers shop online to purchase goods and services, gather product information or even browse for enjoyment. Online shopping environment are therefore playing an increasing role in the overall relationship between markets and their consumers. That is, consumer-purchases are mainly based on the cyberspace appearance such as pictures, image, quality information, and video clips of the product, not on the actual experience. As the internet has now become a truly global phenomenon, the number of internet users worldwide is expected to reach 1.8 billion by 2010 according to the survey of click stats, this growing and diverse internet population means the people having diverse taste and purposes are now going to web for information and to buy products and services. The wide use of internet and the rapid growth of technology have created a new market for both the customers and business. Now day's internet is not just another medium to get in touch with customers, but it is an important channel to find potential customers as well as channel to continue relationship with existing customers. Essentially, the idea of online shopping is to lead customers to a convenient way of shopping. Customers will be able to save their time and money, plus retrieve all the product information with just few clicks in few minutes. Plus, purchasing can be done anywhere, anytime according to their preferences.

Review of Literature

According to Vikash and Vinod Kumar (2017) stated in their research that the purpose was to understand the consumer perception regarding online shopping. The authors found that various underline perception of the customers are positive towards online shopping. Online shopping had tremendous potential and more business are going to add online platform to present extended retailer's shelves in the customers. Valarmathi (2017) identified that the Customer Perceptions towards Online Purchase and Digital Marketing in Coimbatore region. It is found that to raise sales and conversions through long-term brand loyalty, the consumer must first start by creating that initial awareness and exposure. Generating significant exposure and awareness for the brand was often very challenging and it can become more difficult online where there's a large amount of outside noise to contend with. Though, along with many challenges, there are also a great opportunities to build online awareness. According to Sivasankaran (2017) evaluated in their research that the study reveals that the majority of the youngsters of the present generation had access to the digital media but they not had the awareness about its optimum utilization. The author Santhi (2017) found that the preferences perceptions and factors influencing satisfaction of online shoppers in Tirupati Town. The results noted that the consumers are becoming more internet savvy every day.

Statement of The Problem

Online marketing has gained a lot of importance in present marketing conditions. But along with its vital growth the number of scamps, fraudulent practices and cheating also increased. Such cheating activities had created fear in the minds of customers and also an adverse impact in the attitude of consumers towards online purchase. The problem area of this survey is consumer's satisfaction towards online shopping will determine the factors that influence customers to shop online and those factors will help the marketers to formulate their strategies towards online marketing in Erode district of Tamilnadu.

ACCEPTED MANUSCRIPT

A theranostic nanocomposite system based on iron oxide-drug nanocages for targeted magnetic field responsive chemotherapy

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Word count for abstract: 141
Word count for manuscript: 4615
Number of references: 34
Number of figures: 8
Number of tables: 1
Number of Supplementary online-only files, if any: 1

Conflicts of Interest: There are no conflicts to declare.

This work was supported by DST-SERB (Ref. No: SB/FT/CS-130/2012) and the authors sincerely thank the Mohamed Sathak Engineering College, Kilakarai for their lab and instrumental facilities.

Materials Science & Engineering C 90 (2018) 119–130

Contents lists available at ScienceDirect

Materials Science & Engineering C

journal homepage: www.elsevier.com/locate/msec

Crystal structure, optical properties, DFT analysis of new morpholine based Schiff base ligands and their copper(II) complexes: DNA, protein docking analyses, antibacterial study and anticancer evaluation

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ARTICLE INFO

Keywords:
Schiff base ligand derived Cu(II) complexes
Structural analyses
Docking analysis
Antibacterial activity
Anticancer evaluation

ABSTRACT

New morpholine derived Schiff base ligands (HL^1 and HL^2) and their Cu(II) complexes $[Cu(L_1)_2]$ (1) and $[Cu(L_2)_2]$ (2) have been synthesized and characterized by ^1H NMR, IR, UV–Vis, EPR studies and cyclic voltammetric analyses. Single crystal X-ray crystallography studies confirm the structure of newly synthesized Schiff base ligands HL^1 and HL^2. The ground state electronic structures of Cu(II) complexes 1 and 2 have been investigated by DFT/B3LYP theoretical analysis with 6-31G (d,p) and LANL2DZ basis set. The affinity towards DNA and protein molecules have been evaluated using computational docking analysis and complex 2 expose significant binding ability with DNA as well as protein due to its towering hydrophobicity. Consequently, complex 2 reveals superior antibacterial activity against some bacterial species besides anticancer activity on human breast cancer (MCF-7) cells than complex 1 and Schiff base ligands (HL^1 and HL^2). These preliminary investigations strongly recommended that complex 2 can be used as a better antibacterial plus anticancer agent.

1. Introduction

Schiff bases play an important role in inorganic chemistry as they easily form stable complexes with most transition metal ions [1–3]. The high stability potential of Schiff base complexes with different oxidation states has extended the application of these compounds in a wide range and they can be used as biological models in understanding the structure of bimolecular or metalloprotein models [4,5]. This is due to their resemblance to natural systems; also these compounds have received much attention as active parts of metalloenzymes [6,7]. The heterocyclic N, O donor Schiff base ligands play an important role in the development of coordination chemistry as they readily form complexes with most of the transition metal ions [8,9]. The synthesis, structure and properties of coordination complexes still arouse considerable research interests because of their potential applications in material science [10]. Moreover bidentate and tetradentate Schiff base ligands involving N, O donor sites possess many advantages such as facile approach for synthesis, relative tolerance, readily adjusted ancillary ligands, tunable steric and electronic coordination environments on the metal centre. Besides showing excellent catalytic activity and magnetic properties, these metallic complexes can be used as well in medicine as anti-cancer drugs, and sensors [11,12]. 4-Phenyl-morpholine derivatives are reported to possess antimicrobial, anti-inflammatory and central nervous system activities [13–15]. Linezolide also possesses a 4-phenyl-morpholine substituent and it was observed that 4-phenyl-morpholine is a potential substituent to impart significant antimicrobial property to quinazoline moiety [16]. These observations have led to the conception that Schiff bases of 4-(4-aminophenyl)-morpholine would possess potential antimicrobial properties. MCF-7 cell has become a prominent model system for the study of breast cancer as it relates to the susceptibility of the cells to apoptosis [17]. Despite the fact that many tumors initially respond to chemotherapy, breast cancer cells can subsequently survive and gain resistance to the treatment [18]. Further, it has become increasingly important in the treatment of a number of

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https://doi.org/10.1016/j.msec.2018.04.032
Received 12 October 2017; Received in revised form 8 April 2018; Accepted 15 April 2018
Available online 21 April 2018
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Sensors & Actuators B: Chemical 273 (2018) 309–315

Contents lists available at ScienceDirect

Sensors and Actuators B: Chemical

journal homepage: www.elsevier.com/locate/snb

A reversible fluorescent chemosensor for the rapid detection of Hg^{2+} in an aqueous solution: Its logic gates behavior

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ARTICLE INFO

Keywords:
Mercury sensor
Logic gates
Live cell imaging
Probe
Turn-on fluorescence

ABSTRACT

A new easily available "off-on-off" colorimetric and fluorescent probe (L) was synthesized and it displayed the selective detection towards Hg^{2+} in aqueous solution over other competing metal ions. In presence of Hg^{2+}, L showed the incredible color and fluorescent response. More interestingly, the color and fluorescence could be recovered upon the addition of EDTA into the $L\text{-}Hg^{2+}$ solution. Moreover, this compound can be effectively applied to molecular logic functions of OR, AND, NOR and NOT gates through the processed spectral results. Based on the reversible and reproducible switching process, we designed a multimolecular-based sequential memory unit exhibits the "Writing-Reading-Erasing-Reading" and "Multi-write" activities in the form of binary logic. Density Functional Theory (DFT) calculations were theoretically supported the photophysical changes. Furthermore, the probe efficacy was studied by monitoring changes in intracellular Hg^{2+} ions in HeLa cells.

1. Introduction

The current growth of chemosensors development was much attention in modern research communities to design single organic molecules which can be potential ability to sense various metal ions by utilizing diverse analytical techniques. Such sensing compounds can attain vitally concerned owing to them contributes the significant role in living systems and contains very much toxic impact on the environment [1–6]. Among the various metal ions, mercury is one of the most toxic metal ions and hazardous heavy metal elements and it's extensively spread in soil, air and water [7,8]. The higher amount of mercury in the human body and can affect a large variety of diseases, even in low concentration, such as human health problems, including minamata disease, myocardial infarction and some variety of cancers and can lead to damage of the brain, kidneys, endocrine system, central nervous system and immune system [9,10]. The U.S. Environmental Protection Agency (USEPA) has set a 2 ppb maximum acceptable level of mercury contamination in drinking water, because of its severe toxicity [11]. Owing to the biological importance of the Hg^{2+} ion, the enormous interest have been focused on to development of an efficient compound for Hg^{2+} ion in environmental, biological and civilian use. Such aspects are inspired the research communities to find out the selective probes for colorimetric and ratiometric detecting of Hg^{2+} ions [12–16]. Hence, it is indispensable to construct the potential receptor that can be absolute detections of Hg^{2+} ions in biological levels.

On the other hand, molecular logic functions is also one of the most research hotspot in chemistry for communication in information technology, a recent development in the molecular approximations available is to build molecular logic devices, such as molecular keypad locks [17,18], information storage devices [19], logic gates [20–22] and so on. Since the first AND logic gate was initiated through optical signals by de Silva et al. [20]. Various organic molecules have been extended to obtain different logic functions such as AND, OR, NOR and their integrated logic operations [23]. In recent times, diverse complex logic functions such as Fuzzy logic and multivalued logic are obtained via the organic compounds [24,25]. Moreover, a variety of significant integrated logic functions such as INHIBIT, [illegible], half adders, half subtractor, full adder and full subtractor have been established with various single molecules [26,27]. The output of the constructed molecular logic systems, corresponding to the above mentioned logic gates

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https://doi.org/10.1016/j.snb.2018.06.067
Received 5 March 2018; Received in revised form 11 June 2018; Accepted 12 June 2018
0925-4005/ © 2018 Elsevier B.V. All rights reserved.

Received: 26 May 2018 | Revised: 3 July 2018 | Accepted: 12 July 2018
DOI: 10.1002/aoc.4538

FULL PAPER

WILEY Applied Organometallic Chemistry

Synthesis, physicochemical characterization and structural studies of new Schiff base ligand and its metal (II) complexes: *In silico* molecular docking analysis, antimicrobial activity and cytotoxicity

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A new Schiff base ligand, namely 2-((4-(diethylamino)phenylimino)methyl)-4,6-di-*tert*-butylphenol (HL), and its derived metal (II) complexes [Cu $(L)_2$] (**1**), [Co $(L)_2$] (**2**) and [Zn $(L)_2$] (**3**) have been synthesized and characterized using various physicochemical techniques. Single-crystal X-ray diffraction studies confirm the structure of newly synthesized HL and complex **2**. Density functional theory analysis was used to investigate their electronic structures and properties. *In silico* docking analysis revealed that complex **1** has significant DNA binding ability (atomic contact energy of −1008.26 kcal mol^{-1}) and complex **2** has a greater affinity with human serum albumin (binding energy of −901.61 kcal mol^{-1}). Complex **2** reveals the highest antimicrobial activity against both fungi and bacteria, whereas complex **1** shows greater cytotoxicity (IC_{50} = 14.3 ±0.9 μg ml^{-1}) to MCF-7 cancer cells.

KEYWORDS
antimicrobial activity, cytotoxicity, *in silico* docking analysis, metal (II) complexes, Schiff base ligand

1 | INTRODUCTION

The chemistry of Schiff base compounds has been studied extensively due to their various applications in electrochemistry and medical fields.[1–5] It has been discovered that the biological activity of some Schiff base ligands becomes enhanced upon chelation with metal ions.[6,7] In some cases, the free ligands do possess higher activity than the corresponding metal complexes, an indication that activity does not depend solely on the presence of metal ions but rather a synergistic effect of many factors.

Studies of the chemistry of salicylaldimine transition metal (II) complexes revealed that the introduction of bulky 2,6-di-*t*-butyl and 3,5-di-*t*-butyl substituents in the phenyl ring enables the production of peripherally bounded M (II)–phenoxyl radical complexes and directly metal-coordinated M (II)–phenoxyl type radical complexes, respectively.[8,9] The chemistry of metal complexes with salen type and other polydentate ligands bearing 2,4-di-*t*-butylphenyl moieties has been extensively studied because of their efficient catalytic activity and their use as model complexes for metalloproteins having metal

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Journal of Molecular Structure 1181 (2019) 342–350

Contents lists available at ScienceDirect

Journal of Molecular Structure

journal homepage: http://www.elsevier.com/locate/molstruc

Structural analysis, antimicrobial and cytotoxic studies on new metal(II) complexes containing N_2O_2 donor Schiff base ligand

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ARTICLE INFO

Article history:
Received 6 October 2018
Received in revised form
26 January 2019
Accepted 3 February 2019
Available online 5 February 2019

Keywords:
Tetra-dentate Schiff base ligand
Metal(II) complexes
Single crystal XRD
Antimicrobial screening
Cytotoxic activity

ABSTRACT

We report the biological activity of the new Schiff base ligand H_2L (H_2L = 6,6'-((1*E*,11*E*)-5,8-dioxa-2,11-diazadodeca-1,11-diene-1,12-diyl)bis(2,4-dichlorophenol)), its derived metal(II) complexes [Cu(L)] (1), [Co(L)] (2), [Ni(L)] (3) and [Zn(L)] (4), alongwith their structural characterizations by using various analytical and spectroscopic techniques. Single crystal XRD studies suggested that the prepared metal(II) complexes adopted a distorted tetrahedral geometry. The ^{1}H NMR and FTIR data concluded that the Schiff base ligand H_2L acts as a tetra-dentate ligand coordinating with metal(II) ions through the oxygen atom of the phenolic group and nitrogen atom of the azomethine group. Complexes 1 and 4 were found to be efficient in bringing about antimicrobial activities. The proposed mechanism of their antimicrobial activities has been discussed. 3-(4,5-Dimethylthiazol-2-yl)-2,5- diphenyltetrazolium bromide (MTT) assay showed the remarkable cytotoxicity of complex 1 (IC_{50} = 19 ± 1.1 μg/mL) on human breast cancer MCF-7 cells than Schiff base ligand H_2L and complexes 2–4. Moreover, AO/EB staining assay revealed cell death due to apoptosis in MCF-7 cells and the generation of ROS by the Schiff base ligand H_2L and its derived metal(II) complexes 1–4 may be a possible cause for their cytotoxic activity.

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1. Introduction

Schiff bases are considered "privileged ligands" because they are easily prepared by the condensation between aldehyde and imines. The Schiff base ligands are able to coordinate with different metal ions, and to stabilize them in various oxidation states [1]. The Schiff base complexes have been used in catalytic reactions [2–4] and as models for biological systems [5–9]. Schiff bases are characterized by an imine group N=CH which helps to clarify the mechanism of Schiff transamination and racemization reaction in biological systems [10]. During the past two decades, considerable attention has been paid to the chemistry of metal complexes of Schiff bases containing nitrogen and other donors [11]. Tetra-dentate Schiff bases with a N_2O_2 donor atom set are well known to coordinate with various metal ions, and this has attracted many authors [12–14]. The reactions of tetra-dentate Schiff bases derived from salicylaldehyde and diamine are the subject of many authors [15–18]. These reactions are important due to great number of molecules that can be generated and the well-known ability of these tetra-dentate ligands to form stable complexes with different metal ions [19]. Symmetric tetra-dentate Schiff base complexes have been extensively used as macro cycle model [20]. Tetra-dentate Schiff base complexes have received considerable attention because of their potential uses as catalysts [21], antibacterial [22], antifungal [23], antitumour [24] agents. Moreover, recently we have reported a few Schiff base metal complexes including in Cu(II), Co(II) and Ni(II) complexes as potent cancer cell damaging metallodrugs [25,26]. Among them, Cu(II) complexes showed better cytotoxic efficiency depending on their various ligand to metal

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https://doi.org/10.1016/j.molstruc.2019.02.005
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SENSOR LETTERS
Vol. 16, 1–5, 2018

Detection of Cu^{2+} Ion by a Simple Antipyrine Based Fluorescence Dyad System Through Fluorescence Quenching

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(Received: xx Xxxx xxxx. Accepted: xx Xxxx xxxx)

A simple antipyrine based dyad system *HMIP* was designed and synthesized from 4-aminoanitpyrine and substituted isophthalaldehyde for selective detection of Cu^{2+} ions through fluorescent quenching mechanism in acetonitrile medium at pH 7. The fluorescent sensor showed a 1:1 stoichiometry with Cu^{2+} ions obtained through Job's plot analysis. The fluorescence turn "OFF" behaviour of *HMIP* was attributed towards ligand-to-metal charge transfer mechanism. The quenching constant was calculated as 1.29×10^4 M^{-1} and the sensor was also found to be reversible with EDTA solution.

Keywords: Fluorescent Sensor, Copper Ion, 4-Aminoantipyrine, Dyad System, ICT, Fluorescent Quenching.

1. INTRODUCTION

Designing and developing of fluorescent chemosensors for selective recognition of cations has attracted considerable interest recently due to its highly sensitive and selective nature, simply analysis, quick responses and real-time screening.[1–3] Copper, being an essential element, has its impact at cellular level. Enzymes containing copper, plays significant roles in catalytic process for various biochemical reactions. Alteration in the levels of copper in human body led to risk of heart diseases. Excessive amount of copper ions led to unfavourable effect in humans like Parkinson's disease, hypoglycaemia and liver damages. Also the presence of excess concentration of Cu^{2+} ions is an important pollutant and has ecological impact in the environment.[4–9] Hence, development of highly selective and sensitive fluorescent probe for detection of copper ion is quite important. Our group has been focusing on developing fluorescent chemosensors with highly selective and sensitive detection of cations.[10–14] In this paper, we have demonstrated a highly selective fluorescent probe *HMIP* for selective detection of Cu^{2+} ion through fluorescent quenching via intramolecular charge transfer process in acetonitrile medium. The binding stoichiometry and the quenching constant were calculated. The reversibility nature of the probe *HMIP* was also studied using EDTA titrations. Effect of pH revealed the optimum pH value as 7 for efficient detection of Cu^{2+} ion by probe *HMIP*.

2. MATERIALS AND METHODS

2.1. Reagents and Instruments

All reagents and chemicals, unless stated otherwise, were acquired from commercial suppliers and used without further purification. 4-Aminoantipyrine and 2-Hydroxy-5-methyl isophthalaldehyde were purchased from Aldrich. Twice distilled water was used for all the experiments. Metal salts used were either chlorides or nitrates salts. UV-Visible and fluorescence measurements were recorded using Jasco V630 and JAsco FP-8300 spectrophotometer respectively using cuvettes of 1.0 cm pathlength.

2.2. Synthesis

The fluorescent sensor *HMIP* was synthesized by following a condensation reaction between 4-aminoantipyrine and 2-hydroxy-5-methyl isophthalaldehyde as reported in

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1546-198X/2018/16/001/005

doi: 10.1166/sl.2018.4054

Sustainable Materials and Technologies 22 (2019) e00125

Contents lists available at ScienceDirect

Sustainable Materials and Technologies

journal homepage: www.elsevier.com/locate/susmat

Recycling of waste tires and its energy storage application of by-products –a review

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ARTICLE INFO

Article history:
Received 15 March 2019
Received in revised form 21 July 2019
Accepted 30 July 2019

Keywords:
Tyre pyrolysis oil
Char
Gas
Supercapacitor
And battery

ABSTRACT

Disposal of a waste tire is a major environmental and economic issue. So to account for its re-usage different recycling methods have been studied. Among them, pyrolysis is regarded as one of the promising routes. Pyrolysis involves thermal degradation of the waste tire at elevated temperature. Tire pyrolysis process produces value-added products such as tire pyrolysis Oil (TPO), pyro char and pyro gas. TPO can be used for alternative fuel for the engine and can also be used as a precursor for benzene, xylene, toluene, and limonene synthesis. TPO has also been used as a precursor in the synthesis of carbon nanotubes. Pyro char can be converted to porous carbon structure and which can be used as adsorption and energy storage material like supercapacitor and battery. Pyro gas can be used directly as industrial fuel and hydrogen. In this way, the waste tire can be converted into valuable materials by pyrolysis.

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1. Introduction

The disposal of waste tires is currently a major environmental and economical issue [1]. The annual generation of waste tires throughout the world is estimated to be about 4 billion tons. Waste tire disposing

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https://doi.org/10.1016/j.susmat.2019.e00125
2214-9937/© 2019 Published by Elsevier B.V.

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Carbon Nanotube from Unconventional Precursor-Optimization of Synthesis Parameters

Submitted: 27 October 2018 , Reviewed: 31 January 2019 , Published: 24 May 2019

DOI: 10.5772/intechopen.84860

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Abstract

J. Environ. Nanotechnol.
Volume 7, No.2(2018) pp. 26-30
ISSN (Print): 2279-0748
ISSN (Online): 2319-5541
doi:10.13074/jent.2018.06.182311

Photocatalytic Reaction Pathway and Mechanism of Degradation Of Pesticide Using Nano Catalysts

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Received: 18.12.2017 Accepted: 02.03.2018

Abstract

In the present study, dichlorvos was degraded with photocatalytic active p-type semiconductor and n - type semiconductors. The nano - WO_3 was synthesized fromsodium tungstate andnano - TiO_2 was synthesized through sol-gel technique from titanium (IV) isopropoxide by hydrothermal treatment. The synthesized materials were characterized by different techniques such as XRD, FTIR, and SEM . In order to find out their photocatalytic ability and degradation of dichlorvos, experiment was carried out in aqueous suspension under UV light. The reaction pathway and mechanism were studied. From the evaluation, nano- TiO_2 showed higher activity when compare with other catalyst.

Keywords: Dichlorvo; Degradation; Photocatalyst; Nano - TiO_2

1. INTRODUCTION

The environment and the whole lot connected with it's been a major difficulty of the general public, due to the fact maximum of our ecological structures particularly water are being continuously contaminated by home and commercial pollution. At some stage in the past numerous many years, the boom of population and the hobby in industry and agriculture have drastically altered the environment and reduced the natural sources. The continual and toxic organic substrates present in waste water effluent have to be removed or destroyed before discharge to the environment. Already existing methods like adsorption or biological treatment appear to have many drawbacks for the reason that former entails only section transfer of the pollution without degradation and the latter cannot be implemented to contaminants which can be toxic to the micro-organism (Hoffmann *et al.*. 1995). Semiconductor assisted photocatalysis is a promising environmentally benign technique which has been broadly and efficaciously used for the elimination of pollution (Ragnarsdottir, 2000).

The organophosphorous insecticides are comprised within the ten most broadly used insecticides all around the global. They're extremely poisonous appearing on acetylcholinesterase hobby (Mileson *et al.*. 1998; Mennear and Dichlorvos, 1998). Dichlorvos (2,2-dichlorovinyl-o,odimethyl phosphate) become commercially synthetic in 1961 and it is used for insect manage in meals storage areas, greenhouses and barns. It's also used for controlling parasites and bugs in homes, aircraft and outside regions (as aerosols, liquid sprays).

On this take a look at, the photocatalytic degradation of dichlorvos using Graphite oxide (GO), Commercial TiO_2 (C-TiO_2), WO_3,nanoTiO_2 as catalysts has been investigated. the objectives have been: (i) to assess the kinetics of pesticide disappearance (ii) to evaluate the photocatalytic efficiency of the catalysts.The photocatalytic degradation of dichlorvos, the use of TiO_2 has already been studied with the aid of other researchers. Harada *et al.*. (1990), tested the charge of the photocatalytic oxidation of dichlorvos the use of rutile TiO_2 and TiO_2/pt as catalysts. Naman *et al.*. (2002), Lu *et al.*. (1996) and Balkaya (1999) examined the effect of various parameters just like the initial awareness of dichlorvos, the addition of salts, the addition of various sensitizers, and many others. No significant attempt has been made, from previous researchers, which will take a look at the photocatalytic efficiency of nano- TiO_2 on dichlorvos oxidation and the elements affecting it.

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CHARACTERIZATION AND BIOLOGICAL EVALUATION OF SILVER NANOPARTICLES SYNTHESIZED BY LEAF EXTRACTS OF *IPOMOEA PES-CAPRAE* (L) R. BR.

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Abstract— The advancement of nanotechnology, the biogenic methods of nanoparticles have an extensive application towards the medical field now a days. It is believed that using biologically inspired methods to avoid using chemicals to avoid land pollution, aqueous leaves extract of *Ipomoea pes-caprae* has been used to green and economic technique in reduction of silver nitrate ($AgNO_3$) to synthesis silver nanoparticles (AgNPs) and it was characterized using UV-vis spectroscopy, Fourier transform infrared spectroscopy (FTIR), X-ray diffraction analysis (XRD), Scanning Electron Microscopy (SEM) and Atomic force microscope (AFM). A peak at 440 nm was established by UV-Visible spectroscopy confirmed the formation of silver nanoparticles (AgNPs) and for calculating the size of AgNPs from XRD and found 48 nm. The FTIR analysis evaluated the presence of different functional groups are carbonyl, amine and phenolic compounds of leaves extract which are involved in the reduction of silver ions and acts as capping. The AgNPs AFM micrograph confirms that AgNPs were in Nano range and spherical in nature. The antibacterial activity of AgNPs against gram-positive *Staphylococcus aureus*, *Bacillus subtilis* and gram-negative pleuralpneumoniae serogroup *Salmonella typhi* and *Escherichia coli* main were analyzed by disk diffusion method and it shows higher zone of inhibition. Human lung adenocarcinoma (A549) and brain tumor (U87) cells treated with various concentrations of AgNPs showed a dose dependent increase in cell inhibition and the IC50 value of the AgNPs was calculated to be 6.5 µg/ml and 7.8 µg/ml.

Index Terms – *Ipomoea pes-caprae*, Silver nanoparticles, Cytotoxicity, Antibacterial activity.

INTRODUCTION

Recently, there is much focusing on natural products obtained from plants and herbal resources. *Ipomoea pes-caprae* (L) R. Br. is an example of these important medicinal resources. *I. pes-caprae* is used in folk medicine against inflammation and gastrointestinal disorder and as an analgesic agent [1]. *I. pes-caprae* is an ancient plant employed in the treatment of headache and various types of inflammation including jellyfish sting dermatitis [2]. In recent years, noble metal nanoparticles have been the subjected of intensive research due to their unique optical, electronic, mechanical, magnetic and chemical properties that are significantly different from those of bulk materials [3]. Numerous approaches using plant extract have been used for the synthesis of metal nanoparticles. The biosynthetic methodologies employing plant extracts [4] have received much attention recently owing to its simplicity, cost-effectiveness and environmentally stable nature, compared to the other existing methods such as using bacteria and fungi [5], chemical [6] and physical methods used for synthesis of metal nanoparticles. In medicine, silver and silver nanoparticles have a large application, including skin dressings and creams containing silver to prevent infection of burns and open wounds [7], medical devices and implants prepared with silver-impregnated polymers [8] and silver embedded fabrics in sporting equipment [9]. Using plant for nanoparticles can be advantageous over different biological methods by eliminating the elaborate process of maintaining cell cultures [10] and it can be suitably scaled up for large-scale synthesis of nanoparticles. Green synthesis of silver nanoparticles [11] have been reported using extracts of various plants such as *Nelumbo nucifera* [11], *Euphorbia hirta* [12], *cinnamon zeylanicum* [13], *Zingiber officinale* [13], *Melia azedarach* [14], etc.

Phytochemicals found in the plant sources might involve in the prevention of chronic and degenerative diseases [15]. Flavonoids are the important groups of phytochemical in plant materials, which have proven pharmacological properties like anti-inflammatory, antiallergic, antibacterial, antifungal and antiviral [16,17]. These are free radical scavengers, COX inhibitors and tumor suppressors [18,19]. Bilalshah et al. [20] isolated important bioactive flavonoid compound from fruits of *Ipomoea*

Journal Homepage: www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI: 10.21474/IJAR01/8307
DOI URL: http://dx.doi.org/10.21474/IJAR01/8307
ISSN NO: 2320-5407

RESEARCH ARTICLE

PHYTOCHEMICAL EVALUATION OF LEAF AND STEM OF IPOMOEA PES-CAPRAE (L) R. BR.

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Manuscript Info

Manuscript History
Received: 04 November 2018
Final Accepted: 06 December 2018
Published: January 2019

Key words:
Ipomoea pes-caprae,
phytochemical screening,
GC-MSD

Abstract

The present study was to investigate various medicinal value phytochemicals in leaf and stem portion of *Ipomoea pes-caprae* were determined by various physic chemical characteristics like moisture content, total ash content acid insoluble ash content, water insoluble ash content and solvent extractive values. The qualitative phytochemical screening and quantitative analysis by GC-MSD with nonpolar solvent n-hexane, suggested the presence of alkaloid, sugar, glycoside, saponins, steroids, terpenoids and flavonoids. The study provides evidence that the leaf and stem has potential source of antimicrobial, anti-inflammatory, antioxidant and cytotoxic agents.

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Introduction: -

Ipomoea pes-caprae (Convolvulaceae) is a valuable medicinal plant, distributed in the tropics and subtropics regions and uses in folk and tribal medicines. *I. pes-caprae* (L.) R. Br.-baybopa is a pan tropical, trailing vine that routinely colonizes on sand dunes. It grows just above the high tide line along coastal beaches, forming large mats that assist in stabilizing sands. This is an evergreen perennial with a large, thick root that can be 10 ft. long and 2 inches in diameter. The entire plant is glabrous and somewhat fleshy. The stem runs along the ground trailing at the nodes with only the flowers being erect, [1,2] *I. pes-caprae* has the potential to scavenging free radicals and can be a vital source of antioxidant phytochemicals [3]and good antinociceptive property due to the presences of components, such as glochidone, betulinic acid, alpha and beta-amyrin acetate, isoquercitrin in the writhing test and formalin test in mice, and to treat dolorous processes, [4]. Leaves are used in rheumatism, and as stomachic and tonic. The extract of the leaves has the astringent, diuretic and laxative properties. It has biological activity like antioxidant, analgesic and anti-inflammatory, antispasmodic, anticancer, antinociceptive, antihistaminic, insulogenic and hypoglycemic [5]. It is also used in inhibition of platelet aggregation, diarrhea, vomiting, and piles [6]. The antioxidant properties in a typical diet are mostly derived from plant sources and polyphenolic components of higher plants act as antioxidant or other mechanisms contributing to anti-carcinogenic action [7].

The therapeutic ability of the plants is not part specific. It varies from plant to plant but all parts are endowed with medicinal properties. It may be root, rhizome, stem, flower, leaf, fruit or seed. Different parts of the plant show different biological activities. Hence it is very essential and important to perform pharmacognostic studies of medicinal plants [8]. Before the plant can be taken up as drug alone or in formulations with other compounds, it is of utmost importance to lay down standardization parameters which will enable to maintain the authenticity and quality of the drug and prevent it from being adulterated and/or substituted. Pharmacognostic studies of different parts is essential for many medicinal plants. Some of the examples are pharmacognostic studies are *Tephrosia purpurea* root [9]; *Fenchel* fruit [10]; *Rhizome of Smilax china* [11]; *Manilkara hexandra* leaf [12]; *Dioscorea bulbifera*

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Synthesis And Biological Evaluation Of 5-(3,4-Methylenedioxyphenyl)-2,4-Pentadienoic Acid Derivatives As Potent Antimicrobial And Cytotoxicity Agents

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Abstract: Black pepper (Piper nigrum L.) fruit for quite some time has been valued as a spice which enhances mouth taste and it is additionally considered as a medicinal plant. The predominant compound present in ethanolic extracts of P. nigrum, the piperine, was crystallized. Piperine, a naturally occurring alkaloid present in black pepper is a chemical constituent the main responsible for healthiness till date. Piperic acid was prepared by alkaline hydrolysis of the obtained piperine. A progression of piperine analogs were synthesized by the coupling of piperic acid with various substituted amines (1a-3e). The synthesized compounds (1a-4e) were screened for their anticancer activity against human growth cell lines (HepG 2, liver Cancer cell line and MCF-7, Breast Cancer cell line) and antibacterial activity (in vitro) against pathogens, Escherichia coli (gram negative) Staphylococcus aureus (Gram positive) bacterial species. The efficacies of the synthesized compounds (1a-4e) were better than those of piperine. In cell lines human cancer cell lines, among the derivatives, 4d indicated huge anticancer activity against breast cancer cell line (MCF-7) with 53.24 % and 4e showed huge potency against liver cancer cell line (HEPG 2). The antibacterial activity of the synthesized was additionally observed to be better for compound 4e and 4d than that of other derivatives. Therefore the approach is novel as the richly available common item piperine is used as precursor for the synthesis of new potential antimicrobial and anticancer reagents.

Keywords – Antibacterial activity, Coupling agent, Piperic acid, Piperine

Date of Submission: 01-05-2018 Date of acceptance: 15-05-2018

I. Introduction

Black pepper is known as king of spices and extensively used all over the world. Piperine was isolated in good yield from ground black pepper by Oersted H Schweigers in 1821. Pepper's pungency was found in 1820 to be due to Piperine. Veritably, it has been thought to cure many illnesses such as fever, malaria and cholera [1]. Piperine ($C_{17}H_{19}NO_3$) is an alkaloid found in the fruits and roots of *Piper nigrum* and *Piper longum* species of Piperaceae family. Pepper contains of piperine, alkaloid (1-9%), pungent resin (5-9%), volatile oil (1-2.5%), piperidine and starch (about 30%) [2,3]. The volatile oil of Piperine has shown to have antimicrobial property [4]. Piperine has anti-inflammatory [5,6], and sedative [7], antidepressant CNS depressant activities [8]. The compound in pepper known as Piperine is commercially utilized in products of different brands to be used against houseflies and other insect pests. Piperine is 1-[5-(1, 3-benzodioxol-5-yl)-1-oxo-2, 4-pentadienyl]-Piperidine [9]. Recent medical studies have shown Piperine to be very helpful in increasing the absorption of certain vitamins such as Selenium, Vitamin B and Beta-Carotene [9].

It is commonly used in various traditional systems of medicine. Piperine has been reported to have various types of pharmacological activities such as anti-inflammatory [11], antioxidant [12], antiasthmatic [13], anti-hepatitis [14], hepato-protective [15], anti-thyroid [16], and antidepressant [17]. Widely used anti-inflammatory drugs (NSAIDs) are used for the treatment of inflammation, pain, fever, stroke [18], kidney damage [19] and hepatotoxicity [20]. Therefore, the development of NSAIDs with fewer side effects is still in much way all over the world.

In the course of the potentialities of piperine, not much work has been carried out to develop the basic pharmacophore analogs as anticancer and antimicrobial agents. The readily synthesized amides derivatives of the piperic acid (5-(3,4-methylenedioxyphenyl)-2,4-pentadienoic acid), a hydrolytic product of the natural compound piperine, and a coupling agent were investigated for their anticancer and antibacterial activities. The piperic acid has been used as a precursor for the synthesis of new potential antimicrobial and anticancer reagents. The new derivatives were synthesized by replacing the piperidine moiety with different substituted amines. The prepared amide derivatives were conjugated piperine derivatives and they are characterized by ^{1}H NMR, ^{13}C NMR, and mass spectral analysis. The biological activity of the synthesized compounds was evaluated and compared with the standard drug piperine.

Vol 12, Issue 5, 2019

(19)

Online - 2455-3891
Print - 0974-2441

Research Article

A POTENT CYTOTOXICITY AND ANTIMICROBIAL ACTIVITY OF ZINC OXIDE NANOPARTICLES SYNTHESIZED BY LEAF OF *IPOMOEA PES-CAPRAE* (L.) R. BR.

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Received: 01 February 2019, Received and Accepted: 27 March 2019

ABSTRACT

Objective: The present study was conducted to investigate the cytotoxicity and antimicrobial activity of zinc oxide nanoparticles (ZnO NPs) synthesized in eco-friendly technique from the leaf extract of *Ipomoea pes-caprae* (L.) R. Br against human lung adenocarcinoma (A549), brain tumor (U87) cells, and human pathogens *Salmonella typhi*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *Bacillus subtilis*.

Materials and Methods: The work was carried out with varying precursor (plant extract) volume to optimize the synthesis of ZnO NPs and it was confirmed by ultraviolet (UV)-visible spectroscopy. Fourier-transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) analysis, scanning electron microscopy, and atomic force microscope (AFM) characterization techniques and evaluate its cytotoxicity activity by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-tetrazolium bromide assay method, antimicrobial activity by disk diffusion method.

Results: A peak at 320 nm with maximum intensity was observed at temperature of 80°C with pH of 8.0 in UV-visible spectroscopy confirmed the formation of ZnO NPs and we calculate the size of ZnO NPs from XRD data found as 15.8 nm. The FTIR analysis evaluated that the presence of different functional groups i.e carboxyl, amine, and phenolic compounds of leaves extract which are involved in the reduction of zinc ions and acts as capping the ZnO NPs. AFM micrograph confirms that ZnO NPs were in nanorange and spherical in nature. The cytotoxicity activity of A549 and U87 cell lines treated with various concentrations of ZnO NPs showed a dose-dependent increase in cell inhibition and the half maximal inhibitory concentration value was calculated to be 7.8 µg/ml. The antibacterial activity of selected pathogens shows higher zone of inhibition.

Conclusion: The present study reveals that synthesized ZnO NPs capping with various bioactive compounds present in the leaf of *I. pes-caprae* show promising activity of cancer cell lines and antimicrobial agents; hence, further detailed study may lead to develop as a novel phytomedicine for the anticancer and antimicrobial drugs.

Keywords: *Ipomoea pes-caprae*, Zinc nanoparticles, A549 cell line, U87 cell line, Anticancer activity, Antimicrobial activity

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INTRODUCTION

Recently, there is much focusing on natural products obtained from plants and herbal resources, *Ipomoea pes-caprae* consider as an example of phytocompounds richest resources. *I. pes-caprae* is used in folk medicine against inflammation and gastrointestinal disorder and as an analgesic agent [1]. *I. pes-caprae* is an ancient plant employed in the treatment of headache and various types of inflammation including jellyfish sting dermatitis [2]. In recent years, noble metal nanoparticles (NPs) have been the subject of focused research due to their unique optical, electronic, mechanical, magnetic, and chemical properties that are significantly different from those of bulk materials [3]. Numerous approaches using plant extract have been used for the synthesis of metal NPs. The biosynthetic methodology employing plant extracts [4] has received much attention recently due to its simplicity, ecofriendliness, and economically viable nature, compared to the other existing methods such as using bacteria and fungi [5], and chemical [6] and physical methods used for synthesis of metal NPs. Zinc oxide NPs (ZnO NPs) have a tremendous potential in biological applications such as biological sensing [7], biological labeling, gene delivery, drug delivery [8], and nanomedicine along with its antibacterial [9], antifungal [10], acaricidal, pediculocidal, larvicidal [11], and antidiabetic activities [12]. ZnO NPs are known to be one of the multifunctional inorganic NPs with effective antibacterial activity [13]. Antibacterial and antifungal activities of ZnO NPs are observed even at very lower concentrations and the antifungal activity does not affect soil fertility compared to the conventional antifungal agents [14], Based on literature, biosynthesis of ZnO NPs was reported using plant extracts including *Aloe vera* (leaf) [15], *Nephelium lappaceum* L. (fruit peel) [16], *Corymbia citriodora* (leaf) [17], *Polyalthia longifolia* (root) [18], *Thevetia peruviana* (flower) [19], *Aloe vera* (fruit) [20], *Zingiber officinale* (rhizome) [21], *Eucalyptus globulus* (leaf) [22], and *Vitex trifolia* L. (leaf) [23]. Some reports show biosynthesized silver NPs from *I. pes-caprae* leaf extracts showed remarkable anticancer activity against liver cancer cells (A549) and human brain tumor cancer cell line (U87) and effective antibacterial activity [24].

In the present work, we tend to describe a green synthetic strategy to prepare ZnO NPs from leaves extract of *I. pes-caprae*. To confirm the presence of ZnO NPs, different characterization techniques were used and evaluate its cytotoxicity and antimicrobial activity of some selected cell lines and microbes.

MATERIALS AND METHODS

Chemicals, media, and cell line

Zinc acetate dihydrate ($Zn(CH_3COO)_2.2H_2O$) was purchased from Sigma-Aldrich, Mumbai, India. High pure double distilled water was used throughout the method. Both normal and Whatman No.1 filter paper were used for the filtration process. The A549 and U87 cell lines were obtained from the National Centre for Cell Sciences (NCCS), Pune.

Preparation of plant extracts

Whole plant of *I. pes-caprae* was collected from Manalmedu coastal area, Ramanathapuram district, Tamil Nadu, India. The well-cleansed leaves were cut into smaller pieces using a sterilized knife thereafter allowed to dry in a hot air oven for 24 h at 40°C. The dried, cut leaves were removed from the oven and cooled down to room temperature before grinding using a mechanical grinder. The powdered leaves were collected and

filtered using mesh to collect very fine powder. The fine powders were

Pseudomonas aeruginosa, and *Bacillus subtilis* using agar well diffusion

NOVEL PRE-PROCESSING FRAMEWORK TO IMPROVE CLASSIFICATION ACCURACY IN OPINION MINING

Helen Josephine V. L.

Duraisamy S.

DOI: https://doi.org/10.47839/ijc.17.4.1145

Keywords: Pre-processing framework, Opinion Mining, Machine Learning, Neural network.

Abstract

The growth of information technology led to the Internet development that in turn helped people in many ways. The major one is to express their views about the products and services through reviews, blogs, feedback, and comments on the website and in social media. The buyers are forced to go through investigation on these reviews/blogs, before choosing any product or service. Out of all online services, Mobile learning app places a vital role to increase the thirst for knowledge. But to identify the suitable mobile learning app, the opinions of the existing customers need to be mined. This research paper analyzes the mobile learning reviews which are available in the corpus. A novel preprocessing framework is proposed in this paper to improve classification accuracy in the dataset - mobile learning app review dataset. The corpus dimension is reduced using SVD through which, the data is prepared for mining. The classification accuracy is evaluated by applying Multinomial Naïve Bayes, Random Forest data mining algorithms and Learning Vector Quantization (LVQ), Elman Neural Network (ENN), Feed Forward Neural Network (FFNN) algorithms with the dataset obtained by the proposed processing method.

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Journal of Web Engineering, Vol. 17, No 6 (2018) 2683-2692
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MAINTAINING SOFTWARE REQUIREMENTS USING FREQUENT PATH MINING AND CLUSTERING ALGORITHM FOR WEB USAGE DATA

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ABSTRACT: The data mining for software engineering is progressing over the past years. It is related to the application of data mining for offering beneficial perceptions the way of enhancing software engineering processes as well as software itself, aiding decision-making. So, data generated by software engineering processes as well as products, subsequently software development are utilized. Regardless of hopeful outcomes, there is often a deficiency of discussion on the role of software engineering practitioners among the data mining methods. On the other hand maintenance as well as advancement of the software could be problematic as often the requirements are no longer actual and/or frequently not even subsist documented. Examining the application of the websites could find out enhancements and aid to keep the website in addition to its software requirements. This paper Software Requirement with Data Mining Analytics ($SRDM_{Analytics}$), a recommender system, which collects the data regarding the use of a website, processes it and makes suggestions to the requirements specification of the website. It encompasses five main steps: mapping, Navigation of frequent paths, Traceability Matrix analysis, Requirements Analytics and report analysis. The second and third steps turn out to be most significant step to raise the $SRDM_{Analytics}$ outcomes. In this research, with the help of Improved Ant Colony Optimization (IACO) algorithm, Navigation of frequent paths are carryout as well as with the help of Fuzzy C Means (TM-FCM) clustering algorithm, traceability matrix formation is carried out. TM-FCM algorithm, relate the links amid the functional requirements as well as the web pages in addition to the website elements. This presented Data Mining based Recommender System (DMRS) for Software Engineering (DMRSSE) is a new method to aid developers in decision making. It could assist developers to identify alternate decisions in an extensive range of software engineering tasks from reusing code to write efficient bug reports. This presented DMRSSE system is utilized for the enhancement of the quality of a web application. The presented system is assessed in real environments with the help of software development experts utilizing an exhaustive collection of criteria, and the outcomes are hopeful.

INDEX TERMS: Software Requirements, Web Usage Mining, decision-making, Software Engineering(SE), Traceability Matrix -Fuzzy C Means (TM-FCM) clustering algorithm, Improved Ant Colony Optimization (IACO) algorithm, frequent paths, Data Mining based Recommender System (DMRS), Software Requirement with Data Mining Analytics ($SRDM_{Analytics}$).

1. INTRODUCTION

At the present time, in Software Engineering, one among the major concerns must do with software quality that is to guarantee that software is constructed thoroughly, methodically, measurably, on budget, on time, and within specification. There is the essential to describe novel requirements, bring up-to-date previous ones and implement modifications consequently, since software progresses along time. Change requests could instigate from diverse stakeholders, for instance users, systems engineers, developers, and service integrators. Modifications in requirements, their unrestrained development all through the project and a poor requirements gathering are the foremost reasons for software project failures [1].

On the other hand, updating a Software Requirements Specification is tough, predominantly in cases where the software project is a website/service, which progresses for its lifespan. This takes place, in spite of software organizations focusing on enhancing their processes utilized to gather, examine, document and keep their requirements in a structured requirements specification written in natural language [2].

Presently, web analytics tool are capable of gathering various data regarding the use of a website. The application of websites produces huge volume of info, which could be utilized for diverse reasons such as evaluation of quality of web-products [3] or to statistical analysis of website data usage [4]. On the other hand, these tools just produce reports with the navigation statistics, period of navigation on the website and other metrics, which are typically utilized simplistically to see which content with more obedience by users [5]. Web analytics has concentrated on analysis as well as reporting of business metrics of interest principally to marketers [6]. An analysis concentrating on the enhancement is not presently carried out and this data is ignored for the enhancement of the quality of a web application.

Data regarding the use of websites could be a good contribution for software requirements maintenance that could aid to enhance the total quality of the offered service. Present requirements management approaches don't utilize this kind of info. The likelihoods of the analysis of this web usage data till now want to be explored [6]. Data collected by web analytic tools along with an appropriate analysis of that data could create suggestions for enhancing the complete software service. In e-commerce, Recommender systems are utilized with the aim of offering user personalization [7] such as content, product, or service's

Cluster Computing
https://doi.org/10.1007/s10586-018-1923-7

Prediction of software fault-prone classes using an unsupervised hybrid SOM algorithm

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Received: 16 October 2017 / Revised: 18 January 2018 / Accepted: 23 January 2018
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Abstract
In software engineering fault proneness prediction is one of the important fields for quality measurement using multiple code metrics. The metrics thresholds are very practical in measuring the code quality for fault proneness prediction. It helps to improvise the software quality in short time with very low cost. Many researchers are in the race to develop a measuring attribute for the software quality using various methodologies. Currently so many fault proneness prediction models are available. Among that most of the methods are used to identify the faults either by data history or by special supervising algorithms. In most of the real time cases the fault data bases may not be available so that the process becomes tedious. This article proposes a hybrid model for identifying the faults in the software models and also we proposed coupling model along with the algorithm so that the metrics are used to identify the faults and the coupling model couples the metrics and the faults for the developed system software.

Keywords Software metrics · Fault prediction · Coupling · Fault proneness · ANN

1 Introduction

Software fault proneness is the popular technique in developing object oriented systems. By using a machine learning approach the quality of the software can be predicted. So that the practical difficulties can be rectified quickly and easily. In general it is very difficult to develop an error free software. The main practical difficulty is the user needs changes every aspects and once the terms are changed automatically a drawback will occur in the side which leads to faults in the software model. The quality assessment is the essential factor while developing and launching the software. Because it is based on the customer needs and the satisfaction is unveiled. So that the main focus for all the developers is only on the quality measures.

In order to predict the faults the some quality attributes are considered. Fault proneness, test issues, maintenance, user friendliness, reliability are some of the attributes in fault prediction. The receiver operating characteristics are very helpful in developing a testing platform to identify the fault proneness and coding levels. In that reliability is generally measured by the number of faults identified in the particular developed software in a particular duration of time. Developers must predict the faults, reduce the faults and the final product must be with less faults or fault free software. So that a design is needed, to develop a model for identify the faults. Applying fault occurrence is based on the design metrics in object oriented design. Developing high quality software is based on the fault prediction. Software fault prediction is a verified system which is in practice to achieve high software reliability. Software quality constitutes one of the greatest goals of every software industry and has become a significant element in their success.

The complexity and size of software applications coupled with the criticality of software failure today, guaranteeing high quality in large software systems during

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Published online: 15 March 2018

e-ISSN : 0975-3397
p-ISSN : 2229-5631

A NOVEL APPROACH FOR CONVERSION OF SEMISTRUCTURED TO STRUCTURED DATA

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Abstract: The flora of the Internet and the status of net objectivity is that transformation can come from everybody. Web mining is a significant research part in today's world. The Web mining is mostly dispersed into three types. First, the web structure mining, second, the web content mining, and the third it focuses on web usage mining. The web usage mining deals with web usage logs which is used to find out patterns from web. The Web structure mining is used to mine information from the structure of hyperlinks .The web Content Mining is used to extract useful information or data from web page. The web content mining is connected but differs from data mining and text mining. In this paper, the research work motive is to learn about web content mining tools, techniques and the examination is concentrated on semi structured data.

Keywords: Web Content Mining, Web usage Mining, Web Structure Mining, Structured Data, Semi Structure Data, Multimedia data, Tools of Web Content mining

I.INTRODUCTION

Web Mining is a division of Data Mining technique which is used to find out and extract information from the web documents. Web mining can be divided into following subtasks. They are

- Resource Finding
- Information assortment and preprocessing
- Generalization
- Analysis

The companies, Organizations and persons are eager to collect information through web data mining which can be used to kindle business and to identify market dynamics and new promotions floating on internet.

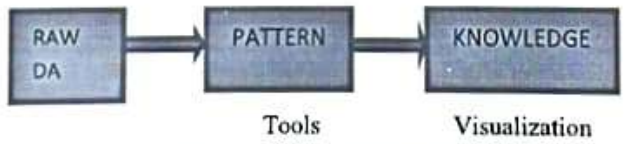

Figure 1.1 : Web Mining Process

The Raw Data can be in the figure of text and images. By using the mining tools, the prototype can be obtained from the raw data and the information can be transformed into knowledge by historical patterns and potential trends. The above Figure 1.1 shows the overview of web mining process.

II. WEB CONTENT MINING

Web Content mining is the mining, drawing out and incorporation of important data from web page content. The content can be a text, image, audio, video, metadata and hyperlink. It also distinguishes personal homepage with other web pages. The Web Content mining is connected but differs from data mining and text mining. The data mining focuses on structured data or structured text. The text mining principally focuses on unstructured data or unstructured text. The Web Content mining is a semi structured data or text and also it concentrates on unstructured data or text. The Natural Language Processing and Information Retrieval are the technologies used in web content mining.

Data / Information Extraction

In this, the structured data are retrieved from web pages which can be from Products and Search results, Value added services Example: Contrast of shopping, Meta search. The techniques used in data/information mining are

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An Analysis and Implication of Data Mining Techniques using Semi structured Data towards clinical data sets

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SuchitraB et al., IJSRR 2018, 7(3), 1011-1016

Research article Available online www.ijsrr.org ISSN: 2279–0543

International Journal of Scientific Research and Reviews

An Analysis and Implication of Data Mining Techniques using Semi structured Data towards clinical data sets

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ABSTRACT

Data mining plays a dynamic role in today's world. In this era, technological inventions, innovations and also development of algorithms has increasing day by day. One of the prevalent applications of data mining is web mining. Web Mining is an active area. Web structure mining, web content mining and web usage mining are the classifications of Web Mining. This paper stipulates the semi structured data and how data mining techniques are used in the semi-structured data and comparison learning has done to showcase the better technique for supporting semi structured data.

KEYWORDS: Web Mining, Data mining, Support Vector Machine, Polynomial ker

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Suchitra B

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Survey paper on various security attacks in mobile ad hoc network

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Survey Paper on Various Security Attacks In Mobile Ad Hoc Network

M. Selladevi, S. Duraisamy

Survey Paper | Journal Paper
Vol.6 , Issue.1 , pp.156-160, Jan-2018
CrossRef-DOI: https://doi.org/10.26438/ijcse/v6i1.156160

Abstract
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Abstract

Mobile Ad-Hoc Network is a self-configured collection of cellular nodes in which there is no need of predefined infrastructure. In this network nodes can arbitrarily alternate their geographic places. MANET is more vulnerable to cyber-attacks than wired networks because of no any central coordination mechanism. Because of their dynamic topology, no infrastructure and no central management system MANETs are liable to various security attacks. In this paper we have proposed a solution to detect and prevent multiple attacks in a network and find a secure way to transfer data from source to destination node. This article briefly discusses about the concept of Mobile Ad Hoc Network (MANET) and its various types of attack and methods to solve the MANET attacks.

Key-Words / Index Term

Ad-hoc network, Infrastructure less network , Dynamic topology, Security attacks

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Simulation Based Comparative Study of Routing Protocols in Mobile Ad Hoc Network

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Abstract - **A manet is a gathering of self-arranged node associated with remote connections. Every node of a mobile ad hoc network goes about as a switch and discovers an appropriate route to forward a packet from source to destination. Manet can be seen as an open type of network where nodes turn out to be a part of any network at any time so that susceptible by various kinds of attack. A wormhole attack is unsafe attack against routing protocols in ad hoc network where nodes attract the packet from one location and retransmit them then onto the next area utilizing long range connect inside the network. A wormhole opening can be effortlessly propelled between two attacker nodes without trading off the portable nodes. In this paper we study and analyse the performance of AODV and DSR under the effect of numerous wormhole attacker nodes. we evaluate the performance in terms of throughput, packet delivery ratio, packet loss and average end-end delay by using Network simulator (NS2) tool. Finally based on the simulation result we investigated the foremost affected routing protocol in terms of network metrics under wormhole attack.**

Keywords — Mobile ad-hoc network (manet), Wormhole attack, AODV protocol, Security, Router, Infrastructure-less.

I. INTRODUCTION

A mobile ad hoc network (manet) (manet) is a group of devices or nodes that transmit across a wireless communication medium mainly primarily based on radio frequency with none constant infrastructure or centralized manage. Cooperation of nodes is critical to forward packets on behalf of every unique once other destinations are out in their direct wi-fi transmission vary. There might be no centralized control or community infrastructure for a manet to be installation, as a consequence making its deployment short and cheaper. The nodes facility to move generously ensures a flexible and accessible vibrant community topology that's any other critical feature of a manet [1]. A number of the manet programs includes emergency disaster, army operations over a battlefield (vulnerable infrastructure), and wasteland expeditions (temporary networks), and community networking via fitness monitoring the usage of scientific sensor community (msn). Each node in an ad hoc network ought to be inclined to ahead packets for different nodes. Every node act each as a number and as a router for the topology of ad hoc networks varies with time as nodes flow, be a part of or go away the community, with this topological lack of confidence calls for a routing protocol to run on each node to create and preserve routes most of the nodes. Mobile ad-hoc networks may be deployed in areas where a stressed-out network infrastructure can be unwanted due to motives which include value or comfort. This will be fast deployed to help emergency requirements, on the spot needs and coverage in emergent regions [1]. Each routing protocol uses different algorithms to look a route [7]. In conventional routing protocols, path for each route from host to host have to be retained in the routing tables earlier. Network topology changes, route updation and route protection can be reflected in routing tables through periodic updates [9–11]. As each mobile communication range is confined, communication beyond the limitation make route maintenance costly. Frequent adjustments inside the paths between different hosts might not be contemplated in the routing tables. As outcomes packets are undeliverable and network overall performance communication degrades. Some other drawback is that every node has restricted battery electricity, so right utilization of power consumption is an crucial issue. To assist the dynamic kind of communication in ad hoc networks proactive and reactive routing protocols were proposed primarily based at the traditional routing algorithms. Due to dynamic nature of routing protocols they are additionally at risk of distinctive types of attacks like blackhole, wormhole, packet replication, dos, flooding, session hijacking and spamming and many others. In this paper, our first complete fulfilment is to evaluate reactive (AODV, DSR) routing protocol with most dangerous routing assault wormhole. The aim of the paper isn't always only simulating the routing protocols towards more than one attacker nodes but additionally compare overall performance against every other [1].

