3.4.3 Number of research papers per teacher in the Journals notified on UGC website during the last five years

Enclosed first page of each journal paper as per the list

(A.Y. 2020-2021)

Original Article | Published: 04 November 2020

Visualization and quantification of aggregate and fiber in self-compacting concrete using computed tomography for wedge splitting test

B. Raja Rajeshwari ✉, M. V. N. Sivakumar & P. Harsha Praneeth

312 Accesses | Metrics

Abstract

Wedge splitting test gained popularity as a stable and simple method to predict the fracture mechanism properties of concrete specimens. The present research focuses on understanding the behavior of self-compacting concrete specimens made with and without steel fibers tested using wedge splitting test, later scanned under high resolution computed tomography. The contribution of hooked end steel fiber and coarse aggregates in fiber reinforced specimens was compared without steel fiber reinforced concrete specimens using high resolution computed tomography. As fracture takes place across the plane perpendicular to the splitting force, i.e. along the depth of specimens. High resolution computed tomography technique was

adopted in visualizing the changes taking place across the matrix, coarse aggregate and steel fibers, along with the specimen's depth. Datasets of the images, obtained from computed tomography, after images analysis and volume reconstruction, revealed a higher coarse aggregate and steel fiber participation in the failure region of without and with fibers specimens. Computed tomography investigation indicated a total of 23 coarse aggregate and 64 steel fibers participated in resisting the failure, during wedge splitting test of without and with fibers specimens. Therefore, high resolution computed tomography can be used in understanding, quantifying the participation of coarse aggregate and steel fiber in the failure plane, under fracture loads.

Solid State Technology

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(2)

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Behaviour Of Pedestrians At Mid-Block While Crossing The Road And Recommendations For Providing Exclusive Pedestrian Phase (Epp)At Those Locations.

Akella Naga Sai baba, CH Kalyani , R. Prasanna Kumar, C.M. Vivek Vardhan

Abstract

Pedestrian crossing and the behavior of pedestrians in different conditions especially at uncontrolled crossings is a subject which needs in depth study and analysis. At uncontrolled junctions,

the pedestrians and their behavior, safety of pedestrian crossing is neglected and no measures are taken

to systematize pedestrian crossings at these junctions. Therefore a practical study of the pedestrian road crossing data is made in this study and statistical analysis of the data is done at uncontrolled crossing junctions in mixed traffic conditions of Indian scenario. The main objective of study is to analyze the pedestrian road crossing behavior at uncontrolled junctions. Adopting multiple regression

technique the various parameters which effect the behavior of pedestrian. Vehicular gap, driver yielding behavior, frequency of attempts to cross, age and condition of pedestrian , rolling gap are some of the parameters that decide the pedestrian crossing .time and other requirements. The surveys

have been conducted at all junctions between Bowenpally to Kompally on national highway manually

and analysis is made. The survey and statistical analysis concluded that at almost all junctions, the vehicular gaps and pedestrians behavior is not up to mark and the parameters considered indicate there

20-21
(5)

Three Point Boundary Value Problems Associated with First Order Fuzzy Difference Systems-Existence and Uniqueness via the Best Least Square Solution

N.Swapna [1], S. Udaya Kumar [2]

[1]Department of Electronics and Computer Engineering, SreeNidhi Institute of Science and Technology Yamnampet(V), Ghatkesar, Telangana, INDIA
[2]Geetanjali college of Engineering and Technology, Cheeryala(V), Keesara(M), Medchal Dist. Telangana, INDIA.

Abstract:

This paper presents a criteria for the existence and uniqueness of solutions to first order fuzzy difference system using QR-algorithm. Modified QR-algorithm is presented for fuzzy linear systems using singular value decomposition.

Keywords: Fuzzy Difference Systems, Modified QR-algorithm, Fundamental matrix, Decode algorithm.

AMS(MOS) classifications 34B15,93B05,93B15

1. Introduction:

Existence and uniqueness of solutions to initial value problems have a long mathematical history going back to Picards. The mere fact that f is continuous on R ensures existence of at least one solution to the initial value problem

$$y^1 = f(t,y), \qquad y(t_0) = y_0 \qquad (1.1)$$

on R. The situation is different for boundary value problems. Length of interval estimates are necessary to prove existence and uniqueness of (1.1). If f satisfies a lipschitz condition in the second variable, then (1.1) has a unique solution. The situation is different for first – order difference system..

$$y_{n+1} = A(n)y_n + f_n, \quad y(n_0) = y_0, \qquad (1.2)$$

where A is an p x p continuous matrix, whose elements $a_{ij}(n)$ are all real or complex valued functions defined on $N_{n_0}^+$ and $y_n \in R^p(C^p)$ with components $y_1(n), y_2(n), \ldots \ldots \ldots y_p(n)$,defined on $N_{n_0}^+$. The corresponding homogeneous equation corresponding to (1.2) is

$$y_{n+1} = A(n)y_n, \quad y(n_0) = y_0 \qquad (1.3)$$

(1.3) possess a unique solution on $N_{n_0}^+$ as can easily be seen by induction.

Implementation of Elliptic Curve Cryptographic Algorithmic Approach for Secured Wireless Communication Applications

Article · December 2020

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digital image transmission with security for medical applications View project

Multi-Level Thresholding for Image Segmentation on Medical Images Using Multi Otsu and Sine Cosine Optimization Algorithm

Erukala Mahender[1*], Dr. Ch. Ramesh Babu[2], Kakkerla Shiva Kumar[3]

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Abstract: Image thresholding is deciding stage in many image processing algorithms. It helps to segment the image, which results in successful prediction correctly. The Sine Cosine is a meta heuristic optimization algorithm that outperforms many conventional algorithms because of its unique principle. Since lung cancer is the most deadly illness, creating a significant number of deaths worldwide, this research used lung cancer CT images. On lung cancer Computed Tomography (CT) images, this paper illustrates how to use the Otsu multi thresholding objective function and Sine Cosine nature-inspired optimization algorithms. The proposed approach uses the Otsu multi thresholding technique on a CT image as an objective function in the Sine Cosine algorithm (SCA). It aids in selecting elite solutions by measuring fitness for a given range of candidate solutions. When the Algorithm's output was evaluated using PSNR and SSIM, as well as calculation time, it was observed that the proposed approach performed higher.

1. Introduction:

Because of their ability to offer accurate outcomes in challenging optimization tasks, nurture-inspired algorithms are becoming highly popular these days. Many of the nature-inspired algorithms are meta-heuristic optimization techniques. These algorithms have the potential to increase the number of candidate solutions in the population. Cancer is one of the most severe diseases in both men and women because it is among the most leading causes of death globally. Early diagnosis increases the probability of effective treatment and survival. However, it is a time-consuming

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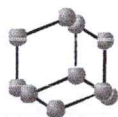
RESEARCH ARTICLE

Leaf Image Classification with the Aid of Transfer Learning: A Deep Learning Approach

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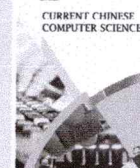
Srinivasa Rao Dammavalam[1,*], Ramesh Babu Challagundla[2], Vangipuram Sravan Kiran[1], Rajasekhar Nuvvusetty[3], Lalith Bharadwaj Baru[1], Rohit Boddeda[4] and Sai Vardhan Kanumolu[1]

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Abstract: ***Background***: Crop diseases are a primary hazard to nutrient safety, which proves to be a serious problem in many places in the world due to the unavailability of essential aid. Typically agriculturalists or specialists perceive the plants with a naked eye for detection and identification of an illness. Machine vision models, in specific Convolutional Neural Networks (CNNs) have directed an impact in feature extraction to a greater extent. Since 2015, numerous solicitations for the automatic classification and recognition of crop illnesses have been established.

Methods: In this paper, we proposed, analyzed, and assessed various state-of-the-art models proposed over a decade. These models are pre-trained with the finest parameters where we modeled a design-oriented method with numerous leaf-images and classified them into infection and healthy class for each type of leaf independently.

Results: Through our examination, we concluded that VGG models stand-alone with many cited prototypes and give on par results. As declared, these VGG models (VGG16 and VGG19) are utilized for feature extraction, and further, we augmented a set of dense layers and train them consequently for classification. The performances of various machine vision prototypes were pictorially perceived and their sophisticated architecture is not only capable of extracting detailed features but also repressed many loop-holes. The performance is assessed and computed for several types of leaf images and the accuracy scores attained were more than 97.5% for VGG16 and 96.72% for VGG19.

Conclusion: AUC-ROC curves were portrayed to illustrate its inspiration in defining an accurate classification where VGG16 and VGG19 have at least 96.6% and 95% area under the curve (AUC) which resembles their robustness.