Improved secure aware wormhole attack detection in mobile ad-hoc networks

Selladay M [1] Latha Maheswari L [2] Duraisamy S [3]

Abstract Keywords References PDF

Abstract

The most challenging process in Mobile Ad-hoc Network (MANET) is detecting the wormhole attacks among various attacks. Most of the routing protocol doesn't have any defence mechanism against wormhole attacks and thus the presence of such attacks may disrupt the network communication by transmitting the packets to unknown location. Different routing protocols have been proposed for wormhole attack detection and prevention based on the different requirements like hardware, synchronization clocks, etc. To avoid such requirements, a Secure Wormhole Attack Detection (SWAD) technique was proposed based on the maximum end-to-end delay computation between two nodes within the transmission range. However, it does not consider the path length which is significantly reduced by the wormhole attacks. Hence in this article, Improved Secure Wormhole Attack Detection (ISWAD) technique is proposed. In this scheme, length of paths from source to any destination is calculated with the maximum end-to-end delay between nodes. Based on both computations, wormhole links through the network is detected and the data is transmitted via an alternative path available in the routing table. Finally, the simulation results show that proposed ISWAD technique achieves better performance than the existing technique in terms of different network metrics like throughput, jitter, etc.

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International Journal of Advanced Research in Computer Science
A Peer Reviewed, Bimonthly, Online Journal
E-ISSN:0976-5697
Starting Year: 2010

EFFICIENT DATA MINING TECHNIQUES FOR BIG DATA ANALYSIS: A SURVEY

M. Amsaveni, S. Duraisamy, S. Duraisamy

ABSTRACT

Technology revolution has been facilitating millions of people by generating tremendous data, resulting in big data. It has been a confirmed phenomenon that enormous amount of data have been generated continuously at unprecedented and ever increasing scales. Even though, big data bears greater value, it brings tremendous challenges to extract hidden knowledge and more valuable insights from big data. The valuable information in big data can be obtained by applying data mining techniques in big data. The goal of big data mining techniques go beyond fetching the requested information or even uncovering some hidden relationships and patterns between data. Big data mining techniques involves various process like feature selection, clustering and classification. In this article, a detailed comparative survey on different processes of big data mining techniques such as dimensionality reduction, clustering and classification for big data analysis is presented. At first, different dimensionality reduction, clustering and classification methods proposed for big data analysis in previous researches are studied in detail. After that, a comparative and state-of-the-art analysis is carried out to identify the limitations in those methods.

KEYWORDS

Big data, Data mining, dimensionality reduction, clustering, classification

FULL TEXT:

PDF

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Different Service Models and Deployment Models of Cloud Computing : Challenges

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ABSTRACT

Cloud Computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. It is an internet based service delivery model which provides internet based services, computing and storage for users in all market fields. This paper discuss the uses and benefits of cloud Computing and various categories of services in a cloud computing. It proceeds to discuss the different deployment models in a cloud computing (public, private, hybrid and community), various advantages, disadvantages and challenges of different models.

Keywords : Cloud, Cloud computing, IAAS, PAAS, StAAS, SAAS, CAAS, NAAS, MAAS and Deployment.

I. INTRODUCTION

Cloud Computing has become the buzzing topic of today's technology driving largely by marketing and services offered by prominent corporate organizations like Google, IBM & Amazon. Cloud computing is the next stage to evolve the internet. Though for some people "Cloud Computing" is a big deal, actually it is not. In reality, cloud computing is something that we have been using for a long time; it is the internet facility along with the associated standards that provide a set of web-services to users. When users draw the term 'Internet' as a "cloud", they simply represent the essential characteristics of cloud computing. Cloud Computing appears as a computational paradigm as well as distribution architecture and its main objective is to provide secure, quick, convenient data storage and net computing service, with all computing resources visualized as services and delivered over the Internet[1][2][3]. Figure 1 shows that cloud computing.

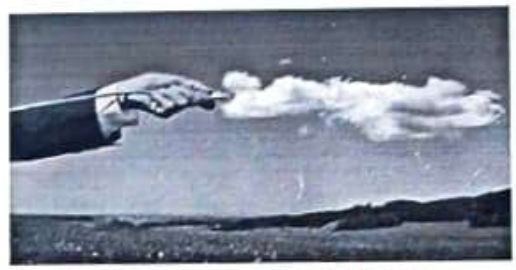

Figure 1. Cloud Computing

1.1 Uses of cloud computing

Probably using cloud computing right now, even if don't realize it. If use an online service to send email, edit documents, watch movies or TV, listen to music, play games or store pictures and other files, it is likely that cloud computing is making it all possible behind the scenes. The first cloud computing services are barely a decade old, but already a variety of organizations from tiny startups to global corporations, government agencies to non-profits are embracing the technology for all sorts of reasons.

Here are a few of the things can do with the cloud:

- Create new apps and services

IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 20, Issue 5, Ver. II (Sep - Oct 2018), PP 12-19
www.iosrjournals.org

Analysis of Data Mining Tasks, Techniques, Tools, Applications And Trends

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Abstract: Data mining is a process which finds useful patterns from huge amount of data. It is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. It uses machine learning, statistical and visualization techniques to discovery and present knowledge in a form which is easily comprehensible to humans. This paper deals with detail study of Data Mining its techniques, tasks and related Tools and also focuses on applications ad trends in the data mining which will helpful in the further research.

Keywords: Data mining, KDD, Clustering, Tools, Regression.

Date of Submission: 23-09-2018 Date of acceptance: 08-10-2018

I. Introduction

Data mining is a hopeful and relatively new technology. Data mining is defined as a process of discovering hidden valuable knowledge by analyzing large amounts of data, which is stored in databases or data warehouse, using various core data mining techniques such as machine learning, artificial intelligence(AI) and statistical[1][2][3]. Figure 1.1 shows various data mining techniques. Many organizations in various industries are taking advantages of data mining including manufacturing, marketing, chemical, aerospace...etc, to increase their business efficiency. Therefore, the needs for a standard data mining process increased dramatically. A data mining process must be reliable and it must be repeatable by business people with little or no knowledge of data mining background.

Fig 1.1 Data Mining Techniques

- Sift through all the chaotic and repetitive noise in your data.
- Understand what is relevant and then make good use of that information to assess likely outcomes.
- Accelerate the pace of making informed decisions.

1.1 Need for Data Mining

- Data mining is the procedure of capturing large sets of data in order to identify the insights and visions of that data. Nowadays, the demand of data industry is rapidly growing which has also increased the demands for Data analysts and Data scientists.
- Since with this technique, analyze the data and then convert that data into meaningful information. This helps the business to take accurate and better decisions in an organization.

IJCSE International Journal of Computer Sciences and Engineering Open Access
Research Paper Vol.-6, Issue-10, Oct. 2018 E-ISSN: 2347-2693

Visual Analytics: Need, Process, Scope, Tools & Techniques and Challenges

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Available online at: www.ijcseonline.org

Accepted: 15/Oct/2018, Published: 31/Oct/2018

Abstract- Visual analytics employs interactive visualizations to integrate users' knowledge and inference capability into numerical/algorithmic data analysis processes. It is an active research field that has applications in many sectors, such as security, finance, and business.. This paper aims at providing an overview of visual analytics, need, scope, tools and techniques and the most important technical research challenges in the field.

Keywords- visual analytics, information visualization, data analysis, user interaction

I. INTRODUCTION

Big data is the term for data sets so bulky and complicated that it becomes not easy to process using conventional data management tools or processing applications. Visual analytics is a form of inquiry in which data that provides insight into solving a problem is displayed in an interactive, graphical manner. The approach uses data visualization technologies to help data scientists and other professionals identify trends, patterns and relationships in the data they are working with. Packaged visual analytics software tools make it easier for non-technical users to use by including drag-and-drop options for setting and modifying analytical parameters. Visual analytics contain various tools and techniques that help user to extract efficient knowledge from complex data and communicate effectively. Visual analytics is a multi-disciplinary area ranging from Bio Technology, Database research, Medicine, Business, Security and also Risk management [2].

Figure 1 Visual Analytics (VA)

Like other types of business intelligence (BI) and business analytics (BA) initiatives, visual analytics applications must incorporate effective data management strategies in order to integrate, unify and standardize data coming from different source systems. Visual analytics is especially helpful in applications involving large, complex data sets and analytical processes that require a high degree of monitoring and interaction -- for example, big data analytics and data mining uses. Figure 1 shows Visual Analytics of big data. Section I mainly deals with the overview of Visual Analytics (VA). This section gives brief introduction to VA, need for VA, VA process and Scope of VA. Section II contains VA tools and techniques and also its benefits. Section III contains research area of VA of Visualization, Interaction and Data Analysis. Section IV contains finding problems and directions of VA and also discuss about the challenges in VA in Big Data. Section V gives an overview on the ideas for future research of VA.

A. The Need for Visual Analytics (VA)

The mother of invention is the need. This new age digital era is full of data and which is exponentially increasing with websites, smart phones and smart technologies connected over the internet. Data is captured like never before. The amount of data generated every minute is mind-boggling [3]. With ever increasing competition and shrinking margins, using data to take better decision is serving a differentiator. This has created a need to look for visual based data analysis that can make sense out of the huge data.

In the field of Business intelligence or data analytics, the insights in visual form are tremendously helpful. It makes the consumption of insights easy to understand and take decisive action. Figure 2 shows that need for data

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IJCSE International Journal of Computer Sciences and Engineering Open Access
Review Paper Vol.-6, Issue-11, Nov 2018 E-ISSN: 2347-2693

IoT Technology is Benefiting Today's Modern Farming Industry

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Available online at: www.ijcseonline.org

Accepted: 23/Nov/2018, Published: 30/Nov/2018

***Abstract*--**Agriculture plays very important role in the development of agricultural country. In India about 75% of population depends upon farming and one third of the nation's capital comes from farming. Issues concerning agriculture have been always hindering the development of the country. The only solution to this problem is smart agriculture by modernizing the current conventional methods of agriculture. To improve efficiency, productivity, global market and to reduce human intervention, time and cost there is a need to divert towards new technology named Internet of Things. It is the network of devices to transmit the information without human involvement. IoT works in synergy with agriculture to obtain smart farming. This paper focuses on major role of IoT in agriculture that leads to smart farming industry.

***Keywords*--**Internet of Things, Smart Farming, Efficiency, Productivity

I. INTRODUCTION

The Internet of things (IoT) is the most efficient and important techniques for development of solutions to the problems. The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity enables these objects to collect and exchange data. IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for direct integration between the physical world and computer-based systems, and resulting in improved efficiency, accuracy and economic benefit.

1.1 Internet of Things (IoT)

In Internet of things, we can represent things with natural way just like normal human being, like sensor, like car driver etc. This thing is assigned an ip address so that it can transfer data over a network. As per the report generated by Garner, at the end of 2016 there will be 30% rise in count of connected devices as compared to 2015. He further says that, this count will increase to 26 billion by 2020 [1]. "Things," in the IoT sense, can refer to a wide variety of devices such as heart monitoring , biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, DNA analysis devices for environmental/food/pathogen monitoring/field operation devices that assist fire-fighters in search and rescue operations[2]. Figure 1.1 shows that the structure of Internet of Things.

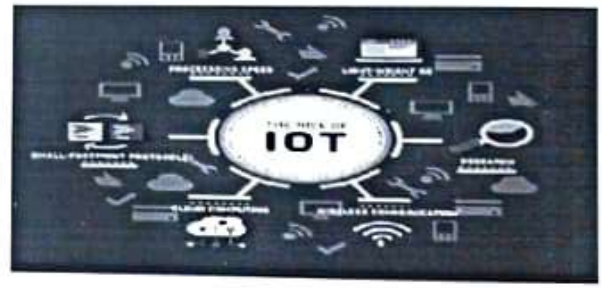

Figure 1.1 Internet of Things

1.2 Why IOT is important?

The Next Industrial Revolution which is going to change our lives in ways never imagined before, The last industrial revolution which is nothing but INTERNET the way we communicate and connect with people has changed like never before and also the Internet boom has improved our lives in many ways. Every time a Industrial Revolution happens there will be enormous changes in the economy create a whole new level of markets. Quick changes in IoT technology makes it a challenging task for the most experienced experts to anticipate the future of standardization in the field. For humanity, which is moderately clutter by nature, the IoT is an extraordinary advancement. On the other hand, for individuals who

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REAL-WORLD ATTACKS ON ZRTP WITH RSA ALGORITHM USING NEURAL NETWORK CLASSIFIER

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ABSTRACT: Voice over Internet Protocol (VoIP) is a trend of applications catching up on the internet in the recent times. The usage of cryptographic methods allows the users to communicate securely, but the computed throughput in addition to the QoS parameters are influenced by the algorithm used. In the technical work studied earlier, Diffie-Hellmann (DH) key exchange algorithm is employed, but it is not quite efficient to tackle against the attacks of malicious intruders. But, it is the only technique available for safeguarding the data from the offenders. In the newly introduced work, the ZRTP security mechanism yields a secure channel for VoIP along with Ron Rivest, Adi Shamir and Leonard Adleman (RSA) algorithm to defend against the intruder threats. It is found that the weakness of ZRTP protocol with RSA algorithm is due to the isolation between the platform state verification process and the key exchange process. End-to-end security is necessary for protecting against wiretapping made on voice calls. The ZRTP key-agreement protocol with the Neural Network (NN) Classifier is used for such communication in real-time. Classifier is utilized for the identification of the dangers from intruders. This comprehensive evaluation reveals a severe vulnerability, which permits wiretapping even when Short Authentication Strings are compared with precision. It explains about the error handling mechanisms of the clients and design of security indicators strongly resulting invulnerable connections. The performance analysis metrics include Recall, Precision, Accuracy and F-Measure result.

KEY WORDS: Voice over Internet Protocol (VoIP), Ron Rivest, Adi Shamir and Leonard Adleman (RSA), Diffie-Hellmann (DH), intruders, and Z and Real-time Transport Protocol (ZRTP).

1. INTRODUCTION

Voice over Internet Protocol (VoIP) is a type of transmission, which lets any individual to call from phone using a broadband internet connection. VoIP access generally permits the user to make calls to others who can also receive calls over the internet. Moreover, VoIP can be explained as a unique solution that facilitates transmitting voice signals over internet connection instead of the conventional telephone line [1].

In the recent VoIP implementations, the voice analog signals are sampled and then encoded employing codec. It is enclosed within an IP packet and transmitted over data cables or the internet facility similar to the manner in which the data packets are transmitted [2]. In the earlier times, VoIP needed a headset to be connected to the computer, and the speaker and receiver can only talk with others with a similar kind of arrangement. It was necessary that the parties had to be informed in prior about the call, so as to intimate the user waiting at the other end of the call and also the time of call [3].

VoIP systems depend on a data network that implies there are possibilities of security vulnerabilities and the kinds of attacks tagged with any data network. For instance, in a traditional telephone system, physical accessing the telephone lines or a get-around of the office private branch exchange (PBX) is needed to carry out activities like wiretapping. However for VoIP, voice is transformed into IP packets, which may be carried through several network access points. Hence the data is endangered to several more probable points of attack, which can be exploited for interruption by malicious attackers.

Truly, every security risk related with IP, like computer viruses, Denial of Service (DoS) and man in the middle attacks can also prove to be damaging to VoIP systems. Hijackers have also attempted using the VoIP technology to usurp identities and take away money [4]. This type of attack is identical to an email-based phishing attack, and therefore it is termed as "vishing". A victim will get an email or be reached through a phone call, which guides him or her to a customer service number where they are passed through multiple voices cued menus, trying to steal account numbers, Personal Identification Number (PINs), and other crucial data.

Communication with security in VoIP networks is a huge challenge owing to its packet loss rate, absence of authentication and eavesdropping. Therefore, a protected secret sharing approach along with single path routing attains a robust secure communication employing enhanced secret sharing algorithm in VoIP networks. Secret shared security exploited in the VoIP network will avoid dangerous attacks. In order to yield security, the infrastructure is developed with the aim of satisfying the below aspects including solid authentication, access control strategies, and key control.

In the technical work proposed, the ZRTP security approach yields a secure channel for VoIP employing Ron Rivest, Adi Shamir and Leonard Adleman (RSA) algorithm to safeguard against the malicious attacks. It is found that the weakness of ZRTP

International Journal of Pure and Applied Mathematics
Volume 119 No. 12 2018, 1941-1957
ISSN: 1314-3395 (on-line version)
url: http://www.ijpam.eu
Special Issue

ijpam.eu

REVERSE ENGINEERING APPROACH FOR OBJECT ORIENTED SYSTEM IN DESIGN LEVEL PERSPECTIVE

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Abstract

For evolving object oriented software, the design changes are the critical factor. A reverse engineering technique should exploit whatever information is available concerning the changes of a piece of code. The change based reverse engineering would be more scaleable, because it focus reverse engineering efforts on changing pieces of code instead of the full code base The research involves in implementing a modular reverse engineering technique for Object oriented Medium sized projects designed through UML for Java environment. The research analyze the drift in design from the earlier version of the software to the current version after a Quality indication supplied by the Design Phase Tool . The Design Phase Tool assists Reverse engineering tasks as it supplies the change information in the software which was captured in the design stage itself for later verification .The research takes critical analysis of the following object oriented metrics , class size, method size, Design size, Inheritance. The research differs from

International Journal of Engineering & Technology, 7 (3.34) (2018) 908-912

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Crop Yield Prediction from Soil Parameters through Neupper Rule Established Algorithm

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Abstract

Agriculture is considered as the backbone of the Indian economy. Soil classification is used to maintain and enhance its productivity, to avoid soil degradation and to overcome environmental damage. Repeated Incremental Pruning to Produce Error Reduction (Ripper) was used for crop yield prediction. Though the computational cost of this method is very much decreased, the accuracy is not much increased for prediction of crop yield. Artificial Neural Network (ANN) was widely used technique for yield prediction of crop. But with a large number of hidden layers and nodes, the training time will increase and leads to over fitting of networks. Sometimes, it comes out with hardly interpretation results. Counter Propagation ANN (CP-ANN) was a technique which combining features of both supervised and unsupervised learning technique which effectively predicted the crop yield. However, the prediction accuracy of this method is still poor. In order to overcome the above problems and to improve the crop yield prediction accuracy, a Neupper rule based algorithm is proposed in this paper. The proposed algorithm combines ANN and Ripper classifier algorithms. The soil parameters such as phosphorus (P), potassium (K), sulphur (S), calcium (C), magnesium (Mg), zinc (Zn), copper (Cu), iron (Fe) and manganese (Mn) are given as input to ANN which returns weight of each soil parameter. Then, a decision tree is constructed based on weight values. After this, rules are generated based on the building and optimization stage of Ripper algorithm. The proposed Neupper rule based algorithm improves the accuracy of crop yield prediction by combining ANN and Ripper. Finally, the experiments are carried out in terms of accuracy, precision and Root Mean Square Error (RMSE) to prove the effectiveness of the proposed crop yield prediction method.

Keywords: *Agriculture; crop yield prediction; feature selection; classification.*

1. Introduction

Crop yield prediction [1] is more significant as it can support decision makers in agricultural sector. It also assists in identifying the relevance of attributes which significantly affect the crop yield. In earlier days, the yield prediction was carried out only by the experience of the farmers. The improved technology covers many ways that leads to know the productivity of crop. The application of data mining techniques is one of the best ways to provide the solution for this crisis. Due to increasing population, the food demands are also increased. Crop models and decision tools are increasingly used in agricultural fields to improve production competence.

Crop yield predict analysis requires a model of how crops respond to soil factors. Various data mining techniques have been used for crop yield prediction. Ripper [2] is one of the supervised classification approaches where the training data was distributed randomly in two sets are growing set and pruning set. In growing set, each rule keeps on growing until no information gain is possible is further. Then in pruning step, unnecessary terms were eliminated. But the crop yield prediction accuracy of Ripper is low. ANN [3] was an efficient technique for crop yield prediction. There are three layers such as input layer, hidden layer and output layer in ANN. The input neurons got the input from user, then in the hidden neurons the input was converted into (-1,1) interval. Finally the output neurons represented the attribute values that were predicted. When increasing the number of hidden layers, the training time for crop yield prediction gets increased. CP-ANN [4] was similar to Self Organizing Maps (SOM) due to the fact that an output layer was appended to SOMs input layer. It attained non linear class limit separation. However, the prediction accuracy of crop of this method is low.

In order to improve the prediction accuracy of crop yield, a Neupper rule based algorithm is proposed in this paper. In the Neupper rule based algorithm, both ANN and Ripper classifiers are combined together. Initially, input neurons of ANN get various soil parameters such as phosphorus (P), potassium (K), sulphur (S), calcium (C), magnesium (Mg), zinc (Zn), copper (Cu), iron (Fe) and manganese (Mn). The output neurons of ANN return the weights of each soil parameter. Then based on the weight values of soil parameters decision tree is constructed through Ripper classifier procedure. The Ripper procedure has two steps they are build rule step and prune rule step. In the build rule step, the rules are built by adding conditions to the rule until the weight value of soil parameter is greater than user defined threshold value. Then, in the prune rule step the unnecessary rules are pruned. Based on the rules, the yield of rice, wheat and maize is predicted.

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International Journal for Research in Engineering Application & Management (IJREAM)
ISSN : 2454-9150 Vol-04, Issue-05, Aug 2018

An Optimized Feature Selection and Classification of Soil Parameters for Crop Yield Prediction

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Abstract—In India, agriculture is generally considered as an essential contributor to the economic growth. Mainly, the agricultural activities depend on the seasonal changes, biological and economic causes. The agricultural yield prediction is a challenging and desirable process for each country. In modern world, cultivators are struggling to produce the yield since unpredictable climatic changes and drastically reduce in water resources. Crop yield prediction is achieved by using historical data about crop yield, weather and soil. Many classification algorithms have been proposed to predict the crop yield precisely. This article presents a wheat yield prediction based on Artificial Neural Network (ANN) classification with Feature Selection (FS) using Particle Swarm Optimization (PSO). Initially, different soil parameters are collected and the most relevant features are selected by using PSO. Then, the selected features are classified by ANN model to obtain the trained model. By using the trained model, the quality of crop yield is predicted and compared the performance of the proposed system. Finally, the experimental results show that the proposed ANN classification with FS achieves better performance than the other techniques.

Keywords—Crop yield prediction, Soil characteristics, ANN, Feature selection, PSO.

I. INTRODUCTION

Agriculture plays a significant role in most of the countries like India where the demand of food has been increased due to an unconditional growth of population. In earliest years, people cultivate the crops in their own land and also natural crops are harvested which have been used by different people, animals and birds [1] since such crops can provide healthy life. In modern years, the agriculture is slowly degrading due to the innovative technologies. Also, people don't have the knowledge about the cultivation of the crops in a right time and at a suitable place. By using the modern techniques, the seasonal climatic conditions are also being changed against basic properties such as soil, water and air which provide to insecurity of food. There is no proper solution and technologies by analyzing the issues and problems like weather, temperature, etc., for avoiding the agricultural degradation.

There are different ways for increasing the economical growth in the agricultural field. There are several ways to increase the crop yield and the quality of the crops. Different data mining algorithms like decision trees, naive bayes, etc., are also used for predicting the crop yield production efficiently [2-3]. Data mining refers the process of finding correlations or patterns in huge relational databases. The patterns, associations or relationships among all this data can provide information which can be converted into knowledge about historical patterns and future trends [4]. For instance, information about crop production can support the cultivators in order to identify the crop losses and prevent it in future. Accurate information about history of crop yield is an essential to make decisions related to agricultural risk management.

Hence in this paper, wheat yield prediction using feature selection is proposed by considering different soil parameters. Initially, different soil parameters such as phosphorus (P), potassium (K), sulphur (S), calcium (Ca), magnesium (Mg), zinc (Zn), copper (Cu), iron (Fe) and manganese (Mn) are collected. Then, the PSO algorithm is used to select the most relevant parameters to train the classification model. For achieving classification, ANN is

A Dynamic Multi-class Neupper Classification for Multiple Crop Yield Prediction

S. Manimekalai, K. Nandhini

Abstract: In agricultural applications, the most essential task is predicting the crop yield to classify the yield productivity over a certain interval of harvesting. The state-of-the-art classifiers are used for predicting the yield quality of any one crop whereas it takes more time to simultaneously train multiple types of crops for predicting their yield quality. For a specific crop yield prediction using soil parameters, a Krill-Herd (KH)-based feature selection with Dynamic Neupper (DNeupper) rule-based classifier has been proposed. However, multiple types of crops were not simultaneously predicted within a single classifier since it creates a multi-class classification problem. Hence in this article, KH with Dynamic Multi-Class Neupper (KHDMCNeupper) rule-based classification algorithm is proposed to predict all three crops such as rice, wheat and maize together with increased prediction accuracy. In this model, the most optimal soil parameters for all crops and their relative weights are computed based on KH and Rough Set (RS) theory. Then, these weight values are combined with soil parameters and given as input to the Artificial Neural Network (ANN) which is used to construct a tree in DNeupper classifier. By constructing a tree, the classification rules for all three crops are generated to predict the yield quality. Thus, the proposed classification technique can support simultaneous prediction of multiple crops with high accuracy. Finally, the experimental results show the efficiency of the KHDMCNeupper classifier compared to the KHDNeupper classifier in terms of accuracy, precision, recall and f-measure.

Index Terms: Crop yield prediction, DNeupper rule-based classifier, KH, Multi-class classification

I. INTRODUCTION

The economical system of each state is mainly related to the agricultural activities or yield productivity. Nonetheless, most of the rural lands still yield less yield productivity due to insufficient deployment of agricultural technologies. Usually, the yield quality depends on various aspects such as healthy soils, water quantity and atmospheric conditions which impact on the plant growth level. In India, the factors that affect the crop yield are inadequate water quantity, yielding range and lack of modern agronomic practices. Therefore, there is a need to support agriculture for balancing the industrial and economic growth of the nation. As a result, different data mining techniques have been proposed to support cultivators in order to predict the crop growth level under those various aspects.

Many data mining techniques [1] have been proposed on the basis of historical information about weather, water quantity and crop growth level to increase the yield productivity. Most of the crop yield prediction systems are useful for cultivators to make decisions about the soil type, irrigation level and type of crop to be planted. As well, it supports to predict the desired data from a raw dataset for analyzing the yield productivity issues and making an appropriate decision. Over the past few decades, several classification algorithms [2] have been proposed to predict the crop yield quality. Among those, crop yield prediction has been achieved by classifying the soil parameters based on the Neupper rule-based algorithm which is a combination of Artificial Neural Network (ANN) and Ripper classifiers [3]. In addition, a WK-SMOTE algorithm with feature selection algorithms such as PSO and KH [4] were added to solve the class imbalanced data and choose the most optimal soil features when number of soil parameters were increased. Moreover, DNeupper rule-based algorithm [5] was proposed to enhance the crop yield prediction by finding the feature spaces with a large kernel space between clusters and close proximity of the classes. However, all three crops were not simultaneously predicted within a single classifier since it creates a multi-class classification problem.

Hence in this paper, a KHDMCNeupper rule-based classification algorithm is proposed to predict all three crops together with increased prediction accuracy. In this model, the relative weights of the most optimal soil parameters using KH algorithm for all crops are computed based on RS theory. These weight values with soil parameters are given as input to the ANN for constructing a decision tree of DNeupper classifier. Based on the constructed decision tree, the classification rules for all three crops are generated and the crop yield quality is also predicted efficiently for all crops simultaneously.

The rest of the paper is organized as follows: Section II presents the previous researches related to the crop yield prediction. Section III explains the proposed crop yield prediction. Section IV illustrates the performance effectiveness of the proposed algorithms and Section V concludes the research work.

II. LITERATURE SURVEY

Mustafa et al. [6] analyzed land suitability for different crops based on the multi-criteria decision making approach using remote sensing and GIS. In this analysis, land suitability was analyzed for generating yielding pattern for kharif and rabi seasons in Kheragarah tehsil of Agra. Agricultural and non-agricultural lands were outlined by using Decision Tree Classifier (DTC) and

Revised Manuscript Received on March 20, 2019.

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Revised Manuscript Received on March 20, 2019

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IJRTE

International Journal of Applied Engineering Research ISSN 0973-4562 Volume 14, Number 9 (2019) pp 2238-2243
© Research India Publications. http://www.ripublication.com

Algorithms Associated with Streaming Data Problems

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Abstract:

The constant frequency and variety of high-speed data have resulted in the growth of large data sets in the last two decades. Storage of this data in memory is not possible due to storage constraints. As a result, today's streaming algorithms need to work with one pass of data. Many streaming algorithms address different problems with data streams. Data stream problems though originated around the '70s have gained popularity only in that last 15 years due to the exponential growth of data from a variety of sources. Today's researchers aim at providing solutions to specific problems that are found across many industries. Most of the problems addressed in this paper are the ones researchers have considered as oft faced problems in the industry like heavy-hitters/top k elements or frequency count or membership check or cardinality. Algorithms addressing these problems like Bloom Filter, Count-min Sketch, HyperLogLog and such are being continuously improved for faster and effective results. Hashing is a technique used by many algorithms to resolve massive data problems affecting today's applications. Hashing enables streaming data to be able to store and retrieve data resourcefully. In this paper, we analyze both the problems in streaming data and the various algorithms used to resolve them.

Keywords: Bloom Filter, Count-min Sketch, Data Stream Problems, HyperLogLog, Streaming Data

1. INTRODUCTION

A data stream is defined as a continuous sequence of high-frequency data (Volume and Velocity) from different sources (Variety) which is too big to be stored in memory. There is continuous progress being made on algorithms in recent years due to the advent of streaming data.

A more formal definition of a stream would be, an input stream arriving sequentially a_1, a_2....., item by item, and describes an underlying signal [1] The objective is to compute an output value for a function of the stream using elements from the input stream, for example, Most frequently occurring items, number of distinct items and such. At any instance t, an algorithm has access to $a_1, a_2....a_t$ for which the output to $f(a_1, a_2....a_t)$ can be calculated.

Since data streams are fast moving data, it is hard to store and reproduce. So, we need algorithms that do a single pass to solve data streaming algorithms. Time series model, Cash register Model, and Turnstile Model are a few streaming models. The difference between the models is how the input streams are handled based on the underlying signals [1]

- Time series model: Each a_i is equal to A[i] which is the underlying signal. They appear in increasing order of i. This is useful for data dependent on time series, for example, temperature checks every hour on a day. Stock price note every 5mins.
- Cash register model: Known as the most popular data stream model ai's are increments to A[j]'s. $a_i = (j, I_i), I_i \geq 0$ mean $A_i[j] = A_{i-1}[j] + I_i$ where Ai is the state of the signal after seeing the ith item in the stream. Much as in a cash register, multiple a_i's could increment a given A[j] over time. This is where each value of the signal gives a positive increment to the previous value to obtain a new value. Like a cash register adding occurrences of element values to a counter over time.
- Turnstile Model: Where increments can also be negative. Like a turnstile in an amusement park that keeps count of people entering and exiting a park, the turnstile model allows both positive and negative inputs. Here a_i's are updates to A[j]'s. $a_i = (j, U_i)$ mean $A_i[j] = A_{i-1}[j] + U_i$ where Ai is the state of the signal after seeing the ith item in the stream and $U_i$maybe positive or negative.

Though the turnstile model seems to be the best model it is only from a theoretical purpose; the cash register model is used in most algorithms from a practical purpose. [1]

Many algorithms have been developed to deal with such massive data problems, and that is what we will be discussing in our paper. The paper is sectioned as first the Introduction; the next section lists various streaming problems, and their associated algorithms formalized to resolve it. The following section includes an update on where the latest algorithms are being used today, and lastly the conclusion with our findings.

2. DATASTREAM PROBLEMS AND ASSOCIATED ALGORITHMS

In this section, we will discuss a few problems or frequently asked questions in data streams and different algorithms used to answer them. All One-pass data stream algorithms have

1. First, an *initialization* section which is executed before the incoming of the stream

International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075, Volume-8 Issue-7, May, 2019

Faster Query Response for Streaming Data using Probabilistic Data Storage Model

Ramesh Balasubramaniam, K. Nandhini

Abstract: Instead of focusing on making programmable changes for faster query response time our focus is on how the data is stored. In Streaming data, an efficient way to speed up delivery of results is by storing data compactly using a compresseddata storage model that will be beneficial in providing real-time analytics. In this paper, a data storage model named PDSM is presented, using Probabilistic data structures which provides answers to real-time queries on data streams. PDSM is a Probabilistic Data Storage Model that stores streaming data using hash functions as the primary data mapping method for incoming stream elements.Hash functions map a data set of arbitrary size to a data set of a fixed size. So regardless of source dataset size, the PDSM has a smaller fixed storage size which proves beneficial as a storage model.PDSM uses sketches (Count-min probabilistic data structure)to record the frequency of streaming data element occurrences and filtering (Bloom Filter probabilistic data structure)to check membership of elements in a stream. PDSM is usedto answer most sought-after queries, this way reducing query time on the most frequent questions.As PDSM uses Probabilistic data structures the accuracy of output results is an estimate and not 100% accurate. However, in streaming data, this is not a critical factor asall data elements in the stream are not required data, and a probabilistic estimate is a close enough answer to the query. Since storage used is minimal, this paper provides PDSMas a positive solution to faster query response time for streaming data and storage ofbig static datasets.

Index Terms: Faster Query Response, Hashing, Little Memory, Probabilistic data Structures, Sketching.

I. INTRODUCTION

Given the magnitude of new sources of data in various sectors, there is a vast opportunity and competitive advantage for organizations to utilize this enormous (Big) data. Harnessing the power of streaming data from log files, sensors, social media, and other input sources businesses can be empowered to make decisions swiftly and confidently.

In data warehousing, 'Aggregate' is a summary table used to produce faster query response time on large data sets. Using a 'Group by' SQL query, a table is derived on large data sets. This paper is based on the words of Ralph Kimball, considered as one of the original architects of data warehousing [1]: "The single most dramatic way to affect performance in a large data warehouse is to provide a proper set of aggregate (summary) records that coexist with the primary base records. Aggregates can have a very significant effect on performance, in some cases speeding queries by a factor of one hundred or even one thousand. No other means exist to harvest such spectacular gains."

Revised Manuscript Received on May 10, 2019

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Aggregation methods are needed for streaming data also, but if the same data warehouse (database aggregate) concepts are applied it will result in high-latency processes, a massive amount of memory usage and a significant server configuration to address real-time use cases. So, applying Kimball's principal/concepts of aggregation, a different technique is needed to address new/current streaming datasets. All data analytics is not from historical data; both Stored historical data (data at rest) and incoming live streaming data (data in motion) are used to provide answers to queries. Database aggregation is used in Relational Database Management Systems (RDBMS) for query performance improvement. However, in today's big data/streaming models a parallel processing framework like Hadoop MapReduce technique and its ecosystem lead to large memory in the name node and a huge number of data nodes. In response to this problem, our study proposes on providing faster query performance with little process power, time & memory, with the one small drawback of having to give up minimal (negligible) accuracy percent. In streaming data, a probabilistic estimate is considered accurate enough during data analysis. PDSM is a Probabilistic Data Storage model that stores streaming data using Count-Min Sketch, and Bloom Filter data structures to answer most sought-after queries. Most queries are based on simple additive metrics like the total number of items sold, most frequently read news article, etc. This can very efficiently be summarized daily using PDSM. Count-Min Sketch records the frequency of streaming data element occurrences, and Bloom Filter does a membership check of elements in a stream. These data structures use hash functions as primary data mapping methods for incoming stream data elements. PDSM can be used as a data accumulator during query processing or a compact storage of raw data in stream-based computing.

II. BACKGROUND

Currently,the most widely used methods to improve query performance of large dataset are DatabaseSummary Table, In-Memory Database, and MapReduce Framework.

A. In-Memory Databases (IMDBs)

IMDBs rely on main memory to store data compared to the summary table method uses disk for data storage. As the required data is stored 'in memory', IMDBs have faster access time during processing and queries and are more predictable than disk mechanisms.

IJITEE

International Journal of Engineering & Technology, 7 (4) (2018) 5671-5678

SPC

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET
doi: 10.14419/ijet.v7i4.14224
Research paper

Extensive analysis of techniques in data streams

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Abstract

Applications are generating huge capacities (volume) of data at high speeds (velocity) from various sources such as images, text, audio, and video (variety). Big data streams are generated by many applications in today's world like IoT devices, online purchases, internet traffic, social media, stock exchanges and more. The data source decides whether the processing should be by batch or stream. It is impossible and unnecessary to record all incoming data, hence the need for data reduction techniques in data streaming. These techniques (sampling, sketching, hashing, dimension reduction, and more) enable us to narrow down the big data to relevant data. This data sampled, filtered, hashed, or processed through other techniques is used as input for data analysts to derive meaningful information. A well-designed Data Stream Management System will strike a balance between the right data processing and the cost of processing. This paper highlights the different techniques used in streaming data, related work in that area and the uses in today's world.

Keywords *Hashing; Sampling; Sketching; Stream Data Model; Streaming Techniques.*

1. Introduction

In the advent of big data and the 3V's - Volume, Velocity, and Variety (which keeps growing and now includes 6V's - Value, Veracity, and Variability) data is being generated continuously (infinite) by many data sources. Data streams date from satellite information processing systems to today's social networks Internet of Things (IoT). In today's smart environment, data is also classified as periodic or event triggered. The periodic devices generate big data streams because they produce a constant amount of data at regular intervals. Event triggered devices on the other hand are activated only when a certain event is encountered. An event triggered device might in turn trigger other devices which leads to a bigger network of data streaming too. Applications that generate big data streams are online purchases, Social networks, Stock market trading, clickstreams, sensors, GPS systems and more. As Fig 1 indicates stream computing delivers real-time analytic processing constantly on in-motion variable data. It enables descriptive and predictive analytics to support real time decisions.

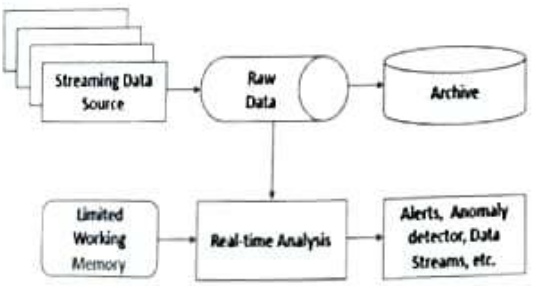

Fig. 1: Data Stream Management System.

This paper's focus is on techniques used in streaming data that provide meaningful data to analysts. First, is the introduction to the stream data model which includes Data Stream Management Systems (DSMS), stream sources, queries, and stream processing. Secondly, is the presentation of several techniques used in streaming algorithms like sketching, clustering, hashing, and more. Finally, in the conclusion are the findings and next steps.

2. Stream data model

There are two problems [15] that a Relational database management system (RDBMS) cannot handle when it comes to streaming data:

- Managing changes in data arrival rate during a specific query lifetime
- The continuous flow of the data stream into the system that cannot be stored in a traditional way; therefore, only the most recent data can be used for answering the queries at a given time point.

To address these issues DSMS was developed by the database community having different semantics associated to the queries [9].
In a Database Management System (DBMS) data is stored on disks and queries are used to define or modify structures and to insert, modify or retrieve the stored data. Data Stream Management System (DSMS) on the other hand has no data stored on any disk storage. The source to the DSMS is a continuous stream of variable (speed unknown) data. If the DSMS is not able to read all data in the source, the unread data is lost. [9] As Table 1 points out, in DBMS data is stored permanently and queries are transient. Whereas, in a DSMS queries are stored permanently in sensors and data is a continuously produced stream [15].
Despite these differences, DSMSs resemble DBMSs, in their processing. All incoming data go through a transformation using common SQL operators like selections, aggregates, joins, and operators defined by relational algebra [6].

Table 1: Comparison between DBMS & DSMS Functional Feature

Feature	DBMS	DSMS

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Comparison Analysis of Biowatermarking Using DWT, DCT and LSB Algorithms

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Abstract. Nowadays data exchange through computer networks has increased to a great extent. Though the advancement in internet technology has made our life more easy and convenient, this rapid growth in internet usage and data sharing has given many challenges to the researchers. Providing security to the data sent through the network which may be a normal text, image, audio or video has been a big challenge to the network community till now. Watermarking, a technique applied to hide an information, has seen a lot of research interest recently. Many E-Commerce and E-Governance applications needs some method to protect ownership and copyrights by which the unauthorized access to digital products can be detected and controlled. This paper presents an implementation and comparison of Biowatermarking with palmprint using DWT, DCT and LSB algorithms. The experimental results show that the quality of watermarking using LSB is higher than DCT and DWT.

Keywords: Text watermarking · Data hiding · Authentication
Biowatermarking · Biometrics

1 Introduction

Watermarking is a technique which is applied to hide a proprietary information using digital media like images, digital audio, digital music, or digital video. Watermark can be considered as a kind of a signature that reveals the owner of the multimedia object. Copyrighted material can be easily exchanged over peer-to-peer networks, and this has caused major concerns to those content providers who produce these digital contents.

The watermark system undergoes through three stages [1]: first one is the process of generation and embedding the watermark in the original media. Then, transmission of watermarked data in the network to the receiver. The process of detection of the embedded watermark is the final stage.

Most of watermarking techniques can be classified into several categories based on some criteria [2] as shown in Fig. 1. The watermarking technique can be visible or invisible. In visible watermarking technique, the watermark can be observed by the

© Springer International Publishing AG 2018
D. J. Hemanth and S. Smys (eds.), *Computational Vision and Bio Inspired Computing*,
Lecture Notes in Computational Vision and Biomechanics 28,
https://doi.org/10.1007/978-3-319-71767-8_73

REVIEW ON ANALYSIS AND PREDICTION OF DIABETIC MELLITUS USING DATA MINING TECHNIQUES

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ABSTRACT: Data mining plays an efficient role in prediction of diseases in health care industry. Diabetes is one of the major global health problems. Indian Council of Medical research (ICMR) revealed diabetes is fast gaining the status of a potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease. Diabetes is a metabolic disorder disease where the improper controlling of blood glucose levels led to risk of many diseases like heart attack, kidney disease, eye etc. Many classification and clustering algorithms are developed and implemented for prediction of diabetic mellitus and accuracy estimation but there is no such algorithm which will provide severity in terms of ratio interpreted as impact of diabetes on different organs of human body. This paper gives detailed review of existing data mining classification and clustering techniques used for analyse and prediction of diabetic mellitus.

Keywords: Diabetic Mellitus, Data Mining, Classification, Clustering

I. INTRODUCTION

Data mining is considered as the process of extracting important patterns from a given database and it always act as a valuable tool for converting data into usable information. Data mining has a wide range of applications in different areas that include marketing field, banking sector, educational research, surveillance, telecommunications fraud detection, and scientific discovery.

Data mining take holds great potential for the healthcare industry to enable health systems to systematically use data and analytics to identify inefficiencies and best practices that improve care and reduce costs. Some experts believe the opportunities to get better care and reduce costs simultaneously could apply to as much as 30% of overall healthcare spending.

Data mining has become an essential methodology for computing applications in medical informatics. Progress in data mining applications and its implications are manifested in the areas of information management in healthcare organizations, health informatics, epidemiology, patient care and monitoring systems, assistive technology, large-scale image analysis to information extraction and automatic identification of unknown classes.

Diabetes mellitus, or simply diabetes, is a set of related diseases in which the body cannot regulate the amount of sugar in the blood. It is a group of metabolic diseases in which a person has high blood sugar, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar makes the classical symptoms of polyuria, polydipsia and polyphagia. There are three main types of diabetes mellitus (DM). Type 1 DM results from the body's failure to produce insulin, and presently requires the person to inject insulin or wear an insulin pump. This form was before referred to as "insulin dependent diabetes mellitus" (IDDM) or "juvenile diabetes". Type 2 DM results from insulin resistance, a condition in which cells fail to use insulin properly, sometimes combined with an absolute insulin deficiency. This form was previously referred to as noninsulin dependent diabetes mellitus (NIDDM) or "adult-onset diabetes". The third main form, gestational diabetes occurs when pregnant women without a previous diagnosis of diabetes develop a high blood glucose level. It may lead development of type 2 DM.

II. LITERATURE REVIEW

Mira Kania Sabariah et al,[4] proposed Random forest classification and regression tree to detect Type-2 Diabetes Mellitus in early based on the training diabetic data set. Early detection of diabetic mellitus is necessary to classify the diabetic mellitus patients to treat and control it.

L. Xu, et al., [5] proposed a prediction model for diabetes using logistic regression in Chinese people with readily available clinical training and test data sets. Lifestyle factors like food habits and physical activity have been used for diabetic prediction.

Janice, Lopez, Robert Bailey, Marcia and Kathy Annunziata [6] dealt with the diabetic risk factors includes older age, family history, and obesity and physical inactivity for the patient perspective with respective to age and ethnicity and risk.

M Mounika et al [7] utilizing Naïve Bayes classification, the effective treatment for different age group and prediction is done. It is clearly defined that drug prescription is effective for old age groups with type-2 diabetes, drug prescription and dietary controls is effective for adult age groups where as young age groups need to concentrate on other factors such as dietary controls, physical exercise, smoke cessation and insulin. Drug prescription is strongly recommended for old and adult age groups but for young age group drug prescription is not required, insulin is strongly recommended for young age groups with type-1 diabetes. There is a risk of side effects due to intake of drugs so young age groups are advised to follow other modes of treatments like

A survey on efficient logo recognition and detection techniques

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Abstract—Logos play an important rule in business environment. They uniquely identify the business. Logos are special visual objects that are commonly used in business and government as a declaration of document source and ownership. Logos are generally used to aid and promote instant public recognition for an organization. There are chances of using fake logos by competitor to destroy brand detected. This can be achieved using machine learning techniques and other computer vision algorithms.

***Keywords*—logo recognition, ,detection, fast-RCNN,CNN,SSD**

I. INTRODUCTION

Logos are vital to a business organization. They are the ones which speak up for the product or brand that is enclosed by it. Logo detection is a useful tool in marketing applications such as verification of product placement, online brand management, contextual ad placement of consumer analysis. Analyzing the presence of brands and logos in social media, television or printed media can be tedious task if done manually [1]. Duplicate logos are not easy to detect through human vision but can easily be detected through various computer vision and machine learning algorithms.

Logo recognition a subset of object recognition, as most logos can be considered objects with a planar surface. In addition logos are designed to catch someone's attention. However, a specific logo class can have relatively large intra-class variance and the recognition of logos in natural images has to deal with perspective tilt which is the main difference to near-duplicate retrieval approaches[2].

II .LITERATURE SURVEY

R. Ghani and K. Nigam et el (2000). Presented technique is based on common split never exist, co-testing algorithms this assemble a character divide may out-perform algorithms never helps division. These outputs help shown why co-testing algorithms are pair discriminative in common and robust to the assumptions of their embedded classier. Illustrate that when learning from addressed and unlabeled information, algorithms explicitly leveraging a common Independent split of the characteristics outperform algorithms that Do not. The co-training setting applies to information a set that has a common separation of their features in to dual disjoint sets. There has been sign never interest in supervised learning algorithms that associate addressed and unaddressed information for word learning tasks.

IJSRCSEIT
International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2018 IJSRCSEIT | Volume 3 | Issue 5 | ISSN : 2456-3307

A Survey on Semantic Search Encryption Using Cloud Computing

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ABSTRACT

As Cloud Computing becomes widely, more and spread sensitive data are being centralized into the cloud. Data in outsourced to the public cloud for economic savings and ease of access. However, the privacy information has to be encrypted to guarantee the security. To implement efficient data utilization, search over encrypted cloud data has been a great challenge. The existing solutions depended entirely on the submitted keyword-based search schemes, and almost all of them depend on predefined keywords extracted in the phases of index construction and query. In view of the deficiency, as an attempt, we propose a semantic expansion based similar search solution over encrypted cloud data. Our solution could return not only the exactly matched files, but also the files including the terms semantically related to the query keyword. In the proposed scheme, a corresponding file metadata is constructed for each file. Then both the encrypted metadata set and file collection are uploaded to the cloud server. Further more, we a basic idea for significantly improved scheme to satisfy the security guarantee of searchable symmetric encryption (SSE).

Keywords : Searchable Symmetric Encryption, Cloud Computing, Web Ontology Language, Fuzzy Concept, GCP, RSL

I. INTRODUCTION

Semantic search should occur while a term is ambiguous, meaning it able to have numerous meanings foe a example , if one considers the lemma "bark", which many be understood as "the sound of a dog," "the skin of a tree," or "a three-masted sailing vessel"). In a structure of this type, every lexical concept coincides therefore with a semantic network node and is related to others with aide of unique semantic relationships in a hierarchical and hereditary structure. during this manner, each construct is enriched with the characteristics and that mean of the near nodes. Each node of the network (called Synset) groups a collection of synonyms that represent the similar lexical concept. Semantic search used in a methods RDF: the useful resource Description Framework Semantic search seeks to enhance search accuracy by understanding the searcher's intent and therefore contextual meaning phrases as they a appear with in the searchable dataspace, whether on the Web or inside a closed system, to get larger relevant consequence. Semantic search structure consider varied points as well as context of search, location, intent, variation of words, synonyms, generalized and specialized queries, concept matching and natural language queries to provide applicable search results. Major web search engines like Google and Bing incorporate a many elements of semantic search. In vertical search, LinkedIn publishes their semantic search methodology to activity search by way of

International Journal of Current Trends in Engineering & Research (IJCTER)
e-ISSN 2455–1392 Volume IV Issue IX, September 2018 pp. 01-08
Scientific Journal Impact Factor : 3.468
http://www.ijcter.com

Security Issues and Challenges in Cloud Computing

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Abstract: Cloud is a windfall to new generation technology. But if it fails to ensure proper security protection, cloud services could ultimately result in higher cost and potential loss of business thus eliminating all the potential benefits of cloud technology. So the aim of the cloud security and its researchers to help enterprise information technology and decision makers to analyze the security implications of cloud computing in their business. The main issues concerned with cloud are security, privacy, reliability, legal issues, open standard, compliance, freedom, long term viability etc. The various security issues associated with cloud computing take in privileged access, regulatory compliance, data location, data segregation, recovery, investigative support, data availability. When a customer moves toward cloud computing, they have a clear understanding of potential security and risk connected with cloud computing. This paper presents a comprehensive study on the challenges and issues of security in cloud computing.

Keywords—Cloud, Cloud computing, Security, Attacks

I. INTRODUCTION

Cloud computing is the use of various services, such as software development platforms, servers, storage and software, over the internet, often referred to as the "cloud." In general, there are three cloud computing characteristics that are common among all cloud-computing vendors[1][2]

1. The back-end of the application (especially hardware) is completely managed by a cloud vendor.
2. A user only pays for services used (memory, processing time and bandwidth, etc.).
3. Services are scalable

Figure 1. Cloud Computing

Many cloud computing advancements are closely related to virtualization. The ability to pay on demand and scale quickly is largely a result of cloud computing vendors being able to pool resources

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IJSRCSEIT
International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2018 IJSRCSEIT | Volume 3 | Issue 7 | ISSN : 2456-3307

Different Service Models and Deployment Models of Cloud Computing : Challenges

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ABSTRACT

Cloud Computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. It is an internet based service delivery model which provides internet based services, computing and storage for users in all market fields. This paper discuss the uses and benefits of cloud Computing and various categories of services in a cloud computing. It proceeds to discuss the different deployment models in a cloud computing (public, private, hybrid and community), various advantages, disadvantages and challenges of different models.

Keywords : Cloud, Cloud computing, IAAS, PAAS, StAAS, SAAS, CAAS, NAAS, MAAS and Deployment.

I. INTRODUCTION

Cloud Computing has become the buzzing topic of today's technology driving largely by marketing and services offered by prominent corporate organizations like Google, IBM & Amazon. Cloud computing is the next stage to evolve the internet. Though for some people "Cloud Computing" is a big deal, actually it is not. In reality, cloud computing is something that we have been using for a long time; it is the internet facility along with the associated standards that provide a set of web-services to users. When users draw the term 'Internet' as a "cloud", they simply represent the essential characteristics of cloud computing. Cloud Computing appears as a computational paradigm as well as distribution architecture and its main objective is to provide secure, quick, convenient data storage and net computing service, with all computing resources visualized as services and delivered over the Internet[1][2][3]. Figure 1 shows that cloud computing.

Figure 1. Cloud Computing

1.1 Uses of cloud computing

Probably using cloud computing right now, even if don't realize it. If use an online service to send email, edit documents, watch movies or TV, listen to music, play games or store pictures and other files, it is likely that cloud computing is making it all possible behind the scenes. The first cloud computing services are barely a decade old, but already a variety of organizations from tiny startups to global corporations, government agencies to non-profits are embracing the technology for all sorts of reasons.

Here are a few of the things can do with the cloud:

- Create new apps and services

IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 20, Issue 5, Ver. II (Sep - Oct 2018), PP 12-19
www.iosrjournals.org

Analysis of Data Mining Tasks, Techniques, Tools, Applications And Trends

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Abstract: Data mining is a process which finds useful patterns from huge amount of data. It is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. It uses machine learning, statistical and visualization techniques to discovery and present knowledge in a form which is easily comprehensible to humans. This paper deals with detail study of Data Mining its techniques, tasks and related Tools and also focuses on applications ad trends in the data mining which will helpful in the further research.

Keywords: Data mining, KDD, Clustering, Tools, Regression.

Date of Submission: 23-09-2018 Date of acceptance: 08-10-2018

I. Introduction

Data mining is a hopeful and relatively new technology. Data mining is defined as a process of discovering hidden valuable knowledge by analyzing large amounts of data, which is stored in databases or data warehouse, using various core data mining techniques such as machine learning, artificial intelligence(AI) and statistical[1][2][3]. Figure 1.1 shows various data mining techniques. Many organizations in various industries are taking advantages of data mining including manufacturing, marketing, chemical, aerospace...etc, to increase their business efficiency. Therefore, the needs for a standard data mining process increased dramatically. A data mining process must be reliable and it must be repeatable by business people with little or no knowledge of data mining background.

Fig 1.1 Data Mining Techniques

- Sift through all the chaotic and repetitive noise in your data.
- Understand what is relevant and then make good use of that information to assess likely outcomes.
- Accelerate the pace of making informed decisions.

1.1 Need for Data Mining

- Data mining is the procedure of capturing large sets of data in order to identify the insights and visions of that data. Nowadays, the demand of data industry is rapidly growing which has also increased the demands for Data analysts and Data scientists.
- Since with this technique, analyze the data and then convert that data into meaningful information. This helps the business to take accurate and better decisions in an organization.

IJCSE International Journal of Computer Sciences and Engineering Open Access
Research Paper Vol.-6, Issue-10, Oct. 2018 E-ISSN: 2347-2693

Visual Analytics: Need, Process, Scope, Tools & Techniques and Challenges

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Available online at: www.ijcseonline.org

Accepted: 15/Oct/2018, Published: 31/Oct/2018

Abstract- Visual analytics employs interactive visualizations to integrate users' knowledge and inference capability into numerical/algorithmic data analysis processes. It is an active research field that has applications in many sectors, such as security, finance, and business.. This paper aims at providing an overview of visual analytics, need, scope, tools and techniques and the most important technical research challenges in the field.

Keywords- visual analytics, information visualization, data analysis, user interaction

I. INTRODUCTION

Big data is the term for data sets so bulky and complicated that it becomes not easy to process using conventional data management tools or processing applications. Visual analytics is a form of inquiry in which data that provides insight into solving a problem is displayed in an interactive, graphical manner. The approach uses data visualization technologies to help data scientists and other professionals identify trends, patterns and relationships in the data they are working with. Packaged visual analytics software tools make it easier for non-technical users to use by including drag-and-drop options for setting and modifying analytical parameters. Visual analytics contain various tools and techniques that help user to extract efficient knowledge from complex data and communicate effectively. Visual analytics is a multi-disciplinary area ranging from Bio Technology, Database research, Medicine, Business, Security and also Risk management [2].