Keywords: Leaf classification, deep learning, transfer learning, automated plant diagnosis, CNNs.

1. INTRODUCTION

The trick of competent plant disease fortification is carefully connected to the difficulties of supportable cultivation and weather variation. Investigation outcomes designate that weather variation can change phases and amounts of pathogen improvement; it can also change host confrontation, which leads to physiological variations of host-pathogen connections. The condition is more difficult by the fact that today; diseases are increasing globally. New diseases can transpire in places where they were formerly unknown, where there is no native ability to find proper medication.

Cultivation has a huge impact on the production of food, especially with the increasing population. The plant diseases are intimidating the yield of the crop. Plant diseases can have a major impact on decreasing crop production in farming and forestry. Initial discovery and identification of plant diseases oblige to take suitable actions.

There are numerous methods to identify plant pathologies. Some diseases do not have any noticeable indications related, or appear only when it is too late to act. In these circumstances, it is essential to accomplish refined examination, typically by resources of influential microscopes. In some circumstances, the marks can only be perceived in portions of the electromagnetic band that are not obvious to the naked eye.

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Sustainable wireless clouds with security assurance

Kuppani Sathish   , Kamakshaiah Kolli

https://doi.org/10.1504/IJICS.2021.113171

Published online 15 February 2021

Abstract   PDF

Abstract

The smart technology development being an entailment to have an improved quality of living under clean environment, with enhanced social, economic development, public safety and efficient governing would be made possible by the cloud computing, that pillars the smart planning with enhanced decision making and service provisioning. The smart developments must be well planned with the sustainable wireless cloud and should be supported by evaluating, analysing and synthesising to manage with the enormous data flow from diverse fields. This dataflow management that is subjected to threats causing data loss and data mishandling is efficiently prevented by the preventive measures undertaken in the proposed system of security assurance to regulate continuous data transmission to permitted users with authentication, encryption and decryption. The proposed system is validated in CloudSim with regard to throughput and delay to ensure the systems reliability and timely perfect delivery.

Keywords: sustainable wireless clouds, smart planning, decision making, dataflow management, security assurance, throughput, delay
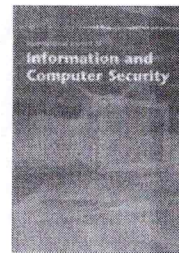
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A DATA MINING APPROACH TO CROP YIELD PREDICTION USING MACHINE LEARNING

Dr. Kamakshaiah Kolli[1], B. Neeraja[2], V. Shiva Narayana Reddy[3]

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Abstract:

One of the essential industrial sectors in India is Agriculture and the economy of a country is relied on it highly for sustainability in rural areas. The Indian agriculture level reduces gradually owing to some factors like excessive utilization of pesticides, water level decrement, climate changes, and unpredicted rainfall, etc. On the agriculture data, descriptive analysis is performed to understand the production level. Because of lack of ecosystem control technologies deployment, most of the agriculture fields are under developed. The production of crops is not increased owing to these issues that affects the economy of agriculture. Based on the prediction of plant yield, agricultural productivity is improved. By using machine learning techniques, the crop from given dataset have to predict by agricultural sectors for preventing this issue. To capture the information, the dataset analyses by supervised machine learning technique (SMLT). The effectiveness of proposed method of machine learning algorithm can compare with best accuracy based on the results. In this paper use ANN with cascade-forward backpropagation and Elman backpropagation for yield prediction. To determine input variables that maximize the interested neurons' activation, the positive gradients backpropagate by Cascade-Forward backpropagation method. A recurrent connection exists from the hidden layer output to its input is included in Elman backpropagation network which is a two layer backpropagation network. These two techniques are better prediction techniques compared to ANN with backpropagation.

Introduction:

In the agricultural sector, it is important that strategy management begins to prosper based on information, bearing in mind the great uncertainty of the factors that influence the crop production and the enormous amount of data that is and can be captured during the whole process of production.