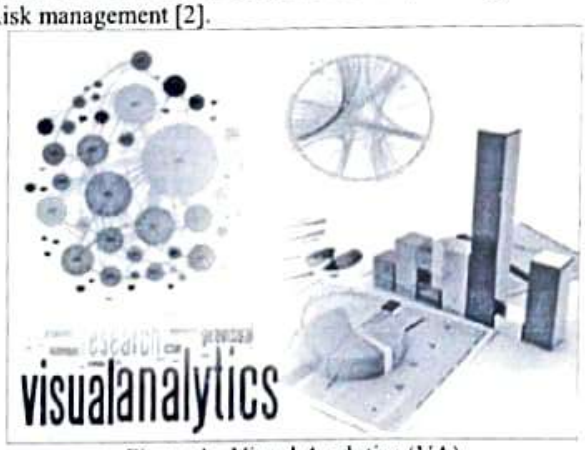

Figure 1 Visual Analytics (VA)

Like other types of business intelligence (BI) and business analytics (BA) initiatives, visual analytics applications must incorporate effective data management strategies in order to integrate, unify and standardize data coming from different source systems. Visual analytics is especially helpful in applications involving large, complex data sets and analytical processes that require a high degree of monitoring and interaction -- for example, big data analytics and data mining uses. Figure 1 shows Visual Analytics of big data. Section I mainly deals with the overview of Visual Analytics (VA). This section gives brief introduction to VA, need for VA, VA process and Scope of VA. Section II contains VA tools and techniques and also its benefits. Section III contains research area of VA of Visualization, Interaction and Data Analysis. Section IV contains finding problems and directions of VA and also discuss about the challenges in VA in Big Data. Section V gives an overview on the ideas for future research of VA.

A. The Need for Visual Analytics (VA)

The mother of invention is the need. This new age digital era is full of data and which is exponentially increasing with websites, smart phones and smart technologies connected over the internet. Data is captured like never before. The amount of data generated every minute is mind-boggling [3]. With ever increasing competition and shrinking margins, using data to take better decision is serving a differentiator. This has created a need to look for visual based data analysis that can make sense out of the huge data.

In the field of Business intelligence or data analytics, the insights in visual form are tremendously helpful. It makes the consumption of insights easy to understand and take decisive action. Figure 2. shows that need for data

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IJCSE International Journal of Computer Sciences and Engineering Open Access
Review Paper Vol.-6, Issue-11, Nov 2018 E-ISSN: 2347-2693

IoT Technology is Benefiting Today's Modern Farming Industry

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Available online at: www.ijcseonline.org

Accepted: 23/Nov/2018, Published: 30/Nov/2018

***Abstract*--**Agriculture plays very important role in the development of agricultural country. In India about 75% of population depends upon farming and one third of the nation's capital comes from farming. Issues concerning agriculture have been always hindering the development of the country. The only solution to this problem is smart agriculture by modernizing the current conventional methods of agriculture. To improve efficiency, productivity, global market and to reduce human intervention, time and cost there is a need to divert towards new technology named Internet of Things. It is the network of devices to transmit the information without human involvement. IoT works in synergy with agriculture to obtain smart farming. This paper focuses on major role of IoT in agriculture that leads to smart farming industry.

***Keywords*--**Internet of Things, Smart Farming, Efficiency, Productivity

I. INTRODUCTION

The Internet of things (IoT) is the most efficient and important techniques for development of solutions to the problems. The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity enables these objects to collect and exchange data. IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for direct integration between the physical world and computer-based systems, and resulting in improved efficiency, accuracy and economic benefit.

1.1 Internet of Things (IoT)

In Internet of things, we can represent things with natural way just like normal human being, like sensor, like car driver etc. This thing is assigned an ip address so that it can transfer data over a network. As per the report generated by Garner, at the end of 2016 there will be 30% rise in count of connected devices as compared to 2015. He further says that, this count will increase to 26 billion by 2020 [1]. "Things," in the IoT sense, can refer to a wide variety of devices such as heart monitoring , biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, DNA analysis devices for environmental/food/pathogen monitoring/field operation devices that assist fire-fighters in search and rescue operations[2]. Figure 1.1 shows that the structure of Internet of Things.

Figure 1.1 Internet of Things

1.2 Why IOT is important?

The Next Industrial Revolution which is going to change our lives in ways never imagined before, The last industrial revolution which is nothing but INTERNET the way we communicate and connect with people has changed like never before and also the Internet boom has improved our lives in many ways. Every time a Industrial Revolution happens there will be enormous changes in the economy create a whole new level of markets. Quick changes in IoT technology makes it a challenging task for the most experienced experts to anticipate the future of standardization in the field. For humanity, which is moderately clutter by nature, the IoT is an extraordinary advancement. On the other hand, for individuals who

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REAL-WORLD ATTACKS ON ZRTP WITH RSA ALGORITHM USING NEURAL NETWORK CLASSIFIER

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ABSTRACT: Voice over Internet Protocol (VoIP) is a trend of applications catching up on the internet in the recent times. The usage of cryptographic methods allows the users to communicate securely, but the computed throughput in addition to the QoS parameters are influenced by the algorithm used. In the technical work studied earlier, Diffie-Hellmann (DH) key exchange algorithm is employed, but it is not quite efficient to tackle against the attacks of malicious intruders. But, it is the only technique available for safeguarding the data from the offenders. In the newly introduced work, the ZRTP security mechanism yields a secure channel for VoIP along with Ron Rivest, Adi Shamir and Leonard Adleman (RSA) algorithm to defend against the intruder threats. It is found that the weakness of ZRTP protocol with RSA algorithm is due to the isolation between the platform state verification process and the key exchange process. End-to-end security is necessary for protecting against wiretapping made on voice calls. The ZRTP key-agreement protocol with the Neural Network (NN) Classifier is used for such communication in real-time. Classifier is utilized for the identification of the dangers from intruders. This comprehensive evaluation reveals a severe vulnerability, which permits wiretapping even when Short Authentication Strings are compared with precision. It explains about the error handling mechanisms of the clients and design of security indicators strongly resulting invulnerable connections. The performance analysis metrics include Recall, Precision, Accuracy and F-Measure result.

KEY WORDS: Voice over Internet Protocol (VoIP), Ron Rivest, Adi Shamir and Leonard Adleman (RSA), Diffie-Hellmann (DH), intruders, and Z and Real-time Transport Protocol (ZRTP).

1. INTRODUCTION

Voice over Internet Protocol (VoIP) is a type of transmission, which lets any individual to call from phone using a broadband internet connection. VoIP access generally permits the user to make calls to others who can also receive calls over the internet. Moreover, VoIP can be explained as a unique solution that facilitates transmitting voice signals over internet connection instead of the conventional telephone line [1].

In the recent VoIP implementations, the voice analog signals are sampled and then encoded employing codec. It is enclosed within an IP packet and transmitted over data cables of the internet facility similar to the manner in which the data packets are transmitted [2]. In the earlier times, VoIP needed a headset to be connected to the computer, and the speaker and receiver can only talk with others with a similar kind of arrangement. It was necessary that the parties had to be informed in prior about the call, so as to intimate the user waiting at the other end of the call and also the time of call [3].

VoIP systems depend on a data network that implies there are possibilities of security vulnerabilities and the kinds of attacks tagged with any data network. For instance, in a traditional telephone system, physical accessing the telephone lines or a get-around of the office private branch exchange (PBX) is needed to carry out activities like wiretapping. However for VoIP, voice is transformed into IP packets, which may be carried through several network access points. Hence the data is endangered to several more probable points of attack, which can be exploited for interruption by malicious attackers.

Truly, every security risk related with IP, like computer viruses, Denial of Service (DoS) and man in the middle attacks can also prove to be damaging to VoIP systems. Hijackers have also attempted using the VoIP technology to usurp identities and take away money [4]. This type of attack is identical to an email-based phishing attack, and therefore it is termed as "vishing". A victim will get an email or be reached through a phone call, which guides him or her to a customer service number where they are passed through multiple voices cued menus, trying to steal account numbers, Personal Identification Number (PINs), and other crucial data.

Communication with security in VoIP networks is a huge challenge owing to its packet loss rate, absence of authentication and eavesdropping. Therefore, a protected secret sharing approach along with single path routing attains a robust secure communication employing enhanced secret sharing algorithm in VoIP networks. Secret shared security exploited in the VoIP network will avoid dangerous attacks. In order to yield security, the infrastructure is developed with the aim of satisfying the below aspects including solid authentication, access control strategies, and key control.

In the technical work proposed, the ZRTP security approach yields a secure channel for VoIP employing Ron Rivest, Adi Shamir and Leonard Adleman (RSA) algorithm to safeguard against the malicious attacks. It is found that the weakness of ZRTP

DOI: http://dx.doi.org/10.26483/ijarcs.v9i3.6118

ISSN No. 0976-5697

Volume 9, No. 3, May-June 2018

International Journal of Advanced Research in Computer Science

SURVEY PAPER

Available Online at www.ijarcs.info

AN EXTENSIVE STUDY TOWARDS ACHIEVING FINE GRAINED ACCESS CONTROL ON ENCRYPTED CLOUD DATA

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Abstract: Outsourcing of business, Scientific and engineering data application on the Third party administrative cloud server have been increasing from the past decade. Unfortunately many servers disregard the security requirement which entails serious security concerns. To provide Confidentiality on the shared sensitive data, many cryptographic technique are usually applied in large numbers though it has lead to serious challenges in the cloud storage against data sharing.In this paper, we study on achieving fine grained access control on encrypted cloud data against several kinds of attacks propagating to the cloud servers such as key leakage attack, Cipher text attack by deducing the key for encryption and decryption. Fine grained access control is employed against encrypted data. In addition to more advantage, the access control mechanism also faces several issues in terms of automatic revocation. In order to handle implication of this study, we plan to propose an Ensemble operator on the Fine grained access control through Time, Location and Profile constrainst on the access policy to the attribute set defined. In this notion, expensive access policy generation for decryption of the cipher text is offloaded to the cloud to some extent. Even obtaining encryption key and decryption key, attacker will not help in decrypting the ciphertext. The proposed notion is used as key encapsulation mechanism to the data outsourced to cloud via third party application. Through extensive analysis on different fine grained access control mechanism on the outsourced data, the ensemble operator model can gain significant performance to highlight the scalability and efficiency.

Keywords: Secure Data Sharing Models, Fine Grained Access Control, Key Leakage Attack, Cipher Text Attack, Cloud Computing, Outsourced data Security

1. INTRODUCTION

Cloud services are growing exponentially through various sizes of cloud service providers, cloud storage service acts primary requirement to user of the cloud, however Security of outsourced data to the cloud represents a key concern for users[1][2]. There exists much risk to outsourced data in terms of data leakage. To secure outsourced data, the cryptographic schemes are usually applied to provide data integrity and data confidentiality. Among many scheme Attribute based Encryption is used in large extent. Attribute based Encryption is used to protect the confidentiality and integrity of outsourced data and further it is used to provide fine-grained access control against various access policy defined with constrainst. It may become one of the promising candidates to address the security concern in cloud computing. The security of cryptographic schemes initiates from the providing privacy to data through cryptographic key. Nowadays cryptography keys been exposed by cryptanalyst which is termed as key exposure problem [3]. There exist many techniques to prevent the key exposure such as key-insulated public key technique [4] and parallel key insulated public key technique [5]. In Particular, Key insulated solution fails by imposing employing brute force attack or pollution attack. To the best of our knowledge, the key exposure protection and automatic revocation solution in cloud storage is not employed.

The proposed model can be been defined in terms of ensemble operator in terms of Time, Location and Profile as access constrainst for data decryption and automatic revocation of user. The defined model can be mentioned as key encapsulation mechanism. The model can reduce expensive access policy generation for decryption of the cipher text. The rest of the section is organized as follows, section 2 describes the review of literature followed by section 3 to define the proposed methodology as outline and finally section 4 concludes the study of the paper.

2. REVIEW OF LITERATURES

In this section, we describe the existing methods applied to cloud data security by incorporating the access control mechanism through usage of Attribute based encryption technique. Further review of literature is sectioned into Methods on Key Exposure Prevention Technique and Automatic Revocation Technique

2.1.Key Exposure Prevention Techniques

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Classification Model for Intrusion Detection

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Abstract-This paper describes the possible factors of security violation and how the security breaks are classified. With the growth of internet or networked computer and associated applications, the Intrusion Detection system and its model are essential to keep resources (Hardware/Software) secure. An Intrusion Detection is a type of Security management system which gathers and analyzes the information from various areas with a computer or a network to identify possible security breaks which includes attacks from outside the organization (intrusion) and attacks from within the organization (misuses).

Keywords-Intrusion Detection, Network, Internet, Malicious.

I. INTRODUCTION

The computer networks are used to transmit the data from one location to another location. The Internet is used to transmit data all over the world. With the growth of these communication technologies, a lot of online applications are designed such as online banking and online purchasing. While implementing this kind of network or internet based applications data can be transmitted through the different computer system (Routers or gateway / workstation). Due to the data transmission from outside environment data can be accessed by attackers or hackers to misuse or destroy the available data.

In general, a flow of data occurs from the source computer to a destination computer over a communication channel (wire / data bus).The security system is needed to restrict access to this data or information or file. Only the sender and receiver should have the access rights according to the security policy. Therefore to increase confidentiality of the network security and availability of data or information stored on the computer system, we need to have automated tools for protecting data or files stored on the computer and also to give alert to the administrator. This system is known as Intrusion Detection System. This paper describes the possible problems faced when we transmit the data through the network or internet and how the problem's solutions are classified.

II. INTRUSION DETECTION SYSTEM

Intrusion is defined as a malicious activity that is someone or something to compromise information system through malicious activity or security policy violation. An Intrusion Detection System is a device or software application that monitors a network or system for malicious activity or security policy violation. Any detected activity is reported to an administrator or security event management system. To identify possible security breaches which include both intrusion and misuse within the system or network, an intrusion detection system gathers and analyzes information from various areas. This intrusion detection system automatically alerts the administrator when someone tries to compromise the information system.

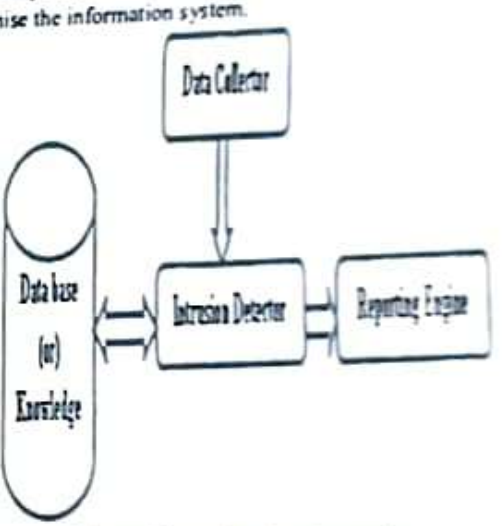

Figure 1: Intrusion detection system

III. CLASSIFICATION MODEL

The intrusion detection is classified into two broad categories, ie, host base intrusion detection and network based intrusion detection. In host base intrusion detection system (IDS), the IDS monitor host system activities such as operating system, system logs, application programs, files and so on. In network based IDS model, IDS placed on the network, it should examine network traffic, network packets. The both network and host based IDS further classified into three categories. They are statistical model, Artificial intelligent based expert's system model and data mining model.

Cancer Gene Expression Model an Classification using Fuzzy Clustering and TSVM

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Abstract: - *Selecting the most possibly cancer-related genes from huge microarray gene expression data is an important bioinformatics research topic due to its significance to improve human's understandability of the inherent cancer-resulting mechanism. This is actually a feature selection problem. The huge number of genes makes it impossible to execute an exhaustive search.In this work, we propose a Feature selection model named as Correlation based Feature Selection (CFS) with Fuzzy C means Clustering Algorithm. And then the Classification part we used a novel framework Transductive support vector machine (TSVM) is proposed. The fuzzy clustering algorithms and the exploration of un-annotated associations between genes and gene ontology categories. Then the TSVM will be compared with the traditional inductive method (SVM) in a series of experiments concerning the two classification problems, with promising results.Experimental results confirm the effectiveness of the proposed method in the area of supervised cancer classification as well as gene marker identification.*

Keywords: - *Transductive support vector machine (TSVM), Fuzzy C means Clustering Algorithm, Feature selection model.*

I. INTRODUCTION

At the moment, gene expression level is evaluated using microarray techniques which measure thousands of gene expressions in a single experiment. This technique is adapted to hybridization of nucleic acid for confirmation of many types of gene expression data at the same time [1]. Nevertheless, most of the genes are not connected with others. So, often biologists spend more time searching for discriminate genes. Thus, constructing a subset of informative genes with microarray data is very important to help recognize a gene that has discriminant power.

Fuzzy clustering algorithm works by assigning a set of genes to a given number of clusters such that each gene may belong to more than one cluster with different degrees [5].

During this process, the algorithm minimizes an objective function. In fuzzy clustering microarray data, several issues need to be addressed. Among these issues are the choices of the fuzziness parameter mand the objective function, and the initialization of fuzzy centroids. More attentions have been given to choices of fuzziness m[2, 6]. In most applications, a Euclidean metrics in objective function and a random initialization have been assumed by default. However, gene expression profiles in microarray experiments may correlate positively or negatively. They should be clustered into one group regardless of their expression values. A fuzzy c-means (FCM) algorithm equipped with an objective function.

Based on Euclidean distance metrics may fail to cluster those genes. With the ever growing knowledge about the biological functions a gene

Application of Data Mining Techniques in Early Detection of Breast Cancer

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Abstract: *Cancer is a class of diseases characterized by out-of-control cell growth. There are over 100 different types of cancer, and each is classified by the type of cell that is initially affected[1]. Breast cancer is the most common invasive cancer in women, and the second main cause of cancer death in women, after lung cancer, early detection of cancer helps the patients to prevent from vulnerability and get cured. Data mining and machine learning technique are used widely in medical sciences in identifying, diagnosing, diseases. In this paper we are proposing possible data mining techniques in early detection of breast cancer, Wisconsin breast cancer data set is used for experiments, and are evaluated using sensitivity, specificity andclassification accuracy.*

Keywords: *Breast cancer survivability, data mining, Wisconsin breast cancer data set, SVM, C5.0, cancer prediction techniques.*

I. INTRODUCTION

Among different cancers, breast cancer is the very common cancer affecting females worldwide, representing 25% of all cancers,
estimated in 2017 among 1.67 million cancer cases diagnosed. Especially women from less developed countries have slightly more number of cases compared with developed nations (883000 cases against 794000 in developed nations)[1]. In India breast cancer rate is lower (28.8 per 100000) than compared with United Kingdom (95 per 100000) but mortality is at par (12.7 vs17.1 per 100000) with United Kingdom. There is an significant increase in the incident and cancer associated morbidity and mortality in India as global and Indian studies describe.

Earlier cervical cancer was most common cancer in India women but now the breast cancer has surpassed the previous and this leads to increase cancer death. Detecting cancer in its initial stage helps the patients from obtaining medical assistance earlier and avoid death.

In this paper, I have presented the data mining techniques to predict breast cancer valuable and survivability rate of breast cancer patients through wisconsin breast cancer data and SEER[3] data and also introduced a primary classification of data through Survival time recode (STR), Vital status recode (VSR) and cause of death. The next session reviews about the related works, third section gives methodology covers prediction analysis, last session provides the experimental results with conclusion and future works.

II. RELATED WORKS

A study on the existing techniques and approaches show that there have been several studies on the survival prediction problem using statistical approaches and artificial neural networks. But we can able to find only few studies related to cancer diagnosis and recurrence using data mining approaches such as C4.5 decision trees. C4.5 is a popular and notable choice tree decision making system which has been utilized by Abdel ghani Bellaachia and Erhan Gauven[9] with two different strategies i.e.

naive Bayes and Back-Propagated Neural Networks. The authors examined the expectation of patients survivability rate of breast growth, with help of utilizing SEER Breast Cancer data. SEER data is a preprocessed information set of 151,886 records. With an alternative approach the authors pre-grouped by including Survival Time recode, Vital Status recode and causes of death. They have used Weka tool box to explore data with respect to above three information. With a few investigation, led by these calculations, they accomplished to prove these techniques are practically identical to existing procedures. Also model developed using c4.5 calculation have improved exception that the other two methods.

Authors Wei-stick Chang, Liou and De-ming [3], exhibited that the hereditary calculation of display provided positive results over other information mining models for prediction of breast cancer patients, through the general exactness of the patients, the expression and quality of classification algorithm. The hereditary calculation, decision trees, calculated relapse and

Comprehensive study of classification model for intrusion detection system: Review

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Abstract: ***The Intrusions Detection is one of the essential components in network security. Intrusion detection system used for monitor patterns of activities in user accounts and detects malicious activities. This paper presents an overview of classification model intrusions detection system. There are many model and techniques have been used to implement intrusions detection system. Th techniques are used as detector part of intrusions detection system (IDS) such as statistical model which includes the techniques Mean, Standard deviations, multivarience, markoprocess model ,Data mining model includes classification ,association rule c clustering techniques and Artificial intelligence includes Fuzzy logic and knowledge expert system. To increase the performance of Intrusions Detection System, IDS approaches may be used as combined together as more than one technique.***

Keywords: ***KDD, Intrusion, data mining, IDS***

I. Introduction

Network and Internet technology has become a essential part in our day to day life. Business or personal Informat transformation using network or internet is one of the major problems. Host based or Network based attacks are increasing frequen Finally it makes huge financial loss to the organization security threats to the Information system have increased the essential of intrus detection system.

The Intrusion detection system used to protect these networks from intruder (unauthorized person). In 1980 J.R Anderson presen the concepts that certain types of threats of the security could be identified a review of information contained in system's audit trail [4] 1985 denning and Neumann [3] has recommended the essential for effective intrusion detection mechanism.

The IDS (Intrusion detection system) is the process of intelligently monitoring the pattern of activity occurring in the netwo /internet and analyzing them for detecting an violation of the security policy. Parker [5] has defined six security issues such confidentiality, integrity, Availability, utility, and possession of the network to be considered during the process of IDS. The intrusions caused by attackers accessing the system from network/internet.

II. Intrusion detection model

The intrusion detection model can be grouped into three models. They are Statistical model, Data mining model and knowledge ba expert system model. The statistical model contains statistical movements, such as mean, median and standard deviation. In data min model, we can implement data mining algorithm such as association rule, decision tree, artificial neural network, clustering are implemen and third model is Knowledge based expert system model .

(a) Statistical Model:

The statistical model used to detect intrusion. This model use statistical properties such as mean, median, standard deviation variance and test to determine whether observed user's Behaviour deviate from expected behaviour (from user profile).To build statisti model to find intrusion use statistical properties for user's normal activities for example – average login time of user. The statisti movement can provide accurate notification of abnormal activities. This method does not require prior knowledge of security flaws.

The activity profile is generated in statistical model by observing the system activities. An activity profile characterizes the behaviour a given subject with respect to the given object.

From the training data set of the user behaviour the mean standard deviation can be computed
By the following formula.

$$\textbf{Mean-vector}\,[\,i\,] = 1/N \sum_{j=1}^{N} Instance[i]$$

$$\textbf{Std-Deviation-Vector}[i] = \frac{1}{N-1} \sum_{j=1}^{N} (behavioural\ instance[i] - mean\ vector[i]^2)^{1/2}$$

Where vector [i] is the i^{th} behavioural instance of the vector.

The intrusion detection system assigning a score to the user normal behaviour. The IDS compute mean, standard deviation of the curr abnormal user behaviour. If the current abnormal user behaviour value (ex: login time) greater than normal user behaviour value, it will will generate alarm.

The statistical anomaly based intrusion detection system establishes user behaviour profiles for normal activities and abnor (current) activities. Then use these profiles are matched based on various methods to detect deviation from the normal behaviour. statistical model can be
Classified as i) Operational model ii) markov process model iii) statistical movement model(mean, standard deviation) and iv) mul model

Monitoring Air Pollution using Tree-Based Routing Scheme for Wireless Sensor Nodes

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Abstract— The air quality in urban areas is a major concern in modern cities due to significant impacts of air pollution on public health, global environment, and worldwide economy. Recent studies reveal the importance of micro-level pollution information, including human personal exposure and acute exposure to air pollutants. Environment pollution is one of the major aspect and ambient air quality monitoring is essential to determine the existing quality of surrounding air, which is polluted by industrial sectors. Hence, present system is designed for monitoring of industrial environmental parameters. The system consists of a base station, gas sensing nodes, a tree-based routing scheme for the wireless sensor nodes and a real-time monitoring application that operates from a remote computer and a mobile phone. The system has been designed to be easily scaled-up to measure other parameters of interest. All aspects of the monitoring system such as sensing activity, transmission from sensor nodes to base station, remote transmission from the base station to the control center or information management system, data storage, and visualization, have also been designed and implemented.

Key words: WSN, Air Pollution, Monitoring System & Tree-Based Routing Scheme

I. INTRODUCTION

Air pollution is one of the most important factors affecting the quality of life and the health of the increasingly urban population of industrial societies. In many cities, the air is polluted by emissions from sources such as cars and trucks, power plants, and manufacturing processes. When gases and particles from those activities accumulate in the air in high enough concentrations, they can be harmful for human health, an environment. Often, terrain and meteorological conditions complicate air quality issues in the area [1]. Although the national trend is toward better outdoor air quality, there are some urban areas in which no improvement has taken place. Concentrations of outdoor air pollutants vary from day-to-day and even during the course of a day. For health protection, the public needs timely information about air quality and other factors (e.g., weather conditions) that affect it. An access to air quality forecasts allows residents to reduce their exposure when the pollutant concentrations are high. To monitor the pollution WSN provide a better monitoring mechanism [2]. It helps to monitor the pollution in industrial society and in any area. Wireless Sensor Networks are grooming technology successfully applicable to monitoring Air Quality, Habitat, Water Quality, Volcano eruption, forest fires, landslides, biodiversity etc.

Wireless sensor networks are made of by a collection of small electronic based devices named as Sensor Nodes or Motes, which are able to aggregate information from targeted area by transducers and it, transmit aggregated information to Sink Node using Wireless communication with appropriate Routing technique [3]. After information processing and handling, data is stored to database system or Server to use it for further preventive, decisive actions and analysis. Basically, Wireless Sensor Network consists of four constructive subsystems Sensor Nodes, Router, Sink Node or Gateway, Information Management-Processing Unit (IMPU). Wireless sensor networks (WSN) have emerged as one of the most promising technologies for the future. Some of the potential application domains are healthcare, army, environment and agriculture, industry, transportation systems and security [4]. Unlike other networks, WSN are designed for specific applications, and thus, they must satisfy a set of requirements that differs from one application to another. Therefore, researchers must address a variety of challenges to facilitate the widespread deployment of WSN technology in real-world domains. As a result, great efforts have been devoted to overcome the energy-saving problem and reliability [5]. Some of the application areas are: Environmental Earth sensing, Area monitoring, Health care monitoring, Forest fire detection, Water quality monitoring, Air pollution monitoring, Landslide detection, Natural disaster prevention, Industrial monitoring, Machine Health Monitoring and many more [6]. Air pollution monitoring is extremely important as air pollution has a direct impact on human health and environment. In this paper we propose a wireless sensor network system for participatory air pollution monitoring. The system consists of a base station, gas sensing nodes, a tree-based routing scheme for the wireless sensor nodes and a real-time monitoring application that operates from a remote computer and a mobile phone. The system has been designed to be easily scaled-up to measure other parameters of interest. All aspects of the monitoring system such as sensing activity, transmission from sensor nodes to base station, remote transmission from the base station to the control center or information management system, data storage, and visualization, have also been designed and implemented. The traditional air quality monitoring system, controlled by the Pollution Control Department, is extremely expensive. Analytical measuring equipment is costly, time and power consuming. In contrast to traditional air pollution monitoring stations, we present the design, implementation, and evaluation of low powet, low cost WSN based Air Pollution Monitoring System which provides real time monitoring of polluted materials at proper locations by using distributed (real time) air pollution monitoring systems. Sensor networks are used in many fields and have been deployed in a variety of applications ranging from monitoring a small room to the large area. In future multiple base stations (BS) and periodically transmits data over a short distance to a base station will lead to control the pollution.

Proceedings of the 2nd International Conference on Inventive Computation Technologies (ICICT 2017)
IEEE XPLORE COMPLIANT - Part Number CFP17K52-ART, ISBN 978-1-5090-6697-1

Hyper Elliptic curve based homomorphic encryption scheme for Cloud Data Security

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[illegible] another rising pattern in the field in PC innovation is [illegible] computing. Generally the information was kept up and [illegible] in the possess servers. Cloud computing is a stretchy, [illegible] dispersed conveyance stage for giving business or [illegible] benefits in overabundance of the Internet. Today, [illegible] provider gives conveyance of registering as an [illegible]. Contingent upon the administration, the colossal [illegible] control over the system and this tremendous measure of [illegible] put away in the cloud service provider. Henceforth, [illegible] is a noteworthy worry for the information in the cloud. [illegible] encryption calculations were combined for securing the [illegible] in the cloud. In this paper, we propose hybrid [illegible] encryption calculation for giving improved security [illegible] of the information that is put away in the cloud. The [illegible] procedure is conveyed by utilizing Hyper Elliptic [illegible] Cryptography(HECC) calculation, which creates a key [illegible] key is sent to the cloud provider where [illegible] multiplicative operations are combined to the [illegible]. Since the cloud supplier has the scrambled key no [illegible] can have the capacity to know which operation [illegible] performed. For the best Performance and most [illegible] security of cloud computing, this paper proposed [illegible] hybrid encryption strategy.

[illegible] computing, cloud provider, encrypted data, [illegible] Curve Cryptography(HECC), Homomorphic [illegible], cloud security, hybrid.

I. INTRODUCTION

[illegible] is the necessity on account of the expanding [illegible] the web or open cloud for putting away the [illegible] is required for saving the respectability, [illegible] of the data framework assets [11]. There [illegible] of the information in the scrambled [illegible] database however in the event that the [illegible] calculations on the encoded information are [illegible] performed then it is the important to unscramble [illegible] yet the decoded information are not secure [illegible] this manner, another thought of the cryptosystem [illegible] that permits the immediate calculation on [illegible] information. This idea is called privacy [illegible]. Be that as it may, decoding is not played [illegible] required is same as calculations on plaintext. While only controlling encoded information, certain augmentations and increases on plaintext qualities can be performed by the clients by utilizing homomorphic encryption [13].

II. BACK GROUND OF THE PROBLEM

A. Cloud Computing

Cloud is a place where one can get to applications and administrations, and where the information can be put away safely [14]. The purposes behind utilizing cloud are

1. Overseeing or keeping up the information is less demanding.
2. The size is vast.
3. With an Internet association getting to the cloud-based applications and administrations from any place with a gadget should be possible.

The data innovation demonstrates for registering is made out of the segments like equipment, programming, systems administration, and administrations. Thus, it is important to empower the advancement and conveyance of cloud administrations by means of the Internet or a private system. There are clients in the cloud. Cloud Provider and Cloud User are the unmistakable performing people in Cloud Computing. Cloud Provider gives cloud administrations. Associations, instructive establishments, people who use the cloud administrations are the cloud clients. Consequently, security, privacy and perceivability as for the cloud suppliers is much fundamental. The principle perspective is to shield the information from hacking.

B. Elliptic Curves

Let K be a field of trademark $\neq 2, 3$, and let $x^3 + ax + b$ (where $a, b \in K$) be a cubic polynomial with no different roots. An elliptic curve over K is the arrangement of focuses (x, y) which fulfill the condition [4]

$y^2 = x^3 + ax + b$, together w ith single component meant by O and called the "point at unendingness"

On the off chance that K is a field of trademark 2, at that point an elliptic curve over K is the arrangement of focuses fulfilling a condition of the type either

$y^2 + cy = x^3 + ax + b$ or

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J.Vikram et al. International Journal of Recent Research Aspects ISSN: 2349-7688, Special Issue: Conscientious Computing Technologies, April 2018, pp. 477-482

Comparative Study of Local Descriptor for Face Description

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Abstract- **This paper presents a novel and effective facial image representation based on Local Binary Pattern (LBP) texture features. The face image is split into several regions from which the LBP feature distributions are abstracted and linked into an augmented feature vector to be used as face descriptor. The accomplishment of the suggested method is determined in the face recognition problem under different attempts.**

1. INTRODUCTION

Finding good descriptors for the appearance of local facial regions is an open issue. Ideally, these descriptors should be easy to compute and have high extra-class variance (i.e., between different persons in the case of face recognition) and low intraclass variance, which means that the descriptor should be robust with respect to aging of the subjects, alternating illumination and other factors.

Using local photometric features [1] for object recognition in the more general context has become a widely accepted approach. In that setting, the typical approach is to detect interest points or interest regions in images, perform normalization with respect to affine transformations, and describe the normalized interest regions using local descriptors. This bag-of-keypoints approach is not suited for face description as such since it does not retain information on the spatial setting of the detected local regions but it does bear certain similarities to local feature-based face description.

One of the first face descriptors based on information extracted from local regions is the eigen features method proposed by Pentland et al. [2]. This is a hybrid approach in which the features are obtained by performing PCA to local face regions independently. In Local Feature Analysis [3], kernels of local spatial support are used to extract information about local facial components. Elastic Bunch Graph Matching (EBGM) [4] describes faces using Gabor filter responses in certain facial landmarks and a graph describing the spatial relations of these landmarks. The validity of the component-based approach is also attested by the study conducted by Heisele et al. in which a component-based face recognition system clearly outperformed global approaches on a test database containing faces rotated in depth [5].

AUTOMATIC face analysis which includes, e.g., face detection, face recognition, and facial expression recognition has become a very active topic in computer vision research [6]. A key issue in face analysis is finding efficient descriptors for face appearance. Different holistic methods such as Principal Component Analysis (PCA) [7], Linear Discriminant Analysis (LDA) [8], and the more recent 2D PCA [9] have been studied widely but lately also local descriptors have gained attention due to their robustness to challenges such as pose and illumination changes. This paper presents a novel descriptor based on local binary pattern texture features extracted from local facial regions.

The texture analysis community has developed a variety of different descriptors for the appearance of image patches. However, face recognition problem has not been associated to that progress in texture analysis field as it has not been investigated from such point of view. Recently, we investigated the representation of face images by means of local binary pattern features, yielding in outstanding results that were published in the ECCV 2004 conference [10]. After this, several research groups have adopted our approach. In this paper, we provide a more detailed analysis of the proposed representation, present additional results and discuss further extensions.

2. LOCAL BINARY PATTERN

The LBP operator [11] is one of the best performing texture descriptors and it has been widely used in various applications. It has proven to be highly discriminative and its key advantages, namely, its invariance to monotonic gray-level changes and computational efficiency, make it suitable for demanding image analysis tasks

The idea of using LBP for face description is motivated by the fact that faces can be seen as a composition of micropatterns which are well described by such operator.

The LBP operator was originally designed for texture description. The operator assigns a label to every pixel of an image by thresholding the 3 _ 3-neighborhood of each pixel with the center pixel value and considering the result as a binary number. Then, the histogram of the labels can be used as a texture descriptor. See Fig. 1 for an illustration of the basic LBP operator.

To be able to deal with textures at different scales, the LBP operator was later extended to use neighborhoods of different sizes [12] Defining the local neighborhood as a set of sampling points evenly spaced on a circle centered at the pixel to be labeled allows any radius and number of sampling

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Image & Signal Processing | Published: 15 June 2019

An Intelligent Recurrent Neural Network with Long Short-Term Memory (LSTM) BASED Batch Normalization for Medical Image Denoising

R. Rajeev ✉, J. Abdul Samath & N. K. Karthikeyan

Journal of Medical Systems **43**, Article number: 234 (2019) | Cite this article

796 Accesses | **13** Citations | **1** Altmetric | Metrics

Abstract

The process of denoising of medical images that are corrupted by noise is considered as a long established setback in the signal or image processing domain. An effective system for denoising in order to remove white, salt and also pepper noises by means of merging the Long

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Process Optimization of Big-Data Cloud Centre Using Nature Inspired Firefly Algorithm and K-Means Clustering

Jayaraj T, J. Abdul Samath

Abstract: **During the last decade, the growth of big data is immeasurable in information technology. Big data has the potential to take all the decisions necessary for a company or business. But it has many challenges as well. As its size and volume are immeasurably ample it is a very challenging task to store, process and mines it. At the same time as a boon to it cloud computing has a large capacity to store this big data and provides tremendous processing power. It is a challenging task to process large amount of data frequently in the big-data cloud center through the thousands of interconnected servers. Due to the day by day growth of the big-data, big-data cloud center is forced to improve its Quality of Service (QoS) metrics like throughput, latency and response time. Hence, to develop an optimal data processing optimization method is a current research problem that has to be solved. The major intention of this paper is to develop an application that provides maximum throughput, minimum latency and reduce the response time. Toward this, we have developed an optimization technique using nature-inspired firefly optimization algorithm and k-means clustering (FA-KMeans). The developed optimization method has been evaluated with state of art algorithms. Its experimental result elucidates that our proposed method provides good throughput, reduces latency and response time.**

***Keywords*: *Cloud computing, Multi Cloud, Firefly Optimization, Big-data*, Big-Data Cloud Centre.**

I. INTRODUCTION

Big data is a structured, unstructured and semi-structured huge voluminous data [1]. It goes on growing unaccountably. Its data size is growing from exabytes to zettabytes. For example, Facebook manages photos of 40 billion users a day [2]. The Walmart process one million customer transaction every hour. Moreover, all these are saved in a cloud memory. Its size is almost 2.5 petabytes. Also, 65000 billion photos are uploaded to Instagram every minutes, likewise per minute videos which cloud be played for 500 hours are uploaded to YouTube. In Google one billion searches are made and 294 billion emails are send every day. By 2020 the number of smartphone users will reach 6.1 billion likewise Internet of Things (connected devices) will be around 26 billion. Its data cannot be stored in the architecture of the current database management system. So, this big data with growing nature produces new challenges day by day. These challenges are reflected in store, processing and data visualization. Meanwhile, the cloud computing provides infrastructure storage and processing power needed for the big data. The architecture of cloud computing has been so designed as to suit big data.

The real scenario of cloud computing is an architecture composed of a group of powerful interconnected servers. These servers are located in different locations. Moreover, these locations are at different ranges. This architecture as a virtual resource is used to store and process different data. Its architecture is shown in fig 1.

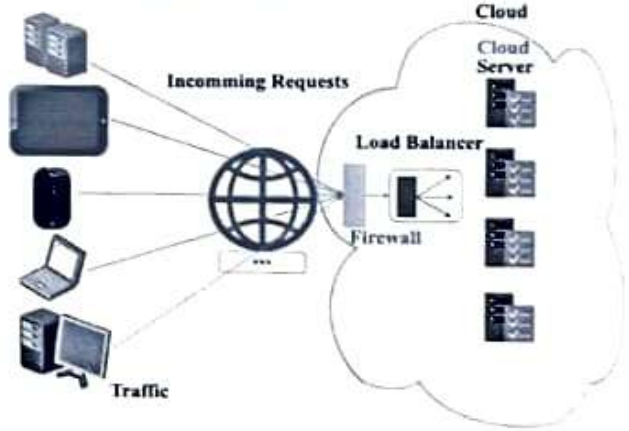

Fig1 Architecture of multi cloud environment.

There are three services in cloud computing [3][4][5]. They are infrastructure as a service (IAAS), platform as a service (PAAS) and software as a service (SAAS).

IAAS is a service model. It delivers infrastructure as a service to the end-user on demand. Generally, IAAS provides data Centre space, storage and hardware services.

SAAS is a software delivery and software licensing model. This software is provided to the cloud service user on a subscription basis on demand.

PAAS is a service provided as per the user demand. It includes Apache, Windows azure, beanstalk etc.

All those hardware and software services are virtualized and provided to the end-users as services. Its service and applications of service are described in fig 2. Still due to the enormous growth of the big data this cloud computing services face a variety of challenges.

Revised Manuscript Received on October 05, 2019.

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Applying Data Mining Approaches to Healthcare Dataset—A Comparative Interpretation

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Source: Journal of Computational and Theoretical Nanoscience, Volume 16, Number 4, April 2019, pp. 1681-1684(4)
Publisher: American Scientific Publishers
DOI: https://doi.org/10.1166/jctn.2019.8097

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Abstract | References | Citations | Supplementary Data | Suggestions

Data mining is the process of pattern discovery and extraction where huge amount of data is involved. Nowadays data mining is becoming very popular; it has been used in the health care industry for various applications. Both the data mining and healthcare industry have emerged some of reliable early detection system and other various healthcare related systems from the clinical and diagnosis data. In this paper we use support vector machine (SVM) and logistic regression to identify the lower back pain disease. Experimental results show that logistic regression gives better classification result than SVM.

Keywords: Data Mining; Health Informatics; Logistic regression; Pattern; Support Vector Machines
Document Type: Research Article

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IJCSE International Journal of Computer Sciences and Engineering Open Access
Research Paper Vol.-6, Issue-12, Dec 2018 E-ISSN: 2347-2693

Comparative Analysis on Parameter Optimization for ARPT

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Available online at: www.ijcseonline.org

Accepted: 18/Dec/2018, Published: 31/Dec/2018

Abstract— Software testing is a principal however complex piece of software development life cycle. It points towards recognizing the bugs and faults in the program of functional behavior. It always needs generation of test cases and suites for confirming their input ranges. The Optimization of Software testing is the foremost challenge. Subsequently to achieve greatest coverage the test must be created from overall dispersed regions of input areas, known Partition testing. Random testing serve better than partition testing nevertheless it also generating high computational overheads. Another technique is Adaptive Random technique having adaptive nature of recovering and finishing a portion of the test cases back to the input for correcting the next test cases lined to be passed. Adaptive Random Partition Testing (ARPT) was used to test software which utilized AT and RT in an alternative manner. The computational intricacy issue of random partitioning in ARPT strategies was resolved by utilizing clustering algorithms. It expends additional time and it prompts overhead procedure to estimate parameters of ARPT. In this paper, the parameters of ARPT 1 and ARPT 2 are optimized using Bacterial Foraging Algorithm (BFA) and Improved BAT algorithm which improves the accuracy of ARPT software testing strategies. However, the BFA has the most critical parameter step size that has strong influence in the convergence and stability of algorithm. In order to solve these problems, the improvised BAT optimization algorithm is proposed in this paper. It improves the accuracy and reduces time consumption of parameter setting of ARPT testing strategies.

Keywords— Software testing, Adaptive Random Partition Testing, BFA, Improvised BA

I. INTRODUCTION

Software testing is a technique aimed at evaluating an attribute or usability or capability of a product or program and determining that it meets its quality [4]. Software testing is the key to ensuring a successful and reliable software product or service, yet testing is often considered uninteresting work compared to design or coding. [3] The process of software testing continues to challenge the software community. This is crucial to the success of a software project. Despite decades of effort to develop an alternative technology to verify the quality of software, system software testing remains the primary way. However, software testing remains a labor-intensive, imperfect and slower process. Hence it is more important to consider testing can be performed more effectively at a lower cost through the use of systematic and automated methods.

There are different systematic and automated methods are developed for software testing. One of the basic approaches to test software is randomly generating test cases from the set of all input domain which is called Random Testing (RT). Adaptive Random Testing (ART) [5] had been developed to enhance the RT in which the adjacent program inputs show a certain degree of similarity in failure revealing behaviors. Partition Testing (PT) is one of the traditional software testing strategies where the input domains are divided into subdomains categorized according to some separation conditions of test cases.

Adaptive and Random Partition Testing (ARPT) [7] testing strategy is a combination of AT and Random Partition Testing (RPT) those are used in an alternative manner to test software. By introducing RPT testing process the time complexity of AT was reduced. [7] ARPT consists of two options namely ARPT 1 and ARPT 2.

APRT 1 and ARPT 2 testing strategies consist of different parameters. Those parameters values are varied based on the software. It needs to estimate over and over for different software. Thus the parameter estimation for different software leads to computation overhead and time consumption.

The computational complexity of random partitioning in ARPT strategies was resolved by using clustering algorithms in random partitioning of ARPT strategies. The time consumption and overhead process of parameter estimation were reduced by Bacterial Foraging Algorithm and Improvised BAT (IBAT) algorithm. However, the BFA

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Asian Journal of Engineering and Applied Technology
ISSN 2249-068X Vol. 7 No. 2, 2018, pp. 96-99
© The Research Publication, www.tpi.org.in

An Exploration of the Image Processing Techniques for the Detection of Leukemia

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Abstract In the pathological diagnostic method, categorization of blood cell has more essential to detect and analyze the disease. The complications that are connected with blood can be distributed only after the blood cell classification. The illness that begins with the bone marrow is the Leukemia. Therefore, it must be handled at the beginning step and proceeds to death if continuing untreated. This present research elucidates an investigation of diagnosing leukemia from microscopic blood image exhausting various image processing algorithms.

Keywords: Image Processing, Leukemia, Blood Cell, Noise Removal, Feature Extraction, Segmentation, Classification

I. INTRODUCTION

Leukemia is a kind of cancer [1] that marks the bone marrow causing the better fabrication of white blood cells which inflow the bloodstream which is more essential, infection-fighting part of your immune system, made in bone marrow. Hence, diagnose myelogenous leukemia has perfectly analyzed a physician will edict a comprehensive blood count bone mellow biopsy and cytogenetic tests. Leukemia is a malignancy (cancer) of blood cells. In leukemia, atypical blood cells have formed in the bone marrow. White Blood Cells (WBC) are the cells accountable for fighting infections. Leukaemia comprises the fabrication of the abnormal WBC.

II. IDENTIFICATION OF LEUKEMIA

Leukemia can be identified [2] with the discrepancy in the subsequent tests

Complete Blood Count (CBC): The effects of a CBC define all characteristics of the bloodstream comprising WBC count, RBC count, Hemoglobin platelet count, Hematocrit, and red blood cell dissemination when examining leukemia these outcomes are most important.

White Blood Cell (WBC) Count: It is a whole number of white blood cells originates in the blood. WBC is often supportive as it breaks down alien staple in the blood that may cause toxicities or disease. In the circumstances of WBC, it is either due to severe illness or leukemia.

Red Blood Cell (RBC) Count: It is the total no of RBC found in blood. In leukemia patients, investigation outcomes must expose a drop in the total amount of RBC.

Haemoglobin: It is the protein originates in the RBC which transmits oxygen to different measures of the body. A leukemia patient has affirmed the number of RBC, and the hemoglobin out to be lesser than average.

Platelet Count: It is the total number of platelets originates in blood is deployed to assist the clotted blood where the skin has tattered and disclosed outside. In leukemia patients, the number of platelets ought to be lesser than usual.

Hematocrit: It is the size of space engaged by crammed red blood cells, assessing the size and number of total RBC. The outcomes have been displayed as the ratio of total red blood cells a small hematocrit would connote leukemia. Moreover, Acute leukemia comes suddenly, progresses quickly and the requirements have canned urgently. Chronic leukemia advances gradually over months or years.

Myeloid and Lymphoid Leukemias: In addition, Leukemia's are named for the kind of white blood cell that is infected. *Myeloid*: Leukemia that initiates in myeloid cells are known as myeloid, myelogenous, or myeloblastic leukemia. *Lymphoid*: Leukemia that begins in lymphoid cells is called lymphoid, lymphoblastic, or lymphocytic leukemia. Lymphoid leukemia cells may gather in the lymph nodes, which turn swollen.

A. Kinds of Leukemia

The following are the types of leukemia [3].

1. *AML (Acute Myeloid Leukemia)*: This type of leukemia disturbs around 2600 adults a year in UK people over 65 can get it.
2. *ALL (Acute Lymphoblastic Leukemia)*: It affects mostly children.
3. *CML (Chronic Myeloid Leukemia)*: Rare condition affects all.
4. *CLL (Chronic Lymphocytic Leukemia)*: Most common and over 60 can get it and rare below 40.

III. STEPS IN IMAGE PROCESSING FOR DETECTION OF LEUKEMIA

Image processing is an effort taken to simplify the various diagnosis and make the process more accurate and prompt in delivering required test reports and to eradicate or minimize manual errors. This will ensure precise reports and help in the treatment of leukemia patients. It not only helps the process to be in a quick and speedy manner with perfection in the clinical diagnosis. The following are the main steps involved in the Image Processing.

Prioritization Based Delay Avoided Secured and Reliable Data Transmission in Wireless Sensor Network

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Abstract--- Intrusion detection system plays a major role in the network communication based applications where the malicious nodes might generate large volume of traffic to collapse the system. There are various research works that are introduced by different researchers for the purpose of detection and prevention of intrusion activities. In our previous work Attack Feature based Fast and Accurate Intrusion Detection System (AF-FAIDS) is introduced to perform intrusion detection in an efficient manner with optimized delay and latency parameters. However the existing work tends to have more limitations where it doesn't concentrate about the accurate identification of intrusion where it only concentrates about the latency. The space sharing in the existing system is done randomly where the incoming packet requests are handled in the first come first serve basis which would reduce the system performance. This is resolved in this proposed research method by introducing Prioritization Based Delay Avoided Secured and Reliable Data Transmission Method (PBDASRDT). In this proposed work, space sharing problem is optimized by allocating the prioritized packets in the optimal manner. Here, PSO algorithm is chosen for the selection of optimal core path based on traffic rate, so that attack detection can be performed in the efficient manner. Here constraints that are considered for the optimal selection of core paths are energy, bandwidth, and reliability. To handle the multi objective problem, here Vikor method is introduced which can choose the most optimal core route path which satisfies the multiple objectives. The overall implementation of the proposed research method is done in the NS2 simulation environment from which it is proved that the proposed research method leads to provide better result than the existing research methodologies.

Keywords--- Delay Avoidance, Intrusion Detection, Data Transmission, Space Sharing Problem, Prioritization, Optimal Route Selection.

I. Introduction

Intrusion detection system is an much concerning problem in various networking solution which would violate the regular data packet transmission rate [1]. Network intrusion detection systems are known to drop packets is some situations, namely in those situations where they are unable to process with sufficient speed the traffic stream that is presented to them for analysis. This may happen if the system has insufficient resources, namely processing resources, to handle all the traffic [2]. It should be highlighted that network intrusion detection can be very resource-demanding, given the high-speed links intrusion detection systems may be required to monitor [3].

Sensor nodes are mostly battery-powered, and they are usually deployed in the area where it is difficult to renew their power source [4]. To support robust operations, senor node is usually densely deployed near the event source and sinks [5]. Congestion may occur when the load in the network is over the available network capacity [6]. For congestion control currently, there are two kinds of methods, which is conducted either by increasing the capacity of the network or by reducing the load in the network [7]. Under specific conditions both methods have advantages and disadvantages. Generally, the resource control method is more efficient when continuously high load demands exist, while the traffic control method is more effective when a transient overload situation arises [8]. Topology aware resource adaptation (TARA) and hierarchical tree alternative path (HTAP) are two profitable struggles that adopt the resource control method. TARA concentrates on the adjustment of the network's supernumerary resources on the congestion situation through capacity analysis model, and consequently mitigates intersection hot spots [9].

There are various research works conducted earlier which does not consider path capacity or bottleneck edge capacity, that how to transfer high and low priority data during congestion. For sensor nodes to mitigate collision and congestion and to ensure synchronization slot duration calculation is also important which is not explored extensively in literature. In fact congestion can be avoided by calculating a suitable sending data rate by the base station for every node on the path according to the capacity of bottleneck edge.

ISSN 1943-023X
Received: 23 July 2018/Accepted: 21 Aug 2018

Cooperative Attack Detection Framework with the Focus on Identity Forage Attack in MANET

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Abstract— Security is the major concern in the Mobile Adhoc Network Environment. Cooperation is the necessary thing among the MANET nodes to avoid the security issues from the malicious attacker's involvement. This is avoided in the existing work namely Cooperative Bait Detection Scheme (CBDS). CBDS method implements a Identity Forage based Collaborative Bait detection scheme to help in achieving the stated goal of avoiding the malicious attacks. However, the existing work only can identify the black hole and grey hole attacks which cannot detect the other types of attack such as wormhole attack which needs to be concentrated more to ensure the secured environment. Among all of the security attack in network layer, wormhole is very dangerous thread over the MANET, one malicious node receives packet from any node and forward that packet through tunnels to different number of malicious node in the network and it affects the entire routing process. This is resolved in this research work by introducing the method namely Identity Forage based Collaborative Bait detection scheme (IDF-CBDS). In this proposed research method, node addresses are not shared directly which is hidden by using group signature concept. The nodes that are participating in the network would be provided with the secret key by using which they would generate signature on route reply message of bait message. These authentications are performed in the cluster head which is selected optimally by using Ant Colony Optimization algorithm. Thus the malicious nodes can be easily differentiated from the genuine nodes. The overall evaluation of the proposed research work is done in the NS2 simulation environment from which it can be proved that the proposed research can attain better performance than the existing research techniques.

Keywords— Security, Cooperative Attack, Identity Forage Attack, Black Hole Attack, Wormhole Attack, Bait Nodes, Ant Colony Optimization.

I. Introduction

MANET is a group of dynamic mobile nodes with no fixed infrastructure [1]. Each mobile node is equipped with wireless transmitter and a receiver with a suitable antenna [2]. Nodes in mobile ad hoc networks move freely in the network and they can organize themselves in a random way [3]. The important sector of ad-hoc network is routing protocols because network topologies keep on changing due to the movement of the nodes. All the network related activities like discovering of topology and delivery of packets is performed by the nodes itself [4]. The nodes communicate over wireless links; they have to compete with the effects of radio communication, such as noise and interference [5]. In MANET the links typically have less bandwidth than a wired network. Each node in a wireless ad hoc network functions as a host as well as a router. The control of the network is distributed among all the nodes of the network [6].

The aim of a security service is to secure network from any kind of attack that encountered in the network and made it harder for a malicious node to breaks the security of the network [7]. MANET providing these services faced lots of challenges. For securing MANET a trade-off between these services must be provided it means if any one service guarantees without taking account of other services that security system will fail [8]. The problem is to provide services one by one in MANET and presenting a way to guarantee each service [9]. Some of the important security services and their challenges as follow:

Availability: In this service, each authorized node must have access to all data and services in the network. Availability challenge arises due to MANET's dynamic topology and its open boundary. Accessing time, which is the time needed for a node to access the network services or data is important, because time is one of the security parameters [10]. By using lots of security and authentication levels, this service is disregarded as passing security levels needs time.

ISSN 1943-023X
Received: 6 Jan 2019/Accepted: 16 Feb 2019

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Published: 18 January 2018

Flexible and reliable ERP project customization framework to improve user satisfaction level

S. Hameed Ibrahim ✉, S. Duraisamy & U. K. Sridevi

Cluster Computing **22**, 2889–2895 (2019)

483 Accesses | **1** Citations | Metrics

Abstract

Enterprise resource planning (ERP) is typically a business process management software, which lets an organization to utilize a system consisting of integrated applications for the management of the business and automation of several back office functions concerned with technology, services and human resources. It has to be planned and developed in an efficient manner in order to assure the enhancement of the process of software development. In the new research framework, an optimal and reliable enterprise resource planning system, which is named analytic hierarchy process based requirement customization framework (AHP-RCF) is proposed. The main goal of this research method is to ensure the optimal and reliable construction of ERP projects with ensured customization requirements. In the new research technique, requirements of various types such as application requirement, process requirements and

ACCENT JOURNAL OF ECONOMICS ECOLOGY & ENGINEERING ISSN: 2456-1037 INTERNATIONAL JOURNAL IF:7.98, ELJIF: 6.194(10/2018), Peer Reviewed and Refereed Journal, UGC APPROVED NO. 48767

FIREFLY OPTIMIZED ANFIS FOR SEGMENTATION OF BLOOD VESSELS AND OPTICAL DISC

S.BEULA PRINCY, DR. S.DURAISAMY

Abstract

Abstract-- Retinal image analysis is becoming increasingly famous in the form of a nonintrusive diagnosis technique in modern ophthalmology. Automated analysis of retinal images is a process with challenges, whose aim is to offer automated techniques for helping in the primitive detection and diagnosis of several eye diseases like diabetic retinopathy and age-related macular degeneration (AMD). In order to diagnose these diseases, much significance has been given to the segmentation of the blood vessels. Earlier, the Markov Random field, neural networks, Adaptive Neuro Fuzzy Inference System (ANFIS) and Genetic optimization based ANFIS (G-ANFIS) have been evolved. But it has not rendered a sufficient result. For the purpose of solving this issue, the new system proposed a Firefly optimization based ANFIS with creditable regard to Mahalanobis Distance (F-ANFIS+MD). At initial step Time Domain Constraint Estimator (TDCE) is proposed for image denoising and Adaptive Histogram Equalization (AHE) is used for image enhancement. Next feature selection is performed by Modified Particle Swarm Optimization (MPSO) exploiting the Harmonic Search (HS) algorithm. Vessel detection and optic Disc (OD) segmentation is performed by F-ANFIS-MD and Adaptive Markov Random Field (AMRF). Then Gray Level Co-Occurrence Matrix (GLCM) features are extracted to analysis the eye diseases like Cataracts, Glaucoma, Ocular Motor Nerve Palsies and Rubeosis Iridis. Finally, the evaluation results reveal the performance of the vessel detection of the newly introduced FANFIS-MD approach. At last, the results from the performance evaluation confirm the performance of the vessel detection of the novel F-ANFIS-MD approach.
Keywords- Retinal Image, MRF, Firefly Algorithm (FA), Vessel Segmentation and Optical Disc Segmentation.