Currently, India has the opportunity to become one of the main paddy exporters. However, there is a problem regarding the index of yield (expressed in tons per hectare) of its

1608

DIGITAL IMAGE FORGERY DETECTION USING SUPER PIXEL SEGMENTATION AND HYBRID FEATURE POINT MAPPING

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Abstract:

In recent years, digital images have a large variety of uses and for different purposes. The most significant and common form is called digital image forgery, which uses the same image in the forgery process, and we have many kinds of image forgeries. For creating a duplicate or hiding any existing objects, a region of an image copies and paste into the same image. For a forgery with particular form, the images are tested in this paper. Images will first be split into super pixels to detect the forgery attack. Because of the high dimensional existence of the feature space, the representation of reduced dimension feature vector is achieved with the implementation of hybrid function point mapping. During the feature matching, the efficiency is also improved. In order to identify the forgery in the picture, the suggested system is successful. The proposed method therefore offers a detecting forgery with efficiency and efficacy that helps to improve the image authenticity in evidence-centered applications.

INTRODUCTION

Digital Image forensics is a field of research that seeks to verify the originality of digital images by retrieving their background content. Digital images are quickly forged by different techniques, leading to changes in their meaning and authenticity. With the enormous growth of technology, the use of the image has been expanding day by day in our daily lives. Because of this, forgery of the digital image has turned out to be increasingly straightforward and indiscoverable.

The ability to create image forgery is nearly as old as photography itself. Over a two-decade, photography is the normal and fascinating art which turned out for creating portraits and by that portrait photographers can earn money by making forgery possible by enhancing deals by retouching their photographs. Detection of image forgery has developed as an amazing study in various applications of digital image processing, image forensics, criminal investigation, biomedical technology, and computer vision, etc. Due to sophisticated software

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Fuzzy K-means clustering with fast density peak clustering on multivariate kernel estimator with evolutionary multimodal optimization clusters on a large dataset

G. Surya Narayana[1] · Kamakshaiah Kolli[2]

Abstract

Many conventional optimization approaches concentrate more on addressing only one appropriate solution. Thus, these methods were to be utilized often, hence there were no chances of producing the intended solution. Therefore, the issue of multimodal optimization has to be considered. So, to reduce the difficulties by the clustering and further, it followed by the optimization technique. Here, the variety of real-time and artificial techniques are used. Using the FCDP-Fast Clustering with Density Peak, we calculate the density values after determining the center with the help of objective function. Then, the fuzzy clustering is applied to form the clustered groups with the density and center values. Finally, we optimize the data using the CDE-Crowding Differential Evaluation methodology. Performance analysis is then proceeded with some existing methods by using the performance metrics like NMI and ARI. After validation, it concluded that the proposed method was superior to the existing method.

Keywords K-means clustering · Multimodal optimization · Crowding differential evaluation · Density value · Center distance

1 Introduction

Being the age of internet dominances and rapid technological advancements, we must be safe and sound so that we could escape from the intruders and spammers in the surroundings. So data

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Code integrity verification using cache memory monitoring

Rajesh Kumar Shrivastava, Varun Natu & Chittaranjan Hota

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UnderTracker: Generating Robust Binaries Using Execution Flow Traces

Rajesh Kumar Shrivastava[1] · Chittaranjan Hota[2]

Abstract

Programs are developed in a manner so that they execute and fulfill their intended purpose. In doing so, programmers trust the language to help them achieve their goals. Binary hardening is one such concept that prevents program behavior deviation and conveys the programmer's intention. Therefore, to maintain the integrity of the program, measures need to be taken to avoid code-tampering. The proposed approach enforces code verification from instruction-to-instruction by using the programmer's intended control flow. *UnderTracker* implements execution flow at the instruction cache by utilizing the read-only data-cache available in the program. The key idea is to place a control transfer code in data-cache and call it from instruction cache via labels. *UnderTracker* injects labels into the binary without affecting the semantics of the program. After the code execution starts, it verifies every control point's legality before passing the control to the next instruction, by passively monitoring the execution flow. We proposed a cache-based monitoring method to verify code integrity. In this, we used side-channel information to monitor the program's execution state. This monitoring system uses a sliding window scheme to detect the violation of code integrity with high reliability. This paper proposes an efficient technique, called *UnderTracker* to strengthen the binary integrity of an I/O intensive running program, with the nominal overhead of only 5-6% on top of the normal execution.

Keywords Superblock · Execution flow verification · Systems security · Cache-based monitoring

1 Introduction

An adversary can tamper code via a malicious form of the binary (executable file) hosted by a third-party. An adversary can also install malicious binary by applying phishing attacks. There are some possible scenarios when code tampering exploits happen listed as follows:

1. An adversary can directly change the application binary through a phishing attack.
2. An adversary can exploit the resource within an application.
3. An adversary can exploit code to inject malicious payload.