Opinion Mining using Machine Learning Techniques

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Abstract **Enormous volume of unstructured data are available in the form of reviews or comments in the social media and the product website. The buyers or the users are enforced to do absolute inspection on these information before choosing any product or service. A machine learning approach is necessary to mine these opinions which help the customer and the organization to make proper decision. This research paper analyses the opinions about the mobile learning system. This paper also examines the classification accuracy of K Nearest Neighbour algorithm. The classification accuracy of K Nearest Neighbour algorithm is compared with Multinomial Naive bayes probabilistic classification algorithm and random forest data mining algorithm. The other classification metrics precision, recall and F-measure also compared for these various machine learning algorithm.**

Keywords — Machine Learning, Opinion Mining, K Nearest Neighbour, Random Forest, Multinomial Naive Bayes

I. INTRODUCTION

Sentiment analysis also called opinion mining, is the field of computational study that analyses people's opinions, sentiments, evaluations, appraisals, attitudes, and emotions towards entities such as products, services, organizations, individuals, issues, events, topics, and their attributes[1]. Opinions expressed in a set of source documents about an object need to be mined, by extracting attributes of the object from the review comments and determining whether the opinions are positive, negative or neutral.

The rapid growth in the communication technology has led to easy access of information. There is a swift increase in the usage of mobile devices in all the fields. Private and Government sectors also aim to enable qualify education for all the students through mobile device. It because popularized the pedagogical methods such as learning through mobile devices [2]. Various mobile learning systems are available and also the users' opinions about these systems are aired in the social blogs or review Websites.

In sentiment analysis, there are two categories of information namely opinion (subjective information) and facts (objective information). Facts are the statements which explain the nature or qualities about the product or events. But the opinions describe the appraisals, attitudes and emotions regarding to the entity [3]. The major research has been done on objective nature of the product but recently more focus on the opinions and emotions on the product.

Opinion mining seeks to identify the opinion conveyed in the text document either by applying information retrieval or computational linguistics. The opinion expressed on the topic is given significance rather than the topic itself [4], [5]. Sentiment analysis or opinion mining analyses to extract the subjective information in source materials by applying natural language processing, computational linguistics and text analytics. Opinion classification is broadly studied in Natural language processing. For the given a set of review documents X, it determines whether each document x, (i=1 to n) expresses a positive, negative or neutral opinion / sentiment on an object. This is identical to supervised classification method in data mining.

In this paper, we implement the machine learning algorithm to analysis the sentiment in free mobile learning system reviews. This analysis assists the service provider / manufacturer to enhance the mobile learning system and also helps the user to choose appropriate mobile learning system without spending much time. Mobile learning is not e-learning that is facilitated with mobile technology, and also the practices other components and explorations across multiple contexts [6]. Mobile learning system helps the learners to learn any subject, at any time, any place and just when the knowledge is required.

In this paper opinion or sentiment classification has been performed on mobile learning system review data set. This methodology not only focuses the opinion words but also giving importance to corpus words which are frequently used in the documents under review. This paper also explains the methodology to remove words which are commonly used in the dataset of mobile learning system reviews. Singular value decomposition methods have been used to rank the corpus and prepare the data for opinion mining. This paper is organized into the following sections. Section II explains about the various techniques

 DOI : 10.18231/2454-9150.2018.0641 © 2018, IJREAM All Rights Reserved

Gain ratio feed forward neural network algorithm to improve classification accuracy

Helen Josephine V. L. [1], S. Duraisamy [2]

Abstract Keywords References

PDF

Abstract

In the field of information technology, there is revolution that has led to an abundance of information in every field through Internet. The rapid growth in the mobile devices indicates that the users and industry are getting more at ease with the mobile environment. An incredible amount of mobile learning systems and users' opinion about these apps are available in the form of reviews on the websites or in the social blogs or feedback. To classify these opinions, Neural Networks algorithm is mostly used to obtain high accuracy. To mine mobile learning app reviews, Gain Ratio based neural network algorithm for opinion mining system is proposed in this research paper. The main focus is to extract the polarity of the reviews, opinion it and conclude whether these reviews are positive or negative or neutral. This research work consists of four steps (i) Estimate score of the words in the review document by using Singular Value Decomposition (SVD) (ii) Feed forward the top ranked words with its weights from the input layer to hidden layer (iii) Calculate gain ratio and select top five positive and negative attributes (iv) Pass the selected attributes from input layer to output layer. This customized neural network classification algorithm helps to improve the classification accuracy.

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IJCSE International Journal of Computer Sciences and Engineering Open Access
Research Paper Vol.-7, Issue-4, April 2019 E-ISSN: 2347-2693

Perspective Analysis of Voice Disorder Detection using various Approaches

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DOI: https://doi.org/10.26438/ijcse/v7i4.12081212 | Available online at: www.ijcseonline.org

Accepted: 20/Apr/2019, Published: 30/Apr/2019

Abstract— Automatic voice pathology detection and classification systems effectively contribute to the assessment of voice disorders, which helps clinicians to detect the existence of any voice pathologies and the type of pathology from which patients suffer in the early stage. This paper performs detailed study on various methodologies like feature extraction techniques, pattern recognition using machine learning, artificial intelligence, data mining, etc., used by various researches to detect the voice disorder using signal processing and voice recordings. The identification of an algorithm that discriminates between pathological and healthy voices with more accuracy is necessary to realize a valid and precise health system. The key contribution of this study is to investigate the performance of several machine learning techniques useful for voice pathology detection. This work provides detailed survey and comparison of the existing works pros and cons. This study also highlights the drawbacks in the existing methods and outlines the important factors to be considered while performing

Keywords— voice pathology, voice disorder, signal processing, machine learning, data mining and feature extraction

I. INTRODUCTION

Pathological voice recognition has been received a great attention from researchers in the last decade. Speech processing has proved to be an excellent tool for voice disorder detection. Among the most interesting recent works are those concerned with Parkinson's Disease (PD), Multiple Sclerosis (MS) and other diseases which belong to a class of neurodegenerative diseases that affect patient's speech, motor, and cognitive capabilities [1, 2]. The speech production is a complex motor act that implies a big number of muscles, of physiological variables and a neurological control implying different cortical and under cortical regions. They distinguished three systems contributing to the production of the speech: the respiratory system, the laryngeal system and the supra-laryngeal system (the articulators) [3, 4]. The nervous system also controls the prosody. This one schematically covers the variations of height (intonation, melody), the variations of intensity (accentuation) and the temporal progress (pauses, debit, and rhythm). Voice pathologies affect the vocal folds during the phonation process. They make vocal folds producing irregular vibrations due to the malfunctioning of different factors contributing to vocal vibrations. Vocal folds are differently affected by vocal fold pathologies resulting in variation in the vibratory cycle of vocal folds because their ability to be closed properly is decreased.

The paper is organized in such a way that the section II discusses about the related work done by researchers in the field of voice disorder detection, the table summarizes the complete details of discussed prevailing works. The section III deals with the findings of this research problem in voice disorder detection with suggested improvements. The final section concludes the entire work summary and the importance of voice disorder detection using machine learning algorithms.

II. RELATED WORK

Among several machine learning techniques existing in literature, Support Vector Machine (SVM) has been widely used in voice signal processing. Godino et al. [5], focused on the classification of pathological and healthy voices based on MFCC to train and test an SVM classifier. These have obtained a good accuracy (92%). The SVM technique was also used in [6] to estimate the presence of dysphonia, investigating four types of pathology: chronic laryngitis, cysts, Reinke's edema and spasmodic dysphonia. The authors proposed an algorithm based on the use of MFCC and Linear Discriminant Analysis (LDA) as a dimensionality reduction method. This algorithm identifies the presence of a pathology with a discrete accuracy (86%). However, it was tested on a very limited dataset. In fact, only 70 pathological

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EXPLOITING CLUSTERING TECHNIQUE FOR ALMANAC BASED RAINFALL PREDICTION

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Abstract—**Data mining is the process of discovering patterns in large data sets involving methods at the intersection of machine learning, statistics and database systems. Various types of methods are available in data mining. Clustering is an unsupervised learning of data mining. Data is divided into similar groups; each similar group is called a Cluster. Most of people in Tamil Nadu are still following the activities based on astrological facts of Panchang (Almanac). Almanac has a mathematical base to predicting the meteorological occurrences. During the study, predicting the rainfall by one of the traditional Almanac or Panchang is studied in attention for one cycle of 81 Tamil year's corresponding to the Gregorian Year from 1936 to 2017 and actual annual rainfall data for Coimbatore is taken. In this work, we adopt k-mean clustering Algorithm, which is the most fashionable algorithms mainly used for cluster mining. In this work, we are trying to research the existing clustering algorithm is sufficient or not for finding the similar patterns in the almanac rainfall predictions.**

Keywords: ***Clustering, Data Mining, K Means, Almanac or Panchang.***

1. INTRODUCTION

Rainfall is important for planning the activities of builders, agriculturists, water supply engineers and all activity plans in the nature. India is an agricultural country and its economy is largely based upon crop productivity. Thus rainfall prediction becomes a significant factor in agricultural based countries like India. Rainfall Prediction is one of the most challenging tasks. Though already many algorithms have being proposed but still accurate prediction of rainfall is very difficult. In an agricultural country like India, the success or failure of the crops and water scarcity in any year is always viewed with greatest concern. Astronomy is an area where Data Mining has a immense role. Numerous techniques of Data mining have been used to solve tasks in Astrology. There has been increasing research interest in use of data mining techniques to scrutinize in the Astrology area.

Data mining is the search and analysis of large data sets, in order to discover meaningful patterns and rules. The key idea is to find effective ways to combine the computer's power to process data with the human eye's ability to detect patterns [14]. Data mining techniques have been broadly applied almost in all fields to analysis the data for pattern the rules, classification, prediction, decision trees, fuzzy rules and so on. Right now the Meteorology Department is forecasting only short term information about weather but long term forecasting is needed for planning. This can be done by two methods namely traditional forecasting and scientific weather forecasting. Traditional forecasting is based on observations and experience using animals, insects, combinations of plants, meteorological and astronomical indicators, and almanacs or panchang over a period of time. The scientific weather forecasting is based on past records of climate succeed in the area using mathematical models.

2. EXISTING APPROACH

IyerAurobind Venkatkumar [1] listed the advantages and disadvantages of clustering algorithms. K-means algorithm is better when clusters are spherical, it can be identified at beginning. But need to define number of clusters at the beginning. The BIRCH algorithm eliminates noisy data but its functioning is affected if the clusters formed are not of spherical shape. Also in DBSCAN there is no need to define number of clusters at the beginning. The complexity of STING algorithm depends on the number of grid cells and not on the number of points but the quality of the clusters highly depends on the granularity of data at the lower levels. As it is

COMPARISON OF RAINFALL PREDICTION BASED ON ALMANAC USING DATA MINING TECHNIQUES

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Abstract- Rainfall becomes a major factor in agricultural based country like India. Rainfall prediction has become one of the most systematically and technically taxing problems in around world. Farmers in Tamil Nadu are still following the agronomic activities based on astrological facts of Panchangam (Almanac). Yet there is very few ever attempted to see the rationality of the ancient knowledge system. Almanac also has a mathematical base for predicting the meteorological occurrences. During the study, the rainfall prediction by one of the traditional Almanac is studied in concentration for one cycle of 60 Tamil year's corresponding to the Gregorian Year from 1957 to 2017. We have a lot of data mining techniques to extract information. In this work, we applied various classification algorithms such as SMO, Random Forest and REPTree on the almanac rainfall dataset in WEKA tool. This paper shows REPTree is best for prediction of rainfall using data mining techniques based on almanac.

Keywords-Rainfall Prediction, Almanac, Prediction, Classification.

1. INTRODUCTION

Data mining is the search and analysis of large data sets, in order to discover meaningful patterns and rules. The key idea is to find effective ways to combine the computer's power to process data with the human eye's ability to detect patterns. Data mining techniques have been broadly applied almost in all fields to analysis the data for pattern the rules, classification, prediction, decision trees, fuzzy rules and so on.

Rainfall is important for planning the activities of agriculturists, builders, water supply engineers, and all activity plans in the nature. India is an agricultural country and its economy is largely based upon crop productivity. Thus rainfall prediction becomes a significant factor in agricultural based countries like India. Rainfall Prediction is one of the most challenging tasks. Though already many algorithm have being proposed but still accurate prediction of rainfall is very difficult. In an agricultural country like India, the success or failure of the crops and water scarcity in any year is always viewed with greatest concern.

Astronomy is an area where Data Mining has been playing a big role. Several techniques of Data mining have been used to solve tasks in Astrology. There has been increasing research interest in use of data mining techniques to scrutinize in the Astrology area.

At present the Meteorology Department is informing only short term forecasting about weather but long term forecasting is needed for planning. This can be achieved by two methods namely traditional forecasting and scientific weather forecasting. Traditional forecasting is based on observations and experience using combinations of plants, animals, insects, meteorological and astronomical indicators, and almanacs or panchangs over a period of time. The scientific weather forecasting is based on past records of climate prevailed in the area using mathematical models.

2. EXISTING APPROACH

Kolluru Venkata Nagendra [1] surveys a range of classification techniques used by various researchers. Artificial Neural Network is applied for Rainfall Forecasting on various parameters are analyzed. They found that MLP method, Naïve Bayesian classifiers and Support Vector Machines are best to predict rainfall compare to other techniques (Numerical & Statistical). They identify that for weekly, monthly and yearly rainfall forecasting Naïve Bayesian , Feed Forward Neural Network and SVM gives best performance respectively.

Dhawal Hirani [2] reports a detailed survey on rainfall prediction using different rainfall prediction methods extensively survey lasted 20 years. From the survey it has been found that most of the researchers used artificial neural networks for rainfall prediction and got significant results. They found that MLP, BPN, RBFN, SOM & SUM are suitable for predict rainfall forecasting techniques.

Seema Mahajan [3] examined the relationship of Gujarat rainfall with significant universal parameters such as SLP, SST, U – Wind & Windstress and V- Wind & Windstress. They taken one month lagged (June – July) for 40 years (From 1960 to 1999) data from National Oceanic and Atmospheric Administration (NOAA) and perform multilinear

Sharing Sensitive data protection for Big data in cloud

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[2]Head, Department of Computer Applications Chikkanna Government College, Tiruppur-2 Tamilnadu, INDIA.

Abstract : Big data is extremely massive volumes of structured and unstructured data that is difficult to process this data using traditional databases and software technologies. The organisation procures large data storage, data delivery on semi-trusted big data sharing platform. It increases the revenue. An enterprise can obtain huge amount of sensitive data by storing, analysing, processing these data. Logging, vulnerability and encryption are very important to keep sensitive data secure in digital world. It reduces the costs of enterprises for users to provide value added data and personalized services. It becomes mandatory to provide the security in big data platform. Customers are looking at field level of encryption, tokenization, and anonymization technologies to protect the data. This abstract presents a framework to share the secure sensitive data on a big data platform using effective encryption algorithm. We process identity-based conditional proxy encryption (IBCPRE) based on heterogeneous cipher text transformation technique to ensure the end-to-end security of big data in the cloud .However, the policy updating has always been a challenging issue when (IBCPRE) is used to construct access control schemes. It also gives security to share the sensitive data.

Key words: Sensitive data, Secure sharing, big data, identity-based conditional proxy re-encryption.

Introduction

Data generated organisation are expanding use of the data. Big data is generates big volume of data set that it is difficult to process using traditional database system and software trends. Big data contains structured, unstructed, semi structured data. These types of data have sensitive data. The huge amount of sensitive data is stored on a big data platform. Big data platform is not only stores large volume of data but also protect the appropriate policies. Most of the data processing happens on the secured data. Enterprise needs proper authentication and authorisation. Sharing sensitive data is used to reduce the cost providing users with personalised services and non-core services. We use identity-based conditional proxy encryption (IBCPRE) to re-encrypt a cipher text but cipher text will be correctively for decryption, if a condition applied and re-encryption is satisfied. It provides fine-grained proxy re-encryption and useful for secure sharing on big data platform.

When transmitting the sensitive data from local system to big data platform, we need to face security issues, sensitive data computing, security problem while storing the data, data use issues in cloud environment. Existing system provides the partial solution for sharing and securing the sensitive data. I am also includes algorithms to provides end-to-end security of sensitive data guaranteed secured storage on Big data using identity-based conditional proxy encryption (IBCPRE) using private space process based on VMM.

Materials and Method

Technologies Used:

During the solution development, following hardwares were used:

- 250 GB HD
- 8 GB RAM

Cloud Environment

Software Requirement:

JAVA, Spark, HTML5

2. Literature survey

More sensitive data is shared by third party sites on the Internet; we need to encrypt data stored at these sites. The main disadvantage of encrypting data is it can be selectively shared only at a coarse-grained level .The author used new system for sharing the encrypted data that is called Key-Policy Attribute-Based Encryption(KP_ABE).KP-ABE decryption distributes the keys in cipertext access control. When the access control changed, the data owner needs to re-encrypt the data.

IBCPRE algorithm (identity-based conditional proxy encryption)

AES algorithm (Advanced Encrypt Standard)

- AES is more secure (it is less susceptible to cryptanalysis than 3DES)
- AES is faster in both hardware and software

www.ijrar.org (E-ISSN 2348-1269, P-ISSN 2349-5138)

Secure Sensitive Data Transmission On Bigdata Platform

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Abstract: Big data is huge volumes of structured and unstructured data that is very difficult to process this data using traditional databases . The organisation contains huge data storage, data delivery on semi-trusted big data platform. It increases the expenditure. An enterprise can acquire enormous amount of sensitive data by storing , analysing , processing these data. Logging, vulnerability and encryption are essential to keep sensitive secure in computerized world. It decreases the costs of enterprises for users to provide value added data and personalized services. It becomes essential to give the security in big data platform. Customers are looking at the field level of encryption, tokenization, and anonymization technologies to secure the information. This conceptual presents a system to share the sensitive data on a big data platform utilizing effective encryption algorithm. We process identity-based conditional proxy encryption (IBCPRE) based on heterogeneous ciper text transformation technique to guarantee the security of big data in cloud. However, the concept updating has always been a challenging problem when (IBCPRE) is used to establish the access control strategy. It also gives security to share the sensitive data.

Key words: Sensitive data, Secure sharing, big data, identity-based conditional proxy re-encryption

1. Introduction

Data generated organisation are expanding use of the data. Big data is generates big volume of data set that it is difficult to process using traditional database system and software trends. Big data contains structured, unstructed, semi structured data. These types of data have sensitive data. The huge amount of sensitive data is stored on a big data platform. Big data platform is not only stores large volume of data but also protect the appropriate policies. Most of the data processing happens on the secured data. Enterprise needs proper authentication and authorisation. Sharing sensitive data provides personalised services and non-core services to the users with minimum cost. We use identity-based conditional proxy encryption (IBCPRE) to re-encrypt a cipher text .Cipher text will decrypted, if a condition is satisfied. It gives the proxy re-encryption and secure the sensitive data on big data platform. When transmitting the sensitive data from local system to big data platform, we need to face security issues, sensitive data computing, security problem while storing the data, data use issues in cloud environment. Existing system provides the partial solution for sharing and securing the sensitive data. I am also includes algorithms to provides end-to-end

Secure Sensitive Data Access Control in Big Data

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massive volumes of it is difficult to process and soft e data sto ng platfor in huge an l world. It reduces the vide value added data and personalized services. It becomes mandatory to provide the security in big data platform. Customers are looking at field level of encryption, tokenization, and anonymization technologies to protect the data. This abstract presents a framework to share the secure sensitive data on a big data platform using effective encryption algorithm. We process identity-based conditional proxy encryption (IBCPRE) based on heterogeneous cipher text transformation technique to ensure the end-to-end security of big data in the cloud. However, the policy updating has always been a challenging issue when (IBCPRE) is used to construct access control schemes. It also gives security to share the sensitive data.

Key words: Sensitive Data, Secure Sharing, Big Data, Identity-Based Conditional Proxy Re-Encryption

I. INTRODUCTION

Data generated organisation are expanding use of the data. Big data is generates big volume of data set that it is difficult to process using traditional database system and software trends. Big data contains structured, unstructed, semi structured data. These types of data have sensitive data. The huge amount of sensitive data is stored on a big data platform. Big data platform is not only stores large volume of data but also protect the appropriate policies. Most of the data processing happens on the secured data. Enterprise needs proper authentication and authorization. Sharing sensitive data is used to reduce the cost providing users with personalized services and non-core services. We use identity-based conditional proxy encryption (IBCPRE) to re-encrypt a cipher text but cipher text will be correctively for decryption, if a condition applied and re-encryption is satisfied. It provides fine-grained proxy re-encryption and useful for secure sharing on big data platform.

When transmitting the sensitive data from local system to big data platform, we need to face security issues, sensitive data computing, security problem while storing the data, data use issues in cloud environment. Existing system provides the partial solution for sharing and securing the sensitive data. I am also includes algorithms to provides end-to-end security of sensitive data guaranteed secured storage on Big data using identity-based conditional proxy encryption (IBCPRE) using private space process based on VMM.

A. Materials & Method

1) Technologies Used

vare's were

JAVA, Spark, HTML5

II. LITERATURE SURVEY

More sensitive data is shared by third party sites on the Internet, we need to encrypt data stored at these sites. The main disadvantage of encrypting data is it can be selectively shared only at a coarse-grained level .The author used new system for sharing the encrypted data that is called Key- Policy Attribute-Based Encryption(KP_ABE).KP-ABE decryption distributes the keys in ciphertext access control. When the access control changed, the data owner needs to re- encrypt the data.

IBCPRE algorithm (identity-based conditional proxy encryption)

AES algorithm (Advanced Encrypt Standard)

AES is more secure (it is less susceptible to cryptanalysis than 3DES).

AES is faster in both hardware and software.

Cloud storage provides services to keep the data available and accessible, and the physical environment has to be preserving and running .Cloud storage keeps encrypted data .This types of data are not recommended for calculation. So, a big data platform provides services to transfer of sensitive data. It provides huge data storage, value added and computational services. These services can be provided high- level computational intelligence based on emerging analytical techniques.

III. PRIMARY SAFETY ASPECTS IN SECURE SENSITIVE DATA SHARING

The Secure sensitive data sharing contains well-being factors. There are insecure Web Interface can be allowed an attacker to utilize an administration web interface. Insufficient Authentication can allow an attacker to use a bad password policy. Insecure Network Services leads to exploit unnecessary or weak services running on the device, There are issues involves in Poor Physical Security which can use USB ports, SD cards or other storage access the device OS and potentially any data stored on the device. Traditional security services are inadequate to share the secured sensitive data. Some security problem while transmitting sensitive data from a data owner's local server to a big data platform. Computational Storage security problems on the big data platform and secure data destruction.

Sensitive Data Transmission with Security Using Identity-based Conditional Proxy Re-Encryption Algorithm (IBCPRE) on Big Data Platform

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Abstract--- Big data is a the substantial volume of information – both organized and unstructured – that inundates a business on an everyday premise. Now a day's utilization of big data platforms is expanding for putting away huge measure of end user's data remotely on big data servers. Sharing sensitive data came about into enormous decrease in expenses of ventures for clients to offer some incentive included information and customized administrations. As enterprises are sharing their vital and sensitive data on big data platforms from various and numerous domains, it is important to give the security and protection in big data platform. For Big Data platforms, secure sharing of sensitive data is testing research issue. In this paper we present framework for secure sensitive data sharing and privacy preserving for shared data over big data frameworks including functionalities, for example, protection saving, open reviewing, information security, storage, data access, secure data destruction using cloud services.

Keywords--- Identity-based Conditional Proxy Re-encryption, Secure Data, Sensitive Data.

I. Introduction

In digital world huge amount of structured, unstructured, semi structured data are generated quickly. When analyzing the data we can obtain huge amount of sensitive data. These data provides the services to other business when it stored on big data platform. Secure sensitive data sharing involves four primary safety factors. First, there are security issues when sensitive data are transmitted from a data owner's local server to a big data platform. Second, there can be sensitive data computing and storage security problems on the big data platform. Third, there are secure sensitive data use problems on the cloud. Fourth, there are issues involving secure data destruction.

Existing technologies have partially provided data sharing and privacy protection issues from various perspectives, but it does not provide the whole process in the full data security life cycle. In any cases, a big data platform is a complete system with multi stakeholder contribution, and thus cannot endure any security breach resulting in sensitive data loss. In this paper, we analyze security issues including the entire sensitive data sharing life cycle and to ensure secure sensitive data sharing on a big data platform, to ensure secure storage on the big data platform using Proxy Re-Encryption (PRE) technology, and using a private space process based on a Virtual Machine Monitor (VMM). Then, a security plug-in and a data self-destruction mechanism help to reduce the client with respect to sensitive data leakage.

II. Related Work

2.1 Data encryption and access control of cloud storage

ABE decryption contains rules are contained in the encryption algorithm, avoiding from the expenses of regular key distribution in cipher text get to control. However, when the access control procedure changes progressively, a data owner is required to re-encrypt the information. A strategy dependent on PRE is proposed in Ref. [1]. However, the semi-trusted agent cannot get the corresponding plaintext or calculate the decryption key of either party in the authorization process [2]. A Homomorphism Encryption (FHE) component is proposed in Ref. [3]. The FHE component grants a particular algebraic operation based on cipher text that yields a still encrypted result. All the more explicitly, recovery and examination of the encrypted data produce correct results, however the information are not decrypted all through the entire procedure.

ISSN 1943-023X
Received: 18 Jan 2019/Accepted: 26 Feb 2019

Int. J. Math. And Appl. ...
ISSN: 2347-1557
Available Online: ...

International Journal of *Mathematics And its Applications*

Strong Implicative and Fuzzy Strong Implicative Filters of Lattice Wajsberg Algebras

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Abstract: In this paper, we consider and discuss some properties of strong implicative filter of lattice Wajsberg algebra. Also, we introduce the notion of fuzzy strong implicative filter and investigate some properties with interesting illustrations. Moreover, we obtain the relation between a strong implicative filter and fuzzy strong implicative filter in lattice Wajsberg algebra.

MSC: 03E70, 03E72, 03G10.

Keywords: Wajsberg algebra, Lattice Wajsberg algebra, Implicative filter, Strong implicative filter, Fuzzy Strong implicative filter.

© JS Publication. *Accepted on: 20.06.2018*

1. Introduction

Zadeh [7] introduced the concept and fuzzy set in 1965. Since then this idea has been applied to other algebraic structure such as groups, semigroups, rings, modules, vector spaces and topologies. With development of fuzzy set, it is widely used in many fields. Filters correspond to sets of formulae closed with respect to Modus Ponens. So filters are important tools in studying non-classical algebras. From the logical point view, various filters correspond to various sets of provable formulae. At present, there are two way to generalize the types of filters: one is fuzzy set theory and the other is folding theory. In the fuzzy approach, a lot of work has been done fuzzy filters which are particular cases of fuzzy set. Mordchaj Wajsberg [6] introduced the concept of Wajsberg algebras in 1935 and studied by Font, Rodriguez and Torrens in [5]. They [5] defined lattice structure of Wajsberg algebras. Further, they [5] introduced the notion of an implicative filter of lattice Wajsberg algebras and discussed some of their properties. Basheer Ahamed and Ibrahim [1, 2] introduced the definitions of fuzzy implicative filter and an anti fuzzy implicative filter of lattice Wajsberg algebras and obtained some properties with illustrations. Recently, the authors [3] introduced the notions of implicative and strong implicative filters of lattice Wajsberg algebra, and investigated some properties of them. In the present paper, we discuss the properties of strong implicative filter. We introduce the notion of fuzzy strong implicative filter of lattice Wajsberg algebra, and investigate some properties with illustrations. Further, we discuss some related properties of strong implicative and fuzzy strong implicative filters of lattice Wajsberg algebra with useful examples.

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Journal of Computer and Mathematical Sciences, Vol 9(8), 893-902, August 2018 ISSN 0976-5727 (Print)
(An International Research Journal), www.comjnals.com ISSN 2319-8141 (Online)

Anti Fuzzy Implicative and Strong Implicative Filters of Lattice Wajsberg Algebras

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(Received on: July 19, 2018)

ABSTRACT

In this paper, we investigate some properties of an anti fuzzy implicative filter of lattice Wajsberg algebra. Further, we introduce the notion of an anti fuzzy strong implicative filter and obtain some properties with interesting illustrations. Moreover, we obtain the condition of an anti fuzzy strong implicative filter is an anti fuzzy implicative filter in lattice Wajsberg algebra.

Mathematical Subject Classification 2010:03E70, 03E72, 03G10.

Keywords: Lattice Wajsberg algebra; Implicative filter; Strong implicative filter; Fuzzy implicative filter; Fuzzy strong implicative filter; Anti fuzzy implicative filter; Anti fuzzy strong implicative filter.

1. INTRODUCTION

The concept of fuzzy set was introduced by Zadeh[11] in 1965. At present, fuzzification ideas play an important role in the study of an algebraic structure. MordchajWajsbreg[8] introduced the concept of Wajsberg algebras in 1935 and studied by Font, Rodriguez and Torrens[1]. They[1] defined lattice structure of Wajsberg algebras. Further, they[3] introduced the notion of an implicative filter of lattice Wajsberg algebras and discussed some of their properties. Basheer Ahamed and Ibrahim[1,2] introduced the definitions of fuzzy implicative filter and an anti fuzzy implicative filter of lattice Wajsberg algebras and obtained some properties with illustrations. Recently, the authors[5] introduced the notions of implicative and strong implicative filters of lattice Wajsberg algebra, and investigated some properties of them.

INTUITIONISTIC FUZZY IMPLICATIVE AND LATTICE IMPLICATIVE FILTERS OF LATTICE WAJSBERG ALGEBRAS

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***Abstract*--In this paper, we introduce the notions of intuitionistic fuzzy implicative and lattice implicative filters of lattice Wajsberg algebra. Also, we discuss some of their properties with illustrations. Further, we investigate the relation between an intuitionistic fuzzy implicative filter and an intuitionistic fuzzy lattice implicative filter. Finally, we obtain the equilvalent condition of an intuitionistic fuzzy implicative filter.**

***Keywords* -- Wajsberg algebra; Lattice Wajsberg algebra; Implicative filter; Fuzzy implicative filter; Intuitionistic fuzzy implicative filter.**

***Mathematical Subject Classification 2010*:**03E70, 03E72, 03G10.

I. INTRODUCTION

The concept of fuzzy set was defined by Zadeh [9]. Since then these idea have been applied to other algebraic structures such as semigroup, group, ring, etc. The idea of intuitionistic fuzzy set was introduced by Atanassov [1, 2], as generalization of the notion of fuzzy set. Mordchaj Wajsbreg [8] introduced the concept of Wajsberg algebras in 1935 and studied by Font, Rodriguez and Torrens [5]. They [5] defined lattice structure of Wajsberg algebras and the notion of an implicative filter of lattice Wajsberg algebras and discussed some of their properties. At present, the filter theory of lattice Wajsberg algebra has been widely studied, and some important results have been obtained. Basheer Ahamed and Ibrahim [3, 4] introduced the definitions of fuzzy implicative filter and an anti fuzzy implicative filter of lattice Wajsberg algebras and obtained some properties with illustrations. Recently, the authors [6, 7] introduced the notions of implicative, strong implicative, fuzzy strong implicative filters of lattice Wajsberg algebra, and investigated some properties of them.

In this paper, we introduce the notion of an intuitionistic fuzzy implicative filter of lattice Wajsberg algebra. We establish the intuitionistic fuzzification of the concept of implicative filters in Wajsberg algebras, and investigate some of their properties. We show that every intuitionistic fuzzy lattice implicative filter of a lattice Wajsberg algebra is an intuitionistic fuzzy lattice implicative filter of with suitable illustrations.

II. PRELIMINARIES

In this section, we recall some basic definitions and properties which are helpful our subsequent discussions.

Definition 2.1. [5] Let $(A, \rightarrow, *, 1)$ be an algebra with a binary operation "$\rightarrow$" and a quasi complement "$*$" is called Wajsberg algebra if and only if it satisfies the following axioms for all $x, y, z \in A$,

(i) $1 \rightarrow x = x$
(ii) $(x \rightarrow y) \rightarrow ((y \rightarrow z) \rightarrow (x \rightarrow z)) = 1$
(iii) $(x \rightarrow y) \rightarrow y = (y \rightarrow x) \rightarrow x$
(iv) $(x^* \rightarrow y^*) \rightarrow (y \rightarrow x) = 1$

Proposition 2.2. [5] The Wajsberg algebra $(A, \rightarrow, *, 1)$ satisfies the following axioms for all $x, y, z \in A$.

(i) $x \rightarrow x = 1$
(ii) If $x \rightarrow y = y \rightarrow x = 1$ then $x = y$
(iii) $x \rightarrow 1 = 1$
(iv) $x \rightarrow (y \rightarrow x) = 1$
(v) If $x \rightarrow y = y \rightarrow z = 1$ then $x \rightarrow z = 1$
(vi) $(x \rightarrow y) \rightarrow ((z \rightarrow x) \rightarrow (z \rightarrow y)) = 1$

INTUITIONISTIC ANTI FUZZY IMPLICATIVE FILTERS OF LATTICE WAJSBERG ALGEBRAS

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Abstract : In this paper, we introduce the notion of an intuitionistic anti fuzzy implicative filter of lattice Wajsberg algebra with a illustration. Also, we discuss some of their properties. Moreover, we investigate some necessary and sufficient conditions of an intuitionistic anti fuzzy implicative filter.

Keywords: Wajsberg algebra, Lattice Wajsberg algebra, Implicative filter, Fuzzy implicative filter, Anti fuzzy implicative filter, Intuitionistic fuzzy implicative filter, Intuitionistic anti fuzzy implicative filter.

I. INTRODUCTION

Zadeh[10] introduced the concept of the fuzzy set in 1965. In 1986 Atanassov[1] introduced the notion of an intuitionistic fuzzy sets as a generalization of fuzzy sets. Also, in[2] some new operations useful for studying the structure of intuitionistic fuzzy sets. The concept of Wajsberg algebras was introduced by Mordchaj Wajsbreg[9] in 1935 and studied by Font, Rodriguez and Torrens[5]. They[5] defined lattice structure of Wajsberg algebras and the notion of an implicative filter of lattice Wajsberg algebras and discussed some of their properties. Basheer Ahamed and Ibrahim [3, 4] introduced the definitions of fuzzy implicative filter and an anti fuzzy implicative filter of lattice Wajsberg algebras and obtained some properties with illustrations. The authors [6, 7, 8] introduced the notions of strong implicative, fuzzy strong implicative, an anti fuzzy strong implicative and an intuitionistic fuzzy implicative filters of lattice Wajsberg algebra, and investigated some properties of them.

In this paper, we introduce the notion of an intuitionistic anti fuzzy implicative filter of lattice Wajsberg algebra. We investigate some properties of an intuitionistic anti fuzzy implicative filters with illustrations. We establish the relation between an intuitionistic anti fuzzy implicative filter and anti fuzzy implicative filter.

II. PRELIMINARIES

Definition 2.1.[5] Let $(A, \to, *, 1)$ be an algebra with a binary operation "$\to$" and a quasi complement "$*$" is called Wajsberg algebra if and only if it satisfies the following axioms for all $x, y, z \in A$.

(i) $1 \to x = x$
(ii) $(x \to y) \to ((y \to z) \to (x \to z)) = 1$
(iii) $(x \to y) \to y = (y \to x) \to x$
(iv) $(x^* \to y^*) \to (y \to x) = 1$.

Proposition 2.2.[5] The Wajsberg algebra $(A, \to, *, 1)$ satisfies the following axioms for all $x, y, z \in A$,

(i) $x \to x = 1$
(ii) If $x \to y = y \to x = 1$ then $x = y$
(iii) $x \to 1 = 1$
(iv) $x \to (y \to x) = 1$
(v) If $x \to y = y \to z = 1$ then $x \to z = 1$
(vi) $(x \to y) \to ((z \to x) \to (z \to y)) = 1$
(vii) $x \to (y \to z) = y \to (x \to z)$
(viii) $x \to 0 = x \to 1^* = x^*$
(ix) $(x^*)^* = x$
(x) $x^* \to y^* = y \to x$

Definition 2.3.[5] The Wajsberg algebra A is called a lattice Wajsberg algebra if it satisfies the following axioms for all $x, y \in A$,

(i) A partial ordering "$\leq$" on a lattice Wajsberg algebra A, such that $x \leq y$ if and only if $x \to y = 1$.
(ii) $(x \vee y) = (x \to y) \to y$
(iii) $(x \wedge y) = ((x^* \to y^*) \to y^*)^*$. Thus, we have $(A, \vee, \wedge, *, 0, 1)$ is a latticeWajsberg algebra with lower bound 0 and upper bound 1.

IOSR Journal of Engineering (IOSRJEN)
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 08, Issue 7 (July. 2018), ||V (IV)|| 01-05

Fuzzy Normal Operator in Fuzzy Hilbert Space and its Properties

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Abstract: In this work we focus our study on Fuzzy Normal operator acting on a Fuzzy Hilbert space (FH-space) we have given several definitions, theorems and discuss in detail the properties of Fuzzy Normal operator in FH-space.

Keywords: Adjoint Fuzzy operator, FH-space,Fuzzy Normal operator,Self-Adjoint Fuzzy operator

Date of Submission: 29-06-2018 Date of acceptance: 17-07-2018

I. INTRODUCTION

In 1984 Katsaras[3]first introduced the notation of Fuzzy Norm on a linear space then after any other mathematicians like Felbin[5],Cheng and Mordeson[12], S.K.Samanta[15]etc.,have been taken a definition of fuzzy normed spaces. The definition of fuzzy innerproduct space(FIP-space) was headmost start by R Biswas[10] and after that according the chronological in[6],[7],[11],[4],[9],Modulate the definition of fuzzy inner product space(FIP-space) has been insert by M.Goudarzi and S.M.Vaezpour in[8],[14]. Also, in [8]and [13]given the connotation of a Fuzzy Hilbert space(FH-Space).In 2017, sudad M.Rasheed defined concept of adjoint fuzzy linear operators, self- adjoint fuzzy linear operators.

In this paper we consider a self-adjoint operator in FH-space and introduce the definition of Fuzzy Normaloperator, we establish a theorem from a fuzzy normal operator in FH-space

The organization of this paper is as follows

In section 2 provides some preliminaryresults, which are used in this paper.In section 3 we introduce the idea of Fuzzy Normal operators, severaltheorems, discuss properties of such fuzzy operators.

II. PRELIMINARIES

Definition (2.1): [8]

A fuzzy inner product space (FIP-Space) is a triplet $(X,F,*)$,where X is a real vector space, * is a continuous t-norm, F is a fuzzy set on $X^2 \times \mathbb{R}$ satisfying the following conditions for every $x,y,z \in X$ and $s,t \in R$

FI-1 $F(x, x, 0) = 0$ and $F(x,x,t) > 0$, for each $t>0$

FI-2 $F(x,x,t) \neq H(t)$ for some $t \in R$ if and only if $x \neq 0$,where $H(t) = \begin{cases} 1, & if\ t > 0 \\ 0, & if\ t \leq 0 \end{cases}$

FI-3 $F(x,y,t) = F(y,x,t)$

FI-4 For any $a \in \mathbb{R}$, $F(ax, y, t) = \begin{cases} F\left(x, y, \frac{t}{a}\right) a > 0 \\ H(t) a = 0 \\ 1 - F\left(x, y, \frac{t}{-a}\right) a < 0 \end{cases}$

FI-5 $F(x,x,t)*F(y,y,s) \leq F(x-y,x-y,t-s)$

FI-6 $\sup_{t<0} [F(x,z,s)* F(y,z,t)] = F(x-y,z,t)$

FI-7 $F(x,y,.): \mathbb{R} \to [0,1]$ *is continuouson* $\mathbb{R}\setminus\{0\}$

FI-8 $\lim_{t\to\infty} F(x, y, t) = 1$

Definition (2.2): [14]

Let $(L, F, *)$ be probabilistic inner product space

1. A sequence $\{x_n\} \in E$ is called T_F -converges to $x \in E$ if for any $\varepsilon > 0$ and $\lambda > 0, \exists N \in \mathbb{N}$ such that $F(x_n - x, x_n - x, \varepsilon) > 1 - \lambda$ whenever $n > N$.

2. A linear Functional $f(x)$ defined on E is called T_F -continuous, if $x_n \xrightarrow{F} x$ implies $f(x_n) \to f(x)$ for all $\{x_n\} \in E$

IOSR Journal of Engineering (IOSRJEN) www.iosrjen.org
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Vol. 08, Issue 9 (September. 2018), ||V (I)|| PP 15-21

Intuitionistic Fuzzy Hilbert Space And Some Properties

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Abstract: In this paper we introduce Intuitionistic Fuzzy Hilbert space (IFHS) and investigate certain some properties of IFHS. Also, we have given several definitions of Intuitionistic Fuzzy Orthogonal and Intuitionistic Fuzzy Orthonormal discuss in detail.

Key Words: IntuitionisticFuzzy Norm(IFN), Intuitionistic Fuzzy Inner Product Space(IFIP-space) Intuitionistic Fuzzy Hilbert Space(IFH-space), Intuitionistic Fuzzy Orthogonal(IF- orthogonal), Intuitionistic Fuzzy Orthonormal(IF- Orthonormal).

Date of Submission: 26-08-2018 Date of acceptance: 07-09-2018

I. INTRODUCTION

In 1984 Katsaras [2]first introduced the notation of fuzzy norm,Later Cheng and Mordeson[3], Felbin[4], S.K Samanta [15] etc.,have defined fuzzy norm and its properties in various ways. R.Biswas[5] and A.M.El-Abyed&Hassan M.El-Hamouly [6] were the first who tried to give a meaningful definition of fuzzy inner product space (FIP-space) and fuzzy norm function.Later on, a modification of the definition given by R.Biswas was done J.K.Kohli and R.Kumar [7] & [8] in 1995.In 2007 P.Majumdar and S.K.Samanta [10] have given a definition of fuzzy inner product space (FIP-space) whose associated fuzzy norm is of Bag and S.K.Samanta [11],[12] type and some properties. In1986,Atanassov[13] introduced the concept of intuitionistic fuzzy sets, which is again a generalization of fuzzy sets.The concept of intuitionistic fuzzy metric spaces was first studied by J.H.Park. Later R.Saadati [14] has defined intuitionistic fuzzy metric and norm.In 2007, P.Majumdar and S.K.Samanta [15] have given a definition of intuitionistic fuzzy normed linear space. In this paper we consider a intuitionistic fuzzy inner product space (IFIP-space) and introduce the definition of intuitionistic fuzzy Hilbert space (IFH-space). We establish some properties of IFHS. The organization of this paper is as follows.

In section 2, some definitions and preliminary results are given which are used in this paper. In section 3 we introduced the concept of intuitionistic fuzzyHilbert space (IFH-space),intuitionistic fuzzy orthogonal,intuitionistic fuzzy orthonormal and its some properties.

II. PRELIMINARIES

Definition (2.1): [15]

Let U be a linear space over the real or complex field F. Let N and M be two fuzzy subsets of $U \times R$ such that $\forall x, y \in U$ *and* $c \in F$ the following holds

(IN1) $N(x,t) < M(x,t) \leq 1$

(IN2) $(\forall t > 0, N(x,t) = 1)$ *iff* $x = \underline{0}$

(IN3) $\forall t \in R$ *and* $t > 0, N(cx,t) = N\left(x, \frac{t}{|c|}\right)$, *if* $c \neq 0$

(IN4) $\forall s, t \in R,\ x, u \in U, N(x+y, s+t) \geq N(x,s) \wedge N(y,t)$

(IN5) $N(x,\cdot)$ is non-decreasing function of R and $\lim_{t\to\infty} N(x,t) = 1$

(IN6) $\forall t \leq 0, M(x,t) = 1$

(IN7) $(\forall t > 0, M(x,t) = 0)$ *iff* $x = \underline{0}$

(IN8) $\forall t \in R$ *and* $t > 0, M(cx,t) = M\left(x, \frac{t}{|c|}\right)$, *if* $c \neq 0$

(IN9) $\forall s, t \in R, x, u \in U, M(x+y, s+t) \leq M(x,s) \vee M(y,t)$

(IN10) $M(x,\cdot)$ is non-increasing function of R.

The pair (N, M) is called an intuitionistic fuzzy norm on U and the triplet (U, N, M) is called an intuitionistic fuzzy normed linear space(IFNLS).

Note 2.1:[15]

Fuzzy Unitary operator in Fuzzy Hilbert space and its properties

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Abstract

In this paper, the definition of Fuzzy Unitary Operator acting on a Fuzzy Hilbert space (FH-space) is introduced. We give several definitions, theorems and discuss in detail the properties of Fuzzy Unitary operator in FH-space.

Key words:

Adjoint Fuzzy operator, Fuzzy Hilbert space, Fuzzy Normal operator, Fuzzy Unitary operator, Self- Adjoint Fuzzy operator.

1. INTRODUCTION

In 1984, the notion of Fuzzy Norm on a linear space is first introduced by Katsaras[7]. Later, many mathematicians like Felbin [5], Cheng and Mordeson [14], S.K.Samanta [17] etc., have been taken a definition of fuzzy norm on a linear space. R.Biswas [2] introduced the headmost start definition of fuzzy inner product space (FIP-space) and also investigated the topological in [8], [9], [13], [6], [11]. Modulate the definition of fuzzy inner product space (FIP-space) is given by A.Bag, M.Goswami and S.M.Vazirpour in [10], [16]. Also, in [10] and [15] given the connotation of a Fuzzy Hilbert space (FH-space). In 2017, Sadiq M.Rasheed defined concept of adjoint fuzzy linear operators, self- adjoint fuzzy linear operators. V.Radharamani et al., [12] defined concept of fuzzy normal operator and their properties.

In this paper we consider a self-adjoint operator in FH-space and introduce the definitions of Fuzzy Unitary operator and establish some theorems from fuzzy unitary operator in FH-space.

The organization of this paper is as follows:

In section 2 provides some preliminary results, which are used in this paper. In section 3 we introduce the idea of fuzzy Unitary operators, several theorems, discuss properties of such fuzzy operators.

2. PRELIMINARIES

Definition (2.1): [10]

A fuzzy inner product space (FIP-Space) is a triplet (V, F, *), where X is a real vector space, * is a continuous t-norm and F is a fuzzy set on $V^2 \times \mathbb{R}$ satisfying the following conditions for every $x, y, z \in V$ and $s, t, \iota \in R$.

FI-1: $F(x, x, 0) = 0$ and $F(x, x, t) > 0$, for each $t > 0$.

FI-2: $F(x, x, t) = H(t)$ for some $t \in R$ if and only if $x = 0$, where $H(t) = \begin{cases} 1, & if\ t > 0 \\ 0, & if\ t \leq 0 \end{cases}$

FI-3: $F(x, y, t) = F(y, x, t)$

FI-4: For any $\alpha \in \mathbb{R}$, $F(\alpha x, y, t) = \begin{cases} F\left(x, y, \frac{t}{\alpha}\right) & \alpha > 0 \\ H(t) & \alpha = 0 \\ 1 - F\left(x, y, \frac{t}{-\alpha}\right) & \alpha < 0 \end{cases}$

FI-5: For any $t, s \in R$, $F(x, y, s+t) \geq F(x - y, x - y, t - s)$

FI-6: $\sup_{s+t=\iota} [F(x, z, s) * F(y, z, t)] = F(x + y, z, \iota)$

FI-7: $F(x, y, \cdot): R \to [0,1]$ *is continuous on* $\mathbb{R}\setminus\{0\}$

FI-8: $\lim_{t\to\infty} F(x, y, t) = 1$

Definition (2.2): [16]

Let $(E, F, *)$ be probabilistic inner product space.

1. A sequence $\{x_n\} \subseteq E$ is called F – converges to $x \in E$, if for any $\epsilon > 0$ and $\lambda > 0$, $\exists N \in \mathbb{Z}^+$ such that $F_{x_n - x}(\epsilon) > 1 - \lambda$ whenever $n \geq N$.

2. A real valued functional $f(x)$ defined on E is called $\mathcal{F}$ – continuous, if $x_n \xrightarrow{\mathcal{F}} x$ implies $f(x_n) \to f(x)$ for every $\{x_n\}$.

Theorem (2.3): [10]

Let $(V, F, *)$ be a FIP- space, where * is strong t- norm, and for each $x, y \in V$, suppose $\rho(x, y) = \sup\{t \in \mathbb{R} : F(x, y, t) < 1\}$. Then (V, ρ) is an IP- space since ρ is an inner product norm on V (determined, given) where $\|x\| = \rho(x, \theta)$, $\forall x \in V$.

Definition (2.4): [10] Fuzzy Hilbert space (FH-space)

Let $(V, F, *)$ be a FIP- space with $IP(x, y) = \sup\{t \in \mathbb{R} : F(x, y, t) < 1\}$, $\forall x, y \in V$. A sequence $\{x_n\}$ in V is called Cauchy sequence with respect to IP, if $IP(x_n - x_m) \to 0$ as $n, m \to \infty$. A FIP- space $(V, F, *)$ is called Hilbert space or FH-space, if every Cauchy sequence in V is convergent to a point in V.

Theorem (2.5): [10]

Intuitionistic Fuzzy Adjoint and Intuitionistic Fuzzy Self - Adjoint Operators in Intuitionistic Fuzzy Hilbert Space

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Abstract:
In this work we introduced an Intuitionistic Fuzzy Adjoint and Intuitionistic Fuzzy Self adjoint linear operators in Intuitionistic Fuzzy Hilbert Space (IFH-Space). We have given several definitions and properties in detail.

Key words:
Intuitionistic Fuzzy Inner Product Space (IFIP-space), Intuitionistic Fuzzy Hilbert Space (IFH-space), Intuitionistic Fuzzy Adjoint Operator (IFA-operator), Intuitionistic Fuzzy Self adjoint Operator (IFSA-operator)

1. INTRODUCTION

In 1984, Katsaras [5] first introduced the notion of fuzzy norm. Later on Cheng and Mordeson [6], Felbin [7], S.S. Samanta [8] etc., have defined fuzzy norm and its properties in various ways. R.Biswas [8] and A.M.El-Abyed & Hassan M.El-Hamouly [9] were the first who tried to give a meaningful definition of fuzzy inner product space (FIP-space) and fuzzy norm. Later on a modification of the definition given by R.Biswas, was done by J.K.Kohli and R.Kumar [10] & [11] in 2005. In 2011, P.Majumdar and S.K.Samanta [13] have given a definition of fuzzy inner product space (FIP-space). In 2017, Sadaf M.Khaleelulla defined concept of adjoint fuzzy linear operators, self- adjoint fuzzy linear operators and their properties.

In 1986, Atanassov [16] introduced the concept of intuitionistic fuzzy sets, which is again a generalization of fuzzy sets. The concept of intuitionistic fuzzy metric spaces was first studied by J.H.Park. Later R.Saadati [17] has defined intuitionistic fuzzy metric and norm. In 2009 M.Goudarzi et all first introduced the notion of IFIP-Space. P.Majumdar and S.K.Samanta [15] have given a definition of intuitionistic fuzzy normed linear space and introduced IFIP-Space in 2011. In 2018 A.Radharamani et all [2] introduced IFH-Space and some properties. In this paper we consider an intuitionistic fuzzy Hilbert space (IFH-space) and introduce the definition of Intuitionistic Fuzzy Adjoint and Intuitionistic Fuzzy Self – adjoint linear operators. We establish some properties of IFA and IFSA-operator.

The organization of this paper is as follows:

In section 2, some definitions and preliminary results are given which are used in this paper. In section 3 we introduced the conceptof intuitionistic Fuzzy Adjoint, Intuitionistic Fuzzy Self - adjoint linear operator and some of its properties.

2. PRELIMINARIES

Definition (2.1): [1]

An intuitionistic fuzzy inner product space (IFIP-Space) is a triplet $(V, F_{\mu,\vartheta}, *)$, where V is a real vector space, $*$ is a continuous t-norm, $F_{\mu,\vartheta}$ is a fuzzy set on $V^2 \times \mathbb{R}$ satisfying the following conditions for every $x, y, z \in V$ and $s, t \in R$

IIP-1 $F_{\mu,\vartheta}(x, x, 0) = 0$ and $F_{\mu,\vartheta}(x, x, t) > 0$, for each $t > 0$

IIP-2 $F_{\mu,\vartheta}(x, x, t) \neq H(t)$ for some $t \in R$ if and only if $x = 0$, where $H(t) = \begin{cases} 1, & if\ t > 0 \\ 0, & if\ t \leq 0 \end{cases}$

IIP-3 $F_{\mu,\vartheta}(x, y, t) = F_{\mu,\vartheta}(y, x, t)$

IIP-4 For any $a \in \mathbb{R}$, $F_{\mu,\vartheta}(ax, y, t) = \begin{cases} F\left(x, y, \frac{t}{a}\right) a > 0 \\ H(t) a = 0 \\ 1 - F_{\mu,\vartheta}\left(x, y, \frac{t}{-a}\right) a < 0 \end{cases}$

IIP-5 $F_{\mu,\vartheta}(x, y, t) * F_{\mu,\vartheta}(x, y, s) \leq F_{\mu,\vartheta}(x + y, x + y, t + s)$

IIP-6 $\sup_{t<0} [F_{\mu,\vartheta}(x, z, s) * F_{\mu,\vartheta}(y, z, t)] = F_{\mu,\vartheta}(x + y, z, 0)$

IIP-7 $F_{\mu,\vartheta}(x, y, .) : \mathbb{R} \to [0,1]$ is continuous on $\mathbb{R}\setminus\{0\}$

IIP-8 $\lim_{t\to\infty} F_{\mu,\vartheta}(x, y, t) = 1$

Definition (2.2): [1]

Let $(V, F_{\mu,\vartheta}, *)$ be an intuitionistic fuzzy inner product space.

1. A sequence $\{x_n\}$ in V is called $F_{\mu,\vartheta}$ converges to $x \in V$ if for any $\varepsilon > 0$ and $t > 0$, $\exists N \in \mathbb{N}$ such that $F_{\mu,\vartheta}(x_n - x, \varepsilon, t) > 1 - \varepsilon$ whenever $n \geq N$.
2. A sequence $\{x_n\}$ in V is called $F_{\mu,\vartheta}$ Cauchy sequence if $\lim_{n,m\to\infty} F_{\mu,\vartheta}(x_n - x_m, \varepsilon, t) = 1$ for any $\varepsilon > 0$ and $t > 0$.
3. A linear functional f on V is called $F_{\mu,\vartheta}$ continuous if $x_n \xrightarrow{F_{\mu,\vartheta}} x$ implies $f(x_n) \xrightarrow{F_{\mu,\vartheta}} f(x)$.

International Journal of Mathematical Archive-10(1), 2019, 6-12
Available online through www.ijma.info ISSN 2229 - 5046

FUZZY HYPONORMAL OPERATOR IN FUZZY HILBERT SPACE

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(Received On: 26-11-18; Revised & Accepted On: 05-01-19)

ABSTRACT

In this paper we introduce the definition of Fuzzy Hyponormal Operator acting on a Fuzzy Hilbert space (FH space) and investigate certain properties of Fuzzy Hyponormal operator using spectrum and we have given some definitions related to Fuzzy Hyponormal operator in FH-space.

Key words: *Adjoint Fuzzy operator, Fuzzy Hilbert space, Fuzzy Normal operator, Fuzzy Hyponormal operator, Spectrum of a fuzzy bounded linear operator, Self-Adjoint Fuzzy operator.*

1. INTRODUCTION

The notion of Fuzzy Norm on a linear space is first introduced by Katsaras[3] in 1984. Then after any other mathematicians have studied fuzzy normed space from several points of view [5], [12], [15]. The definition of fuzzy inner product space (FIP-space) headmost started by R Biswas[10] and after that according the chronological in [6], [7], [11], [4], [9]. Modulate the definition of fuzzy inner product space (FIP-space) has been inserted by M.Goudarzi and S.M.Vaezpour in [8], [14]. The definition of a fuzzy Hilbert space has been introduced by M.Goudarzi and S.M.Vaezpour [8] in 2009. The concept of adjoint fuzzy linear operators, self - adjoint fuzzy linear operators was introduced by Sudad.M.Rasheed [2] in 2007, whereas A.Radharamani *et al.* [1] defined concept of fuzzy normal operator and their properties.