The code tampering method leaves an impact on both ways, technical and business. The technological implications of code modification include password leaking, theft of identification, unauthorized modification of code. On the other hand, the firm is also gets affected by revenue loss and damage to reputation.

There are various application programs available over the internet, which contains a malicious payload. For example, games are the most popular in this category. If a user doesn't want to pay for the game, they use some short-tricks to achieve extra power or life. This bypass allows them to enjoy the game without pay. The adversary has also injected spyware to steal user's information in this type of game bypass technique. They can steal your important data like banking id and password.

One of the most lucrative attack vectors present in a binary is the code reuse attack, and therefore it becomes paramount to protect it. Existing protection methods such as stack canaries (Marco-Gisbert and Ripoll 2013), Data Execution Prevention (DEP) and Address Space
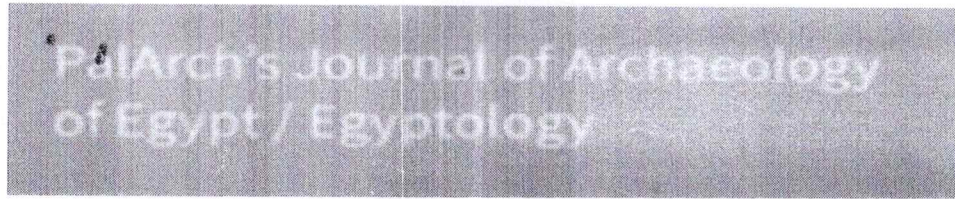
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OCCLUDED FACIAL EXPRESSION RECOGNITION USING ALEXNET

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Abstract:

In artificial intelligence and machine learning fields, facial emotion recognition (FER) is receiving an attention to research as it is an essential commercial and academic potential. By using facial images, this analysis is performed while multiple sensors can use for processing the FER. In interpersonal communication, one of the key channels is that the visual expressions. In the field of FER, a details analysis of research is performed over the past few decades in this paper. The conventional approaches of FER are listed out in addition to the describing representative categories of FER systems and their key algorithms. By using deep networks, the approaches of deep-learning-based FER are presented that allow the "end-to-end" learning. An approach of up-to-date hybrid deep-learning is also focused in this research and it integrates an individual frame's spatial features with the convolution neural network (CNN) for consecutive frames' temporal features. Consequently, the publicly available assessment metrics with a brief analysis and defining of comparing the benchmark results have been provided for a quantitative comparison of FER studies. The existing work carried out was using basic CNN variant which couldn't produce efficient results for larger datasets. This paper proposes a facial recognition system using ALEXNET which produced better results than the existing basic CNN and GoogleNet.

Introduction

In human communication, facial expression is a significant non-verbal way of expecting intentions. In the whole information sharing process, facial expression has tended to play a vital role. In different fields of pattern recognition, computer vision, and psychology, the study of Facial Expression Recognition (FER) has achieve progress attention. In multiple domains, FER has wide applications, including human-computer interaction, virtual reality, augmented reality, advanced systems of driver assistance, education and entertainment.

Humans commonly use various signs to convey their thoughts, such as facial expressions, movements of the hand and speech. Up to 55% of human communications are facial

A DEEP LEARNING APPROACH FOR SEMANTIC SEGMENTATION IN BRAIN TUMOR IMAGES

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Abstract:

In medical technology, Magnetic Resonance Imaging (MRI) has been used widely for detection of tumors and diagnosing various abnormalities in tissues. In scientific research, a major role has been played by the active development in the computerized segmentation of medical image. Based on fast decision making, the doctors can take required treatment easily. In the information technology, the segmentation of brain tumor is a key point. By analysing the radiation therapy treatment, tumor growth, computer-based surgery, developing the growth models of tumor, and treatment responses, the segmentation of brain tumor is motivated. For segmentation of brain tumor, a deep learning-based framework is presented. To achieve the robust performance through a majority rule, deep learning based semantic segmentation architecture is used for segmentation of tumor that can improve the performance effectively.

INTRODUCTION

Medical imaging is utilized the processes and techniques for creating the human body images for different purposes of clinical activities such as diagnosis of medical procedures or medical science subsuming the investigation of normal anatomy and function [1]. In medical field, an invaluable tool is diagnostic imaging. The imaging modalities such as digital mammography (MM), computer tomography (CT), magnetic resonance imaging (MRI), etc. provide an effective mapping of the anatomy of a subject noninvasively.