In this paper we consider fuzzy normal operator in FH-space and introduce the definitions of Fuzzy Hyponormal operator, we establish some theorems from fuzzy hyponormal operator in FH-space.

The classification of this paper is as follows.

In section 2 provides some preliminary definitions, theorems and results, which are used in this paper.In section 3 we introduce the concept of Fuzzy hyponormal operator on FH-space and some properties of fuzzy hyponormal operator have been studied.

2. PRELIMINARIES

Definition 2.1: [8] A fuzzy inner product space (FIP-Space) is a triplet $(X,F,*)$,where X is a real vector space, $*$ is a continuous t-norm, F is a fuzzy set on $X^2\times\mathbb{R}$ satisfying the following conditions for every $x,y,z\in X$ and $s,t\in R$

FI-1 $F(x,x,0)=0$ and $F(x,x,t)>0$, for each $t>0$.

FI-2 $F(x,x,t)\neq H(t)$ for some $t\in R$ if and only if $x=0$,where $H(t)=\begin{cases}1, & if\ t>0\\ 0, & if\ t\leq 0\end{cases}$

FI-3 $F(x,y,t)=F(y,x,t)$

FI-4 For any $\alpha\in\mathbb{R}$, $F(\alpha x,y,t)=\begin{cases}F\left(x,y,\frac{t}{\alpha}\right) & \alpha>0\\ H(t) & \alpha=0\\ 1-F\left(x,y,\frac{t}{-\alpha}\right) & \alpha<0\end{cases}$

FI-5. $F(x,z,t)*F(y,z,s)\leq F(x+y,z,t+s)$

FI-6. $\sup_{t<0}[F(x,z,s)*F(y,z,t)]=F(x+y,z,t)$

FI-7. $F(x,y,.):\mathbb{R}\to[0,1]$ is continuous on $\mathbb{R}\setminus\{0\}$

FI-8. $\lim_{t\to\infty}F(x,y,t)=1$

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FUZZY GRACEFUL LABELING ON GRAPHS RELATED TO CYCLE AND FAN

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Abstract: Kishore and Sunitha [2014] identified chromatic number of few fuzzy graph. Denath [2013] investigated domination in interval-valued fuzzy graphs. Mathew and Mathew [2016] obtained some special degree-sequences in fuzzy graph. Tom and Sunitha [2016] destroyed boundary and interior nodes in a fuzzy graph using sum distance. Samanta and Pal [2015] stated on fuzzy planar graph. In this paper, fuzzy 10k-based-graceful labelings for the graphs $F_n \oplus P_m$, $F_n \oplus K'_{1,4}$, and C_n' are obtained.
Keywords: graceful labelling, fuzzy labelling, 10^k-based-graceful labeling.

I. Introduction:

Eslahchi and Onagh [2006] got vertex strength of some standard fuzzy graphs. Mordeson and Nair [2000] talked about fuzzy graph and fuzzy hepergraph. Rosenfeld and Bhutani attempted on strong arcs in fuzzy graph. Sunitha and Vijayaumar [2002] gave the complement of a fuzzy graph. Akram and Davvaz [2011] discussed on bipolar fuzzy graphs. They [2012] studied strong intuitionistic fuzzy graphs having two memberships. Bhutani and Batton [2003] analysed on M-strong fuzzy graphs with usual properties. Hawary [2011] explained on complete fuzzy graph. Jebesty Shajila and Vimala found fuzzy vertex labelling on wheel and fan.

II. Definitions and Preliminaries

Definition 2.1: Let U and V be two sets ρ is a fuzzy relation from U into V if ρ is a fuzzy set of $U \times V$

Definition 2.2: A fuzzy graph $G = (\sigma, \mu)$ is a pair of functions $\sigma: V \to [0, 1]$ and $\mu: V \times V \to [0, 1]$ such that $\mu(uv) \le \sigma(u) \wedge \sigma(v)$ for all u, v in V.

Definition 2.3: A labeling of a graph is an assignment of values to the vertices and edges of a graph.

Definition 2.4: A graceful labeling of a graph G with q edges is an injection $f: V(G) \to \{0,1,2,\ldots q\}$ such that each edge is assigned the distinct label $|f(x) - f(y)|$.

Definition 2.5: A fuzzy graph $G = <\sigma, \mu>$ has a fuzzy labeling if $\sigma: V \to [0, 1]$ and $\mu: V \times V \to [0, 1]$ are injective such that the membership value of edges and vertices are distinct, and $\mu(uv) \le \sigma(u) \wedge \sigma(v)$ for all u, v in V.

Definition 2.6: A fuzzy graph $G = <\sigma, \mu>$ with p vertices and q edges. Choose a positive integer k with $0 < p + q < 10^k$. has a fuzzy 10^k-based-graceful labeling if $\sigma: V \to [0, 1]$ and $\mu: V \times V \to [0, 1]$ is bijective such that the membership value of edges and vertices are distinct and satisfying the following four conditions: (i). $\mu(uv) \le \sigma(u) \wedge \sigma(v)$ for all u, v in V; (ii). $\mu(uv) = |\sigma(u) - \sigma(v)|$ for all u, v in V; (iii). $\{\sigma(v) \times 10^k$ for all v in $V\} = \{1, 2, \ldots, 2q + 1\}$; (iv). $\{\mu(e) \times 10k$ for all edges e in $G\} = \{1, 2, 3, \ldots, q\}$. Then G is fuzzy 10^k-based-graceful.

Definition 2.7: A fan F_n is obtained by $F_n = K_1 + P_n$.

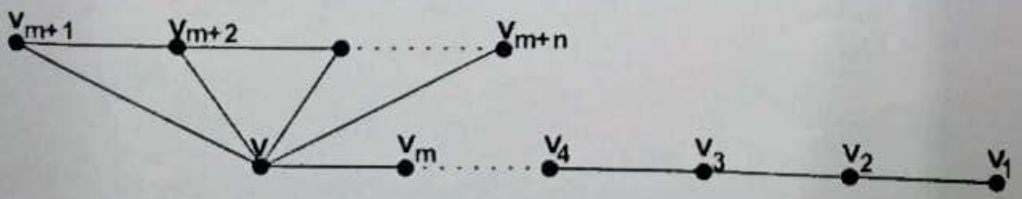
Definition 2.8: Choose a least positive integer k such that $0 < p + q < 10^k$.

III. Fuzzy 10i-based graceful labeling:

Definition 3.1: The graph $F_n \oplus P_m$ is a connected graph such that the vertex having the maximum degree in F_n is identified with any pendent vertex of P_m.

Theorem 3.2: The graph $F_n \oplus P_m$ is fuzzy 10^i-based-graceful.

Proof: Let v be the vertex having maximum degree of F_n. One of the arbitrary labeling for the vertices of the graph $F_n \oplus P_m$.



Consider a graph $G = <\sigma, \mu>$ with $p = (m+n+1)$, and $q = (2n+m-1)$. Its vertex set is $\{v, v_1, v_2, \ldots, v_m, v_{m+1}, v_{m+2}, \ldots v_{m+n}\}$ and edge set is $\{v v_i : i = 1 \text{ to } m\} \cup \{v_m v\} \cup \{v v_{m+i} : i = 1 \text{ to } n\} \cup \{v_{m+i} v_{m+i+1} : i = 1 \text{ to } n-1\}$.

Journal of Computer and Mathematical Sciences, Vol.9(9), 1214-1222 September 2018 ISSN 0976-5727 (Print)
An International Research Journal, www.computermathsci.org ISSN 2319-8133 (Online)

Fuzzy 10^k- Based Graceful Labeling for Graphs Obtained from Circuits Merged with Paths

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(Received on: September 6, 2018)

ABSTRACT

A labeling graph G which can be gracefully numbered is called graceful. A graph which admits a fuzzy 10^k -based graceful labeling is called a fuzzy 10^k-based graceful graph. In this paper the existence of fuzzy 10^k- based gracefulness to graphs obtained from circuits merged with paths were discussed.

Mathematical Subject Classification 2010: 05C78, 05C72

Keywords: Graceful labeling, Fuzzy graceful labeling, Fuzzy 10^k-based graceful labeling, Mirror image of a graph

1. INTRODUCTION

Graph theory is an important tool to represent real world problems. Rosenfeld introduced the concept of fuzzy graphs since it is not always possible to represent all systems in conventional graph theory due to the uncertainty of the parameters in the system. Fuzzy relation on a set was defined by Zadeh[7] in 1965 and definition of a fuzzy graph was given by Rosenfeld and kauffmann in 1973. The concept of graceful labeling has been introduced by Rosa[5] in 1976. A. Nagoorgani, D. Rajalakshmi(a)Subhasini[4] and Bhattacharya P[1] discussed some properties of graph labeling using fuzzy graph theory. R. Jebesty Shajila and S.Vimala[3] performed fuzzy vertex labeling on wheel and fan graphs . The graphs which are used in this paper are discussed in the dynamic survey of graph labeling by J.A. Gallian[2] and the graphs introduced by Vaidya S.K and Lekha Bijukumar[6]. In this paper we discuss the fuzzy 10^k-based graceful labeling for nC_4*P_2, nP_4*P_2, mirror image of nP_3*P_2 and $nC_4*2P_2*(n-1)P_2$ graphs.

Fuzzy 10^k- Based Graceful Labeling of Leaf Graphs Containing Triangles and Squares

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Abstract: A labeling graph G which can be gracefully numbered is called graceful. A fuzzy graph which admits a fuzzy 10^k -based graceful labeling is called a fuzzy 10^k-based graceful graph. In this paper the existence of fuzzy 10^k- based gracefulness of Leaf graphs containing triangles and squares were discussed.

Mathematical subject classification 2010: *05C78, 05C7*

Keywords: ***Graceful labeling, Fuzzy graceful labeling, Fuzzy 10^k-based graceful labeling, Leaf graphs***

1. INTRODUCTION.

The fuzzy approach relates to a grade of membership between [0,1] defined in terms of a membership function of a fuzzy number . Rosenfeld introduced the concept of fuzzy graphs since it is not always possible to represent all systems in conventional graph theory due to the uncertainty of the parameters in the system. Fuzzy relation on a set was defined by Zadeh [8] in 1965 and definition of a fuzzy graph was given by Rosenfeld and kauffmann in 1973. The concept of graceful labeling has been introduced by Rosa [6] in 1976. A.Nagoorgani, D.Rajalakshmi(a)Subhasini [4,5] and Eslahchi C. Onagh B.N[1] discussed vertex strength of graph labeling using fuzzy graph theory. R.Jebesty Shajila and S.Vimala [3] performed fuzzy vertex labeling on wheel and fan graphs. The graphs which are used in this paper are discussed in the dynamic survey of graph labeling by J.A.Gallian[2] and the graphs introduced by Vaidya S.K and Lekha Bijukumar[7]. This note is a contribution of fuzzy 10^k-based graceful labeling of $L_3(n)$ having a common edge and $L_4(n)$ having two common edges and three common vertices.

2. BASIC DEFINITIONS

Definition 2.1 : A fuzzy graph $G = (\sigma, \mu)$ is a pair of functions $\sigma: V \to [0,1]$ and $\mu: V \times V \to [0,1]$ such that for all $u, v \in V$, *we have* $\mu(u,v) \leq \sigma(u) \wedge \sigma(v)$

Definition 2.2 : A labeling of a graph is an assignment of values to the vertices and edges of a graph.

Definition 2.3 : A graceful labeling of a graph G with q edges is an injection $f: V(G) \to \{0,1,2,\ldots q\}$ such that when each edge is assigned the distinct label $|f(x) - f(y)|$

Definition 2.4 : A graph $G = (\sigma, \mu)$ is said to be a fuzzy graceful labeling if $\sigma: V \to [0,1]$ and $\mu: V \times V \to [0,1]$ is bijective such that the membership value of edges and vertices are distinct and $\mu(u,v) < \sigma(u) \wedge \sigma(v)$ for all $u, v \in V$

IJASRM

International Journal of Advanced Scientific Research and Management, Volume 3 Issue 10, Oct 2018

www.ijasrm.com

ISSN 2455-6378

FUZZY 10^k- BASED GRACEFUL LABELING OF GRAPHS RELATED TO CIRCUITS

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Abstract

In this paper the concept of Fuzzy 10^k -based graceful labeling is discussed and the existence of Fuzzy 10^k -based graceful labeling for graphs related to circuits is proved.

Keywords: *Graceful labeling , Fuzzy graceful labeling, Fuzzy 10^k-based graceful labeling*

1. Introduction

Fuzzy relation on a set was defined by Zadeah[8] in 1965.Based on fuzzy relation the first definition of a fuzzy graph was introduced by Rosenfeld and Kaufmann in 1973. The concept of graceful labeling has been introduced by Rosa[6] in 1976.Many remarks on fuzzy graphs and properties were given by Nagoor Gani A. and Rajalaxmi D. (a) Subhashini [5] and Bhattacharya P [1].Many variations of graceful labeling were introduced by Mordeson J.N., and P.S.Nair [4] and also by Vaidya S.K and Lekha Bijukumar [7] Jebesty Shajila and R Vimala S [3] introduced fuzzy vertex labeling of some graphs. Labeling of various graphs were shown by Harary [2]. Fuzzy 10^k-based graceful labeling of $nC_4 * P_2$ and $P_{2n} * nP_2 * P_3$ graphs are discussed in this paper .

2. Basic Definitions.

Definition 2.1 : A fuzzy closed path P_n is called a fuzzy cycle C_n.

Definition 2.2 : A fuzzy graph $G=(\sigma,\mu)$ is a pair of functions $\sigma: V \to [0,1]$ and $\mu: V \times V \to [0,1]$ such that for all $u, v \in V$, *we have* $\mu(u,v) \leq \sigma(u) \wedge \sigma(v)$

Definition 2.3 : A labeling of a graph is an assignment of values to the vertices and edges of a graph.

Definition 2.4 : A graceful labeling of a graph G with q edges is an injection $f: V(G) \to \{0,1,2,\dots q\}$ such that when each edge is assigned the distinct label $|f(x)-f(y)|$

Definition 2.5 : A fuzzy graph $G=(\sigma,\mu)$ is said to be a fuzzy graceful labeling if $\sigma: V \to [0,1]$ and $\mu: V \times V \to [0,1]$ is bijective such that the membership value of edges and vertices are distinct and

$\mu(u,v) < \sigma(u) \wedge \sigma(v)$ for all $u, v \in V$

3.Main Results.

Definition 3.1 : A fuzzy graph $G=(\sigma,\mu)$ with p vertices and q edges is said to be a fuzzy 10^k-based graceful labeling if k is a least positive integer such that $0 < p+q < 10^k$ and $\sigma: V \to [0,1]$ and $\mu: V \times V \to [0,1]$ are injective such that the membership value of edges and vertices are distinct and satisfying the following four conditions

(i) $\mu(u,v) < \sigma(u) \wedge \sigma(v)$ for all $u, v \in V$

(ii) $\mu(u,v) = |\sigma(u) - \sigma(v)|$ for all $u, v \in V$

(iii) $\{\sigma(v) \times 10^k \ for\ all\ v \in V\} \subset \{q+1, q+2, \dots 2q+1\}$

(iv) $\{\mu(v) \times 10^k for\ all\ v \in V\} = \{1,2,\dots q\}$

Definition 3.2 : The fuzzy graph $nC_4 * P_2$ is defined as a connected graph contains n copies of fuzzy circuits with four vertices and a fuzzy path with two

SUPER FUZZY 10^k-BASED GRACEFUL LABELINGS OF FEW TREES RELATED TO STAR AND PATH

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Abstract: Al-Hawary [2011] studied complete fuzzy graphs, and its strong arcs. Anjali and Sunil Mathew [2013] originated energy of a fuzzy graph, and its properties. Debnath [2013] visualized domination in interval –valued fuzzy graph, and its neighbourhood. Samanta and Pal [2013] derived fuzzy k-competition graph and p-competition fuzzy graph, and formulated some fuzzy properties. Samanta, Pramanik, and Pal [2016] highlighted fuzzy coloring of fuzzy graph, and its chromatic number. Mathew and Sunitha [2010] extracted node connectivity and arc connectivity of a fuzzy graph. Tom, and Sunitha [2016] emphasized boundary and interior nodes in a fuzzy graph using sum distance,. In this paper, super fuzzy 10k-based graceful labelings are found for the graphs (1). $P_n * S_m * S_r$ of category I; (2). $P_n * S_m * S_r$ of category II; (3). $P_n * S_m * S_r$ of category III; (4). $P_n * S_m * 2S_m$; (5). $P_n * S_m * 2S_m$; (6). $P_n * S_m * 2S_m$; (7). $P_n * 2S_m * S_m$; and (8). $P_n * 2S_m * 2S_m$.

Keywords: fuzzy 10^k-based graceful labelling, fuzzy 10^k-based graceful labelling, $P_n * S_m * S_r$ of category I, $P_n * S_m * S_r$ of category II, $P_n * S_m * S_r$ of category III, and $P_n * 2S_m * 2S_m$

I. INTRODUCTION:

Alaoui [1999] initiated fuzzification of some concepts of graphs lie as path and circuit. Bhutani [1989] analysed automorphism of fuzzy graph, and its isomorphic fuzzy graphs having same number of vertices and edges. Bhutani and Rosenfeld [2003] explained strong arcs in fuzzy graph. Bhuttai and Balton [2003] discussed M-strong fuzzy graph, and incidence natures. Eslahchi and Onagh [2006] investigated vertex strength of fuzzy graph, and its connectivity between edges. Kishore and Sunitha [2014] identified chromatic number of fuzzy graph. Mordeson [1993] noted some remarks on fuzzy line graph. Mordeson and Peng [1994] constructed few basic operations on fuzzy graph like as union, intersection and complement, and ring sum. Munoz, Ortuno Ramirez, and Yanez [2005] determined coloring in fuzzy graph, Parvathi, Karunambigai, and Atanassov [2009] approached operations on intuitionistic fuzzy graph, and its related fuzzifications. Perchant and Bloch [2002] introduced fuzzy morphisms between graph. Sunitha and Vijaya Kumar [2002] found the complement of a fuzzy graph.

II. DEFINITIONS AND PRELIMINARIES

Definition 2.1: Let U and V be two sets ρ is a fuzzy relation from U into V if ρ is a fuzzy set of $U \times V$

Definition 2.2: A fuzzy graph $G = (\sigma, \mu)$ is a pair of functions $\sigma: V \to [0, 1]$ and $\mu: V \times V \to [0, 1]$ such that $\mu(uv) \le \sigma(u) \wedge \sigma(v)$ for all u, v in V.

Definition 2.3: A labeling of a graph is an assignment of values to the vertices and edges of a graph.

Definition 2.4: A graceful labeling of a graph G with q edges is an injection $f: V(G) \to \{0,1,2,\dots q\}$ such that each edge is assigned the distinct label $|f(x) - f(y)|$.

Definition 2.5: A fuzzy graph $G = <\sigma, \mu>$ has a fuzzy labeling if $\sigma: V \to [0, 1]$ and $\mu: V \times V \to [0, 1]$ are injective such that the membership value of edges and vertices are distinct, and $\mu(uv) \le \sigma(u) \wedge \sigma(v)$ for all u, v in V.

Definition 2.6: A fuzzy graph $G = <\sigma, \mu>$ with p vertices and q edges. Choose a positive integer k with $0 < p + q < 10^k$. has a fuzzy 10^k-based-graceful labeling if $\sigma: V \to [0, 1]$ and $\mu: V \times V \to [0, 1]$ is bijective such that the membership value of edges and vertices are distinct and satisfying the following four conditions: (i). $\mu(uv) \le \sigma(u) \wedge \sigma(v)$ for all u, v in V; (ii). $\mu(uv) = |\sigma(u) - \sigma(v)|$ for all u, v in V; (iii). $\{\sigma(v) \times 10^k$ for all v in $V\} = \{q+1, q+2, \dots, 2q+1\}$; (iv). $\{\mu(e) \times 10k$ for all edges e in $G\} = \{1, 2, 3 \dots, q\}$. Then G is fuzzy 10^k-based-graceful.

Definition 2.7: Choose a least positive integer k such that $0 < p + q < 10^k$.

Definition 2.8: P_n is a path with n vertices in which no vertex is repeated. A path of length (n-1) is called an n-path and it is denoted by P_n.

Definition 2.9: A Comb is a path at which each vertex is identified by a chord P_2.

Definition 2.10: The Ladder L_n ($n \ge 2$) is the product graph $P_2 \times P_n$ which contains 2n vertices and 3n-2 edges.

Definition 2.11: A star graph S_n of order n is a tree on n vertices with one vertex having degree (n-1) and other (n-1) vertices having degree 1. Star is a complete bipartile graph $K_{1,n}$.

ISSN NO:2236-6124

Multi Interval Valued Fuzzy Soft Matrices and its Applications

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ABSTRACT: *In this paper, a new type of Matrix called Multi Interval valued Fuzzy Soft Matrix was introduced and studied some of their properties. Also some basic operations on these matrices are also studied. An application of Multi Interval Valued Fuzzy Soft Matrices in Decision making is illustrated with a numerical example.*

Key Words: Fuzzy Soft Set, Multi-Fuzzy Soft Set, Multi-Interval-Valued Fuzzy Soft Set, Soft set

1. Introduction

The concept of fuzzy sets was introduced by Zadeh [13] in 1965. As an extension of fuzzy sets, Interval Valued Fuzzy Sets (Intuitionistic Fuzzy Sets which were introduced by Atanassov [1][2]), have been found to be very useful and applicable. The concept and basic properties of Soft set theory have been introduced by Molodtsov [8] in 1999. Interval Valued Fuzzy Soft sets was introduced by Yang et al [12]. In 2010, Cagman et al [5] defined soft matrix which is representation of Soft sets. Interval Valued Fuzzy Soft matrices were studied by Rajarajeswari et al [9]. Multi sets and Multi Fuzzy Sets were studied in [3,4] and [11]. Multi Interval valued fuzzy soft sets were introduced by Shawkat Alkhazaleh [10].

AMS Mathematics subject classification (2010): 08A72

2. Preliminaries

In this section we recall some definitions and properties required in this paper.

Definition 2.1

An interval valued fuzzy set $\tilde{X}$ on a universe U is a mapping such that $\tilde{X}: U \to int([0,1])$, where $int([0,1])$ stands for the set of all closed subintervals of $[0,1]$, the set of all interval valued fuzzy sets on U is denoted by $\tilde{P}(U)$. Suppose that $\tilde{X} \in \tilde{P}(U)$, $\forall x \in U$, $\mu_{\tilde{X}}(x) = [\mu_X^-(x), \mu_X^+(x)]$ is called the degree of membership of an element x to $\tilde{X}$. $\mu_X^-(x)$ and $\mu_X^+(x)$ are refered to as the lower and upper degrees of membership of x to X, where $0 \le \mu_X^-(x) \le \mu_X^+(x) \le 1$.

Definition 2.2

Let U be an initial Universe Set and E be the set of parameters. Let $A \subset E$. A pair (F, A) is called Fuzzy Soft Set over U, where F is a mapping given by $F: A \to I^U$, where I^U denotes the collection of all fuzzy subsets of U. An fuzzy soft set is a parameterized family of fuzzy subsets of the Universe U.

Definition 2.3

Let $U = \{c_1, c_2, c_3, c_4, \ldots, c_m\}$ be an Universal set and E be the set of parameters given by $E = \{e_1, e_2, e_3, e_4, \ldots, e_n\}$. Let $A \subset E$ and (F, A) is called Interval Valued Fuzzy Soft set over U, where F is a mapping given by $F: A \to I^U$, where I^U denotes the collection of all interval valued fuzzy subsets of U. Then the Interval Valued Fuzzy Soft Set can be expressed in matrix form as $\tilde{A} = [a_{ij}]$

$\tilde{A} = (a_{ij})$, $i = 1,2,3,\ldots,m$; $j = 1,2,3,\ldots,n$ where

$$a_{ij} = \begin{cases} [\mu_{ij}(c_i), \mu_{ij}(c_i)] (or) [\mu_{ij}^-, \mu_{ij}^+] & c_i \in A \\ [0,0] & c_i \notin A \end{cases}$$

$[\mu_{ij}(c_i), \mu_{ij}(c_i)]$ represents the Interval Valued Fuzzy membership degree of object c_i in the Interval Valued Fuzzy Set $F(e_j)$ with the condition $0 \le [\mu_{ij}(c_i) + \mu_{ij}(c_i)] \le 1$.

If $\mu_{ij}(c_i) = \mu_{ij}(c_i)$ then the Interval Valued Fuzzy Soft Matrix reduces to Fuzzy Soft Matrix.

The set of all $m \times n$ Interval Valued Fuzzy Soft Matrices will be denoted by $IVFSM_{m \times n}$.

Definition 2.4

A pair (F, A) is called a Multi Interval valued fuzzy soft set of dimension K over U, where F is a mapping given by $F: A \to M[Int(U)]^K$, where $M[Int(U)]^K$ denotes the collection of all multi interval valued fuzzy subsets of U with dimension K.

3. Multi-Interval valued Fuzzy soft Matrices

Definition 3.1

ISSN NO:2236-6124

New Algorithm for Solving Unbalanced Assignment Problem

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Abstract

In this paper, we investigate an assignment problem in which cost coefficients are trapezoidal fuzzy numbers. In conventional assignment problem, cost is always certain. This paper develops an approach to solve an unbalanced fuzzy assignment problem by using Robust ranking indices and new algorithm called Haar Hungarian algorithm. Numerical examples were illustrated to solve the fuzzy unbalanced assignment problem by the above two methods.

Key words: *Fuzzy number, Trapezoidal fuzzy number, Fuzzy ranking techniques, Fuzzy assignment problems*

1. Introduction

The unbalanced assignment problem is a special type of linear programming problem in which our objective is to assign number of salesman's to number of areas at a minimum cost(time). However, due to it's highly degeneracy nature a specially designed algorithm widely known as Hungarian method proposed by Kuhn (1) is used for its solution. On the basic of idea the Robust's ranking methods (2) has been adopted to transform the fuzzy unbalanced assignment problem to a crisp one so that the conventional solution methods may be applied to solve unbalanced assignment problem. Mukerjee and Basu [11] proposed a new method for solving fuzzy assignment problems. Amit kumar and Anil gupta [5] proposed two methods for solving fuzzy assignment problems and fuzzy Travelling salesman problem. Dubois and Fortemps [10] proposed a flexible assignment problem, which combines with fuzzy theory, multiple criteria decision making and constrain-directed methodology. Long Sheng Huang and Guang-hui Xu [11] proposed a solution procedure for the assignment problems with restriction of qualification. P.Pandian and K.Kavitha [13] proposed parallel moving method to find an optimal solution to fuzzy assignment problem. In this paper the ranking based on Haar wavelet is used [9], which satisfies the properties of compensation, linearity & additivity.

International Journal of Mathematics And its Applications
Volume 5, Issue 1-A (2017), 45-54.
ISSN: 2347-1557
Available Online: http://ijmaa.in

International Journal of Mathematics And its Applications

Numerical Solution of Intuitionistic Fuzzy Differential Equation by Milne's Predictor - Corrector Method Under Generalised Differentiability

Research Article

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Abstract: Nowadays many real life problems are identified with Fuzzy set theory. The Fuzzy set theory is a useful tool to describe the situation in which data are imprecise or vague or uncertain. This set theory is completely described by its membership function. A membership function of a classical fuzzy set assigns to each element of the universe of discourse a number from the interval [0, 1] to indicate the degree of belongingness to the set under consideration. The degree of non belongingness is just automatically the complement to "1" of the membership degree. But many times, a human being does not express the degree of non membership as the complement to "1".There may be some hesitation about the belongingness and non-belongingness. This missing data or hesitation is accomplished by a set known as intuitionistic fuzzy set. In this paper, Milne's Predictor - Corrector method is used for finding numerical solution of an intuitionistic fuzzy differential equation (IFDE). The proposed method is based on the concept of generalized differentiability. IFDE is transformed into four ordinary differential systems and then Milne's Predictor - Corrector method is applied.Also,the convergence and stability of the proposed method is given and its applicability is illustrated by solving a first order IFDE.

MSC: 34A12,65L05,65L06.

Keywords: Intuitionistic fuzzy differential equation, Numerical methods, Milne's Predictor - Corrector, Generalised differentiability.

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1. Introduction

In 1965, Zadeh introduced the fuzzy set theory [38] and Atanassov extended the concept of fuzzy set theory to intuitionistic fuzzy set (IFS) theory[9].Fuzzy differential equation (FDE) models have wide range of applications in many branches of engineering and in the field of medicine. Many research papers have been focused on numerical solutions of fuzzy initial value problems (FIVPs).Ming Ma et al introduced Euler method for solving FDEs numerically under H-derivative[24]. Numerical solutions for FIVPs using H-derivatives have been studied and can be found out in [1, 3, 5, 16, 27, 31].But they have some disadvantages that the diameter of the solution becomes infinite as the independent variable increases.To over come this disadvantage,Bede and Gal introduced the strongly generalized differentiability to FDEs[12] and first order fuzzy differential equation has been studied under generalised differentiability in [13].Following Bede and Gal[12],Chalco-Cano and Roman-Flores studied numerical solution of fuzzy differential equations by fuzzy H-derivative[14].This opened a way to study numerical solutions of FDEs under generalised differentiability concept.Bede[11]

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NUMERICAL SOLUTION OF INTUITIONISTIC FUZZY DIFFERENTIAL EQUATION BY ADAMS'S PREDICTOR- CORRECTOR METHOD UNDER GENERALISED DIFFERENTIABLITY

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Abstract: Now days, many real life problems are identified with Fuzzy set theory. The Fuzzy set theory is a useful tool to describe the situation in which data are imprecise or vague or uncertain. This set theory is completely described by its membership function. A membership function of a classical Fuzzy set assigns to each element of the universe of discourse a number from the interval [0,1] to indicate the degree of belongingness to the set under consideration. The degree of non belongingness is just automatically the compliment to "1" of the membership degree. But, a human being who expresses the degree of membership of given element in a Fuzzy set very often does not express corresponding degree of non-membership as the complement to "1". This reflects a well known psychological fact that the linguistic negation not always identifies with logical negation. There may be some hesitation about the belongingness and non belongingness. This missing data or hesitation is accomplished by a set known As Intuitionistic Fuzzy set. In this paper, Adams's Predictor - Corrector method is used for finding numerical solution of an Intuitionistic Fuzzy Differential Equation (IFDE). The proposed method is based on generalized characterization theorem. Using the generalized characterization theorem, IFDE is transformed into four ordinary differential systems. Also, the convergence and stability of the proposed method is given and its applicability is illustrated by solving a first order IFDE.

Keywords: Intuitionistic Fuzzy Differential Equation, Numerical methods, Adams's Predictor – Corrector, Generalized Differentiability.

Introduction: In 1965 , Zadeh introduced the fuzzy set theory [1] and Atanassov extended the concept of fuzzy set theory to Intuitionistic fuzzy set (IFS) theory [2] . fuzzy differential equation (FDE) methods have wide range of application in many branches of engineering and in the field of medicine. Many research paper are focused on numerical solution of fuzzy initial value problem (FIVP) . Ming Ma et al introduced Euler method for solving FDE's numerically under H-derivative [3] . Numerical solutions for FIVP's using H-derivatives have been studied and can be found out in [4] to [9]. But they have the some disadvantages that the diameter of the solution becomes infinite as the independent variable increases. To overcome this disadvantage, Bede and Gal introduced the strongly generalized differentiability to FDEs[10] and first order fuzzy differential equation has been studied under generalised differentiability in [11]. Following Bede and Gal, Chalco-Cano and Roman-Flores studied numerical solution of fuzzy differential equations by lateral H-derivative [12]. This opened a way to study numerical solutions of FDEs under generalised differentiability concept. Bede[13] has also proved a characterization theorem which states that under certain conditions a FDE under H-derivative is equivalent to a system of ordinary differential equations(ODEs)[13]. So any numerical method which is used to solve ODEs, can be extended to solve FDEs. Using this characterization theorem, numerical solutions of FDEs have been studied in [14, 15, 16] and the numerical solutions studied through generalised differentiability can be found out in [17, 18, 19, 20, 21, 22, 23].

Melliani and Chadli have discussed differential and partial differential equations under intuitionistic fuzzy environment [24, 25]. Allah Viranloo discussed numerical solution of FDE by Runge Kutta method with

Application of Runge-Kutta method for finding multiple numerical solutions to intuitionistic fuzzy differential equations

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Abstract. The present study is aimed to discuss multiple numerical solutions to first order ordinary differential equation which is intuitionistic fuzzy in nature, under the concept of generalised differentiability. The first order intuitionistic fuzzy differential equation which has been taken for the present study, is changed into four systems of ordinary differential equations by the (α, β)-cut representation of an intuitionistic fuzzy set. After the transformation, each system contains two pair of equations, one is for membership function and the other for non-membership function. Then, the fourth order Runge-Kutta method is applied in each pair and the competence of the method over Euler method and Modified Euler method are shown by solving a real time problem.

1. Introduction

Many real world problems can be solved by converting them into ordinary differential equations. But in most of the cases, the exact solution is not possible and hence it is necessary to study its numerical solutions. In general most of the real world problems do not contain crisp or precise data. Therefore, to accommodate the impreciseness, the concept of fuzzy set was introduced. However, there are situations in which even the fuzzy sets are also not enough. For, the refinement of fuzzy set, namely, intuitionistic fuzzy set was introduced. In the literature, it is found that a very few investigations on the study of numerical solutions of ordinary differential equations which are intuitionistic fuzzy in nature. An ordinary differential equation with intuitionistic fuzzy number as its initial value, was studied and solved numerically using Runge-Kutta method by Abbasbandy and Allahviranloo[1]. A study has been made on an Nth-order intuitionistic fuzzy linear differential equation which is time dependent, by Lata and Kumar [2]. In recent times, strong and weak solutions of first order homogeneous intuitionistic fuzzy differential equation have been discussed by Mondal, et al. [3] and the authors have studied an application of a system of differential equations with triangular intuitionistic numbers as its initial value [4]. Nirmala and Chenthur Pandian [5] have used Euler method for the discussion of the numerical solution of intuitionistic fuzzy differential equation (IFDE)

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A New Ranking Method Is Used In Costs, Supplies and Demands Are Octagonal Intuitionistic Fuzzy Numbers

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Abstract — In this paper we introduce Octagonal Intuitionistic fuzzy numbers with its membership and non-membership functions. A new method is proposed for finding an optimal solution for intuitionistic fuzzy transportation problem, in which the costs,supplies and demands are octagonal intuitionistic fuzzy numbers and using new ranking method in this paper. The procedure is illustrated with a numerical example.

Keywords — Intuitionistic fuzzy transportation problems, Octagonal Intuitionistic fuzzy numbers, Ranking method, Modi method, Initial Basic Feasible Solution, Optimal Solution.

1. INTRODUCTION

The central concept in the problem is to find the least total transportation cost of commodity. In general, transportation problems are solved with assumptions that the cost, supply and demand are specified in precise manner. However in many cases the decision maker has no precise information about the coefficient belonging to the transportation problem. Intuitionistic fuzzy set is a powerful tool to deal with such vagueness.

The concept of Intuitionistic Fuzzy Sets (IFSs), proposed by Atanassov in [1]and[2] , has been found to be highly useful to deal with vagueness. Many authors discussed the solutions of Fuzzy Transportation Problem (FTP) using various techniques. In 1982, O'heigeartaigh [9] proposed an algorithm to solve Fuzzy Transportation Problem with triangular membership function. In 2013, Nagoor Gani. A and Abbas. S [8], introduced an new method for solving in Fuzzy Transportation Problem. In 2016, Mrs. Kasthuri. B [7] introduced Pentagonal intuitionistic fuzzy. In 2015, V. Thamaraiselvi and R. Santhi [3] introduced Hexagonal Intuitionistic Fuzzy Numbers. In 2015, Thangaraj Beaula – M. Priyadharshini [4] proposed A New Algorithm for Finding a Fuzzy Optimal Solution.K. Prasanna Devi, M. Devi Durga [5] and G. Gokila, Juño Saju [6] introduced Octagonal Fuzzy Number.

The paper is organized as follows, In section 2, introduction with some basic concepts of Intuitionistic fuzzy numbers, In section 3, introduce Octagonal Intuitionistic Fuzzy Definition and proposed algorithm followed by a Numerical example using Modi method and In section 4, finally the paper is concluded.

2. PRELIMINARIES

2.1. FUZZY SET [9]

Let X be a nonempty set. A fuzzy set of X is defined as
function, which maps each element of X to a value between 0 and 1.

2.2 FUZZY NUMBER [9]

A fuzzy number is a generalization of a regular real number and which does not refer to a single value but rather to a connected a set of possible values, where each possible value has its weight between 0 and 1. The weight is called the membership function.

Bessel Gaussian Beam Propagation through Turbulence in Free Space Optical Communication

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Received January 18, 2018; in final form, March 6, 2018

Abstract—This paper investigated the experimental demonstration of jitter analysis for Bessel Gaussian beam propagation through the atmospheric turbulence conditions using two different wavelength lasers such as red and green laser. Axicon lens is used to generate Bessel Gaussian beam experimentally and different modulation schemes such as PAM, PPM, PWM, ASK, BPSK and QPSK are used to analyze the phase and time jitter. The Plano-Convex type Axicon is used to create a ring shaped approximation of a Bessel Gaussian beam which increases in diameter over distance while retaining a constant ring thickness. In this BG beam propagation, for red laser the noted phase jitter value is 45.196 radians in ASK and for green laser 36.955 radians in with turbulence conditions. Hence the lower wavelength BG laser beam (green laser) is more energetic than the lower wavelength BG laser beam (red laser).

Keywords: free space optical communication, Bessel Gaussian beam, axicon, ASK, BPSK, QPSK, PPM, PAM, PWM, phase jitter, time jitter

DOI: 10.3103/S1060992X18020029

1. INTRODUCTION

Free space optical (FSO) communication link involves the transfer of data/information between two points using optical radiation through the unguided channel. The information signal or data to be conveyed could be modulated on the intensity, phase or frequency of the optical carrier. FSO link is mainly based on line-of sight (LOS), thus to ensure a successful interchange of information needs that both the transmitter and the receiver directly one another without any barrier in their path. Nowadays FSO is the hot research topic because of its smart features, which include: (i) no licensing essentials; (ii) virtually unlimited bandwidth for providing near-optimal capacity and supporting high-speed applications; (iii) widespread link range in excess of 5 km; (iv) high energy efficiency due to low power consumption, reduced interference and fading immunity; (v) high scalability and reconfigurability; (vi) protected and reliable data transmission medium; (vii) minimal cost of deployment; and (viii) time-to-market [1], [2], [3]. FSO beam propagation is possible by several beam propagation profiles and in which researches are going on very seriously. In this article discussed the experimental generation of Bessel Gaussian beam and it propagate to turbulence conditions. Bessel–Gauss beam (BGB) was introduced by Gori et al. [4], and its optical implementation has attracted much attention [5–7]. An optical vortex occurs as a particular solution to the wave equation in cylindrical coordinates; the doughnut mode of a laser is an example of an optical vortex beam [8], [9]. When an optical vortex is hosted within a Gaussian beam, the resulting beam exhibits an annular intensity profile with a dark core, whilst maintaining a helical phase structure. In recent days, many researchers are generated the Bessel Gaussian beam experimentally by using Axicon lens [10–13].

In this paper, we used various modulation schemes to transmit data in a specially designed artificial turbulence atmosphere for FSO communication and the results are compared. In Section 2, we discussed

ISSN 2349 5359

RESEARCH ARTICLE

Focal Shifting of Radially Polarized Laguerre Bessel Gaussian Beam with Radial Cosine Phase Plate

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ABSTRACT: Focal shift of radially laguerre polarized Bessel Gaussian beams induced by cosine phase masks are investigated theoretically by vector diffraction theory. Results show that when the radially polarized laguerre Bessel Gaussian beam with cosine phase plate is focused, the focal pattern differs considerably with frequency parameter (C) in the cosine function term. Increasing the value of frequency parameter in the cosine part of the phase mask, focal shift may occur, simultaneously, the focal shift direction may change. Moreover, by altering frequency parameter of the phase mask will change the energy distributions of maximum intensity peak and other small intensity peaks.

KEYWORDS: Vector diffraction theory; Optical Trapping; Laguerre polarized Bessel Gaussian beams; High NA lens.

DOI: 10.29294/IJASE.4.4.2018.740-745

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1. INTRODUCTION

Recently the focal shift, which refers to the phenomena that the peak or the axial maximum intensity of the focused beam is shifted away from the geometrical focus [1-3], has attracted much attention for several decades [4-6]. In past few decades, the focal shift has been studied for various of beams, for example, Gaussian beams [3,5], flattened Gaussian beams [7], Gaussian Schell-mode beams [8] and so on. These beams have the transverse maximum intensity along with the optical axis after passing through the focusing system, therefore the position of axial maximal irradiance of the focused beam is usually viewed as the actual focal position [2,3], which is determined by the axial intensity distribution of the beam. The focal shifts may play a crucial role in achievement of super resolution and in optical trapping [9]. In optical trapping system there are two kinds of forces acting on the particle. One is the optical gradient force, which plays a crucial role in constructing optical trap and its intensity is proportional to the optical intensity gradient; the other kind of force is scattering force, which usually has complex forms because this kind of force is related to the properties of the trapped particles, and whose intensity is proportional to the optical intensity. Optical gradient force is necessary for optical trapping, and its direction is opposite to the optical gradient direction. Tracing the movement of the point of absolute maximum intensity along optical axis has attracted many researchers for several decades [10-12]. It was found that the point of absolute maximum intensity does not coincide with the geometrical focus but shifts along optical axis. This phenomenon is referred to as focal shift. Focal shifts have taken an important part in design and optimization of various optical systems and extremely important for image formation in defocused planes, for increasing the depth of focus and in automatic focusing [13]. More interestingly, the focal shift may be in continuous in certain optical focusing systems. It was found that the focal shift may be accompanied by an effective permutation of the focal point, and this effect is referred to as focal switch [14,15]. The polarization and phase wave front are very important characteristics to alter propagating and focusing properties of beams [16-20].In our knowledge, the focusing properties of radially polarized Laguerre Bessel gaussian beam with cosine phase wave front are not studied. In this paper the focal shift of the radially polarized Laguerre Bessel gaussian beam with radial cosine phase plate is investigated theoretically by vector diffraction theory.

2. VECTOR DIFFRACTION THEORY OF RADIALLY POLARIZED LAGUERRE BESSEL GAUSSIAN BEAM

The radially polarized laguerre Bessel Gaussian beam with cosine phase plate and then focused through a high NA lens system is shown in Figure1. The analysis was performed on the basis of Richards and Wolf's vectorial diffraction method [21] widely used for high-NA lens system at arbitrary incident polarization. In the case of the incident polarization, adopting the cylindrical coordinates r,z,φ and the notations of Ref. [22], the electric field E(r,z,φ) in the vicinity of the focal region can be written as

$$\vec{E}(r,z) = E_r \vec{e}_r + E_z \vec{e}_z \rightarrow (1)$$

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Received 15.02.2018 Accepted: 10.04.2018 Published on 27.05.2018

Optics and Laser Technology 102 (2018) 40–46

Contents lists available at ScienceDirect

Optics and Laser Technology

journal homepage: www.elsevier.com/locate/optlastec

Full length article

Generation of ultra-long pure magnetization needle and multiple spots by phase modulated doughnut Gaussian beam

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ARTICLE INFO

Article history
Received 3 June 2017
Received in revised form 27 November 2017
Accepted 7 December 2017

Keywords
Vector diffraction theory
Inverse Faraday effect
Doughnut Gaussian beam
Multiple optical trapping
High NA lens

ABSTRACT

Based on vector diffraction theory and inverse Faraday effect (IFE), the light induced magnetization distribution of a tightly focused azimuthally polarized doughnut Gaussian beam superimposed with a helical phase and modulated by an optimized multi belt complex phase filter (MBCPF) is analysed numerically. It is noted that by adjusting the radii of different rings of the complex phase filter, one can achieve many novel magnetization focal distribution such as sub wavelength scale (0.29λ) and super long (52.2λ) longitudinal magnetic probe suitable for all optical magnetic recording and the formation of multiple magnetization chain with four, six and eight sub-wavelength spherical magnetization spots suitable for multiple trapping of magnetic particles are achieved.

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1. Introduction

The possibilities of manipulating magnetization without any applied magnetic field have attracted the growing attention of researchers during the last fifteen years. The emerging Big Data era demanding the ever increasing speed and capacity to store and process information makes magnetization switching on ultra-short time scales a fundamentally challenging topic with implications for magnetic data storage [1]. Gerrits et al. [2] demonstrate that circularly polarized femtosecond laser pulses can be used to non-thermally excite and coherently control the spin dynamics in magnets by way of the IFE. Stanciu et al. [3] first demonstrated the all-optical magnetic recording (AOMR) by a single 40 fs circularly polarized laser pulse by the IFE. Since then all optical magnetic recording become a topic of much research interest and number of experimental works on improvement in ultrafast magnetization reversal of optic-magneto materials induced by the IFE was demonstrated [4–10]. Recently, Bernitta et al. [11] introduced the first materials specific ab initio theory of the magnetization induced by circularly polarized laser light in metals and compute the effective optomagnetic fields that corresponds to the induced magnetizations. They showed that the IFE is strongly materials and frequency dependent and demonstrated the existence of both spin and orbital induced magnetizations. Freimuth et al. [12] suggested that the ultrafast demagnetization in 3d transition metal ferromagnets is dominated by transverse spin fluctuations rather than by a reduction of the exchange splitting. In All optical Magnetic Recording (AOMR), the magnetization reversal induced by focusing a circularly polarized beam with an objective has been demonstrated to be an essential method for the longitudinal magnetization recording. Since ultra fast high density data storage demands a highly confined pure longitudinal magnetic probe of sub-wavelength scale, several methods utilizing amplitude and phase modulation to the input circularly polarized beam has been suggested for reduction of magnetization spot size and to improve the probe depth [13–16]. However generating pure longitudinal magnetization of ultra-long focal depth within a sub-diffraction limited region by the IFE has remained a challenge toward sub-wavelength AOMR. Recently, Jiang et al. [17] showed that the interaction between the polarization singularity of an azimuthally polarized beam and optical vortices in the tight focus cannot generate longitudinal electric components, which results in the generation of pure longitudinal magnetization. They

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https://doi.org/10.1016/j.optlastec.2017.12.008
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RESEARCH ARTICLE

Tight Focusing Properties of Radially Polarized Doughnut Gaussian Beam through a Dielectric Interface

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ABSTRACT: Tight focusing properties of an radially polarized doughnut Gaussian beam through a dielectric interface is theoretically investigated by vector diffraction theory. For the incident beam with topological charges (m), probe depth (d) and revive in the vicinity of focal plane, which results in the generation of many novel focal patterns. Such kind of focal structures may find applications in micro-particle trapping, manipulation, and material processing.

KEYWORDS: Radially polarized DG beam, Focal shift, Dielectric interface, Vector diffraction theory.

https://doi.org/10.29294/IJASE.5.2.2018.896-900

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1. INTRODUCTION

In recent years, cylindrically polarized beam have attracted great interests because of its interesting properties and potential applications [1-4]. For example, tight focusing of radially polarized light beams can create a very strong longitudinal electric field component in the focal region [1]. Moreover, in many practical applications, an objective is used to focus an incident light beam through an interface between different media of different refractive indices. For example, in the application of semiconductor inspection, light beams are focused from air onto silicon substrate. Torok et al [5] developed the theoretical method for studying the focusing of an electromagnetic wave through dielectric interfaces [6, 7]. More recently, a sub-wavelength light needle with a longer depth of focus (over 9.5λ) has been obtained using dual-beam focusing [8]. All these researches, the incident light beam is focused mainly in the vacuum. However, in some practical applications, the incident light beam is focused through an interface between different media by a high-NA lens. For example, in the case of optical trapping, a laser beam is focused through an interface between glass and water [9].

In recent times, many other kinds of beams, such as the Laguerre– Gaussian (LG) beam, the high order LG beam, the high order BG beam and the sinh-Gaussian beam:, Multi gaussian beam, Hollow gaussian beam are discussed in depth [10-14]. Generally, their results have indicated that the form of the designed filters and their corresponding focusing performance are strongly influenced by the incident beam. Therefore, a new kind of radially polarized beam called doughnut Gaussian (DG) beam is introduced in a high NA focusing system. The defined DG beam is similar to a hollow Gaussian beam. In 2010, a subwavelength focal spot was achieved by using a radially polarized narrow-width annular beam [15]. The DG beam, which is similar to the narrow-width annular beam, is falling to the category of the Gaussian beams [16].Considering that the intensity is null at the center of the doughnut beam, the focusing field of a radially polarized DG incident beam through a high NA lens will exhibit high resolution. Meanwhile, other focusing patterns, such as a doughnut beam and the special polarized beam, were also investigated, based on the filtering technology [17-21]. In this Letter, we study the tight focusing of radially polarized doughnut gaussian beam passing through dielectric interface by vector diffraction theory. The principle of the optical focusing radially polarized DG beam is given and the simulation results are discussed in depth.

2. The principle of the optical focusing radially polarized DG beam

The scheme of the optical system is shown in Fig. 1. Assume the interface between two dielectric media of refractive indices $n_1 = 1$ and $n_2 = 3.55$, such as focusing in air onto silicon substrate in the application of semiconductor inspection. The geometric focus of the objective without the interface is located at the origin of the coordinate system. The distance between the interface and the geometric focus is d which is referred to as probe depth in Ref. [6]. For radially polarized beams, on the basis of vectorial Debye theory [2] the Cartesian components of the electric field vector in the focal region may be expressed as [22]

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Received: 15.09.2018 Accepted: 28.10.2018 Published on: 27.11.2018

Optical and Quantum Electronics (2019) 51:19
https://doi.org/10.1007/s11082-018-1726-3

Sensitivity enhancement of surface plasmon resonance sensor with 2D material covered noble and magnetic material (Ni)

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Received: 4 July 2018 / Accepted: 10 December 2018
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Abstract
In this paper, surface plasmon resonance (SPR) sensor on 2D materials such as MoS_2 and graphene on Au and magnetic material Ni in Kretschmann configuration is analyzed using transfer matrix method. Here we noted that by sandwiching the MoS_2 layer between the Au and Ni film and adding graphene over Ni film improved the sensitivity as high as 229°/RIU. We also noted that the sensitivity of the proposed sensor changes with the addition of no. of layers of graphene and MoS_2. We expect that such a high sensitivity SPR sensor could find optional application in chemical examination, medical diagnostic and biological detections.

Keywords Surface plasmon resonance · Sensitivity · Biosensor · Grapheme · MoS_2

1 Introduction

Last two decays SPR sensors have drawn great attention in sensing technology due to their distinctive benefits such as their enormous sensing properties, label free detection and biocompatibility (Zheng et al. 2016; Ozbay 2006; Gupta and Kondoh 2007; Srivastava et al. 2016). They took important part in many investigations such as bimolecular detection, bimolecular interaction (Zeng et al. 2011; Shalabney and Abdulhalim 2011), optical bi stability (Dai et al. 2015; Xiang et al. 2014), sensing technology (Singh et al. 2012; Esteban et al. 2011), food safety, environmental changes detection and so on. It is possible to use SPR sensor in earlier disaster or disability diagnostic analysis, when increasing its sensitivity as high as possible and hence to develop a good sensor with a superior sensitivity is of great interest. In common, there are two quite different detection techniques have been

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Published online: 01 January 2019

Research Article

Effect of Complex Phase Plate on Tight Focusing of Azimuthally Polarized Dark and Anti-dark Gaussian Beam

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ABSTRACT

This study was focused on azimuthally polarized Dark and Anti-dark Gaussian (DADG) beams passing through a high numerical aperture lens (NA). The Vector Diffraction theory was used to study the lens theoretically. It was reported that with appropriate phase modulation of the input DADG beam, the intensity distribution of the focused region can be modified to be a focal hole segment with numerous focal holes separated by varied axial distances. A chain of focal hole segments like this can be used for multiple trapping of low refractive index particles as well as an erase beam for STED microscopy with a high screening rate.

Keywords: Flattops; Optical tubes; Optical bubbles; Three-dimensional optical tube.

1. INTRODUCTION

A wide range of applications, including dark optical traps for atoms and manipulation (Friedman *et al.* 2002), guiding and binding of microparticles and biological cells (Mizmar *et al.* 2010) and erase beams for super-resolution fluorescence microscopy (Cizmar *et al.* 2010; Watanabe *et al.* 2003), have recently driven the generation of three-dimensional (3D) optical tube beams, which are dark regions in space surrounded by light. However, the most current technology of producing such optical tubes exhibits significant fluctuations due to unexpected diffraction. In addition, the DOE (Diffractive optical element) in the pupil plane is utilised to generate focus structures such as optical tubes, flattops and optical bubbles, which are useful for optical trapping and manipulation (Grimm *et al.* 2000; Tian and Pu, 2011; Lalithambigai *et al.* 2012). To establish a stable particle trap and transport particles with low and high refractive indexes, dissimilar optical gradient forces are necessary, and the scattering force considered is always proportional to optical intensity. Three-dimensional (3D) multi-site optical trapping requires a large number of concentrated spots in the focal region for high refractive index particles and a large number of focal holes for low refractive index particles, which is challenging to produce. A number of approaches for building multiple optical traps have been published; for example, a phase-contrast method for generating an array of focused spots utilising a multi-beam system was recently proposed (Lalithambigai *et al.* 2013; Prabakaran *et al.* 2014; Yiqiong Zhao *et al.* 2005; Cao *et al.* 2013). Dark hollow beams (DHBs) with zero central intensity have recently piqued the interest of many researchers due to their numerous uses in modern optics, atomic optics and binary optics. Several hollow laser beams with various intensity profiles have been introduced (Wang *et al.* 2004; Cai and Ge, 2006; Ito *et al.* 1996; Kuga *et al.* 1997; Cai *et al.* 2003; Mei and Zhao, *et al.* 2006a; 2006b; 2008). One such beam is the dark/anti-dark beam (DADB), which is theoretically introduced partially coherent diffraction-free modes (Ponomarenko *et al.* 2007). These beams can have intensity profiles with dips (or peaks) on a background to operate as nano-level atomic traps. Zhu *et al.* initially developed the approach of superposition of uncorrelated Bessel modes utilising holographic technology to construct DADBs (Zhu *et al.* 2019). A genuine cross-spectral density function criterion (Hyde and Avramov-Zumarovic, 2019) and a fully coherent class of dark/anti-dark paraxial modes named dark/anti-dark Bessel–Gaussian beams (DADGBs) have been proposed (Faroq and Belafhal, 2018). The propagation properties of these beams in a turbulent environment have recently been studied (Yaalou *et al.* 2019). The purpose of this study is to investigate the impact of a complex phase filter (CPF) on the focal characteristics of a tightly focused azimuthally polarised dark and anti-dark Gaussian (DADG) beam. It has been discovered that by properly designing a sophisticated phase filter for the incident DADG beam, one may produce several innovative focused patterns, such as focal ring splitting and multiple focal hole structures.

2. THEORY

The analysis was carried out using Richards and Wolf's Vectorial Diffraction approach, which is extensively utilised for high NA focusing systems with arbitrary incident polarisation. The incident azimuthally polarised beam's electric field distribution near the focussing is given by Richards and Wolf, 1959.

Materials Research Express

ACCEPTED MANUSCRIPT

Sb doped ZnO nanostructures prepared via co-precipitation approach for the enhancement of MB dye degradation

To cite this article before publication: jagadhesan S *et al* 2018 *Mater. Res. Express* in press https://doi.org/10.1088/2053-1591/aaaf80

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This content was downloaded from IP address 130.237.165.40 on 18/02/2018 at 00:51

Studies on Diamond like Sn doped ZnO Nanostructures prepared via co-precipitation approach for improving photo-catalytic application

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In this paper, pure Zinc Oxide (ZnO) nanoparticles (NPs) and Tin (Sn) doped ZnO nanostructures (NSs) prepared by using Co-precipitation approach are reported. The hexagonal wurtzite structure of pure ZnO and Sn (0.05% & 0.075%) doped ZnO NSs were analyzed by powder X-ray diffraction (PXRD) technique and the presence of various functional groups were identified by Fourier Transform Infrared Spectroscopy (FTIR) analysis. The optical energy gap was estimated by Tauc's plot under UV-Vis absorbance spectra. The shape and surface morphology of pure ZnO and diamond like structured Sn (0.075%) doped ZnO NSs are analysed by using FESEM and HR-TEM analysis. Sn (0.075%) doped ZnO NSs shows higher catalytic properties for the degradation of MB dye molecules under UV light, which provides promising application for detecting and eliminating organic pollutant.

(Received December 4, 2017; accepted April 5, 2018)

Keywords: Nanostructures, Co-precipitation, Tin doped ZnO, Photo-catalytic

1. Introduction

In recent decades, refractory organic pollutants can be degraded by using photo-catalysts of TiO_2 and ZnO wide-band gap semiconducting materials under UV irradiation [1]. Compared with TiO_2 nanoparticles, ZnO shows higher photo-catalytic efficiency in both acidic and basic medium for the degradation of organic dyes, which has been reported by various researchers [2–4]. In addition, ZnO material absorbs more light quanta than TiO_2 material [5, 6]. Zinc oxide (ZnO) has large exciton binding energy (60 mV) and shows various applications in many devices such as ultrasonic transducers, piezoelectric transducers, varistors, phosphors, pigments, photoelectric and UV-absorbers [7–13]. Nowadays, doping is a most powerful technique to improve the charge separation in the semiconductor systems, compared with various dopants Sb, Sn, Er and Al materials have been widely used [14, 15]. Among them, Sn is one of the most important doping element for improving the photo-catalytic activity of ZnO [16]. Because, doping of Sn with ZnO material shows the different structure of electronic shell and its the ionic radius of Sn^{4+} (0.69 Å) are similar to Zn^{2+} (0.74 Å) [17]. Sun et al. reported the effect of Sn doping in ZnO for the degradation of Methylene Blue (MB) dye solution under sunlight irradiation. They reported that the Sn doped ZnO nanoparticles greatly enhances the photo-catalytic activity compared with pure ZnO nanoparticles [1].

Various synthesis approaches have been used for the preparation of pure and doped ZnO nanomaterial, among them sol–gel processes [18], co-precipitation [19], aqueous solution deposition [20] and mechanochemical processing [21] are important. Compared with all other methods, co-precipitation method is one of the simplest and inexpensive method. By using this method the size and shape of the particles can be easily controlled by altering the pH of the medium [22]. The present study focused on diamond like structured Sn doped ZnO NSs prepared via co-precipitation approach for the photo-degradation of Methylene Blue (MB) dye. Nowadays most of the textile industries discharge MB dye as waste. The discharged dye is very harmful to human and it causes vomiting, heart rates, cyanosis, tissue necrosis, skin diseases and intestinal problems [22]. So in our study, we were choosing MB dye as a model pollutant for dye degradation process.

2. Materials and methods

2.1. Materials for synthesis of pure and Sn doped ZnO NSs

The Zinc sulfate Heptahydrate ($ZnSO_4 \cdot 7\ H_2O$), Sodium Hydrogen Carbonate ($NaHCO_3$) and Tin (II) chloride dihydrate ($SnCl_2.2H_2O$) chemicals were used for the synthesis of diamond like structured Sn doped ZnO nanostructures. All the chemicals were purchased from Merck.

2.2. Synthesis of pure ZnO NPs

In each 200ml beaker, 0.1 M zinc sulfate heptahydrate ($ZnSO_4 \cdot 7H_2O$) and 0.1M sodium hydrogen carbonate

Nanoflakes like Bi doped ZnO nanostructures prepared via Co-Precipitation approach for the enhancement of dye degradation

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In the present work, pure zinc oxide (ZnO) nanoparticles (NPs) and flakes like structured Bismuth (Bi) doped ZnO nanostructures (NSs) were prepared by simple co-precipitation approach. Purity of the prepared material and the presence of various functional groups in the synthesized materials are confirmed by powder X-ray diffraction (PXRD) and Fourier Transform Infrared Spectroscopy (FTIR) analysis. The structure and morphology of Bi (0.02%, 0.04% & 0.06%) doped ZnO NSs were determined by using Field Emission Scanning Electron Microscopy (FESEM) and the presence of elemental composition in the synthesized samples were identified by Energy Dispersive X-ray spectroscopy (EDAX) analysis. The photo-catalytic activity of Bi (0.02%, 0.04% and 0.06%) doped ZnO NSs was studied for methylene blue dye degradation.

(Received November 8, 2017; accepted June 7, 2018)

Keywords: Nanoflakes, Co-precipitation, Photo-catalytic activity

1. Introduction

In recent years, increased industrialization makes a serious threat to human health in the form of environmental pollution. In recent years, ZnO nanomaterials fascinate the researchers due to its unique physical and chemical properties [1]. However, the ZnO NPs having high excitonic binding energy (~60 meV), n-type semiconductor with a wide band gap energy (3.37 eV), and this enhanced property to be used in various applications such as biosensors, gas sensors, nanogenerators and varistors [2]. And also, ZnO is a better candidate for the photo-catalytic degradation of organic pollutants present in water [3]. Generally, ZnO nanomaterial was synthesized by hydrothermal method, co-precipitation method, sol-gel method, biosynthesis method and sono-chemical method [1, 3]. Among them, Co-precipitation method is important for the production of ZnO nanoparticles in large volume. Because, the shape and size of the synthesized particles can be easily controlled by altering the pH of the medium [2].

In recent trends, doping is very useful technique to improve the charge separation in the semiconductor system [4]. Doping of ZnO material has good optical and electrical properties to be adapted, through alteration of its electronic structure and band gap [5]. Many dopant materials are used to enhance the photo-catlytic activity of ZnO nanoparticles [4]. So, in our present study we focused the importance of Bi doped ZnO NSs prepared via co-precipitation approach for the enhancement of dye degradation process and Methelyne Blue (MB) dye was used as a model pollutant.

2. Experimental

2.1. Materials for synthesis of pure and Bi doped ZnO NS

The Zinc sulfate Heptahydrate ($ZnSO_4 \cdot 7\ H_2O$), Sodium Hydrogen Carbonate ($NaHCO_3$) and Bismuth nitrate ($Bi(NO_3)_3 \cdot 5H_2O$) were used for the synthesis of Bi doped ZnO. Methylene blue (MB) dye was used for the photo-degradation process and all the chemicals were used in analytical grade and purchased from Merck.

2.2. Synthesis of pure ZnO NPs

In each 100 ml of double distilled (DD) water, 30 ml zinc sulfate heptahydrate ($ZnSO_4 \cdot 7H_2O$) and 30 ml sodium hydrogen carbonate ($NaHCO_3$ solution) was taken. After that diluted sodium hydrogen carbonate solution was added drop wise into the diluted solution of zinc sulfate heptahydrate in aqueous condition and stirred that solution at 30 min. After stirring, the solution was washed several times with DD water. Finally, the obtained white precipitate was dried in hot air oven at 150°C for 1h and annealed at 450°C for 3h. During the drying process, $Zn(OH)_2$ fully conversion into ZnO NPs. Finally, pure ZnO NPs was taken into further characterization.

2.3. Synthesis of Bi doped ZnO NSs

Firstly, 100 ml of 0.1 M zinc sulfate heptahydrate was taken and then doping material of bismuth nitrate

J. Environ. Nanotechnol.
Volume 8, No.2(2019) pp.20 - 23
ISSN (Print): 2279-0748
ISSN (Online): 2319-5541
doi:10.13074/jent.2019.06.192367

Synthesis and Characterisation of Inorganic Acid Doped Conducting Polymer

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Received: 18.10.2018 Accepted: 12.12.2018

Abstract

Conducting polymeric materials containing conjugated bonds have attracted much interest in scientific and technological areas in recent years. The unique optical, electrical and chemical properties offer these materials to be used in electronic displays, telecommunication, biosensors, anti-corrosion coatings and etc. On comparing with polyaniline, poly ortho toluidine have attracted considerable attention as they exhibit better solubility in wide range of solvents. Poly (o-toluidine) (POT) was synthesized by chemical oxidative polymerisation technique by using sulfuric acid (H_2SO_4) as protonisation agent and ammonium peroxo disulfate (APS) as oxidizing agent .The optical, structural, morphological and size of particles have been investigated. X-ray diffraction showed that the POT is a partially crystalline polymer due to doping of highly concentrated sulfuric acid. A flaky like feature was observed via scanning electron micrograph (SEM). Better protonation effect of POT was indicated by UV spectroscopy. Chemical structure of POT was investigated by FT-IR. Nano particle size analysis displays that the synthesized POT has good result because the particle size is below than 100 nm.

Keywords *: POT, FT-IR, optical and structural properties, SEM, Particle size.*

1. INTRODUCTION

Conducting polymer is also known as conjugated organic polymer with the highly π-conjugated polymeric chains. It has been widely used in different areas such as chemical and biosensors, catalyst, photovoltaic cells, batteries, supercapacitors and energy storage device applications and etc., due to its excellent unique optical properties and electrochemical activity and biocompatability. A different kinds of conducting polymers have been developed for different applications (1).The properties of polymers obtained from substituted anilines is somewhat different fro those of polyaniline. Poly ortho toluidine (POT) is a derivative of polyaniline with methyl group ($-CH_3$) attached in the ortho position at the aromatic ring (2).

Chemical, electrochemical and photo-induced are the techniques to initiate the polymerization. In the first case, chemical oxidants such as ferric chloride, Ammonium peroxo disulfate (APS) are used to oxidize the monomer. In the second case the monomer is oxidized electrochemically and in the third technique a light is required to oxidize the monomer. Poor reproducibility of bulk conducting polymer and difficult to remove the grown film from the electrode surface are the drawbacks of electrochemical polymerization. Most of the conducting polymer in bulk form can be synthesized via chemical oxidative polymerisation which results in more homogeneous morphology than the electrochemical route (3, 4, 5).

In general conducting polymer exists in three different states classified as leucoemaraldine, pernigraniline, and emaraldine. Again it exists in two forms namely insulating and conducting state under the

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J. Environ. Nanotechnol.
Volume 7, No.2(2018) pp. 07-17
ISSN (Print): 2279-0748
ISSN (Online): 2319-5541
doi:10.13074/jent.2018.06.182310

Influence of Copper Doping on Structural, Morphological, Electrical Properties of WO_3 Nanoparticles

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Received: 22.02.2018 Accepted: 27.03.2018

Abstract

In this work, Pure and Cu-doped WO_3 nanoparticles have been synthesized using the wet chemical method. The effect of Cu-doping on the structural, morphological, electrical and dielectric properties of WO_3 nanoparticles was investigated. XRD pattern described that Cu-doping without affecting the monoclinic structure of the samples and the few peaks corresponding to Cu, it conforms secondary phase. The presence of more distortion centers and interstitials in Cu-doped sample led to increasing the crystallite size. FESEM analysis has shown the morphology of doped and pure WO_3 nanoparticles to be quasi-spherical. EDAX spectra confirmed the presence of W, O and Cu. The DC and AC conductivity have been measured at a temperature range from 303-403K in the frequency range of 42Hz-5MHz. The DC conductivity was found to increase with increasing Cu and indicates the semiconducting nature. The activation energy has also been observed to decrease with Cu doping. The DC conductivity of the present samples follows small polaron hopping. The frequency dependence of dielectric constant (ε'), dielectric loss (tan δ) and AC conductivity of WO_3 nanoparticles of different Cu doping concentration at different temperature was measured. Temperature variation of frequency exponents in 15 wt% Cu-doped WO_3 suggests that AC conduction is attributed to be correlated barrier hopping.

Keywords: *Cu-doped WO_3, Dielectric study, Electrical conductivity; FESEM; XRD.*

1. INTRODUCTION

Tungsten oxide (WO_3) is one of the most important transition metal oxide n-type semiconductors with the band gap of 2.7 eV. It has many excellent properties, such as, nontoxic, cheap, unique optical and electrical properties, which has a wide range of applications in the field of the sensor, smart windows, electrochromic, photocatalysts and photodetector (Wen Zeng *et al.* 2014; Georg *et al.* 2008; Danine *et al.* 2014; Changhua *et al.* 2014; Zhiyang He *et al.* 2015). A number of methods have been employed for doped transition metal oxide nanoparticles with different sizes and shapes, such as colloidal chemical, template, RF thermal plasma, sol–gel, screen printing, chemical co-precipitation (Huijuan Xia *et al.* 2008; Hui Song *et al.* 2015; Mingshui Yao *et al.* 2015; Somayeh Fardindoost *et al.* 2010; Hubalek *et al.* 2004; Upadhyay *et al.* 2014) and so on. Among these methods, the wet chemical method seems to be a versatile, low-cost, and environmentally friendly method for preparing WO_3 nanostructures. To date, properties of WO_3 can be tuned according to the research interest, by doping with various metal atoms to proper pre-determined needs and applications (Wang *et al.* 2007). The metal dopant induces a significant modification in the optical and electrical properties of WO_3. The numerous researchers have reported the changes induced by incorporation of transition metal ions into WO_3 lattice (Huijuan Xia *et al.* 2008; Kuzmin *et al.* 2014; Ahsan *et al.* 2012; Cholsong Pang *et al.* 2010; Gaury *et al.* 2013).

In the few decades, the number of reports on transition metal doped WO_3 system, very fewer work is done on Cu-doped WO_3. The main reason for choosing dopant Cu act as an electron receptor offers electrons to WO_3 conduction band and changes the electronic structure and carrier concentration of the metal oxide. Particularly, Cu is an equivalent substance in WO_3 and so far enhances electrical conductivity (Wang, 2011). For example, the doping of Cu occupies the atomic sites instead of interstitial sites of the WO_3 lattice. Therefore, Cu incorporation WO_3 photonic crystal structure exhibit an enhanced sensitivity to TMA (to check the freshness of fish) compared with the pure WO_3 (Shenmin Zhu *et al.* 2010). The Cu-doped WO_3 found that the sensing properties of acetone gas have been significantly

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IOSR Journal of Applied Physics (IOSR-JAP)
e-ISSN: 2278-4861 Volume 10, Issue 4 Ver. II (Jul. – Aug. 2018), 28-41
www.iosrjournals.org

A Study on the Nanotechnology in Water and Waste Water Treatment

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Abstract: *In most parts of the world, increases in population, the use of huge quantities of fertilizers and pesticides in modern agriculture, the expansion of food processing industry and the growth of other industrial processes contribute to the volume of sewage and waste water. Therefore wastewater treatment attempts to remove compounds with a high BOD, pathogenic organisms and harmful chemicals. Waste water treatment issues have been emergent problems these days. Its treatment is fetching must in this Industrial world. Nanotechnology holds great potential in advancing water and wastewater treatment to improve treatment efficiency as well as to augment water supply through safe use of unconventional water sources. Here we review recent development in nanotechnology for water and wastewater treatment. Nanoparticles have a great impending to be used in waste water treatment. Some of the inimitable characteristics of it having elevated surface area can be used efficiently for removing mortal metal ions, disease causing microbes, inorganic and organic solutes from water. The different classes of nanomaterials also have the authority to be efficient for water treatment like metal-containing nanoparticles, carbonaceous nanomaterials and zeolites. Nanotechnology has led to various efficient ways for treatment of waste water in a more precise and accurate way on both small and large scale.*

Keywords – *Wastewater Treatment, Water reuse, Nanotechnology, Nanoparticles, Nanomaterials, Membrane processes.*

Date of Submission: 14-07-2018 Date of acceptance: 31-07-2018

I. Introduction:

Our current water supply faces enormous challenges, both old and new. Worldwide, some 780 million people still lack access to improved drinking water sources (WHO, 2012). It is urgent to implement basic water treatment in the affected areas (mainly in developing countries) where water and wastewater infrastructure are often non-existent. In both developing and industrialized countries, human activities play an ever-greater role in exacerbating water scarcity by contaminating natural water sources. At the time of Independence, i.e., in 1947, the per capita availability of water in India was 6,008 cubic metres a year. It came down to 5,177 cubic metres a year in 1951 and to 1,820cubic metres a year in 2001. According to MidTerm Appraisal (MTA) of the 10th Plan, per capita availability of water is likely to fall down to 1,340 cubic metres in 2025 and 1,140 cubic metres in 2050. Wastewater from numerous industries such as paints and pigments, glass production, mining operations, metal plating, and battery manufacturing processes are known to contain contaminants such as heavy metal. These heavy metals in wastewater are not biodegradable and their existence in receiving lakes and streams causes bioaccumulation in living organisms, which leads to several health problems in animals, plants and human beings such as cancer, kidney failure, metabolic acidosis, oral ulcer, renal failure and damage for stomach of the rodent (El-Latif et al. 2013). As trace elements, some heavy metals (eg. Copper, zinc, selenium) are essential to maintain the metabolism of the human body. However, at higher concentration they can lead to poisoning (Singanan 2011). Gakwisiri et al. (2012) in his study reported that when zinc is present in less quantity in humans body, it affects health considerably. Heavy metals can enter a water supply by industrial and consumer waste, or even from acidic rain breaking down soils and releasing heavy metals into streams, lakes, rivers and groundwater (Renge et al. 2012). Wastewater regulations were established to minimize human and environmental exposure to hazardous chemicals.

Nanotechnology, the engineering and art of manipulating matter at the nanoscale (1-100 nm), offers the potential of novel nanomaterials for the treatment of surface water, groundwater and wastewater contaminated by toxic metal ions, organic and inorganic solutes and microorganisms. At the present time many nanomaterials are under active research and development. Recent advances in nanotechnology offer leapfrogging opportunities to develop next-generation water supply systems. Our current water treatment, distribution, and discharge

RESEARCH ARTICLE

Tight Focusing Properties of Radially Polarized Doughnut Gaussian Beam through a Dielectric Interface

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ABSTRACT: Tight focusing properties of an radially polarized doughnut Gaussian beam through a dielectric interface is theoretically investigated by vector diffraction theory. For the incident beam with topological charges (m), probe depth (d) and revive in the vicinity of focal plane, which results in the generation of many novel focal patterns. Such kind of focal structures may find applications in micro-particle trapping, manipulation, and material processing.

KEYWORDS: Radially polarized DG beam, Focal shift, Dielectric interface, Vector diffraction theory,

https://doi.org/10.29294/IJASE.5.2.2018.896-900

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1. INTRODUCTION

In recent years, cylindrically polarized beam have attracted great interests because of its interesting properties and potential applications [1-4]. For example, tight focusing of radially polarized light beams can create a very strong longitudinal electric field component in the focal region [1]. Moreover, in many practical applications, an objective is used to focus an incident light beam through an interface between different media of different refractive indices. For example, in the application of semiconductor inspection, light beams are focused from air onto silicon substrate. Torok et al [5] developed the theoretical method for studying the focusing of an electromagnetic wave through dielectric interfaces [6, 7]. More recently, a sub-wavelength light needle with a longer depth of focus (over 9.5λ) has been obtained using dual-beam focusing [8]. All these researches, the incident light beam is focused mainly in the vacuum. However, in some practical applications, the incident light beam is focused through an interface between different media by a high-NA lens. For example, in the case of optical trapping, a laser beam is focused through an interface between glass and water [9].

In recent times, many other kinds of beams, such as the Laguerre– Gaussian (LG) beam, the high order LG beam, the high order BG beam and the sinh-Gaussian beam, Multi gaussian beam, Hollow gaussian beam are discussed in depth [10-14]. Generally, their results have indicated that the form of the designed filters and their corresponding focusing performance are strongly influenced by the incident beam. Therefore, a new kind of radially polarized beam called doughnut Gaussian (DG) beam is introduced in a high NA focusing system. The defined DG beam is similar to a hollow Gaussian beam. In 2010, a subwavelength focal spot was achieved by using a radially polarized narrow-width annular beam [15]. The DG beam, which is similar to the narrow-width annular beam, is falling to the category of the Gaussian beams [16].Considering that the intensity is null at the center of the doughnut beam, the focusing field of a radially polarized DG incident beam through a high NA lens will exhibit high resolution. Meanwhile, other focusing patterns, such as a doughnut beam and the special polarized beam, were also investigated, based on the filtering technology [17-21]. In this Letter, we study the tight focusing of radially polarized doughnut gaussian beam passing through dielectric interface by vector diffraction theory. The principle of the optical focusing radially polarized DG beam is given and the simulation results are discussed in depth.

2. The principle of the optical focusing radially polarized DG beam

The scheme of the optical system is shown in Fig. 1. Assume the interface between two dielectric media of refractive indices n_1 = 1 and n_2 = 3.55, such as focusing in air onto silicon substrate in the application of semiconductor inspection. The geometric focus of the objective without the interface is located at the origin of the coordinate system. The distance between the interface and the geometric focus is d which is referred to as probe depth in Ref. [6]. For radially polarized beams, on the basis of vectorial Debye theory [2] the Cartesian components of the electric field vector in the focal region may be expressed as [22]

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Received: 15.09.2018 Accepted: 28.10.2018 Published on: 27.11.2018

Optica Applicata, Vol. XLIX, No. 4, 2019
DOI: 10.37190/oa190407

Manipulating the magnetization focal patterns using complex phase filters

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Based on vector diffraction theory and inverse Faraday effect, the light induced magnetization distribution of a tightly focused azimuthally polarized Bessel–Gauss beam superimposed with a helical phase and modulated by an optimized multi belt complex phase filter (MBCPF) is analyzed numerically. It is noted that by adjusting the radii of different rings of the complex phase filter, one can achieve many novel magnetization focal distributions, such as sub-wavelength scale (0.29λ) and super-long (71λ) pure longitudinal magnetic probe and magnetization chain composed of nine, six and four magnetic spots of sub-wavelength scale. The authors expect that these results pave the path for fabricating magnetic lattices for spin wave operation, multiple atoms or magnetic particle trapping and transportation, confocal and magnetic resonance microscopy, as well as multilayer ultrahigh density magnetic storage.

Keywords: inverse Faraday effect, high NA lens, multi belt complex phase filter, azimuthally polarized Bessel–Gauss beam.

1. Introduction

In the past two decades, controlling the magnetic state of a medium with the help of femtosecond laser pulses is an emerging and rapidly developing research area in the field of modern magnetism. Recent research has shown that it is possible to realize deterministic and controllable switching of magnetic orders by ultrafast light pulses [1–7]. Excitation of ultrafast magnetic oscillations through non-thermal optical processes has

Int. J. Adv. Sci. Eng. Vol.9 No.1 2607-2616 (2022) 2607 E-ISSN: 2349-5359; P-ISSN: 2454-9967

RESEARCH ARTICLE

Focusing Properties of Spirally Polarized Annular Multi Gaussian Beam by High NA Lens

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ABSTRACT: Focusing properties of spirally polarized annular multi Gaussian beam by High NA Lens are investigated theoretically by vector diffraction theory. Results show that the optical intensity in focal region of spirally polarized annular multi Gaussian beam can be altered considerably by the beam order and spiral parameter. Spiral parameter can induce focal pattern change in axial direction remarkably and many novel focal patterns including optical bubbles, focal hole and focal spots of long focal depth and axially separated focal spots and flattop profile are evolved. We expect such a tunable focal patterns are useful for optical manipulation of micro particles.

KEYWORDS: Focusing property, annular multi Gaussian beam, Vector diffraction theory, High NA Lens.

https://doi.org/10.29294/IJASE.9.1.2022.2607-2616 **©2022 Mahendrapublications.com, All rights reserved**

INTRODUCTION

Polarization, as an intrinsic nature of light, plays an important role in engineering the optical field and controlling the interaction of light with matter. In recent years, cylindrical vector (CV) beams have attracted significant interest due to the unique focusing features compared with homogeneously polarized beams [1]. Two extreme cases of CV beams are radially polarized (RP) and azimuthally polarized (AP) beams. It is found that an AP beam can be focused to generate a hollow dark spot with totally transverse polarization for the electric field, whereas it is a strong longitudinally polarized hot spot for the input RP beam [2-4]. The longitudinal component of the focus from such CVB is much stronger than the transversal component, and the size of the longitudinal focus is much smaller than the transversal focus [5]. Focal engineering using radially, azimuthally and cylindrically polarized beams has been studied through engineering the amplitude, phase and polarization. Recently, focusing CVB to a very tight spot was one of the most important topics for optical researches and application including sharper focus [6-10], multiple focal spots [11-14], optical needle [15-18],flat-top focus [19], optical chain [20,21], focal spot array[22-24], optical channel [25-27], optical cage [28-31], and spherical spot [32-35] etc. These new properties led to many potential applications, such as optical trapping and manipulation of particles [36,37], high resolution microscopy [38], optical data storage [39], and electron acceleration [40]. The cylindrical vector beams, most focus has so far been mainly on the tightly focused electric field distributions. However, the presence of phase filters or Amplitude filters makes some applications more difficult or even impossible. Bing Hao and James Leger have recently investigated the numerical aperture (NA) invariant focus shaping using spirally polarized beams. They proposed that spirally polarization is another kind of spatially variant polarization bearing radial symmetry [41]. The spirally polarized beam possesses axially symmetric polarization patterns, with linear polarization at any point of the transverse profile and with the electric field lines being logarithmic spiral. Recent investigation of the tight focusing properties of spirally polarized beam suggested several possible applications such as as optical tweezers, particle trapping, laser cutting, material processing, microscopy, etc.[42-46].The studies of energy flow in the focal plane of optical fields are also important and useful, as they indicate the wide use of such beams in manipulating and transporting absorptive

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Received: 18.06.2022 Accepted: 27.07.2022 Published on: 01.08.2022

Contents lists available at ScienceDirect

Optics Communications

journal homepage: www.elsevier.com/locate/optcom

Generating sub wavelength pure longitudinal magnetization probe and chain using complex phase plate

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ARTICLE INFO

Keywords:
Inverse Faraday effect
High NA lens
Multi belt complex phase filter
Transversely polarized beam

ABSTRACT

Based on inverse Faraday Effect, the three-dimensional magnetization field distribution induced by the azimuthally polarized annular multi Gaussian transmitted through a multi belt complex phase filter (MBCPF) is investigated numerically using vector diffraction theory. Numerical results shows that by properly adjusting the radii of different rings of MBCPF, one can achieve sub wavelength (0.286λ) pure longitudinal magnetic probe with ultra-long focal depth of (35λ). We also noticed that magnetization chain composed of eight, four and two magnetic spots of subwavelength scale is also achieved by properly modulating the radii of MBCPF. The authors expects such a pure ultra-long subwavelength magnetic probe and magnetic chain can be used to realize all optical magnetic recording (AOMR), multilayer magneto-optical data storage, ultra-compact optomagnetic devices, magnetic particle trapping and transportation, fabricating magnetic lattices for spin wave operation, as well as confocal and magnetic resonance microscopy.

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1. Introduction

The increasing interest in developing ultra-compact optomagnetic devices has recently invoked intensive research attention on light-induced schemes, which are capable of steering longitudinal magnetization at the sub-wavelength scale in the magnetic materials. Magneto-optical material has attracted intensive research interest due to its potential and appealing applications in all optical magnetic recording (AOMR) [1–7]. Stancin et al. first demonstrated the all-optical magnetic recording (AOMR) by a single 40 fs circularly polarized laser pulse by the inverse Faraday Effect (IFE) [8]. To further facilitate those fascinating and practical applications, it is highly desirable to obtain a super-long and sub wavelength longitudinal magnetization needle, as well as an extra-long and sub-wavelength longitudinal magnetization chain. Based on the vector diffraction theory and the inverse Faraday Effect (IFE) in magneto-optic (MO) film, the circularly polarized beam allows a sub-wavelength magnetic confinement in the tight focusing condition [9–13]. Since then all optical magnetic recording become a topic of much research interest and number of experimental work on improvement in ultrafast magnetization reversal of optic-magneto materials induced by the inverse Faraday Effect was demonstrated [14–17]. Recently, it has been reported that this doughnut spot produced be the tightly focused azimuthally polarized beam can be changed into a significantly sharper focal spot when a vortical phase encoded on the azimuthally polarized beam [18,19], which shows the intriguing prospect in practical applications due to its sub-wavelength lateral spot size and purely transverse electric field [20–22]. Recently many novel methods such as using hybridly polarized beam and multi belt spiral phase plates are suggested to suppress the side lobe and to improve the focal depth of the transversely polarized focal field [23–27]. Jiang et al., calculated the light-induced magnetization of an azimuthally polarized vortex beam in a high numerical aperture (NA) objective lens [28]. They found that a sub-wavelength (0.508λ) and pure longitudinal magnetization spot is generated in the focal region. Since then generating a pure magnetization focal field using the azimuthally polarized vortex beam instead of the circularly polarized beam become a topic of great interest. The light-induced magnetization produced by tight focusing of azimuthally polarized beams with helical phase has

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Received 1 July 2017; Received in revised form 29 August 2017; Accepted 2 September 2017
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Research Papers

Comparative Modelling Studies of 400 MHz ST-X Quartz SAW Delay Lines for Potential Gas Sensing Applications

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(received April 1, 2017; accepted November 28, 2017)

Surface Acoustic Wave (SAW) devices like delay lines, filters, resonators etc., are nowadays extensively used as principal solid state components in many electronic applications and chemical vapour sensors. To bring out the best from these SAW devices, computational design and modelling are resorted too. The present paper proposes the modelling of 400 MHz ST-X Quartz based SAW delay line, by three models namely Impulse Response Model (IRM), Crossed field Equivalent Circuit Model (ECM) and Coupling-of-Modes (COM) model. MATLAB® is employed as a computational tool to model the experimental output of the SAW device. A comparative discussion of the modelled device results is also provided.

Keywords: SAW delay line, impulse response model, equivalent circuit model, COM model, SAW sensors.

1. Introduction

Presently, sensing technology makes a prolific use of a wide variety of physical, chemical and biological sensors for investigating and monitoring solid (KANNAN *et al.*, 2004), liquid (BUI *et al.*, 2015, 2016) and gaseous phases in many applications (LEE *et al.*, 2011; STAPLES, VISWANATHAN, 2005). Among these sensors, the gas sensors play a crucial role in domestic and industrial fronts and also helps to predict the presence of organic volatile compounds like pollutants, explosive materials and drugs (LEE *et al.*, 2012). The gas sensors can be measured precisely using conventional analytical methods, such as gas chromatography and gas chromatography based mass spectrometry (PENZA, CASSANO, 2004). However, these methods are expensive and not portable besides giving a relatively complex behaviour and slow performance. To overrule these gaps, the electronic nose (E-nose) sensor (SINGH *et al.*, 2014), is perhaps the only device which gives timely warning and shows promising characteristics for the detection of toxic and harmful gases (RAI *et al.*, 2013) simultaneously with desired accuracy (RAI *et al.*, 2017). These sensors employing the Surface Acoustic Wave (SAW) technology are highly sensitive to surface perturbations allowing even sub-ppb level detection (RAI *et al.*, 2010). The advantages of these SAW sensors include compact size, speed, reliability, accuracy, low cost, real time measurement, high sensitivity, room temperature detection and wireless sensing in inaccessible areas (SINGH *et al.*, 2014).

SAW delay line devices are the basic portion of SAW sensors (FILIPIAK *et al.*, 2012). The principal solid state components of SAW sensors consist in measuring time delay changes, frequency changes due to SAW propagation on the piezoelectric substrate between two IDTs, which is caused by device parameters that are being measured (FILIPIAK *et al.*, 2012).

A typical SAW device consists of a piezoelectric substrate with interdigital transducers (IDTs) (WHITE, 1967). The IDT is bidirectional as SAWs are propagating both to the left and to the right from the IDT (WHITE, VOLTMER, 1965). As the electrical signals are applied to input IDT, it converts the applied electrical signals to mechanical signals (Surface Acoustic Waves) which then propagate through the piezoelectric substrate (SHARMA *et al.*, 2011). The mechanical signals are finally detected from the output IDT. The travel length between two IDT is called as delay length (VENKATESAN, PANDYA, 2013). Fig-

PAN

Review Papers

Review of Surface Acoustic Wave Sensors for the Detection and Identification of Toxic Environmental Gases/Vapours

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(*received December 16, 2017, accepted April 30, 2018*)

Detection and identification of toxic environmental gases have assumed paramount importance precisely in the defense, industrial and civilian security sector. Numerous methods have been developed for the sensing of toxic gases in the environment ever since surface acoustic wave (SAW) technology came into existence. Such SAW sensors called electronic nose (E-Nose) sensor use the frequency response of a delay line resonator. SAW device is focused and given importance. The selective coating between input and output interdigital transducers (IDTs) in the SAW device is responsible for corresponding changes in operating frequency of the device for a specific gas/vapour absorbed from the environment. A suitable combination of well-designed SAW delay lines with selective coatings not only help to improve sensor sensitivity and selectivity but also leads to the minimization of false frequency alarms in the E-Nose sensor. This article presents a comprehensive review of design, development, simulation and modelling of a SAW sensor for potential sensing of toxic environmental gases.

Keywords: toxic gases, SAW sensors, E-Nose, gas sensors, selective coating.

1. Introduction

The concentration of chemical pollutants in the environment has increased tremendously due to various factors like rampant industrialization, sudden population growth, and gross mismanagement of natural resources (AFZAL *et al.*, 2013; JAKUBIK *et al.*, 2016; MISHRA *et al.*, 2016; SINGH *et al.*, 2016; RAI *et al.*, 2017). These chemical pollutants come in various forms such as toxic industrial chemicals (TICs), volatile organic compounds (VOCs), hazardous gases, chemical warfare agents, explosive vapours, environmental pollutants, etc. As such, there is an urgent need for the development of stable technologies for their timely detection and identification in the environment (MATHANGHI *et al.*, 2011b; RAI *et al.*, 2013b; LEE *et al.*, 2013). Chemical warfare agents (CWAs) are weapons of mass destruction which can cause instant death or temporary incapacitation or permanent impairment in humans and other living organisms. A good chemical sensor needs to have many desirable traits like better selectivity, sensitivity, lower response time, fewer false alarm rates, low power consumption, reliability over distinct environmental conditions, swift recovery time, portability and a simple user interface (HARMER, MARQUIS, 2004; HO *et al.*, 2005; RAI *et al.*, 2010; AFZAL *et al.*, 2012; JAKUBIK *et al.*, 2016).

A lot of effort has been put by researchers around the globe to the development of reliable techniques for detection of such chemicals in the environment. Raman spectroscopy, Ion mobility spectroscopy, Flame photometry, Infra-red spectroscopy, Surface acoustic wave (SAW) technology, Calorimetric, Conductometric, Photo ionization and Flame ionization are some of the existing techniques for this purpose (WOHLTJEN, DESSY, 1979; CHANG, SHIH, 1998; MOORE, 2004; SFEROPOULOS, 2009; SINGH *et al.*, 2016). Each method has its own advantage as well as a limitation of their hands-on application as a sensor. Among these techniques, SAW technology is one of the promising and efficient technologies for sensing of chemical agents at lower concentration levels (ppm and ppb). Precise detection of hazardous chemical compounds in gaseous and liquid environments is possible with the help of such SAW sensors. These sensors have the advantage of being compact sized, affordable, highly sensitive and being reliable (WOHLTJEN, DESSY, 1979; CHANG, SHIH, 1998; MOORE, 2004; SFEROPOULOS,

18-19 "Research Publication CDF

Int J Life Sci Pharma Res. ISSN 2250-0480; SP- 05; "National Conference on Unearth the new frontiers in life sciences -2019"

SP-1

ENZYMATIC APPROACH ON PROCESSING OF TENCEL FABRIC

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ABSTRACT

"The Earth will not continue to offer its harvest, except with faithful stewardship. We cannot say we love the land and then take steps to destroy it for use by future generations."

- John Paul II

As the Quote goes though the garment industry and recent technologies has created enormous opportunities even beyond what nature can offer but the damage and the impact it creates to the environment is beyond the acceptable level. The damage it causes starts right from the farming of cotton till the final finishing and processing of fabric. The industry use different harmful chemicals in various processes like, desizing, scouring, bleaching, mercerizing, dyeing, washing, finishing, and it utilizes large quantities of water and also large amount of waste waters in each stages of processing Biotechnology is the process of applying living organisms and their different components for industrial processes and products. In the current scenario the application of biotechnology is wide. The use of enzymes in the garment industry has found to be an ecofriendly approach in various processing and best alternative for a quality and safe product. The application of enzymes have found roots in various processing of textiles like scouring, bleaching, mercerizing, dyeing, finishing, degumming and finishing, where the alternatives used in the traditional methods where harmful chemicals whose disposal was a threat to the environment. The enzymes are not only ecofriendly alternatives but they are also very specific and efficient, working under mild condition creating less damage to the fabric. Furthermore, the application of enzymes results in reduced energy, temperature, water saving and process times, thereby improving the quality and process integration of the product. The current study aims at processing tencel fabric with enzymes and creating an eco-friendly fabric.

KEYWORDS: *Enzymes, application, textile industries, processing, eco-friendly characteristics.*

INTRODUCTION

Enzymes have played an important role in many aspects of life since the dawn of time. In fact they are vitally important to the survival of life itself. The globalization and technology development has made new concepts and progresses in the textile industry. Eco friendliness has turned to be the major criteria for the textile products due to the awareness of environmental impact caused by various chemical processing of textiles and also the strict governmental legislation on effluent treatment and customer's interest to use eco-friendly products. Today enzymes have become a vital part in textile processing. The enzymes have two major applications. Firstly in preparatory process like desizing where amylases are majorly used and the secondly in the finishing process. In finishing process Cellulase, proteases, lipases, pectinases etc., are being used. The most common application is bio washing where the traditional pumice stone is being replaced with enzymes. There are various applications which entail enzymes included fading of denim and non-denim, bio-scouring, bio-polishing, wool finishing, peroxide removal, decolourization of dyestuff, etc.[2]

Application of enzymes

The principal enzymes applied in textile industry are hydrolases and oxidoreductases. The group of hydrolases includes amylases, cellulases, proteases, pectinases and lipases/esterases.[9] The use of enzymes in textile industry is one of the most rapidly growing field in industrial enzymology. The enzymes used in the textile field are amylases, catalase, and laccase which are used to removing the starch, degrading excess hydrogen peroxide, bleaching textiles and degrading lignin.[3] The use of enzymes in the textile chemical processing is rapidly gaining globally recognition because of their non-toxic and eco-friendly characteristics with the increasingly important requirements for textile manufactures to reduce pollution in textile

EFFECT OF FABRIC PARAMETERS ON THERMAL CONDUCTIVITY OF RIB BAMBOO LYCRA KNITTED FABRICS

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Abstract: This study has been undertaken to analyse the effect of fabric parameters on the thermal conductivity of rib bamboo/lycra knitted fabrics. The effect of GSM, thickness, porosity, loop length, lycra denier and plating structure on thermal conductivity and thermal resistance was evaluated and analysed. The results indicated that GSM, porosity, loop length, lycra denier and plating structure had an influence on the thermal conductivity and thermal resistance.

Keywords: **Bamboo, Thermal comfort, Thermal resistance, Knitted fabrics, Lycra Denier, Plating Structure.**

1. INTRODUCTION

As technological upgrades keep evolving in the textile industry, new fabrics, new innovations have increased to a greater extent, and so does our people's living style in terms of clothing standards. The primary requirement of new millennials on clothing is not only style and durability but also clothing comfort, Guanxiong et al., (1991). Milenkovic (1999) defines comfort as "a neutral state compared to the more active state of pleasure".It is the absence of discomfort or unpleasantness. Clothing comfort includes three main considerations: psychological, sensorial and thermo-physiological comfort. (www.textilepapers.tripod.com) (2005)

Thermal comfort is defined as 'The condition of mind which expresses satisfaction with the thermal environment'. Thermal comfort of clothing is associated with the thermal balance of the human body and its thermal responses to the dynamic interactions with the clothing and environment systems denotes Frydrych et al., (2002). Thermal comfort is one of the significant parameters of clothing comfort, which determines the degree of pleasures from physiological, psychological, and physical harmony between the human body and the environment. Clothes having better thermal comfort, protect the thermal and humidity balance of the human body by transferring the human body's heat and moisture at various environmental conditions and activities denotes Das et al., (2007). Thermal comfort is an important aspect of clothing properties. The heat and moisture balance between the body and the environment determines the level of thermal comfort for the human body. The body's ability to adapt to heat and cold is crucial to the maintenance of life. If external factors become unbearable, the body can not compensate and death may result, the maintenance of a fairly steady body temperature even under a variety of external conditions, is important and can be controlled through proper clothing.

Bamboo fibres possess many excellent properties when used as textile materials such as high tenacity, excellent thermal conductivity, resistance to bacteria, and high water and perspiration absorption. Regenerated Bamboo fibre, called ecological fibre, has many good properties such as anti-ultraviolet, anti-bacterial and odour-resistant, and is used for functional textile products. It absorbs and evaporates sweat very easily hence it gives a comfortable feel. It can be spun into 100% Bamboo yarn and also blended with natural and man-made fibres like cotton, polyester, silk etc says Saravanan and Prakash, (2007). Lycra is the brand name of the polyurethane or spandex fibre made by Dupont. It is basically a grafted polymeric fibre and the speciality of the fibre is the very high extensibility (up to 400%), Ray (2011). Spandex is a synonym of elastane fibre. Adding lycra in knitted fabrics provides added comfort and stretchability. Stretch fiber, yarn, or fabric provides the necessary elasticity for the garment to respond to every movement of the body and return to its original size and shape. The degree and direction of elasticity determine the end use of the stretch garments. The most important property requirements for stretch garments are in the order of body comfort fit, breathability, and durability

2018-19 not Pub

International Journal of Applied Social Science
Volume 5 (10), October (2018) : 1626-1633
Received : 06.08.2018; Revised : 19.08.2018; Accepted : 07.09.2018

RESEARCH PAPER
ISSN : 2394-1405

Tirupur Sivakasi Area

Analysis of Anti-Bacterial Efficacy in Bamboo and Bamboo /Cotton Handloom Fabrics Finished with Selected Herbal Extracts

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ABSTRACT

Substances which are considered anti-microbial have been used by man since ancient times for the protection and preservation of fabrics, which is one of the fundamental aspects in many of the textile applications today. These protective agents known as anti-microbial are fungi static, bacteriostatic and bactericidal. The anti-microbial agents also give special protection from different forms of textile rotting. Natural antimicrobial agents are environment friendly and can be safely used on textile materials. The study describes on the anti-bacterial activity of selected natural medicinal herbs on selected handloom bamboo and its blend materials, which exhibits a high zone of inhibition against micro-organisms.

Key Words : Bamboo, Bamboo blend material, Medicinal herbs, Anti-bacterial

INTRODUCTION

Textiles like agriculture have been an elementary part of the human need since the dawn of human civilization. Textile fabrics are made from natural as well as manmade or synthetic fibres. Textiles, in every stages of its production absorb many hazardous unwanted toxic chemicals. To reduce its contact, renewable resources are gaining popularity among the people due to their positive impact in agriculture, environment and economy states Kavitha and Christy (2014). In the 21st century, consumers around the globe demand for eco-friendly organic products.

The eco problems in textile industry start right from the manufacturing of the fibres to the making of the final goods. Pollution control is as important as making a product free from the toxic effect of chemicals. With regard to the clothing and textiles, ecology of production, ecology in the disposal of waste and also human ecology where the effect of textiles or apparels upon human skin should be the prime factors of concern in the present scenario. Kumari *et al.* (2013) is of opinion that textile industries globally should change their technology in the manufacturing processes so that eco-friendly materials are produced which will satisfy the customer needs.

"Eco textiles" refers to a select group of textiles that have reduced carbon, energy and pollution

How to cite this Article: Paulose, Vinitha and Jayalakshmi, I. (2018). Analysis of Anti-Bacterial Efficacy in Bamboo and Bamboo /Cotton Handloom Fabrics Finished with Selected Herbal Extracts. *Internat. J. Appl. Soc. Sci.*, 5 (10) : 1626-1633.

SPECIAL ISSUE ISSN: 2278-4853. Vol 8, Spl Issue 3, March 2019. Impact Factor: SJIF 2018 = 6.053

Asian Journal of Multidimensional Research (AJMR)

(Double Blind Refereed & Reviewed International Journal)

UGC APPROVED JOURNAL

A STUDY ON THE ECO FRIENDLY NATURAL DYEING OF SANDYNO WOOL YARNS

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ABSTRACT

Wool, a supremely oldest and universally valuable eco – protein fibre which can enhance other fibre properties when blended, extends its application into a new product playing a pivotal role in the textile industry. Natural dyes also provide a creative natural finish to the textile materials. Wool dyeing, to improve its quality and appearance both in the pure and blended form is a challenging art. Colouring of wool enhances its beauty and luster. Colouring started with natural resources and because of its limited shades and fastness synthetic dyes over took the natural dyes. This study focused on the selection of the new developed geno type sheeps wool from Sandynila, Ooty, Tamil Nadu and blending it with other natural vegetable and protein fibres which will result in obtaining of new spun wool yarns with selected proportions, eco dye the same and make wool as best suited for apparel production suitable for green consumerism.

KEYWORDS: *Eco Protein Fibre, Natural Dyeing, Wool.*

SPECIAL ISSUE

ISSN: 2278-4853. Vol 8, Spl Issue 3, March 2019. Impact Factor: SJIF 2018 = 6.053

Asian Journal of Multidimensional Research (AJMR)

(Double Blind Refereed & Reviewed International Journal)

UGC APPROVED JOURNAL

PROLOGUE PAVEWAY OF HERBAL DYED MEDICAL PRODUCTS TOWARDS GREEN CONSUMERISM

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ABSTRACT

Green fibres in textiles provide a way for healthy, comfortable clothing, which ultimately will be fully biodegradable.Eco friendly textiles and fabrics cover a wide range of natural and recycled fibres. Eco textiles are those which are produced from eco-friendly manner and processed under eco-friendly limits. Eco friendly fabrics are considered eco-friendly, due to their availability from nature without any harmful effects. Due to increasing demand and to the higher profit resulting from the sale of products with environmental benefits, a new trend is gaining ground which is called as green marketing or green consumerism.Dyeing eco textiles using green herbal plants invoke green consumerism of utilised goods which serve consumers to a great extent,as are recently called as Herbal Textiles or Herbal Clothing's. Herbal Clothing is believed to help restore balance within the body's systems and strengthen the immune system. As major emphasis is now given to eco-friendly production technique such as herbal application on clothing, this study focusses on the selection of certain selected herbs and its application on eco-friendly fabrics,converting the same into medical products to heal certain common ailments.The outcome of the results from subjects proved to be satisfactory.

KEYWORDS: *Eco Textile, Green Consumerism, Herbal Textile.*

Int. J. Adv. Sci. Eng. Vol.9 No.1 2607-2616 (2022) 2607 E-ISSN: 2349 5359; P-ISSN: 2454-9967

RESEARCH ARTICLE

Focusing Properties of Spirally Polarized Annular Multi Gaussian Beam by High NA Lens

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ABSTRACT: Focusing properties of spirally polarized annular multi Gaussian beam by High NA Lens are investigated theoretically by vector diffraction theory. Results show that the optical intensity in focal region of spirally polarized annular multi Gaussian beam can be altered considerably by the beam order and spiral parameter. Spiral parameter can induce focal pattern change in axial direction remarkably and many novel focal patterns including optical bubbles, focal hole and focal spots of long focal depth and axially separated focal spots and flattop profile are evolved. We expect such a tunable focal patterns are useful for optical manipulation of micro particles.

KEYWORDS: Focusing property, annular multi Gaussian beam, Vector diffraction theory, High NA Lens.

https://doi.org/10.29294/IJASE.9.1.2022.2607-2616 **©2022 Mahendrapublications.com, All rights reserved**

INTRODUCTION

Polarization, as an intrinsic nature of light, plays an important role in engineering the optical field and controlling the interaction of light with matter. In recent years, cylindrical vector (CV) beams have attracted significant interest due to the unique focusing features compared with homogeneously polarized beams [1]. Two extreme cases of CV beams are radially polarized (RP) and azimuthally polarized (AP) beams. It is found that an AP beam can be focused to generate a hollow dark spot with totally transverse polarization for the electric field, whereas it is a strong longitudinally polarized hot spot for the input RP beam [2–4]. The longitudinal component of the focus from such CVB is much stronger than the transversal component, and the size of the longitudinal focus is much smaller than the transversal focus [5]. Focal engineering using radially, azimuthally and cylindrically polarized beams has been studied through engineering the amplitude, phase and polarization. Recently, focusing CVB to a very tight spot was one of the most important topics for optical researches and application including sharper focus [6–10], multiple focal spots [11–14], optical needle [15–18],flat-top focus [19], optical chain [20,21], focal spot array[22–24], optical channel [25–27], optical cage [28–31], and spherical spot [32–35] etc. These new properties led to many potential applications, such as optical trapping and manipulation of particles [36,37], high resolution microscopy [38], optical data storage [39], and electron acceleration [40]. The cylindrical vector beams, most focus has so far been mainly on the tightly focused electric field distributions. However, the presence of phase filters or Amplitude filters makes some applications more difficult or even impossible. Bing Hao and James Leger have recently investigated the numerical aperture (NA) invariant focus shaping using spirally polarized beams. They proposed that spirally polarization is another kind of spatially variant polarization bearing radial symmetry [41]. The spirally polarized beam possesses axially symmetric polarization patterns, with linear polarization at any point of the transverse profile and with the electric field lines being logarithmic spiral. Recent investigation of the tight focusing properties of spirally polarized beam suggested several possible applications such as as optical tweezers, particle trapping, laser cutting, material processing, microscopy, etc.[42–46].The studies of energy flow in the focal plane of optical fields are also important and useful, as they indicate the wide use of such beams in manipulating and transporting absorptive

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Received: 18.06.2022 Accepted: 27.07.2022 Published on: 01.08.2022

Theoretical analysis of a high-performance surface plasmon resonance biosensor using BlueP/WS_2 over a Cu-Pt bimetallic layer

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Received February 22, 2023; accepted June 23, 2023; published July 2, 2023

Abstract—The present theoretical study exhibits the possibility of achieving an incredibly highly sensitive surface plasmon resonance-based biosensor comprising a Cu-Pt bimetallic layer and a BlueP/WS_2 hybrid nanostructure for an angular interrogation method. Based on the Transfer matrix method, the thickness of Cu and Pt and the number of BlueP/WS_2 layers are optimized to obtain the best possible sensitivity and FOM. A well-optimized Cu-Pt-BlueP/WS_2 hybrid structure generates sensitivity as high as 502°/RIU with an FOM of 128.7RIU^{-1}. Such a sensor is handy for detecting biomolecules.

In recent years, surface plasmon resonance (SPR) has been found to be a potential sensing technique owing to its advantages, such as real-time measurement, stable performance, high sensitivity, and accurate detection [1]. Typically, the SPR sensing technique considerably utilizes the Kretschmann configuration, which has the advantages of having a metal film directly coated over the prism, applying a monochromatic light source, and achieving a high signal-to-noise ratio [2]. Gold (Au) and silver (Ag) are primarily chosen as the ideal SPR metals for SPR sensors [3]. On the other hand, Copper (Cu) is cost-effective and produces a much sharper resonance curve compared to Au and Ag. However, Cu is chemically reactive, which affects the SPR sensor stability, and hence needs a protective layer to tackle this issue [4, 5]. Sharma *et al.* demonstrated that a thin platinum (Pt) can be utilized as a protective layer when deposited over Cu to prevent Cu from oxidizing and enhance the sensor sensitivity [6]. Platinum is chemically more stable, inert, highly reflecting, and possesses a high melting point [7]. The BlueP/TMDCs are widely used two-dimensional (2D) heterostructure nanomaterials in biosensors owing to their large charge transfer, high energy bandgap, high mobility, good work function, and optical absorption [8]. Liu *et al.* reported that adding a BlueP/WS_2 layer over a Nickel layer significantly improved the sensor sensitivity to 270°/RIU [9]. Shivangani *et al.* reported that the SPR sensor with an added BlueP/WS_2 layer as an outer layer improved the sensitivity up to 374°/RIU and acted as a protecting layer with enhanced absorption of biomolecules [10]. This theoretical work suggested a modified Kretschmann configuration that employs a CaF_2 prism, Cu-Pt bimetal, and BlueP/WS_2.

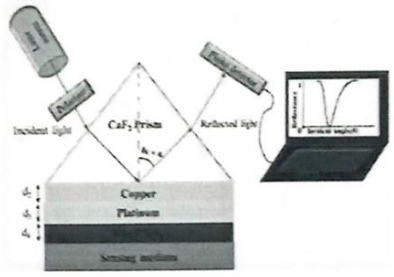

Fig. 1. Schematic diagram for the SPR biosensor with the proposed Cu-Pt- BlueP/WS_2 structure.

The schematic design of the suggested SPR biosensor developed as a modified Kretschmann configuration is illustrated in Fig. 1. This proposed biosensor is a five-layer structure made of Cu-Pt-BlueP/WS_2. We considered a 633nm wavelength p-polarized laser as the source. The refractive index of a CaF_2 prism is given as n_1= 1.4329 [10]. The dielectric constant of metals involved are calculated using the Drude-Lorentz model $\varepsilon_m(\lambda) = \varepsilon_{mr} + \varepsilon_{mi} = 1 - (\lambda^2\lambda_c / \lambda_p^2(\lambda_c + i\lambda))$, where the collision wavelength (λ_c) and plasma wavelength (λ_p) for Cu and Pt [5, 7] are shown in Table 1. The monolayer BlueP/WS2 (L) thickness is 0.75nm, and the refractive index is 2.48+0.17i [10]. The sensing medium is located in the fifth layer with a refractive index of n_s = 1.33 (water).

Metal	λ_c (m)	λ_p (m)	Ref.
Cu	4.0852×10^{-5}	1.3617×10^{-7}	[5]
Pt	1.795×10^{-5}	2.415×10^{-7}	[7]

Table 1

We obtain the reflected light intensity (reflectance) by using N-layer matrix method [11]. In the proposed model, there are five layers (N=5). The reflection coefficient (r_p) of the p-polarized incident light through the multilayer structure will be:

$$r_p = \frac{(M_{11} + M_{12}q_N)q_1 - (M_{21} + M_{22}q_N)}{(M_{11} + M_{12}q_N)q_1 + (M_{21} + M_{22}q_N)} \quad (1)$$

Reflectance (R_p) for p-polarized light is:

$$R_p = |r_p|^2. \quad (2)$$

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sensors

MDPI

Article

Numerical Investigation on High-Performance Cu-Based Surface Plasmon Resonance Sensor for Biosensing Application

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Abstract: This numerical research presents a simple hybrid structure comprised of TiO_2-Cu-$BaTiO_3$ for a modified Kretschmann configuration that exhibits high sensitivity and high resolution for biosensing applications through an angular interrogation method. Recently, copper (Cu) emerged as an exceptional choice as a plasmonic metal for developing surface plasmon sensors (SPR) with high resolution as it yields finer, thinner SPR curves than Ag and Au. As copper is prone to oxidation, especially in ambient conditions, the proposed structure involves the utilization of barium titanate ($BaTiO_3$) film as a protection layer that not only preserves Cu film from oxidizing but enhances the performance of the sensor to a great extent. Numerical results also show that the utilization of a thin adhesive layer of titanium dioxide (TiO_2) between the prism base and Cu film not only induces strong interaction between them but also enhances the performance of the sensor. Such a configuration, upon suitable optimization of the thickness of each layer, is found to enhance sensitivity as high as 552°/RIU with a figure of merit (FOM) of 136.97 RIU^{-1}. This suggested biosensor design with enhanced sensitivity is expected to enable long-term detection with greater accuracy and sensitivity even when using Cu as a plasmonic metal.

Keywords: surface plasmon resonance; biosensor; sensitivity; titanium oxide; copper; barium titanate

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Citation: Muthumanikkam, M.; Vibisha, A.; Lordwin Prabhakar, M.C.; Suresh, P.; Rajesh, K.B.; Jaroszewicz, Z.; Jha, R. Numerical Investigation on High-Performance Cu-Based Surface Plasmon Resonance Sensor for Biosensing Application. *Sensors* **2023**, 23, 7495. https://doi.org/10.3390/s23177495

Academic Editor: Andreas Ebner

Received: 25 July 2023
Revised: 21 August 2023
Accepted: 25 August 2023
Published: 29 August 2023

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1. Introduction

The SPR sensor is found to be prominent among the various current sensing approaches owing to its reliability, rapid analysis, high sensitivity, accurate detection, and label-free detection method for chemical and biological analytes [1–3]. This makes it possible to use the SPR sensor for various purposes, including environmental monitoring, pressure sensing [4], temperature sensing [5], medical diagnosis [6], DNA hybridization detection, discovering drugs [7], spotting molecules, glucose monitoring [8], formalin detected in the food preservatives [9], etc. The SPR method has the virtue of being able to identify even minute variations in the refractive index (RI) of the sensing medium [10]. The attenuated total reflection (ATR) phenomenon is supported by the angular interrogation method, and SPR sensors frequently prefer the angular method because of its simplicity and high resolution [11]. In general, plasmonic materials, including silver (Ag) and gold (Au), have been utilized in SPR sensors. As gold is invulnerable to degradation and corrosion, it is recommended as a superior plasmonic material for the SPR sensor. The drawbacks of Au are that it has low biomolecule adhesion capabilities and provides wider reflectance curves [12,13]. Ag is considered a potential substitute metal since it is less expensive and

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https://doi.org/10.1007/s12596-023-01428-y

RESEARCH ARTICLE

Generation of sub-wavelength longitudinal magnetization needle and multiple longitudinal spots using circularly polarized beam through an annular walsh function filter

D. Thiruarul[1] · J. William Charles[1] · M. Lavanya[2] · K. B. Rajesh[1] · Z. Jaroszewicz[3]

Received: 27 June 2023 / Accepted: 22 September 2023
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Abstract This numerical work demonstrates the possibility of generating sub wavelength scale magnetization spot of long focal depth and axially separated multiple magnetization segments using annular Walsh function filter. Numerical result calculated on the basis of vector diffraction theory (VDT) and Inverse Faraday Effect (IFE) shows upon suitably choosing the parameters of Walsh function filter such as order and annular obstruction, one can generate and tune the longitudinal magnetization needle and multiple magnetization spots in the focal plane for the input circularly polarized Bessel Gaussian beam. The generated sub wavelength magnetization structures are highly applicable in fields such as all-optical magnetic recording, multiple trapping and transportation of magnetic particles, magnetic resonance microscopy and multilayer ultra-high-density magnetic storage.

Keywords Annular Walsh filter · Circularly polarized beam · Inverse Faraday effect

Introduction

Generation of sub-wavelength longitudinal magnetic probe as well as multiple magnetic spots in magneto-optical material (OM) films are at great interest due to its novel applications in all-optical magnetic recording (AOMR), high density magneto optical data storage, magnetic resonance nanoscopy [1–3]. In recent years, magnetization dynamics as well as switching in the magnetic material by ultra-fast laser pulse has been demonstrated by many researchers [4–8]. In 2007, stanciu et al., first experimentally demonstrate AOMR without any applied magnetic field [1]. In 2008, L.E. Helseth numerically investigate the impact of strongly focused electromagnetic wave in E x E* media and derived vectorial magnetization distribution induced by the inverse Faraday effect (IFE)[9]. In 2008,Y.Zhang et al., numerically demonstrated the formation of sub wavelength scale magnetization domain in an OM film owing to the IFE upon tight focusing of circularly polarized beam [10].Followed by this several articles demonstrating the formation of pure longitudinal magnetization spots with ultra long focal depth using both azimuthally and circularly polarized beams are reported recently [1, 10–19]. Apart from this several recent articles more number of articles are reported to generation of the sub-wavelength longitudinal magnetization chain of spots by using different types of pupil engineering [20–28]. For example, 4π configuration is used to generates sub-wavelength longitudinal magnetization needle/chain of spots by using circularly as well as azimuthally polarized beam as an input beam [20, 26–28]. However, 4π configuration are highly affected by aberrations and coherence mismatching due to misalignment of two objective lenses [29–30]. On the other hand, M. Udhayakumar et al., proposed a simple method to demonstrate the longitudinal magnetization needle/chain of spots by using complex phase filter in the input pupil with single objective lens [3–5, 23–24]. In recent years, Walsh function filters are used in the input pupil to manipulate the point spread function(PSF).In 1923, J.L. Walsh defined as the Walsh function is a closed set of normal orthogonal functions over the interval (0, 1) except at a finite number of zero crossings within the specified domain[31]. In

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Published online: 17 November 2023

ISSN 2319-829X
Humanities and Social Science Studies, Vol. 12, Issue 1, No. 3, January – June : 2023

A STUDY ON CONSUMERS LEVEL OF SATISFACTION TOWARDS ECO-FRIENDLY PRODUCTS WITH SPECIAL REFERENCE IN TIRUPUR CITY

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ABSTRACT:

Manufacturers, buyers and consumers have recently raised worries about products environmental effect. Consumers and producers have focused their attention on "green" or environmentally friendly items such as low-power electrical appliances, e-vehicles, organic food products, lead-free paints, recyclable paper, and phosphate-free detergents. Green marketing is becoming increasingly important to Indian marketers. Although there has been a lot of study on green marketing all around the world, there has been very little academic research on customer level of satisfaction in Tirupur city. This study gives a brief overview of environmental challenges and identifies consumers' green values, as well as their level of environmental knowledge, green goods, and activities.

Keywords: Eco-friendly, Environmental, Non-toxic, Sustainable, Ecosystem, Recyclable.

INTRODUCTION

The term eco-friendly describes a product that is not hurtful to the environment. However, it can get more complex than that, as there are many factors of something that might be harmful to the environment. So many different things can negatively influence the environment, such as not using proper measures when disposing of products. Eco-friendly products may seem to be more expensive, but long-term they are actually more professional. Eco-friendly products tend to last much longer. These products are typically made from recycled materials and are sturdy, withstanding most drops, kicks, and dishwashers.

STATEMENT OF THE PROBLEM

Nowadays, the environment emerging as a significant issue for business, society, Government. It's one of the most importance emerges from increasing environmental deprivation namely ozone depletion, solid waste, pollution, global warming, and climate change. To tackle environmental problems, consumers believe that eco-friendly is the way to integrate with their buying behavior that can protect the environment.The purpose of the study is to find out the level of satisfaction towards the environmental concern products. The main aim is to find out how the consumer behaves when they are about to purchase ecofriendly product.

OBJECTIVES OF THE STUDY

- To know the satisfaction level of eco-friendly product users in Tirupur city.
- To know the environmental problems faced by the respondentin Tirupur city.

RESEARCHMETHODOLOY

SAMPLE DESIGN:

The consumers of eco-friendly products are selected by using the convenience sampling method.

TOOLS FOR ANALYSIS:

- Percentage Analysis

An Empirical Study on Risk and Return Analysis of Infrastructure Sector In selected companies In Mutual Funds In India

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Abstract:

In an economy, the financial system facilitates the transformation of savings of individuals, governments and businesses into investment and consumption. Such system consists of various intermediaries, markets, instruments and services. A number of financial institutions act as mobilizes and depositors of savings, suppliers of credit and also providers of various financial services to the community. This paper aims to know risk and return analysis of infrastructure sector mutual funds in India. For the purpose 15 most preferred infrastructure sector companies over a period of one year viz.2013-14 have been taken through judgment sampling and Yield on 10 year govt. bond has been taken as the surrogate for the risk free rate of return viz.7.56% p.a. It's an empirical study stating the ranking & evaluation of funds based on three ratios namely, Jenson's, Treynor's & Sharpe's. The study produced sufficient information of risk and return associated with fund and their rank depending on their performance which will ultimately help investors to choose the best mutual fund generating maximum return with minimum risk. In last concluding remarks has been given.

(Keywords: Mutual Fund, Risk Free Returns, Infrastructure Sector, SEBI and AMFI)

Introduction:

These institutions vary in their roles, objectives and offerings and can be classified on the basis of their primary activities, or the degree of their specialization in relation to savers, investors and borrowers with whom they deal.

As a mobilisor of savings, Mutual Fund companies (MFs) or Asset Management Companies (AMCs) are widely appreciated for their role in helping, not only wealthy investors but also small savers, to make them able to access to such professionally managed investment portfolios on the cost of small entry charges. This way in an economic system consisting of varied class of investors, such services can facilitate in creating a sound financial environment.

Sector Funds - Infrastructure Funds

The infrastructure facility in the country plays a vital role in the economic development of that country. The development of many industries has been troubled if key industries such as coal, power and oil are absent in the nation. The role of financial sector for the growth of infrastructure industries by providing huge funds is a remarkable one. Earlier, it was difficult for the private sector to raise huge funds for establishing infrastructure industries; therefore, most of the industries in this sector were started by the Government of India for a long time. Whereas now, the liberalization of economic policy permits private sector to come forward to start such type of industries. These industries could raise their capital with the help of the Development Banks and the Merchant Banks. Infrastructure funds are those sector funds which invest in companies that are either directly or indirectly involved in the infrastructure development in India. Companies that are involved in the industry like energy, power, metals, estate, etc., are a part of infrastructure segment.

Infrastructure funds are sectorial funds and thus are riskier than other types of mutual funds. With sectorial funds, a lot more research is required before investing. If investors have a good understanding of this sector, can invest in infrastructure funds. Carefully chosen infrastructure funds perform very well over

EFFECTIVE EASE REFORMS IMPLEMENTATION PERFORMANCE OF PUBLIC SECTOR BANKS

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ABSTRACT

Since 1991, Indian banking has been driven to reforms that have resulted in incremental progress in various aspects of performance over time, particularly in terms of efficiency, capitalization, technology, and governance, with an equal emphasis on stability. In the meantime, numerous countries saw bank collapses as a result of the Global Financial Crisis of 2007–2008. Indian banks, on the other hand, were spared from potentially catastrophic financial losses. However, it was unable to avoid the effects of the Indian economy's recession. It had a delayed negative impact on the Indian economy, and it has since been experiencing a crisis as a result of Stressed Assets. To address the problem, the government has launched a comprehensive 4Rs approach that includes transparently recognising NPAs, resolution and recovery, recapitalization, and reforms. Manthan's Whole-Time Directors and Senior Executives suggested a six-point action plan on Enhanced Access and Service Excellence, or EASE. The EASE reforms were designed to improve PSB performance and ensure financial stability, among other things. The EASE reforms, which launched in January 2018, and the program's subsequent edition, EASE 2.0, built on the foundation created by EASE 1.0 and accelerated reform efforts. The effectiveness of the PSB EASE Reforms on PSB performance is investigated in the present study, and it has been found to be beneficial.

Key Words: EASE, Banking reforms, Digitalization, Banking, Finance

INTRODUCTION

The financial industry is regarded as the economy's backbone. Banks, as important financial system players, assist in channelling savings into investments and promoting economic growth. Public sector banks have played a significant part in the country's economic development. Since 1991, Indian banking has been exposed to reforms that have resulted in gradual improvements in various aspects of performance over time, particularly in terms of efficiency, capitalization, technology, and governance, with an equal emphasis on stability. In the meantime, the global financial crisis of 2007–2008 resulted in bank collapses in a number of countries.

However, Indian banks with low risk exposure to abroad operations were spared from potentially catastrophic financial losses. However, it was unable to avoid the effects of the Indian economy's recession. It had a long-term negative impact on the Indian economy, and it has been experiencing a crisis due to stressed assets in recent years, as well as AQR by the RBI and the discontinuation of special dispensation of restructured standard assets, resulting in the erosion of substantial banks' net worth and, as a result, the weakening of the public sector banking system.

JECET; December 2022- February2023. Sec. B; Vol.12. No.1, 001-012.
[DOI: 10.24214/jecet.B.12.1.00112]

E-ISSN: 2278-179X

Journal of Environmental Science, Computer Science and Engineering & Technology

An International Peer Review E-3 Journal of Sciences and Technology

Available online at www.jecet.org

Section B: Computer Science

Research Article

AADM Model Optimizes Bandwidth Aggregation in Networking

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Received: 20 November 2022; **Revised:** 12 December 2022; **Accepted:** 24 December 2022

Abstract: You may be able to purchase multiple low-cost lines and combine them to get the bandwidth you need with today's bandwidth aggregation technology [1], allowing you to expand further (and gradually) as usage continues to rise. As your business expands, so does the number of people using your network. As a result, you might need more bandwidth for your Internet connection or your dedicated leased line connections to remote offices. However, it's possible that your finances haven't grown to the point where you can afford to upgrade to the next level of connectivity, such as replacing your T-1 with a T-3. Instead, you may be able to purchase multiple low-cost lines and combine them with the bandwidth aggregation technology of today to get the bandwidth you need, allowing you to expand further (and gradually) as usage continues to rise.

Keywords: Bandwidth, aggregation, Algorithm, Broadband

1. INTRODUCTION

Bandwidth aggregation is simple in concept: you simply combine the bandwidth of two or more connections to provide a single connection. Implementation can be simple or complex and can include load balancing and failover. Bandwidth aggregation [2] can be done via software, a dedicated

Novel Adaptive Neuro Fuzzy Inference Modeling Algorithms for Predicting Equity Prices and Indices

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ABSTRACT

Equity markets are considered as dynamic entities behaving in complex manner posing a challenging problem to equity forecasters. Traditional equity market forecasting is based on fundamental and technical analysis. Adoption of neural networks to forecast equity prices have been applied by many, however with shortcomings Recent studies focus on the use of artificial intelligence and machine learning; deploying methods such as artificial neural networks or genetic algorithms. Deployment of ensemble models, which combine the outputs of different machine learning algorithms, is also a common approach in machine learning. Adaptive Neuro fuzzy inference system (ANFIS) is a hybrid technique that integrates the advantage of learning in an Artificial Neural Network (ANN) and using a set of fuzzy if-then rules with appropriate membership functions to generate input-output pairs with a high degree of accuracy which is built on top of Fuzzy Sets and Fuzzy Modelling. ANFIS is a powerful tool for prediction, and this method has applications in prediction of stock prices. The study was done between 4/2017 to 5/2022.ANFIS model is used to predict closing prices of a few stocks and NIFTY index.

Keywords: ***Closing Price Prediction, ANFIS, Grid Partitioning, Subtractive Clustering, Fuzzy C Means***

1. INTRODUCTION AND PROBLEM DISCUSSION

Traditional equity market forecasting is based on fundamental and technical analysis. Fundamental analysis is suitable for long term investors with a buy and hold strategy, which examines the current and future health of the economy by analysing data like money supply, interest rate, inflation, financial data of the company like Price/Earnings ratio, dividend yield. Technical analysis is based on the premise that patterns repeat regularly and makes use of past patterns to predict future prices. Technical analysis tools are employed by traders with short time horizon; few hours or few weeks. Many traditional time series models have been proposed and applied to equity price forecasting. The prediction of stock prices has always been an attractive studying area that many people are interested in as it has the ability to generate profits and reduce losses to retail traders and institutional investors by better prediction of closing prices. So an ANFIS model for prediction for closing prices of equity indices and individual equity is developed.

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Received: 10th March 2022 *Revised: 16th April 2022* *Accepted: 25th May 2022*

AN INTRUSION DETECTION SYSTEM TO DETECT AND MITIGATING ATTACKS USING HIDDEN MARKOV MODEL (HMM) ENERGY MONITORING TECHNIQUE

D. SUDHA AND DR. A. KATHIRVEL

ABSTRACT

The operational state transition model is used in the IEEE 802.15.4 mobile adhoc network (MANET) literature to anticipate energy usage. In some circumstances, if the residual energy calculation is not dependent on a node's operational statuses, the exact quantity of energy exhausted by each node may not be revealed. To address these challenges, we propose in this study to use an energy monitoring technique to create an intrusion detection system that can identify and neutralise attacks. By monitoring the node's energy, the malicious attacks are disclosed in this technique. Using a Hidden Markov Model, the monitoring nodes forecast energy (HMM). Attacks are reduced by establishing an attack-free route between the source and the destination. We demonstrate that the proposed method is effective by using simulation data.

1.1 INTRODUCTION

The IEEE 802.15.4 Mobile Adhoc Networks (MANETs) are a collection of wireless nodes that work together to monitor a variety of environmental conditions (for example, forest fires, air pollutant concentrations, and object movement) without the need for any underlying infrastructure. Mobile adhoc networks are widely used to suit unique application needs due to their inexpensive production costs and quick deployment. Intrusion detection is one of MANET's applications that has grown in prominence due to its unique implementation, such as mobile nodes deployed in an ad hoc manner to monitor any military scenario (Raza et al 2015). MANETs are networks of small, low-cost, low-energy, multipurpose sensors that are installed in close proximity to track an object, monitor a phenomenon, or regulate a process. The Internet of Things (IoT) is a new concept that seems to represent the future of MANET. She assumes that all human beings will be equipped with sensors that connect to form networks that make life much easier. Internet of Things (IoT) wireless nodes dynamically connect to the Internet and use the Internet infrastructure to collaborate and complete tasks (Murad et al. 2013).

1.2 Various Types of Attacks

MANET applications are more vulnerable to security attacks. Such as,

1.2.1 Eavesdropping or Passive Information Gathering

MANET applications use insecure radio channels as communication media. If the information is sent in clear text, nearby enemies can passively interfere with communication between the two legitimate nodes. Opponents can intercept the conversation and use it to later launch more advanced attacks on the MANET.

1.2.2 Node Malfunctioning

Real sensor nodes can behave inefficiently in the network. A malfunction of a wireless node can reject high-speed data packets or reject packet forwarding requests (if it is acting as a relay device). These nodes can have a significant impact on the overall performance of your network and should be identified immediately.

1.2.3 Denial of Service (Dos)

Denial of service (DoS) attacks can take many forms. Such attacks can be used to temporarily reduce network capacity to provide services, or to interrupt or disrupt network communication. Different types of DoS include black holes, resource exhaustion, sinkholes, wormholes, flooding, guided routing loops, and more.

1.2.4 Node Subversion

If a trespasser captures a genuine node, it may reveal all encryption information, secret keys, and algorithm to the trespasser. The attacker can then simply access the secure communication of the MANET under assault. The adversary can utilise the true node as an attacker in order to perform an insider assault. At this point, such a node may be effectively permitted, and the attack may go undetected by the MANET. This assault could result in a high level of security breach and serious consequences.

1.2.5 Message Corruption

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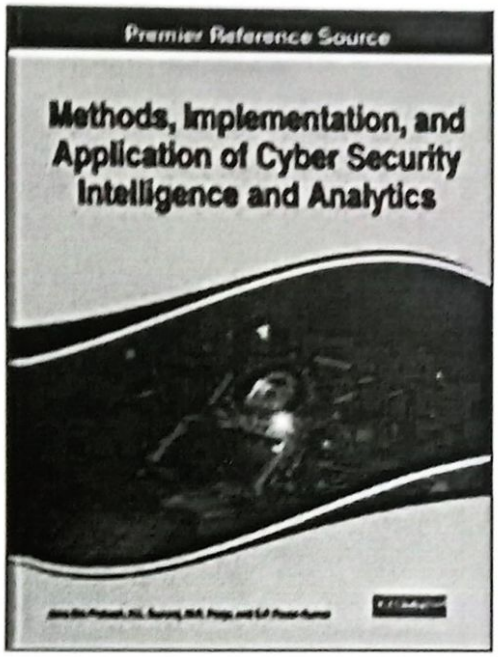

Artificial Intelligence-Based Billing System: Fingerprint Mechanism

Kathirvel A., Sabarinathan C., Saravanan N., Ramesh S., Meera S., Karnavel K., Sudha D.

Source Title: Methods, Implementation, and Application of Cyber Security Intelligence and Analytics
Copyright: © 2022
Pages: 14

DOI: 10.4018/978-1-6684-3991-3.ch009

Chapter 9
Artificial Intelligence–Based Billing System: Fingerprint Mechanism

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ABSTRACT

In our daily lives, we conduct billions of payment transactions, yet each payment method requires the transport of a substance. It is typical for users to have a variety of payment materials on hand, such as cash, credit cards, and even mobile phones. Meanwhile, these goods are easily stolen or misplaced. People suffer enormous trauma as a result of these incidents. This chapter details a biometric payment application created to introduce the concept of hardware less payments. It allows users to pay anytime and anywhere by registering their finger without any hardware. This involves registering user information once, and then all subsequent transactions are confirmed and processed by the user's fingerprint, with the application managing the entire process. This solution creates a new payment option and eliminates the risk of shipping valuables abroad. For the company, this application enables an efficient and secure payment system.

DOI: 10.4018/978-1-6684-3991-3.ch009

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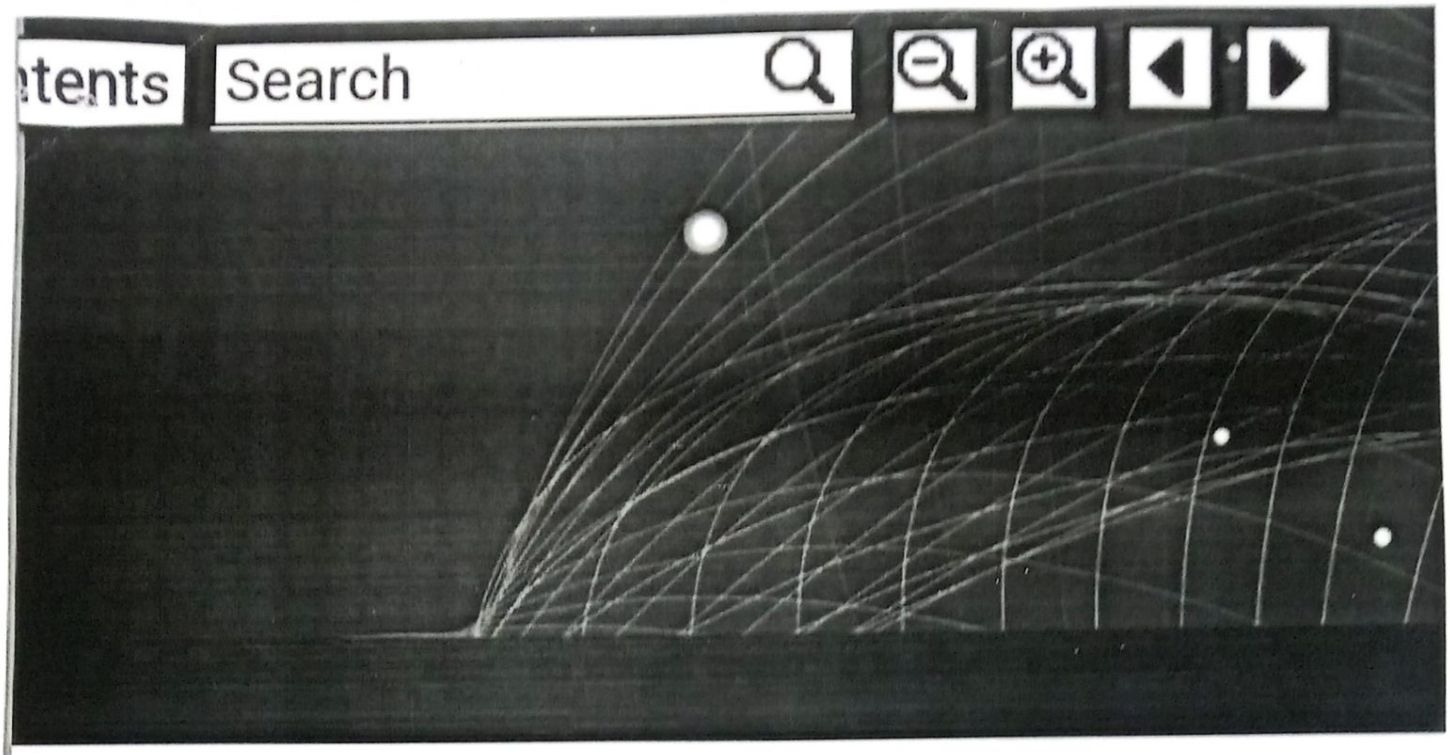
INTRODUCTION TO PAYMENT TRANSACTIONS

Since the early 16th century, payment transactions have been a part of our lives. It progressed from the barter system, in which products were exchanged in exchange for goods or services, to the modern form of transactions, which includes cash, credit/debit cards, e-wallets, and other methods. The barter system was used for a while until it was discovered that it was inaccurate owing to discrepancies in the value estimation of the items or services exchanged.

Later, coins composed of costly materials such as gold and silver were used in a more standard m
ner. This approach was convenient since it provided a uniform value for all goods and services,
was adopted by practically every King or ruler in the world. Currency bills and coins were intro
with the development of governments and the growth of civilisation. Currency bills are still in use
Many financial institutions, such as banks, have introduced the public to various paper and card-b
payment operations. The internet, e-commerce, e-payment, mobile banking, and payment have all gro
in popularity as a result of technological advancements and digitisation. All of these transactions have



SECURITY AND PRIVACY-PRESERVING TECHNIQUES IN WIRELESS ROBOTICS

Edited by
Amit Kumar Tyagi, Ajith Abraham,
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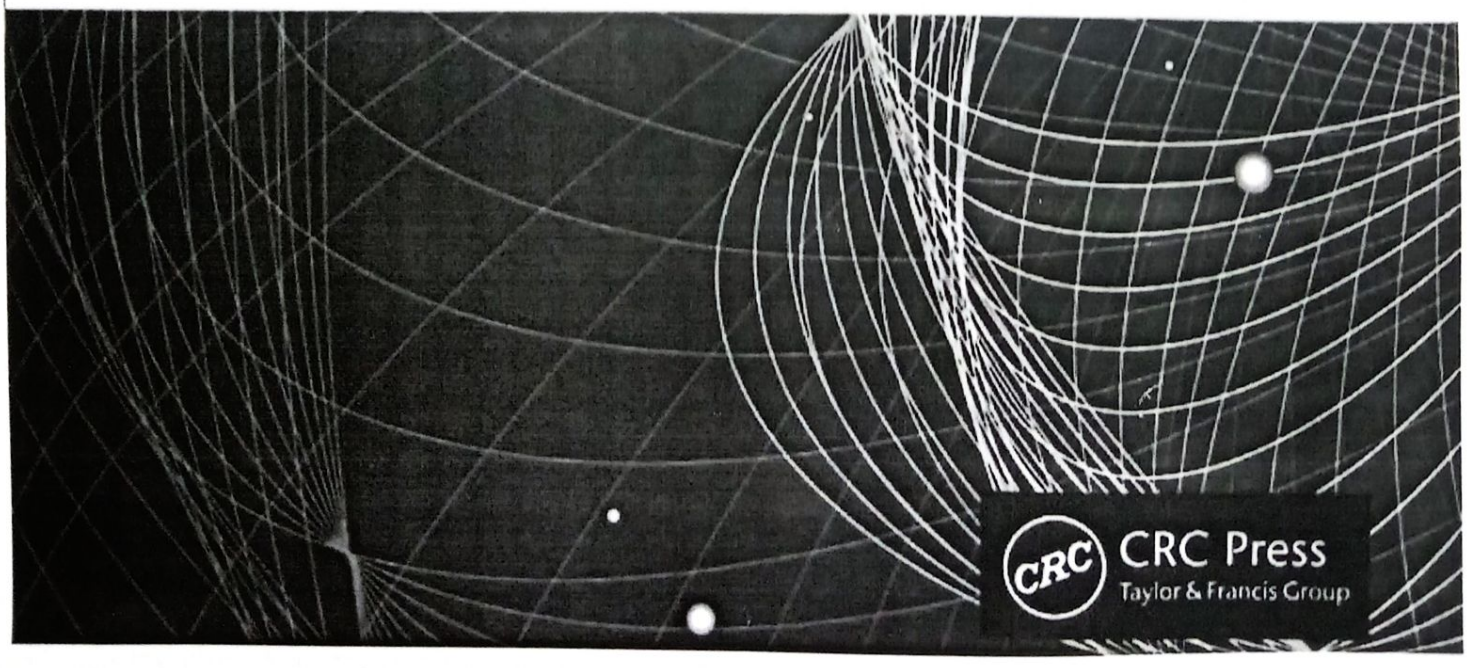

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EIDR SYSTEM FOR MANET USING TRUST INFERENCE MODEL

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Abstract

Mobile Ad hoc Network (MANET) is highly sophisticated than wired network. Ad hoc wireless network is mostly affected by different resources such as high processing energy, storage capabilities and battery backup and etc. Due to the open nature, poor infrastructure, quick deployment practices, and the conflict environments, make them susceptible to a wide range of attacks. Recently, the network attack affects the performance of networks such as network lifetime, throughput, delay, energy consumption, and packet loss. The conventional security mechanisms like intrusion detection system (IDS) of network security are not enough for these networks. In this paper, we introduce an enhanced intrusion detection and response (EIDR) system using to calculate the trust value of each sensor node using the multi objective differential evolution (MODE) algorithm. The computed trust value is used to design the intrusion response action (IRA) system, which offers additional functions and exhibit multiple characteristics of response to mitigate intrusion impacts. This results that the proposed EIDR system has a better detection rate and false positive rate without affecting network performance.

Keywords: Mobile Ad hoc Network (MANET), Intrusion Detection System (IDS), EIDR, (MODE), Intrusion Response Action (IRA).

ISBN: 978-93-91077-60-0

INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY

RESEARCH ARTICLE

Attention Balanced Multi-Dimension Multi-Task Deep Learning for Alopecia Recognition

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OPEN ACCESS

Received: 04-01-2023
Accepted: 08-04-2023
Published: 09-05-2023

Citation: Saraswathi C, Pushpa B (2023) Attention Balanced Multi-Dimension Multi-Task Deep Learning for Alopecia Recognition. Indian Journal of Science and Technology 16(18): 1365-1373. https://doi.org/10.17485/IJST/v16i18.29

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Funding: None

Competing Interests: None

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Published By Indian Society for Education and Environment (iSee)

ISSN
Print: 0974-6846
Electronic: 0974-5645

Abstract

Objective: To increase the accuracy of Alopecia Areata (AA) classification by learning local and global features across AA images and scalp hair images. **Methods**: An Attention-based Balanced Multi-Task Deep (AB-MTDeep) learning system is proposed. In this system, the MTDeep model incorporates both Multi-Task Learning (MTL) and Cross-Residual Learning (CRL) to simultaneously train hair and scalp images for recognizing AA conditions. In MTL, a new shared encoder is added to the MTDeep model, whereas in CRL, cross-residual layers are added to improve the model's efficiency. According to this learning, both local and global features are learned at multiple scales, as well as, concatenated to get the cross-feature representation. Such features are then classified by the softmax classifier to recognize AA conditions. **Findings**: Finally, the test outcomes demonstrate that the AB-MTDeep system on hair and scalp image databases realizes an accuracy of 95.11% compared to all other classical systems. **Novelty**: This model has considerably increased the accuracy of classifying AA conditions. Thus, it represents a promising classifier for AA classification.

Keywords: Dermatology; Alopecia Areata; FRCNNLSTM; Multitask learning; Crossresidual learning

1 Introduction

Many researchers have determined the variations in scalp conditions, yet in a few scenarios, they are difficult to find[(1)]. The deep learning-based intelligent scalp recognition system known as ScalpEye[(2)] elucidates how to automatically interpret scalp-hair microscopic images to evaluate the condition of the patient's scalp. The developed system is used for recognizing and diagnosing common scalp issues like psoriasis, cellulitis, baldness, and oily hair. This system includes a mobile application, a web-enabled deep learning engine, a web-enabled management system, and compact scalp microscopy. The deep learning engine used to detect various kinds of scalp issues is the FRCNN with the Inception_ResNet_v2_Atrous structure. AA is one of many scalp symptoms, with a lifespan frequency of about 2%[(3)] and a distinctive feature of rapid

International Journal of Engineering Trends and Technology
ISSN: 2231 – 5381 / https://doi.org/10.14445/22315381/IJETT-V70I8P236

Volume 70 Issue 8, 347-358, August 2022
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Original Article

Computer Imaging of Alopecia Areata and Scalp Detection: A Survey

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Received: 13 June 2022 Revised: 12 August 2022 Accepted: 24 August 2022 Published: 27 August 2022

Abstract *- Alopecia Areata (AA) is a frequent inflammatory affliction that causes erratic Hair Loss (HL). As with other resistant-influenced disorders, the development of AA is assumed to be the result of a complicated balance between surroundings and heredity. Various factors can cause hair loss, and trichoscopies and biopsies are usually required to ensure the cause of AA. There is currently no remedy for AA, although doctors can recommend various medications to support hair regrowth rapidly. AA does not immediately cause illness and is not communicable, but it is tough to adjust psychologically. Further, many people's experience with AA is regarded as a terrible infection that needs counselling for the mental and physical components of HL. So, an efficient HL detection system should be developed to tackle this emotional perceptive. Detecting the AA detection with scalp condition is required to find out the cause of AA level and can provide guidance for proper treatment. Computer vision using deep learning techniques is gaining significant attention because of improved performance over previous approaches. This article presents detailed analyses of different AA detection approaches using (Artificial Intelligence) AI techniques with modern Deep learning. First, AI-based frameworks designed by researchers in the past for different AA are studied briefly. After that, a comparative study is conducted to understand those frameworks' drawbacks and suggest new solutions to improve the AA detection system.*

Keywords *- Artificial Intelligence, Alopecia Areata, Hair Loss (HL), Scalp Condition, Detection System.*

1. Introduction

Hair is an important part of a person's appearance and may greatly influence their perceived attraction and identity. On the human scalp, 100,000 to 350,000 hair follicles go through cyclic stages of development. The frequency of the hair growth cycle is affected by age, disease, diet, and physiological characteristics. HL, also known as baldness, is a natural source of aging. There are two categories of HL, focal and diffuse, each with many underlying causes [1]. Table 1 presents the various kinds of HL and their characteristics, whereas Table 2 presents their causes.

Table 1. Varieties of HL and their Characteristics

HL category	Unique characteristics
Diffuse HL	
Women pattern HL	hair thinning is one symptom; unbroken hairline in front; a no-pull test
Men pattern HL	Hair loss is a symptom. ; M type pattern; negative pull test
Diffuse AA	Patchy Distribution; the positive pull test
Alopecia Universal (AU)	Total Hais Loss on the scalp and body
Telogen effluvium	30%–50% HL Positive pull test three months after the inciting incident
Anagen effluvium	2 weeks after chemotherapy, HL of up to 90% occurs suddenly.
Focal HL	
Non-scarring AA	Exclamation point hairs surround the usual scalp.
Tinea capitis	A potassium hydroxide investigation revealed a scaly scalp with fungus.
Traction alopecia	Patchy; may be scarred; may be related to hair habits.
Trichotillomania	Scarring and psychological distress are possible.
Scarring alopecia	Scalp scarring and thinning (e.g., discoid lupus erythematosus)

Table 2. Causes of Different Kinds of HL

Diffuse HL	Focal HL
1. Telogen effluvium (e.g., after disease or stress) 2. Anagen effluvium (e.g., after chemotherapy or radiotherapy) 3. Drugs	1. AA (possibly autoimmune) 2. Cicatricial (scarring) alopecia (e.g., lichen planopilaris, discoid lupus erythematosus, folliculitis decalvans) 3. Traction alopecia (e.g., improper hair ironing and braiding)

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Int. J. Adv. Sci. Eng. Vol.8 No.2 2188-2193 (2021) 2188 E-ISSN: 2349 5359; P-ISSN: 2454-9967

RESEARCH ARTICLE

Strongly B* - Continuous Multiset Functions In Multiset - Topological Spaces

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ABSTRACT: In this paper, we introduce the new concept of Sb^*- Open, closed and continuous multiset function in multiset topological space. Also study some interesting properties of Sb^*-closed and Sb^* –continuous mutiset function in multiset topological space

KEYWORDS: Multiset function, strongly b*- continuous M-set functions, strongly b*-open maps and closed maps.

https://doi.org/10.29294/IJASE.8.2.2021.2188-2193 ©2021 Mahendrapublications.com, All rights reserved

1. INTRODUCTION

Levine [12] introduced the concept of generalized closed sets in topological spaces and a class of topological spaces called $T_{\frac{1}{2}}$ - spaces. Dunham [7] and Dunham and Levine [8] further studied some properties of generalized closed sets and $T_{\frac{1}{2}}$ - spaces. Strong forms of continuous maps have been introduced and investigated by several mathematicians. Strongly continuous maps, perfectly continuous maps, completely continuous maps, open continuous maps were introduced by Levine [14], Noiri [19], Munshi and Bassan [16] and Reilly and Vamanamurthy [21] respectively.

Semi continuous functions have been studied by several authors. Dontchev [5], Ganster and Reilly [6] introduced contra - continuous functions and regular set - connected functions. Erdal Ekici [9] introduced and studied a new class of functions called almost contra – pre - continuous functions which generalize classes of regular set – connected [6], contra – pre continuous [12], contra continuous [5], almost s - continuous [18] and perfectly continuous functions [19]. Sunil Jacob John and Girish introduced Multiset Topology [26]. In this paper, we introduce the new concept of Sb^*- Open, closed and continuous mutiset function in multiset topological space. Also study some interesting properties of Sb^*-closed and sb^* –continuous mutiset function in multiset topological space.

2. PRELIMINARIES

In this section the necessary basic definitions are studied.

Definition 2.1[21]: A map f: X → Y from a topological space X into a topological space Y is called semi- generalized continuous (sg-continuous) if $f^{-1}(V)$ is sg- closed in X for every closed set V of Y.

Definition 2.2[2]: A function f: X → Y is said to be generalized continuous (g-continuous) if f^{-1} (V) is g-open in X for each open set V of Y.

Definition: 2.3[4]: A function f: X→ Y is said to be αg - continuous if $f^{-1}(V)$ is αg - open in X for each open set V of Y.

Definition 2.4[20]: A subset A of a topological space (X, τ) is called a strongly b^*- closed set (briefly sb^*- closed) if cl(int(A)) ⊆ U whenever A ⊆ U and U is b open in X.

Definition 2.5[19]: Let X and Y be topological spaces. A map f: X → Y is called strongly b*-continuous (sb*- continuous). If the inverse image of every open set in Y is sb*- open in X.

Definition 2.6: Let X and Y be topological spaces. A map f: X → Y is called strongly b*- closed (sb*-closed) map, if the image of every closed set in X is sb*- closed set in Y.

Definition 2.7: A subset (X, τ) is said to be α-closed set, if cl(int(cl(A))) ⊆ A.

Definition 2.8: A subset R of $M \times M$ is said to be an M-set relation on M, if for every member $\left(\frac{m}{x}, \frac{n}{y}\right)$ of R has a count, product of $c_1(x, y)$ and $c_2(x, y)$. we denote $\frac{m}{x}$ related to $\frac{n}{y}$ by $\frac{m}{x}$ R $\frac{n}{y}$.

Definition 2.9: An M-set relation f is called an M-

*Corresponding Author: rajeshagm@gmail.com

Received: 15.09.2021 Accepted: 25.10.2021 Published on: 15.11.2021

Smart Intelligent Computing and Communication Technology
V.D. Ambeth Kumar et al. (Eds.)
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doi:10.3233/APC210063

Experimental Investigation of Pulse Modulation Schemes in Free Space Optical Communication Under Turbulence

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Abstract. When we allow an optical beam to travel through Free Space Optical (FSO) Communication system, the optical beam faces immense issues due to so many factors such as diffraction, scattering, signal absorption, etc. These factors put down the quality rate of FSO communication system. In this experimental analysis, an artificial controlled turbulence chamber was built to create FSO communication with optical source laser. The signal to be tested is generated with the help of a LASER source, is allowed to pass on through the immense turbulent states by employing various pulse modulation schemes such as Pulse Amplitude Modulation (PAM), Pulse Duration Modulation (PDM), and Pulse Position Modulation (PPM) separately. In all the three modulation schemes, the parameters such as phase Jitter and 3dB bandwidth are observed and the observed values are compared. The results show that phase jitter value is 9.8414 radians for PPM. Also, PPM has the highest ability to overcome jitter than the remaining two schemes under high atmospheric turbulence parameters. However, in the case of Bandwidth utilization, PDM modulation reduces its utilization to 12MHz.

Keywords. Free Space Optical communication; PPM; PAM; PDM; Phase Jitter; 3dB bandwidth, performance, measurement.

1. Introduction

In the current scenario, free space optical (FSO) communication focuses a deep attentiveness in optical community because of its immeasurable advantages such as huge amount of data transmission over unlicensed spectrum, wireless communication technique used to send and receive various types of data at faster rate, larger bandwidth, gives high performance in optical networks, etc. [7-12]. Although, along with the advantages FSO faces certain troubles due to the presence variety of turbulent factors present in the environment which effects its performance [1,13]. FSO chooses Laser as

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2020-21

தொகுதி-8 எண் 2
Vol. 8 No. 2

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பங்குனி - ஆனி 2051
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(பன்னாட்டுப் பன்முகத் தமிழ்க் காலாண்டு ஆய்விதழ்)

Journal of Modern Thamizh Research

(A Quarterly International Multilateral Thamizh Journal)

Arts and Humanities (all), Language Literature and Literary Theory, Tamil
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Published by
RAJA PUBLICATIONS
No. 10 (Upstair), Ibrahim Nagar, Khajamalai,
Tiruchirappalli - 620 023, Tamil Nadu, India.
Mobile : 9600535241
Website : www.rajapublications.com

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தொகுதி : 8 எண் : 2
Vol. 8 No. 2

ஏப்ரல் - ஜூன் 2020
April - June 2020

ISSN : 2321 - 984X

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47	[illegible]	[illegible]	306-311
48	[illegible]	[illegible]	312-318
49	[illegible]	[illegible]	319-325
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ஆவணங்களில் கொங்கு வேளாளரின் சிறப்புப் பட்டப் பெயர்கள்

ர. சங்கமேஸ்வரன்
உதவிப்பேராசிரியர், வரலாற்றுத்துறை, சிக்கண்ணா அரசு கலைக்கல்லூரி
திருப்பூர், தமிழ்நாடு, இந்தியா

ஆய்வுச்சுருக்கம்

பயிர்த் தொழில் செய்துவந்த கொங்கு நாட்டைச் சேர்ந்த கொங்கு வேளாளர்கள் நாளடைவில் நிர்வாகப் பணிகளிலும் பங்குகொண்டு அரசர்களிடம் பல சிறப்புப் பட்டப் பெயர்களைப் பெற்றுள்ளது ஆவணங்கள் மூலம் தெரியவருகிறது தொடக்கத்தில் ஊர்ச்சபை, நாட்டுச்சபை உறுப்பினர்களாச் செயல்பட்டு பின்னாளில் நாட்டுத் தலைவர்களாக உயர்ந்து அரையர், மாராயர், காலிங்கராயர், முவேந்த வேளான், முதலிக்காமிண்டன், மன்றாடியார், பட்டக்காரர், பாளையக்காரர், வேணாடுடையார், வாணவராயர், பகதூர் போன்ற பட்டங்களைப் பெற்று அரசர்களுக்கு நிரை செலுத்தி ஆட்சியுரிமை, நிர்வாகம், வரி வருல், நீதி வழங்கள் ஆகியவற்றை மேற்கொண்டு சிறப்பெய்தினர்.

முன்னுரை

கொங்கு வேளாளர் வேளாண்மையைத் தொழிலாகக் கொண்டவர்களாக இருந்தபோதிலும் அரசு தொடர்பான பல பணிகளையும் ஆற்றியுள்ளமை ஆவணங்கள் மூலம் தெரியவருகிறது அவர்கள் பல சிறப்புப் பட்டப் பெயர்களைப் பெற்று பட்டக்காரர்களாகவும், பாளையக்காரர்களாகவும், நீதிபதிகளாகவும், அரசு அலுவலர்களாகவும் பல அரசர்களிடம் பணியாற்றியுள்ளனர்.

கலைச்சொற்கள்

கொங்கு நாடு; வெள்ளாளர்; கொங்கு வேளாளர்; கொங்குச்சோழர்; கொங்கிளங்கோன்; கொங்காள்வான்; மகமை; சந்தியா தீபம் அரையர்; மாராயர்; காலிங்கராயன்; வேளான்; காமிண்டன் முதலி, மன்றாடியார்.

கொங்கு நாடு

நம் செந்தமிழ்நாடு சேர, சோழ, பாண்டிய நாடுகளைப் போலவே தொண்டை நாடு, கொங்கு நாடு என்ற இரண்டு தனிப்பகுதிகளையும் பழங்காலத்தில் தன்னகத்தே கொண்டிருந்தது பழம் பெரும் இலக்கியமாகிய தண்டியலங்காரம், "மிகை தமிழ்நாடு ஐந்து" என்றும், வை சமய நூலகளில் மிகத் தொன்மையானதாகக் கருதப்படுகின்ற திருமந்திரம், "தமிழ் மண்டலம் ஐந்து" என்றும் தமிழ்நாட்டில் ஐந்து பிரிவுகளைக் கட்டுக காட்டுகின்றன கொங்கு நாடு மிகப் பழங்கால முதலே தமிழகத்தின் ஒரு பகுதியாகவே இருந்து வந்துள்ளது கொங்கு நாடு தற்போதைய மாவட்டப் பிரிவுகளில்கூறு கோயம்புத்தூர், நீலகிரி, திருப்பூர், ஈரோடு, கரூர், நாமக்கல், சேலம், தர்மபுரி, கள்ளகுறிச்சி மாவட்டத்தில் ஏற்காடு, ஆத்தூர், கங்கவல்லி, திருவண்ணாமலை மாவட்டத்தில் செங்கம், திருச்சி மாவட்டத்தில் குளித்தலை, திண்டுக்கல் மாவட்டத்தில் பழனி ஆகிய வட்டங்களை உள்ளடக்கியதாக இருந்தது

கொங்கு வேளாளர்

"வேளாளன் என்பான் விருந்திருக்க உண்ணாதான்" என்கிறது திரிகடுகம்' வேளாண் என்பதற்கு உபகாரி எனப் பொருள் கூறுகிறது தமிழ் பேரகராதி' வேள்ளம் என்ற சொல்லிருந்தே வெள்ளாளர், வேளாளர், வேளாண்மை என்ற சொற்கள் வந்திருக்க வேண்டும்' வேள்ளத்தை ஆண்டு பயிர்த் தொழில் செய்தவர்கள் வெள்ளாளர்கள், வேளாளர்கள் எனப் பெயர் பெற்றனர் வேளாளர் என்ற பெயர் கி.பி. ஏழாம் நூற்றாண்டு முதலும், வெள்ளாளர் என்ற பெயர் கி.பி ஒன்பதாம் நூற்றாண்டு முதலும் பெரு வழக்கிற்கு வந்தன.' வேளாளர் தமிழகம்

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(பன்னாட்டுப் பன்முகத் தமிழ் காலாண்டு ஆய்விதழ்)

Journal of Modern Thamizh Research

(A Quarterly International Multilateral Thamizh Journal)

Arts and Humanities (all), Language Literature and Literary Theory, Tamil
UGC Care Listed (Group-I) Journal

Published by
RAJA PUBLICATIONS
No. 10 (Upstair), Ibrahim Nagar, Khajamalai,
Tiruchirappalli - 620 023, Tamil Nadu, India.
Mobile : 9600535241
Website : www.rajapublications.com

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உதவிப்பேராசிரியர், வரலாற்றுத்துறை,
சிக்கண்ணா அரசு கலைக்கல்லூரி, திருப்பூர் - 2, தமிழ்நாடு, இந்தியா.

ஆய்வுச்சுருக்கம்:

தமிழக வரலாற்றைப் பொறுத்தவரையில் நடுகற்கள் முக்கிய வரலாற்று ஆதாரமாகக் கருதப்படுகிறது. இந்த ஆய்வுக் கட்டுரை புலிக்குத்திக்கல் என்ற நடுகல் வகையைப் பற்றி ஆய்வு செய்யப்பட்டதாகும். குறிப்பாகத் தமிழக வரலாற்றில் நடுகற்கள் வரலாறு, அதிலும் குறிப்பாக ஈரோடு மாவட்டம், பர்கூர் மலைப்பகுதி கிராமங்களில் உள்ள சோளகப்பழங்குடியினரின் புலிக்குத்திக்கல் பற்றிய ஒரு ஆய்வாகும். இவ்வாய்வின் மூலமாக இங்குள்ள நடுகற்கள் எந்த இனத்தைச் சார்ந்தவர்கள் உடையது, எதற்காக இந்த நடுகற்களை இவர்கள் அமைத்தார்கள், நடுகற்கள் பற்றிய நம்பிக்கைகள், நடுகற்களில் தற்போதைய நிலை போன்றவற்றை இக்கட்டுரை ஆராய்ந்துள்ளது.

முன்னுரை:

இந்திய வரலாற்றைப் பொறுத்தவரையில் இலக்கிய ஆதாரங்கள், கல்வெட்டு ஆதாரங்கள், நாணயங்கள், செப்பேடுகள், அகழ்வாய்வுகள் போன்றவற்றின் அடிப்படையில் வரலாறானது வடிவம் பெறுகிறது. அதன் அடிப்படையில் பார்க்கும் பொழுது கல்வெட்டு ஆதாரங்களின் வரிசையில் கிடைக்கப்பெறும் நடுகற்கள் வரலாற்றில் முக்கிய இடம்பெறுகின்றன. சில நடுகற்கள் எவ்வித உருவங்களும் இல்லாமலும் , கல்வெட்டுகள் இல்லாமலும் காணப்படுவதும் உண்டு அதை பெருங்கற்காலத்தைச் சார்ந்தவை என பிரிக்கப்படுகின்றது.இதற்கு புலிமான்கோம்பை நடுகற்களை உதாரணமாக கூறலாம். இன்னும் சில நடுகற்கள் புடைப்புச் சிற்பங்களை கொண்டதாகவும் கல்வெட்டுகள் அற்றதாகவும் காணப்படுகின்றன. மேலும் சில இடங்களில் கிடைக்கப்படும் நடுகற்கள் புடைப்புச் சிற்பங்களுடன் கூடிய கல்வெட்டுகளையும் கொண்டுள்ளன. மேற்சொன்ன வகையில் கிடைக்கப்பெறும் நடுகற்களின் மூலமாவும் அதன் சிற்பத்தின் தன்மைகளும் ஏற்றாற்போல வரலாற்றில் காலங்கள் நிர்ணயிக்கப்படுகின்றன. அதேபோல் ஒரு குறிப்பிட்ட மக்களின் வாழ்க்கை முறையைப் பற்றி அறிந்து கொள்ளவும் முடிகிறது, வீரதீர செயல்களைப் பற்றியும், தியாகங்களை பற்றியும் நாம் இந்த நடுகற்கள் மூலமாக சிறப்பான முறையில் அறிந்து கொள்ள முடிகிறது. எனவே நடுகற்கள் குறிப்பிட்ட மக்களது சமுதாய மற்றும் பண்பாட்டு நிலையை விளக்குவதால் இவை வரலாற்றில் முக்கிய இடம் பிடிக்கின்றன.

நடுகற்கள் எதற்காக அமைக்கப்படுகின்றன?

நடுகற்கள் அமைக்கப்படுவதற்கு சில காரணங்கள் இருந்து வந்துள்ளது. இன்றைய காலகட்டங்களில் இராணுவத்தில் போரிட்டு இறக்கும் வீரர்களுக்கு இந்திய அரசாங்கம் விருதுகளை வழங்குவதைப் போல அக்காலத்தைய மக்களின் உன்னதமான தியாகத்திற்கும், வீர மரணத்திற்கும் நடுகற்கள் அமைக்கும் முறை இருந்து வந்துள்ளது. இவ்வகையான நடுகற்களை அமைக்கும் பொழுதுதான், அவர்களின் வீர தீர செயல்பாடுகள் பெருமளவில் மக்கள் மனதில் நிலை பெற்றிருக்கும் என்ற நம்பிக்கையும் இருந்து வந்துள்ளது. தனது மன்னனின் விசுவாசத்திற்கு பாத்திரமாக போர்க்களத்தில் உயிர் நீத்திருந்தாலோ அல்லது தமது உயிரைக் காப்பாற்றுவதற்குப் போராடி தன்னுடைய இன்னுயிரை நீத்து இருந்தாலோ அவர்களுக்கு நடுகற்கள் வைக்கும் வழக்கம் பரவலாகத் தமிழ் சமூகத்தில் காணப் பெற்றுள்ளது.

ISSN-2349-5

FACTORS INFLUENCING THE BUYING TENTION OF ORGANIC TEA CONSUMERS *IN COIMBATORE DISTRICT*

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trend of population and concern for nutrition, health, quality of foods and environment n has resulted a change in consumption of organic foods especially Organic Tea. In this several studies have been conducted about the awareness and nature of consumption of organic concluded that it is significantly higher in developed countries than developing ones. Most of the ...ed to developed countries. Very few research studies have been conducted in detail with various factors that influence consumes perception with respect to organic tea products district. The rise in per capita purchasing power, accompanied by the increase in awareness the social, environmental and health benefits of organic products, has not only increased the ...products but also incentivized the development of the organic value chain, as evidenced by developments in industries such as e-commerce, supply chain, storage and processing. The ...aims at analysing factors influencing consumer awareness levels and buying perception Organic Tea with the help of structured survey of 385 respondents in Coimbatore district

Environment, Organic Tea, Health, Lifestyle, Premium

duction:

...practiced with varying levels of success in 178 countries. However, the North ... European Union regions (as single markets) generate the bulk of the global sales. The global ... to US$89.7 billion in 2016 from US$7.9 billion in 2000. According to Snehaghan and ... "Consumption of Tea has always been a social and more of a habitual concept for most of ...consumers. Increasing health awareness and widespread diseases will lead to a consumption of ...Tea and Green Tea with more natural flavours". It is the most popular consumed drink in India. As ...overview, Production and trade; Retail facts; Consumer behavior 2016, "Turkey is the largest tea-...country in the world, with a per capita tea consumption of approximately 6.96 pounds per year. In ...India has an annual consumption of 0.72 pounds per person". In cities and towns people are more ...about the health benefits of different type's organic tea products. So the demand for such product ...in the ...areas.

Kala Sarovar ISSN: 0975-4520
(UGC Care Group-1 Journal) Vol-23 No.04(IX) October-December 2020

KNITTED GARMENT EXPORTERS PREFERENCE USING INTERNATIONAL COMMERCIAL TERMS: SPECIAL REFERENCE FROM TIRUPPUR DISTRICT

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Abstract

Incoterms are definitions and translations of business terms that are universally acknowledged. It implies that they are intended for use in contracts for the offer of products. In global exchange, Incoterms help characterize the duties of the gatherings regarding expenses and danger. The delivery reports must, in this way, obviously express the Incoterms pertinent to the exchange. The incoterms are utilized by purchasers and venders to characterize their separate functions in the possession, danger, and obligations in a global exchange measure, including their transportation. These guidelines are additionally acknowledged by governments, worldwide associations, and legitimate specialists over the world, which makes it simpler to actualize the equivalent if there should arise an occurrence of any contest or settlement. In global trade language is biggest barrier that time incoterms plays a inevitable role .Therefore using incoterms is significantly reduce the language barrier and help to negotiate the buyer and seller in international ltrade. This study focused only incoterms mostly used by india special reference to knitwear exporters from tiruppur district.

Keywords: Incoterms, ICC, FOB, CIF, CFR, CIS, International Trade.

INTRODUCTION

The uniqueness of every area and nation impacts the neighborhood tongue. This is genuine even among English-talking nations. We as a whole sk'll a lorry in the UK is known as a truck in the US. Notwithstanding, the International Chamber of Commerce (ICC) has ensured that no such equivocalness exists with regards to business. In view of this, it thought of International Commercial Terms, which means 'International Commercial Terms'. It not just enables purchasers and venders to explain their questions with respect to foreign exchange contracts, yet additionally conveys business plans easily. A portion of these International Commercial Terms apply to any method of transportation and some of them apply just to transportation across ocean and inland streams.

USES OF INTERNATIONAL COMMERCIAL TERMS

Incoterms are definitions and translations of business terms that are universally acknowledged. It implies that they are intended for use in contracts for the offer of products. In global exchange, Incoterms help characterize the duties of the gatherings regarding expenses and danger. The delivery reports must, in this way, obviously express the Incoterms pertinent to the exchange. The ICC previously accumulated elite of Incoterms route in 1936. The 100-year-old association has been refreshing it throughout the a very long time to ensure they stay pertinent with changes in exchange rehearses. In the course of recent many years, there has been an update of Incoterms concurring with the primary year of every decade: 1990, 2000, 2010.

The incoterms are utilized by purchasers and venders to characterize their separate functions in the possession, danger, and obligations in a global exchange measure, including their transportation. These guidelines are additionally acknowledged by governments, worldwide associations, and legitimate specialists over the world, which makes it simpler to actualize the equivalent if there should arise an occurrence of any contest or settlement.

The part of incoterms in global obtainment and exchange can't be overemphasized. It resembles a general business language that is perceived and acknowledged by everybody around the globe. It diminishes irregularities in language by normalizing explicit terms. It empowers gatherings to utilize the global gracefully chain and decreases the odds of unjustifiable exchange rehearses by carrying greater clearness to trade exchanges.

CONSUMER ATTITUDE TOWARDS ORGANIC FOOD PRODUCTS IN COIMBATORE CITY

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ABSTRACT

The term "Organic Food" is foods that are produced in the methods and standards of organic farming. Various methods and standards are followed in different countries on their economic basis. In general, organic farming features, practices and resources promote ecological balance and to conserve biodiversity. Constantly, using of pesticides and fertilizers are strictly restricted for producing organic products. Organic foods are not usually produced and farmed by using irradiation, industrial solvents, and synthetic food additives etc.The current study focused on consumer attitude towards organic food products that are carried in Coimbatore city with a sample size of 150 household respondents who are familiar in organic food products by adopting multistage sampling technique.

Keywords: Organic Food, Products, Organic Farming etc.

LIST OF ORGANIC STORES TAKEN FOR THE STUDY.

1. Bio Basics - Vadavalli, Coimbatore.
2. **Bonville Organic International** - Edayarpalayam Coimbatore.
3. **Sri Ayyappa Ghee Stores** - RS Puram, Coimbatore.
4. **Genius Nature Herbs Pvt Ltd** - Madhampatti Coimbatore.
5. **Aram Organic Store** - Saibaba Colony, Coimbatore.
6. Go Nature Organic Foods - Srivalli Bus Stop, Coimbatore.
7. **OTR Organic Farm Products** - Saibaba Colony,Coimbatore.
8. **Senthur Organic Product** - Nesavaalar Colony, Coimbatore.
9. **Sugam Organic Food Store** - Peelamedu, Coimbatore.
10. **Multi Organic Foods** - Papanaicken Palayam, Coimbatore.

INTRODUCTION

Food consuming pattern and attitude is changing rapidly among consumers and they are concentrated in preferring healthy and safety food products. There are strictly avoiding food items consisting of fertilizers, pesticides and synthetic chemicals which are not suitable for their health and environment. Organic products

THINK INDIA JOURNAL

ISSN:0971-1260
Vol-22-Issue-14-December-2019

Consumers Awareness And Perception Towards Organic Products With Special Reference To Coimbatore City

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ABSTRACT:

Organic foods are foods produced by methods that comply with the standards of organic farming. Standards vary worldwide. However, organic farming in general, features practices that strive to foster cycling of resources, promote ecological balance, and conserve biodiversity. Organizations regulating organic products may choose to restrict the use of certain pesticides and fertilizers in farming. In general, organic foods are also usually not processed using irradiation, industrial solvents or synthetic food additives.

Currently, organic food is food produced in a way that complies with organic standards set by national governments and international organizations. Although the produce of kitchen gardens may be organic, selling food with the organic label is regulated by governmental food safety authorities.

There is no sufficient evidence in medical literature to support claims that organic food is safer or healthier than conventionally grown food. While there may be some differences in the nutrient and anti-nutrient contents of organically and conventionally produced food, the variable nature of food production and handling makes it difficult to generalize results. Claims that organic food tastes better are generally not supported by evidence.

A broadly defined category of food which, in the purest form, is grown without chemical fertilisers or pesticides and sold to the consumer without adding preservatives and synthetic food enhancers; it is widely believed by advocates of alternative healthcare that organically grown foods are safer and more nutritious; however, there are no compelling data

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ISSN: 0474-9030.
Vol 68, Issue 2, Jan 2020.

FINANCIAL INCLUSION AND FINANCIAL LITERACY

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Abstract :

Understanding the basics of managing money is vital for the well being of people and empowering them financially India's flagship financial inclusion programme, Pradhan Mantri Jan Dhan Yojana (PMJDY), has been able make universal access to a bank account a near reality, but the level of usage of accounts remains quite low. India has now 180 billion accounts. But 48 per cent of the bank accounts have seen no transactions in the last one year, according to the World Bank's Global Findex database. We must remember that the right measure of financial inclusion is not access, but regular usage.For making successful use of financial services, people need to be literate enough to understand the basics of managing money. This skill is known as financial literacy. In simple terms, it refers to a set of skills that allow people to manage their money wisely along with some understanding of essential financial concepts, not least an appreciation of the trade-off between risk and return

Key words : Financial Inclusion, Financial literacy, Money Management

INTRODUCTION

India is one of the largest and fastest growing economies of the world, but what has been the most disturbing fact about its growth is that its growth has not only been uneven but also discrete. It has been uneven in the sense that there has been no uniformity in its growth performance and it has been discrete and disconnected with regard to growth and distribution of growth benefits to certain sectors of economy. The Indian economy, though achieved a high growth momentum during 2003-04 to 2007-08, could not bring down unemployment and poverty to tolerable levels. Further, a vast majority of the population remained outside the ambit of basic health and education facilities during this high growth phase. In recent decades, economic and social inequalities have increased alongside high growth rates which have increased regional inequalities. Over 25% of Indians continue to live in abject poverty. As a result, Inclusive growth has become a national policy objective of the Union Government. And thus the need for inclusive growth comes in the picture of Indian economic development. In context of Indian growth planning it is a relatively new terminology which got the attention of policy makers in the Eleventh Five Year Plan.

Inclusive growth as the literal meaning of the two words refers to both the pace and the pattern of the economic growth, it basically means, broad based, shared, and pro-poor growth. As per the Planning Commission of India "The term "Inclusive" should be seen as a process of including the excluded as agents whose participation is essential in the very design of the development process and

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Impact factor 5.8

JASC: Journal of Applied Science and Computations ISSN NO: 1076-5131

PROBLEMS FACED BY GARMENT EXPORTERS IN TIRUPUR DISTRICT - CURRENT SCENARIO

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ABSTRACT

Tirupur is the seventh biggest city in Tamil Nadu and is one of the quickest creating urban communities in the state. Prevalently known as "Dollar City" or "Little Japan" or Banian City" it exceeds expectations in sewed instant pieces of clothing. However, at first look, nothing about Tirupur can influence one to trust that this town wins and yearly $1200 million or more in outside trade. This is on the grounds that the state government and neighbourhood civil specialists have been too moderate to even think about coping with this dynamic development. The primary issues and troubles looked by the Tirupur Garment industry identify with raw material accessibility, evaluating, auxiliary and subordinate ventures like processing units, work, tax assessment and other law-implementing organizations.

Keywords: export, export problems, garments, textiles, Government Policy.

INTRODUCTION

The material and attire industry can be extensively isolated into two portions - yarn and fiber, handled textures and clothing. The household material industry in India is assessed to reach US$ 223 billion by 2021FY from US$ 150 billion in November 2017, while cotton creation in India is have achieved 36.1 million bunches in FY19. In FY19, development in private utilization is relied upon to make solid residential interest for materials. Material and attire trades from India are relied upon to increment to US$ 82 billion by 2021. Fares of materials and attire from India came to US$ 21.95 billion in FY19*. Synthetic pieces of clothing remain the biggest

ISSN NO: 1021-9056

LEVEL OF PERCEPTION ON MARKETING PROBLEM ON FLOURICULTURE FLOWERS IN TAMIL NADU

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Abstract

In India, floriculture is emerging as an important commercial crop. A lot of importance has been given to this sector due to its multiple uses, satisfying the aesthetic needs of the people. The economic development of a country depends on the development of the core industry in which the majority of its people have been engaged for quite a long time. Indian economy has been largely based on agriculture from time immemorial. Objectives of the study, to analyse the level of perception on marketing problem on floriculture flowers in Tamil Nadu. Methodology of the study, the study is a combination of both descriptive and analytical. The farmers are continuously cultivating Jasmine/rose/cutflower intensively and extensively. Whether they get gain or loss. The familiarity and acquaintance of the researcher with the District economy has influenced the decision in selecting Tamil Nadu. The primary data as well as secondary data has been collected. Conveience sampling method has been used in this study. Suggested this study, the trends in arrivals of traditional flowers in the market of Tamil Nadu, show a substantial increase over a period of time. But there has been congestion and lack of proper infrastucture in the market. There is no agency to regulate the prices in the market. Conclude this study, The new seed policy had already made it feasible to import planting material of international varieties.

Keywords: Air frieght, seasonal, exbortiant etc.,

INTRODUCTION

Floriculture is becoming a booming industry in the World today. This sector, according to international trade classification, encompasses (a) bulbs, tubers and tuberous roots, (b) other

ISSN NO: 0022-1945

LEVEL OF PERCEPTION ON FACTORS INFLUENCING TOWARDS EXPORT OF FLORICULTURE PRODUCTS IN TAMIL NADU

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Abstract

Floriculture in India is being viewed as a high growth Industry. Commercial floriculture is becoming important from the export angle. The liberalization of industrial and trade polices has paved the way for development of export oriented production of cut flowers. The new seed policy has already made it feasible to import planting material of international varieties. Objectives of the study, to findout to level of perceptionon factors influencing towards export of floriculture products. Methodology of the study, Primary as well as secondary data has been used in this study. Primary data collected from floricultural exporters from interview schedule. Secondary data collected from National Horticulture Board (NHB), Agricultural and Processed Food Products and Export Development Authority (APEDA) to know the provision for floriculture development as well as trade of flowers. Suggested this study, all these are contributory factors for not reaching the flowers to various destinations on time. This is also affecting the quality of flowers due to lack of direct flights to various destinations. Adequate and direct flights with enough space should be arranged to overcome this problem. Conclude this study, the proposed study has carried out a primary investigation mainly focusing on the traditional flower-growing farmers for knowing their socio-economic conditions and income and employment generation.

Keywords: Flight rates,Export, import etc.,

Heritage
Core Listed Journal
ISSN: 0474-9030.
Vol 68, Issue 2, Jan 2020.

FINANCIAL INCLUSION IN DIGITAL INDIA AND OVERCOME THE CHALLENGES FOR SUCCESSFULL IMPLEMENTATION

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bstract

oday the world is digital world. All over the universe being digital. Digital india comes and evelopment is growing, it is a programme to prepare india for a knowledge future. Digital is a -governance services for the people of india in the digital platform, like e-commerce services, nancial services, database services, etc. In the public sector and private sector in the field of ducation, medical, banking, transportation, judiciary, marketing, etc. Digital india campaign was ne of the great initiatives launched by the government of India with the main purpose to make ie society and economy digitally empowered. Through digital india, the government makes ire to provide all its services electronically to the citizens of the country with the mandated nplementation and transparency. It will be more beneficial to the educated people in india because educated people may face many security issues due to the hackers. The are many problems and allenges in the way of its successful implementation like digital illiteracy, poor infrastructure, w internet speed, lack of coordination among various departments, issue pertaining to taxation c. The paper also highlights the financial inclusion in vision of digital India Programme, the key ojects and pillars of digital India Programme, opportunities of digital programme to develope dia and Problems that government needs to address quick and also to overcome the challenges r successful implementation of digital india programme.

eywords: World, Digital India, Empowered, Challenges, Overcome.

TRODUCTION

e Journey of e-Governance initiatives in India took a broader dimension in mid 90s for wider sectoral plications with emphasis on citizen-centric services. Later on, many States/UTs started various overnance projects. Though these e-Governance projects were citizen-centric, they could make ser than the desired impact. Government of India launched National e-Governance Plan (NeGP)

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A STUDY ON THE AWARENESS ABOUT GREEN SKILL DEVELOPMENT PROGRAMME AMONG COLLEGE STUDENTS IN TIRUPUR TALUK

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Abstract

"To protect the environmental right of our future generations, all of us have a green social responsibility. The fast evolving and emerging technologies in dynamic world to combat the menace of environmental degradation need to be complemented by specially trained and skilled manpower in various field at all levels. Imparting skill sets for greener transformation will generate employment opportunities and strengthen our resolve to conserve and preserve the priceless environment." - Dr. Harsh Vardhan, Minister, Environment, Forest and Climate Change. The Green Skill Development Programme (GSDP) of the Ministry of Environment, Forest and Climate Change is an initiative for skill development in the environment and forest sector to enable India's youth to get gainful employment and/or self-employment. The programme endeavours to develop green skilled workers having technical knowledge and commitment to sustainable development. It will help in the attainment of the Nationally Determined Contributions, Sustainable Development Goals, National Biodiversity Targets as well as Waste Management Rules (2016). The pilot project of GSDP was launched in June 2017. The Hon'ble Minister Dr. Harsh Vardhan has launched the full fledged Programme on 14th May 2018. Every programme of the government requires citizen participation which may be fulfilled through awareness. In this context, the present study has been carried out to find out the level of awareness about Green Skill Development Programme among college students in Tirupur Taluk.

Keywords: ***Skill India, Skill development, Green skill, Environmental degradation, Sustainable development.***

PROBLEMS AND PROSPECTS OF COCONUT PRODUCT MARKETING IN COIMBATORE DISTRICT

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ABSTRACT:

In India coconut product marketing is one of the oldest, widely accepted, and highly appreciated cultivation. In this paper, an attempt has been made to determine the problems of coconut product marketing in Coimbatore District. A sample of 100 respondent's were purposively selected from Coimbatore District. The findings were analyzed using simple percentage analysis, and cross tabulation. Findings reveal that male respondents who have above 5 acres have high level of marketing problem towards coconut product

Keywords: *Coconut, Product, Important, Uses, Problems, Varieties, Marketing, Agriculture, Etc.*

INTRODUCTION

Coconut is a fundamental and important cultivation of Indian economy. If coconut production increases overall economic growth goes upwards. Coconut cultivation is an agricultural system which originated in the oldest century due to the early man's farming practices. During and after freedom it remains the largest economic sector in the country and plays a significant role in the overall primary sectors' socio economic development of India.

EVOLUTION AND GROWTH OF VIETNAM TEXTILE INDUSTRY

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Abstract

Vietnam, one of the leading textile industries in the country is at present the third largest exporter in the global apparel trade. The Industry showed a fast growth from 1980's and is contributing substantially to the country's economic development. Vietnam was able to achieve this in a short time and is consistently growing. The reasons for this development are studied and the factors that supported this growth is analyzed. At present the industry is facing stiff competition from its competitors and is struggling to keep up its export growth rate. With limited raw material base it has to import majority of its fabric and export at a competitive price. The industry faces many challenges and has to overcome these challenges in the future to maintain sustained development. A detailed study is made to understand the reasons for its steady growth and the factors that supported the past achievements so that the industry could understand that measures to be taken to overcome the future challenges. The study found that the garment exporters have already analyses the areas that should be developed to meet up to the future and are already taking steps with the help of its Government to enable the industry to suit itself the future expectation of the international apparel market.

Keywords: Textile Industry, Challenges, Export and Stiff Competition

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1.1. Introduction

Vietnam, a South East Asian country, is the world's 14 most populous country with 61.79 % of the population in the working age group. The textile and garment industry of Vietnam has a long history with hundreds of year's tradition where sericulture and weaving silk was practiced for a long period. Textile industry began its development during 1958 and has been its major export industry since 1980's when it opened its economy. Vietnam is a densely populated country with 94.5% literacy rate. The textile

A Discriptive Study on Challenges & Opportunities Faced by Fishery Sector's in India

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Abstract - Today Indian fishery sector shows the tremendous growth and fishery sector plays vital role while providing employment opportunity to millions of people in the country. At present Indian fishery sector contribute 6.5% of global fish production and 8% of global fish trade. Fish and fish production of the country total accounted for 1% GDP in January 2019. The fish production is facing steady growth and has proved that there is 17 fold increases etc. in 1950-51 the fish production is 0.75 MMT and in 2017-18 it was12.6 MMT it is an all time high fish production achieved by India. This paper deals with the year wise export performance form 2008-2017, item wise export performance with percentage of growth and challenges as well as opportunities faced by fishery sector particularly fishermen in India. This paper suggest that government must entitled the fishermen communities and arrange proper facility for their life time securities.

***Key words**: Fishery sector, aquaculture, agriculture, export performance, fisherman*

INTRODUCTION

Agriculture [illegible] developed [illegible] agriculture [illegible] sector [illegible] largest producer of fish in the world [illegible] production of 10.08 million metric tonnes next to China. India blessed with vast coastline [illegible] today fishing sector plays one of the most [illegible] employees more than 14.5 million people and helps in increasing net foreign supply of food, generate adequate revenue to nation, huge export potential and play a big source of earning foreign exchange to our country. At present India is the second [illegible] world with 12.6 MMT fish production with the value of Rs.47,620 crore in 2018-19 and [illegible] fish production with 65% of production [illegible] production from culture fish. Agriculture acted as backbone of Indian economy but in present days fish and fish products export are defined as one of the largest sector which contributes 11.09% in 2017-18. Indian fish are exported to major developed countries in the world. The fishery sector acts as a source of large section of population comes under below poverty line especially fishermen.

OBJECTIVE OF THE STUDY

i. To examine the product wise export performance and year wise growth of marine products in India.
ii. To analyse the challenges and opportunities faced by Indian fishery sector and fishermen.

REVIEW OF LITERATURE

B. Ganesh Kumar, K.K. Datta et al. (2008), auction system is a primary process in India's fish activity. But every state has followed separate marketing policies in India. Due to lack of awareness, fisherman have no knowledge on price so middlemen's role is very important in fishing activity. The study concluded, but everyone can follow uniform policies to avoid interaction of middlemen and profit is directly goes to fishermen.

Capt. Sricharan. V. Kazi and Dr. CH. Venkataiah (2012), in fishery sector we are compare to past years 2010 and 2011 as boom period while using Reefer containers (REFER) for export activities. Due to involvement of modern technology the containers were enlarged in size and [illegible] handling system, transportation system, seafood processing plants, testing labs and so are facing development in their structure.

Sanjida Binte Islam and Dr Md Mamun Habib (2013), each and every stage of an unit's supply chain is important for all activities. The supply chain in fishery sector is very important because the products are perishable in nature. The six aspects of supply chain are inventory, information, transportations, sourcing, pricing and adequate facilities. The timely delivery as well as timely shipment to international market and local markets to avoid contamination.

S.Pavithra, P.S.Ananthan, M.Krishnan (2014), the shrimp exported from India's started in 1991-2011 but in 1992 there is decrease in shrimp export then interaction of China and Indonesia as well changed the unit value may start decline in major market. For good quality, breeding and hygienic nature Indian shrimp has continued demand in International market.

Anjana V.M and Dr. Rosa K.D (2015), in every year there is steady increase in fishery export of our country. The product frozen fish and frozen shrimp have ranked first position in India and South East Asia is largest importer of our country product. For improvement in the government should follow stable marketing policies to reach all over the world.

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AN EMPRICAL STUDY ON EXPORT PERFORMANCE OF MARINE PRODUCT EXPORTERSTOWARDS CONFIRMATORY FACTOR ANALYSIS (CFA)

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ABSTRACT

The present study aims to analyze the export performance of marine product exporters in Tirupur district. Tirupur is a well known Cluster in knit tech city of Tamil Nadu and is now gaining importance in both domestic and international markets. The marine sector plays a dominant role in the economic development, foreign exchange, employment opportunities to all level of people in the society. The primary data has been collected from 140 respondents through well structured questionnaire based on reading questionnaire method. Most of the respondent has 10 to 20 years experience in the field because they have properly adopted the management for their long journey process to satisfy their buyers.

Key words: Export Performance, Quality, Marine sector, CFA-Amos

1. INTRODUCTION:

Today, marine sector is major upgrading market in India. Without the import and export activity there is no proper economic development. Fishery sector gives vital opportunities for national income, employment, export earning, nutritional security and most important thing is cheap rich in protein for human consumption. Marine product exports are very large group in agricultural exports and in 2018-2019 the value has accounted for export of marine product as Rs. 47,620 Cr. India is second largest producer of fish in the world with 13.7 million metric tonnes production in 2018-2019 and first in inland fish production. In India, Tamil Nadu is ranked 4th in fish production with brackishwater, inland and marine fishery resources both capture, culture fisheries in rural areas, mechanised boats, traditional fishing crafts and the government has plan to enhance the inland fish production in upcoming years.

1.1. NEED OF THE STUDY:

The fishery exports has nominal role in increasing the countries utility. Most of the exporters have strong export business but the same time some them loose their business in short time. CAF in Amos used to verify the structure of observed variables in the study. To overcome the position the CFA-model will suggest the proper variables to give attention to their business activities in international market.

1.2. OBJECTIVE OF THE STUDY:

To find out the influence of export performance based on quality upgradation, price, trust worthiness and timely delivery.

2. REVIEW OF LITERATURE:

N.Aswathy et al (2011) the study reveals macro analysis of the pricing strategy and marketing channels of fish products and concluded that hygienic handling and proper packaging gives promising price scope in the export market.

Apu Das et al (2013) determine the consumer preferences in fishery market with 160 customers were revealed that hygienic and infrastructure facility plays a major role.

Sonmonia Bhuyan et al (2013) the study analyse the technical effeciency in fish farming with 150 respondents and concluded that good breeding with latest technology helps huge price in export market.

Pankajkumar Hanmantrao Mugaonkar et al (2013) reveals the awareness of sea food labelling with 120 respondents and concluded that moreover 50% of the consumers has awareness related to label reading habit

Journal of
Environmental
Nanotechnology

Research Article

Effect of Complex Phase Plate on Tight Focusing of Azimuthally Polarized Dark and Anti-dark Gaussian Beam

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Received: 21.08.2019 Accepted: 25.09.2018 Published: 30-09-2019
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ABSTRACT

This study was focused on azimuthally polarized Dark and Anti-dark Gaussian (DADG) beams passing through a high numerical aperture lens (NA). The Vector Diffraction theory was used to study the lens theoretically. It was reported that with appropriate phase modulation of the input DADG beam, the intensity distribution of the focused region can be modified to be a focal hole segment with numerous focal holes separated by varied axial distances. A chain of focal hole segments like this can be used for multiple trapping of low refractive index particles as well as an erase beam for STED microscopy with a high screening rate.

Keywords: Flattops; Optical tubes; Optical bubbles; Three-dimensional optical tube.

1. INTRODUCTION

A wide range of applications, including dark optical traps for atoms and manipulation (Friedman *et al.* 2002), guiding and binding of microparticles and biological cells (Mizmar *et al.* 2010) and erase beams for super-resolution fluorescence microscopy (Cizmar *et al.* 2010; Watanabe *et al.* 2003), have recently driven the generation of three-dimensional (3D) optical tube beams, which are dark regions in space surrounded by light. However, the most current technology of producing such optical tubes exhibits significant fluctuations due to unexpected diffraction. In addition, the DOE (Diffractive optical element) in the pupil plane is utilised to generate focus structures such as optical tubes, flattops and optical bubbles, which are useful for optical trapping and manipulation (Grimm *et al.* 2000; Tian and Pu, 2011; Lalithambigai *et al.* 2012). To establish a stable particle trap and transport particles with low and high refractive indexes, dissimilar optical gradient forces are necessary, and the scattering force considered is always proportional to optical intensity. Three-dimensional (3D) multi-site optical trapping requires a large number of concentrated spots in the focal region for high refractive index particles and a large number of focal holes for low refractive index particles, which is challenging to produce. A number of approaches for building multiple optical traps have been published; for example, a phase-contrast method for generating an array of focused spots utilising a multi-beam system was recently proposed (Lalithambigai *et al.* 2013; Prabakaran *et al.* 2014; Yiqiong Zhao *et al.* 2005; Cao *et al.* 2013). Dark hollow beams (DHBs) with zero central intensity have recently piqued the interest of many researchers due to their numerous uses in modern optics, atomic optics and binary optics. Several hollow laser beams with various intensity profiles have been introduced (Wang *et al.* 2004; Cai and Ge, 2006; Ito *et al.* 1996; Kuga *et al.* 1997; Cai *et al.* 2003; Mei and Zhao, *et al.* 2006a; 2006b; 2008). One such beam is the dark/anti-dark beam (DADB), which is theoretically introduced partially coherent diffraction-free modes (Ponomarenko *et al.* 2007). These beams can have intensity profiles with dips (or peaks) on a background to operate as nano-level atomic traps. Zhu *et al.* initially developed the approach of superposition of uncorrelated Bessel modes utilising holographic technology to construct DADBs (Zhu *et al.* 2019). A genuine cross-spectral density function criterion (Hyde and Avramov-Zumarovic, 2019) and a fully coherent class of dark/anti-dark paraxial modes named dark/anti-dark Bessel–Gaussian beams (DADGBs) have been proposed (Faroq and Belafhal, 2018). The propagation properties of these beams in a turbulent environment have recently been studied (Yaalou *et al.* 2019). The purpose of this study is to investigate the impact of a complex phase filter (CPF) on the focal characteristics of a tightly focused azimuthally polarised dark and anti-dark Gaussian (DADG) beam. It has been discovered that by properly designing a sophisticated phase filter for the incident DADG beam, one may produce several innovative focused patterns, such as focal ring splitting and multiple focal hole structures.

2. THEORY

The analysis was carried out using Richards and Wolf's Vectorial Diffraction approach, which is extensively utilised for high NA focusing systems with arbitrary incident polarisation. The incident azimuthally polarised beam's electric field distribution near the focussing is given by Richards and Wolf, 1959.

Journal · 2019-20 Entry

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மார்கழி 2050 - பங்குனி 2051
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(பன்னாட்டுப் பன்முகத் தமிழ்க் காலாண்டு ஆய்விதழ்)

Journal of Modern Thamizh Research

(A Quarterly International Multilateral Thamizh Journal)

Arts and Humanities (all), Language
(UGC-CARE List)

Published by
RAJA PUBLICATIONS
No. 10 (Upstair), Ibrahim Nagar, Khajamalai,
Tiruchirappalli - 620 023, Tamil Nadu, India.
Mobile : 9600535341
Website : www.rajapublications.com

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தொகுதி-8 எண்1
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Published by : Raja Publications, No. 10, Upst[illegible] Trichi[illegible]0 023, Tamil Nadu, India. Mobile : 9600535241
Printed : The Printing House, Tiruchirappalli - 620 [illegible], Tamil Nadu, India. Ph: +91 - [illegible]21

சோளக பழங்குடி ம க்களின் (ம்பிக்கைகள்

சி. குருசுந்திரபத்ம
உதவி பேராசிரியர், வரலாற்று துறை,
சிக்கண்ணா அரசு கலைக்கல்லூரி, திருப்பூர் - மிழ்நாடு. இந்தியா.

ஆய்வுச்சுருக்கம் :

இந்த ஆய்வு கட்டுரை சோளகர் என் பழங்குடி மக்களின் வாழ்வியலில் உ முன்னு பழக்கவழக்கங்கள் பற்றி ஆராய்கி ஆய்வுக்கு ஆங்கிலேயர்கள் கால எழுதப்பட்ட புத்தகங்களின் கரு அடிப்படையிலும் பர்கூர் பகுதிவாழ் பழங்குடிகளை நேரில் சந்தித்த அ அடிப்படையிலும் இந்த ஆய்வு அமையப்பெற்றுள்ளது. இன்றைய நவீ மருத்துவத் துறையில் பெரு நோய்களுக்கு மருந்துகள் கண்டுபி இருந்தாலும் இந்த பழங்குடி மக்கள் பழமையான மருத்துவமல்லாத செயல் நம்பிக்கை வைத்துவருவதையும் அதன விளைவுகளையும், விவசாயம் என்ற கூட மூடப்பழக்க வழக்கங்கள் எவ்வை சோளகர் பழங்குடி மக்களை கட் வைத்திருக்கிறது என்பதையும், பெரும்பான்மையான மக்கள் நம்ப மாந்திரீகம் போன்ற நம்பிக்கைகள் வாழ்க்கையை மேம்படுத்திக்கொள்ள வாய்ப்பாக நம்பிக் கொண்டிரு என்பதையும், இக்கட்டுரை விளக் அதுமட்டுமல்லாது வசியம் போன் இம்மக்கள் எந்த அளவிற்கு ஆழ்ந்த கொண்டுள்ளனர் எனவும், பெண்கள் இந்த மூடப்பழக்க வழக்கங்களில் உ படுகிறார்கள் எனவும் அதனால் அவர்க எவ்வாறு பாதிக்கப்படுகிறது எ அறிந்துகொள்ள முடிகிறது. அந்நோடு இருளில் சிக்கி இருக்கும் இம்மக் யுகத்தில் வாழும் மக்களோடு எவையெல்லாம் அவர்களுக்கு எட்டா

என்பதையும் இந்த ஆய்வுக்கட்டுரை
விளக்கி து.

இவ் உலகில் எல்லா நாடுகளிலும்
பழங்குடி மக்கள் வாழ்ந்துவருகின்றனர்.
உலகி இந்தியாவில்தான் அதிகமான
வன்னி ில் பழங்குடிமக்கள் வாழ்கின்றனர்.[1]
இந்திய ர் தொகையில் சுமார் 8.6%[2] தமிழக
மக்கள் கையில் 1.1%[3] பழங்குடிமக்கள்
வாழ்ந்து கின்றனர். பெரும்பாலும் நீலகிரி,
கொல லை, சேர்வராயன் மலை,
பச்சிமலையில் பர்கூர், தாளவாடி,
திப்பம், பூர் போன்றபகுதிகளில் அதிகம்
வாழ்கி அரசின் பழங்குடி னத்தவர்களின்
இனப்பி டி தமிழகத்தில் 36 பழங்குடி
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மற்றவ ம் இருந்து மாறுபட்டு
னைம் ன்றது.இவர்கள் பெரும்பாலும்
ர்நாட பகுதிகளில் ந்தாலும்,
ரோடு ம் அந்தியூர் க்காவிலுள்ள
ஜகே பகுதியில் ப ங்காலமாக
வாச்சாரத்தை ரி வாழ்ந்து
வருகி இம்மக்கள் நவீ ழில்நுட்பம்,
காடுக பு, பொருளாத ட்டுப்பாடுகள்,
டிடப் போன்றவை ாக்கத்தால்
வெளி லாச்சாரம் அ விலிம்பில்
கொள்ளலாம் ங்குடிமக்கள்
வர்களுக்கென் ந தலியான
கைகள் இரு எவ்வது
ர்கள், மலை லாளர்கள்
போல ம் ஏற்படுத்திக்கொள் ஒன்றாகும்,
மூல கூர் மலைப்ப ல் வாழும்

Mei Exporters Statisfaction Towards Various Incentive Schemes - Empirical Study

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Abstract - Tirupur is a textile town in Tamilnadu, which is popularly known as "DOLLAR CITY"., Emerging as a major hub for production of knitted garments. Among various industries, garment industry has grown significantly for the past three decades. This might have been due to increase in demand for garments, particularly due to increasing demand for Indian knitted garments abroad. Tirupur exporters are specialized in producing cotton based knitted garments.

Keywords - Satisfaction, Factor analysis, MEIS, SEIS, Collection, Variables etc.,

INTRODUCTION

The industry has now become one of the largest employment providers. Garments designed and manufactured to individual specifications and trends are exported to more than 100 countries world wide, the major regions being North America, EU, Latin America, and Middle East. The success is reflected in the fact that today garment export is one of the most important and the highest foreign exchange earners for the country

Tirupur city contributes over 56% in knitted garments. Buyers from 35 countries frequently visiting Tirupur. Tirupur can deliver customized samples in less than 12 hours and half a million pieces in a matter of few days. The Government of India in its Export / Import policy has recognized the city as the "Town of Export Excellence".

STATEMENT OF THE PROBLEM

Among various industries, garment industry has grown significantly for the past three decades. This might have been due to increase in demand for garments, particularly due to increasing demand for Indian knitted garments in abroad. Due to larger demands of foreign buyers, the garments industry was able to flourish. However, this industries also not an exception to problems. The industry has problems relating to labour, production marketing and finance as a result, the performance of the garment industry gets affected. In addition to technological and competitive problems, these problems pose a threat to the garment industry and hence it became necessary for this industry to concentrate on these vital issues and ensure better performance. It is also relevant to consider the factors that affect the growth of the garment industry and take appropriate remedial measures to solve the problems. In this context, it would be more relevant to make an attempt to study the performance related issues so as to know the comprehensive plan for the success of the garment industry despite its problems.

OBJECTIVES OF THE STUDY

1. To analyze the level of satisfaction towards exporters in Tirupur .
2. To give suitable suggestion to improve the satisfaction of exporters.

METHODOLOGY OF THE STUDY

The data has used primary data only. The primary data was collected from 300 units by using interview schedule method. For the purpose of collecting primary data, the interview schedule was prepared in such a way that the respondents were able to understand clearly and give their opinions freely and frankly. The interview schedule had been pre-tested and validated so as to meet the accuracy and reliability. Data was collected from Tirupur Exporters. Purposive sampling method has used in this study. Factor analysis has been used in this study. Data was collected from Septermber 2018 to December 2018.

LIMITATIONS OF THE STUDY

The study has consumed lot of time, involved several problems and became a challenge for the researcher to complete the data collection. The inferences of the study are subject to the limitations which are inherent to primary data. However adequate care has been exercised to collect unbiased data. The problems include difficulty in meeting the head of the exporting units, the reluctance on their part in providing the data etc.

ANALYSIS AND INTERPRETRATION

DIMENSIONALITY OF THE MULTI-SCALE ITEMS (FACTOR ANALYSIS)

Factor Analysis is a set of technique, which analysis correlation between variables and reduces their numbers into fewer factors which explain much of the original data, more economically. Even though a subjective interpretation can result from a factor analysis output, the procedure often provides an insight into relevant psychographic variables, and results in

BBA A - 18-19

EMPLOYABILITY SKILLS: PERCEPTIONS AND FACTS

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Abstract : The study has investigated the relationship of the engineering students' demographic variables (gender, medium in school, nativity, number of training programs attended earlier) on the factors of employability skills (stress coping, communication skills, leadership skills, team work and problem-solving skills, time management, and self-efficacy) in Coimbatore District. Most of the skills expected by different employers are communication, team working, leadership, initiative, problem solving, flexibility, attitude and enthusiasm. However, many of these skills overlap one another. Improving one skill will naturally improve other skills. Descriptive research design has been adopted in this study. The sample is final year engineering students of Coimbatore district. The researcher approached 150 students for this study and found only 137 students to have responded authentically. A well-structured questionnaire has been used to collect the primary data. Reviews on previous studies have been done with the help of various research journals. Analysis of variance in the collected data has been performed statistically to arrive at meaningful implications. This study has highlighted the importance of aligning employability with academic values by making explicit links between the demographic variables of engineering students and their employability skills. In addition, it has identified that there is a significant mean difference among the different gender of engineering students on the factor of employability skills namely communication skills where medium of instruction would have a played a significant impact.

Index Terms **- Communication Skills, Leadership Skills, Self-Efficacy, Stress Coping, Time Management.**

I.INTRODUCTION

Employers across all industries search for candidates who can demonstrate a wide range of employability skills which primarily include communication skills, team work, organizing, analytical skills, problem solving, negotiation skills, leadership skills and commercial awareness.

Employability skills are also commonly known as graduate qualities or transferability skills. Employability skills or graduate capabilities which emphasize on nurturing of non-technical skills are much essential for the engineering candidates at some level.

Enhancement of employability skills in higher engineering education have always been a subject of grave concern as critical need of these elements among graduates are essential to fulfil the modern industry's job expectations. In fact, due to competitive nature of engineering activities, industry is also recognizing the centrality of greater need of contemporary professional attributes, understanding, and capabilities of graduates; which has indirectly created a drastic impact on the employability rate of engineering graduates. In this connection, ample evidence indicates the existence of a significant gap between the students capabilities developed at the university/ higher educational institutions and the expectations of the contemporary employers.

As such, the educational curriculum should be frequently revaluated and revised to be relevant and to gravitate towards shaping the graduate's attributes that are desirable to the industry. However, there is a growing concern that the higher engineering education responsible for producing graduates with broader skills and attributes that are beyond technical and discipline competencies is not keeping pace with the need of work front. Hence, prioritising improvement in the engineering education system towards a different dimension is crucial in influencing the current trends in the engineering education to address this shortfall.

Services Rendered by Indian Construction Equipment Manufacturers Association to its Members

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Abstract
Earthmoving and Construction Equipment in India is one of the key sector in India's economic growth and having lot of potentials for the equipment manufactures and the component suppliers to bridge the gap between demand and supply. Also Construction equipment industry faces lot of challenges on the improvement side like technologies, quality, performance and safety features in the equipment. Another major problem is unskilled labours used for operating the machines. So, it became an imperative study about ICEMA and how it connects with other Governing bodies, Ministry's, associations from different countries and its members. This paper mainly aims the objectives and services offered by Indian Construction Equipment Manufacturers Association to its members in various forms of activities and bridge the gap for the growth of the industry.

Keywords: Indian Construction Equipment Manufacturers Association, Construction Equipment Industry, Mutual benefits, Responsibilities, Attributes, Demand and market growth.

INTRODUCTION

In India Earthmoving and Construction Equipment (ECE) industry is a key driver for growth of the economy. This industry is highly responsible for propelling India's overall development. Admittedly, from a general macro-economic perspective, India's construction equipment market has witnessed acceleration in its growth over a period in the past and present. The market is seeing a completely new level in its growth and the growing numbers should give a reason for optimism in Construction Equipment sector. It is expected that, Indian construction industry will become the third largest market for the global construction industry and especially the growth attributable to various infrastructure projects in the country. Over the next nine years, analysts expected an average growth of 6.2 percent per annum. The Earthmoving and Construction Equipment industry witnessed a year on year growth of around 35 percent in the first half of 2018. According to the ICEMA report, 120,000 units of construction equipment are expected to be sold by 2020. The possibility is very high to achieve these figures easily by the Indian construction industry from the focus of Government initiatives and ensures time-bound creation of world class infrastructures in the country.

INDIAN CONSTRUCTION EQUIPMENT MANUFACTURERS ASSOCIATION

"Indian Construction Equipment Manufacturers Association" (ICEMA) was established seven decades before in 1949 as a "Tractor & Allied Equipment Manufacturers and Importers Association Limited". This association was started with 10 Indian member companies, primarily manufacturers and importers of tractors, earthmoving and allied equipment. In 1986, this association was rechristened as "Indian Earthmoving & Construction Equipment Industry Association Limited (IECIAL)". The main objective of this association is to make the body a national point of reference for the Indian Earthmoving & Construction Equipment (ECE) industry. The association was renamed as Indian Construction Equipment Manufacturers Association

Plasmonics
DOI 10.1007/s11468-017-0526-0

Properties of Surface Plasmon Polaritons Excited by Radially Polarized Sinh Gaussian Beams

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Received: 23 September 2016 / Accepted: 3 February 2017
© Springer Science+Business Media New York 2017

Abstract Properties of surface plasmon polaritons (SPPs) excited by radially polarized sinh Gaussian beams with high-numerical-aperture system is investigated theoretically based on vector diffraction theory. It is observed that by properly tuning the beam waist size (w_0) and beam order (m) of the incident sinh Gaussian beam, one can achieve higher confinement in axial and lateral size of the generated plasmonic focal spot. We observed that sinh Gaussian beam of larger w_0 and m results in generation of highly confined plasmonic focal spot.

Keywords Surface plasmon · Radially polarized laser · Sinh gaussian beam

Introduction

As a technique to visualize refractive index distributions with small variations on metallic surfaces, surface plasmon (SP) microscopy has been proposed [1]. The enhancement of the electromagnetic field at the interface is responsible for surface-enhanced optical phenomena such as Raman scattering, second harmonic generation (SHG), and fluorescence. [2]. Recently, study of focusing SPPs has attracted great attention due to its important focusing properties. Tightly focused laser beams and appropriate plasmonic lens such as nanometer-sized protrusions or holes have been applied for focusing SPPs [3–5]. To improve the lateral spatial resolution on a planar surface, a focused beam technique utilizing radially polarized beam is proposed to confine the SPs in to a diffraction-limited plasmonic focal spot size [6–9]. These SPP microscopes have the SPP's propagating in a particular direction on that metal surface as sensing probes, and the spatial imaging resolution is basically limited by the SPP propagation length, which is typically a few tens of micrometers long [10]. Recently, Z. Man etal studied the properties of surface plasmon polaritons (SPPs) excited by generalized cylindrical vector (CV) beams in high-numerical-aperture microscopic system both theoretically and experimentally [11]. They observed that variety of total field distributions such as virtual probe, flat-topped pattern, and doughnut can dynamically be obtained through simply selecting the desired CV beams. In order to obtain focusing spot with higher resolution, several methods have been proposed based on far field apodization technique and handling of evanescent waves with near field diffraction structure [12–15]. However, the presence of a physical annular apodization or phase filter makes some applications more difficult or even impossible. Moreover, those specially designed apodizers are quite complex in phase and amplitude transmittance, so fabricating them is difficult and their efficiency is also low. Recently considering only the mode or intensity profile of incident beam is considered to be the best method to achieve focusing with high resolution. For example, the sharper focal spot was achieved by higher order radially polarized Laguerre-Gaussian beam and hollow Bessel-Gaussian beam [16–19]. Optical beams with zero central intensity, called dark-hollow beams (DHBs), have been paid much attention due to their potential applications in guiding and manipulating the neutral atoms and micro-size particles [20]. Recently, Q. Sun et al. introduce a new sinh-

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Published online: 22 February 2017

Int. J. Adv. Sci. Eng. Vol.4 No3 651-655 (2018) 651 ISSN 2349 5359

RESEARCH ARTICLE

Tight Focusing Properties of Phase Modulated Longitudinally Polarized Doughnut Gaussian Beam

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ABSTRACT: We investigated the focusing properties of a phase modulated radially polarized doughnut Gaussian beam by a high numerical aperture (NA) lens based on vector diffraction theory. We observed that our proposed system generates a sub wavelength focal spot of 0.42λ having large uniform focal depth of 5 λ. This kind of non diffracting focal segments is called as dark channel, which may have application in atom trapping, nanolithography, trapping and manipulating particles.

KEYWORDS: Radially polarized beam, Vector Diffraction theory, Doughnut gaussian beam, Optical Trapping.

DOI: 10.29294/IJASE.4.3.2018.651-655

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1. INTRODUCTION

Recently, research on longitudinally polarized laser beams has become a very hot topic due to its potential applications in various areas, such as particle acceleration [1], second harmonic generation [2], fluorescent imaging [3], optical data storage [4] and optical trapping [5]. A radially polarized beam can be focused to generate a strong longitudinal electric field at the focal plane, resulting in a focal spot sharper than that for a linearly polarized beam [6,7]. In theory, a radially polarized Bessel–Gauss beam is focused with a binary optical element and a high numerical aperture (NA) objective to produce a sub-wavelength longitudinally polarized light needle with a depth of focus (DOF) about 4λ [8]. Subsequently, several approaches, such as a narrow width annular beam [9], dual-beam focusing [10] and higher-order beams [11–13], have been employed to realize smaller focal spot sizes and longer DOF. It is of great importance to design the diffractive optical element (DOE) efficiently and accurately. Much work has been done to realize the desired goal methods of designing DOE [14-22,23]. Huang et al [24] formulated a method that combines the global-search-optimization (GSO) algorithm and the tight focusing properties of radially polarized light to design a DOE.

However, to the best of our knowledge, most of the previous research has dealt with beams with either the uniform [25,26] or Laguerre–Gaussian pupil apodization functions [25,27,28]. There has been hardly any investigation of incident beams with Gaussian and Bessel–Gaussian pupil apodization functions, much less a comparison of the optical shaping generated from these beams. Wang et.al [29] proposed the double-mode radially polarized (RP) beams can be generated conveniently. But the vector beams possess a uniform pupil apodization function; therefore, the corresponding optical shaping formed by those vector beams belongs to the case of uniform apodization pattern [25]. In fact, not only can double-mode vector beams with uniform pupil apodization functions be conveniently generated with that approach but so can Laguerre–Gaussian (LG), and Bessel–Gaussian (BG) beams as long as we replace the original computer-generated phase hologram with a new one that carries information of both suitable phase and corresponding amplitude. Having known the different properties of different pupil apodization functions in the case of not only propagation but also tight focusing [30], the optical shaping generated from the LG, the Gaussian, and the BG beams are assumed to show some novel properties. Therefore, a new kind of phase modulated radially polarized beam called doughnut Gaussian (DG) beam is introduced in a high NA focusing system. The defined DG beam is similar to a hollow Gaussian beam. In 2010, a sub-wavelength focal spot was achieved by using a radially polarized narrow-width annular beam [31]. The DG beam, which is similar to the narrow-width annular beam, is falling to the category of the Gaussian beams [32]. Considering that the intensity is null at the center of the doughnut beam, the focusing field of a radially polarized DG incident beam through a high NA lens will exhibit high resolution. In this article, we demonstrate the focusing performance of a longitudinally polarized doughnut gaussian beam with high NA focusing system.

2. Principle of the optical focusing system

A schematic diagram of the suggested method is shown in Fig.1.The longitudinally polarized doughnut Gaussian beam is focused through a multi belt binary phase filter (MBBPF) and is subsequently focused by a high NA lens. The analysis was performed on the basis of Richards and

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Received: 19.02.2018 Accepted: 25.02.2018 Published on: 20.03.2018

2018 extra

Opt Quant Electron (2018)50:77
https://doi.org/10.1007/s11082-018-1320-8

Tight focusing properties of spirally polarized LG $_{(1,1)^*}$ beam with High NA Parabolic mirror

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Received: 28 March 2017 / Accepted: 5 January 2018
© Springer Science+Business Media, LLC, part of Springer Nature 2018

Abstract The tight focusing of double ring shaped spirally polarized beam with high NA Parabolic mirror system is analyzed numerically based on the vector diffraction theory. Calculation results show that intensity distribution in focal region can be altered considerably on changing the spiral parameter (C) and pupil to beam ratio (β) of the incident double ring shaped beam. Many novel focal patterns such as focal spot, dark hollow focus and flat top profile of sub wavelength scale are achieved by proper tuning β and C.

Keywords Spirally polarized beam · High NA parabolic mirror · Vector diffraction theory · Optical trapping

1 Introduction

Recently, there is an increasing interest on cylindrical vector beams, mostly driven by the advances made in micro-fabrication techniques and theoretical modelling techniques that were not available with homogeneous polarization (Zhan and Leger 2002; Rao et al. 2009; Wang et al. 2013; Prabakaran et al. 2012). The Radial and azimuthal polarized beams are two special cases of cylindrical vector beam and it is observed that due to the strong longitudinal field component in the radial polarization beam focuses more sharply than the

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Published online: 27 January 2018

Journal of
Environmental
Nanotechnology

Research Article

Tight Focusing of Radially Polarized Pair of Vortices Beam through a Dielectric Interface

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Received: 03.01.2018 Accepted: 13.03.2018
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ABSTRACT

Tight focusing properties of radially polarized Gaussian beam with a pair of vortices through dielectric interface is theoretically investigated by vector diffraction theory. For an incident beam with a pair of vortices of opposite topological charges, the vortices move toward each other, annihilate and revive in the vicinity of the focal plane, which results in the generation of many novel focal patterns. The usable focal structures generated through the tight focusing of the double-vortex beams may find applications in micro-particle trapping, manipulation, Nano material processing etc.

Keywords: Dielectric interface; Radially polarized *Gaussian beam.*

1. INTRODUCTION

In researches, the incident light is focused into a uniform medium of refractive index n. However, in many practical applications, an objective is used to focus an incident light beam through an interface between different media of different refractive index. For instance, in the case of laser trapping, a light beam is focused through an interface between glass and water (Ke and Gu, 1998), After that, many researches on the focusing of light beams through dielectric interfaces have been carried out (Biss and Brown, 2001; Wierssma *et al.* 1997; Helseth, 2001; Petrov, 2004; Petrov, 2005). Biss and Brown discussed the focusing of cylindrical vector beams (CVBs) through a dielectric interface (Biss and Brown, 2001). Zhang *et al.* presented the tight focusing of radially and azimuthally polarized vortex beams through a dielectric interface and a uniaxial birefringent crystal, respectively (Zhang *et al.* 2008a; Zhang *et al.* 2008b). Moreover, in many practical applications, an objective is used to focus an incident light beam through an interface between different media of different refractive indices. For example, in the application of semiconductor inspection, light beams are focused from the air onto a silicon substrate. Torok *et al.* developed the theoretical method for studying the focusing of an electromagnetic wave through dielectric interfaces.(Torok *et al.* 1995a; Torok *et al.* 1995b; Torok *et al.* 1995c). For its unique properties, tightly focused light beam. For its unique properties, tightly focused light beams have wide potential applications in optical data storage, microscopy, material processing, micro-particle trapping manipulation, etc.(Zhang *et al.* 2008; Ganic *et al.* 2003; Helseth 2000). On the other hand, a great deal of attention has been given to the research of the vortex beam since 1992. The vortex beam, also known as the helical beam, has a continuous spiral phase wavefront, which carries an orbital angular momentum (OAM) (Allen *et al.* 1992; Stephen *et al.* 1994). In recent years there has been much research on tight focusing of different kinds of vortex beams, such as linearly polarized, circularly polarized, elliptical polarized vortex beams (Zhang *et al.* 2008; Singh *et al.* 2009; Chen and Pu, 2009). An optical vortex dipole (a pair of vortices with opposite topological charges) propagating in a Gaussian beam may produce a variety of possible trajectories different from that of canonical vortex beams.

2. THEORY

Assume the interface between two dielectric media of refractive indices n1 = 1 and n2 = 3.55, such as focusing in the air onto silicon substrate in the application of semiconductor inspection. The geometric focus of the objective without the interface is located at the origin of the coordinate system.

Research Article: Open Access

VIBGYOR ePress

International Journal of Optics and Photonic Engineering

ISSN: 2631-5092

Tight Focusing Properties of Circularly Polarized Annular Multi-Gaussian Beam through a Uniaxial Birefringent Crystal

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Abstract

Focusing properties of circularly polarized annular multi-Gaussian beams through a uniaxial birefringent crystal is investigated numerically by vectorial Debye theory. Results show that the optical intensity in focal region of circularly polarized annular multi-Gaussian beams can be altered considerably by the topological charge [n], beam order [m] and birefringence [Δn]. Many novel focal structures such as focal spot, focal hole and flat top profile of sub wavelength structure are achieved.

Keywords

Uniaxial birefringent crystal, Circularly polarized laser, Annular multi-Gaussian Beam

Introduction

In Recent years, focal shaping of tight-focusing of laser beams such as highly confined focal spot/hole with extended focal depth, multiple focal spots, optical bubble etc., has important applications in high-density optical data storage [1], laser micro/nano-processing [2], particle and electron acceleration [3], super-resolution scanning confocal microscopy [4] and optical trapping [5]. The intensity distribution of the focal structure in the focal region has been frequently discussed [6-13]. To produce different types of intensity distribution in the focal plane one may insert a physical mask in the pupil plane of the objective [14-18]. However, fabricating those physical masks are difficult and their efficiency is also low. On the other hand, optically, uniaxial crystals are performing the same operations without additional devices [19]. Alejo and Deng, et al. studied the properties of light beams propagating in birefringent material [20,21]. The brief explanation of focusing into a birefringent medium is given by Stamnes, Jiang and Dhayalan, et al. [22-26]. A. Ciattoni, et al. analyzed the propagation of radial and azimuthal vortex beam in the uniaxial crystal system [27-29]. Stallinga, et al. briefly explained the vectorial approach of focusing into the uniaxial crystal [30]. Radially and azimuthally polarized vortex beams through a uniaxial crystal system are studied numerically and experimentally [31,32]. Recently properties of circularly polarized beam have explained by many researchers [33-37]. Rao Lian-Zhou, et al. extends the analysis of tightly focusing circularly polarized vortex beams through uniaxial crystals with small axial birefringence [38]. Recently, Murugesan, et al. numerically demonstrated that focal structures such as splitting of single focal spot on to multiple spots and focal shift of maximum intensity in the axial direction can be obtained by tightly focused circularly polarized double ring-shaped beam and axial birefringence [39]. Anthony A. Tovar, et al. introduced a new class of beam called multi-Gaussian beam which consist of a small sum of finite-width Gaussian beams side by side each of which represents an intuitive com-

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Accepted: October 22, 2018: **Published:** October 24, 2018

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Citation: Murugesan R, ThiruArul D, Rajesh KB, Lavanya M, Mahadevan G (2018) Tight Focusing Properties of Circularly Polarized Annular Multi-Gaussian Beam through a Uniaxial Birefringent Crystal. Int J Opt Photonic Eng 3:011

Research Article

Journal of Environmental Nanotechnology

Tightly Focusing Properties of Radially Polarized Double Ring Shaped Beam through a Uniaxial Birefringent Crystal

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ABSTRACT

Using vectorial diffraction theory for small birefringence, the properties of a radially polarised Double ring-shaped beam closely oriented through a uniaxial birefringent crystal is computed. Increase the birefringence value [Δn] to adjust the intensity distribution of focal structure in the focal area around the longitudinal axis, and change the pupil to beam ratio[β] to separate the focal position. Also, by changing the pupil to beam ratio, a single focal spot can be broken into two.

Keywords: Radially Polarized Double Ring Shaped Beam; Uniaxial Birefringent Crystal.

1. INTRODUCTION

Tight focusing of the laser beam has attracted much attention because of its much smaller focus spot and strong longitudinal component (Urbach and Pereira, 2008; Dorn *et al.* 2003; Yan *et al.* 2011). In a range of microscopes and spectroscopes, tightly focused light beams can improve imaging precision and boost the concentrated electric field at the nanometer scale. Tightly focused light beams have wide potential applications in optical data storage, optical trapping, and microscopy (Zhang *et al.* 2008; Youngworth and Brown, 2000; Lerman and Levy, 2007; Walker and Milster, 2001; Helseth, 2001). The longitudinal field component at the focal point of a radially polarized beam (RPB) is larger than that of any other focused field (Urbach and Pereira, 2008). In 2003, direct detection and characterization of this sharp longitudinal field by an experimental demonstration was reported (Dorn *et al.* 2003). Tightly focused radially polarized beam has many attractive applications such as particle acceleration (Romea and Kimura, 1990), fluorescent (Novotny *et al.* 2003), second harmonic generation (Yew and Sheppard, 2007), Raman spectroscopy (Hayazawa *et al.* 2004), optical trapping (Zhan, 2004) material processing (Niziev and Nesterov, 1999) and particle acceleration (Tidwell *et al.* 1993), optical data storage (Xiangping *et al.* 2007), applications in high-resolution microscopy (Cheng *et al.* 2011), surface plasmon excitation (Zhan, 2006), particles accelerating (Varin and Piche, 2002) and in material processing (Meier *et al.* 2007). Normally the focusing beam was assumed to be a single-ring-shaped beam, which is often referred to as a radially polarized TEM01* (R-TEM01 *) mode beam (Dorn *et al.* 2003; Youngworth and Brown, 2000; Quabis *et al.* 2000). On the other hand, a double-ring-shaped beam was experimentally observed as a higher-order radially polarized mode (R-TEM11*) directly from a laser cavity (Moser *et al.* 2005). By disruptive interaction between the inner and outer rings with a pi phase change, radially polarised mode(R-TEM11*) beams will effectively decrease the spot size (Kozawa and Sato, 2006; 2007). Recently modulating the focal patterns using double ring-shaped beam is a topic of great interest, and many works are reported (Nie *et al.* 2014; Rajesh *et al.* 2011; Tian and Pu, 2014; Lalithambigai *et al.* 2013; Zhang *et al.* 2009; 2010). Many optical components, including waveplates, compensators, polarizer, and so on, make use of the birefringent effect of uniaxial crystals to realize their functions. Thus, it is of practical significance to study the propagation dynamics of light beams in uniaxial crystals. The properties of light beams propagating in birefringent materials have attracted many researchers' interest for years (Fleck and Feit, 1983; Stallinga, 2001; Ciattoni *et al.* 2002; Avendano-Alejo and Rosete-Aguilar, 2006). Ciattoni et al have been studying the propagation of a paraxial optical beam along the optical axis of a uniaxial crystal in a series of papers (Ciattoni *et al.* 2002; 2003; 2001a; 2001b; 2001c; 2002a; 2002b; 2002c; 2002d; Provenziani *et al.* 2002; Ciattoni *et al.* 2002; 2003). Stamnes et al presented consistent numerical and experimental results for focusing two/three-dimensional electromagnetic waves into uniaxial crystal (Jain *et al.* 2009; Stamnes and Jiang, 1998; Jiang and Stamnes, 2000). The propagation of various kinds of laser beams in uniaxial crystals parallel and orthogonal to the optical axis has been reported (Lu and Luo, 2004; Deng *et al.* 2008; Tang, 2009; Li *et al.* 2010; 2011; Zhou *et al.* 2012; Deng *et al.* 2007; Liu and Zhou, 2008; 2009a; 2009b; 2009c; Du and Zhao, 2010; Zhang and Cai, 2011; Li and Chen, 2012; Zhou *et al.* 2013; Deng *et al.* 2013; Shen *et al.* 2014; Zhang and Cai, 2011). The tight focusing of radially, azimuthally and circularly polarized laser beams through a uniaxial crystal associated with focal shift have