For a word neoplasm, the tumor is used as a synonym and it is formed with the cells based on an abnormal growth. Tumor is not mandatorily related to the cancer.

Three different types of tumor include:

1) Malignant
2) Pre-Malignant
3) Benign

A benign tumor is a kind of tumor which doesn't able to expand abruptly and not affecting the neighboring healthy tissues and non-adjacent tissues [2]. The common example of benign tumors is the moles.
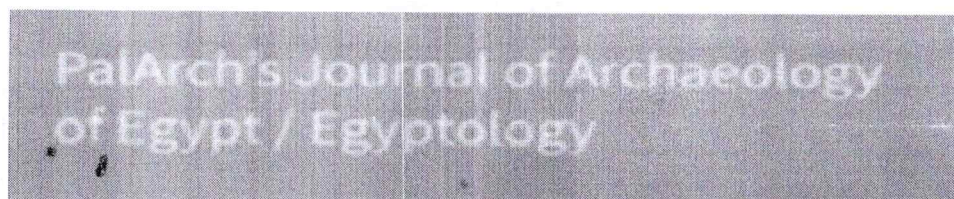
A NOVEL SATELLITE IMAGE SEGMENTATION USING VGGNET

M. Srinivas[1], Shakira[2], D.Venkateswarlu[3]
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[2]Department of CSE, Geethanjali college of Engineering and Technology, Hyderabad, Telangana, India

Abstract:

The Satellite image classification technique is included the grouping of values of image pixels within the substantial groups. However, satellite image segmentation have involved various kinds of procedures and approaches. Three types of techniques of satellite image classification are automatic, hybrid, and manual which are having individual advantages and disadvantages. In the 1st group, most of the methods of satellite image classification are made classified. By relying on the requirements of the satellite image classification, the suitable technique of classification is to be chosen. To assess the remote sensing measurements frequently out of a space platform, a plain graphical indicator is developed that assists in evaluating the target which is identified with live green vegetation is called as normalized difference vegetation index (NDVI). Based on pixel feature extraction and classification using VggNet. According to color and texture, the satellite image is segmented into small regions and these segments are further made into classification of different regions with the use of VggNet.

1. Introduction

Wetlands are relevant to the fields of peatland, fennel, Marsh, or stream whether permanent or temporary, natural or artificial with brackish, fresh, or salt water that is flowing or stagnant, including areas of sea water with a depth not exceeding six metres at low tide. The transitional regions between deeper ecosystems of water such as lakes and rivers and dry lands are also existed. Wetlands have inundated land or waterlogged soils permanently, intermittently, or seasonally. They consists of an essential resource for humans and for plants and animals of wetland. The essential components of the human diet are fish, eggs and birds found in wetland ecosystems. For the purposes of medical and food, 51 edible species of wetlands detected by seven major wetlands based on the studies conducted between 2003 and 2006 in Norteast India. They found that at least 27 species were traded, generating revenue

Analyzing and Predicting Cyber Security Violations using Machine Learning Techniques

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Abstract — To deepen our insight into the evolution of a threat situation, study of cyber incident data sources is an essential process. This is a relatively recent subject for science and many experiments still have to be conducted. Throughout this article, we present statistical analysis of the 12-year cyber hacking operation (2005-2017) violation incident data set which includes attacks by malware. We prove that, in comparison to the literary results, breach sizes and inter-arrival times for hacking breaches can be modeled instead of distributions, since they have an auto-correlation. In order to adapt the time of the intercom and the scale of the violation, we suggest complex stochastic process models. We also prove that the inter arrival periods and the violation scale can be estimated from these models. We perform quantitative and qualitative pattern research on the data set to achieve a better understanding of the growth of hacking infringement incidents. We derive a variety of observations into cyber security, including the challenge of cyber hacking in its scale, but not in its severity.

Keywords: Cyber risk analysis, Hacking breach, breach prediction, data breach cyber threats, trend analysis, cyber security data analytics and time series.

Introduction

An information breakdown is the protection for the transfer, transmission, stolen or as any use of important, safe or confidential information by an unapproved person. The breakdown of data is the purposeful or unintended intrusion into a non-trustworthy realm of safe or private/classified data. This

Implementation of Elliptic Curve Cryptographic Algorithmic Approach for Secured Wireless Communication Applications

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Abstract- *In this paper an approach for efficient implementation of elliptic cryptographic algorithm is proposed. This approach proves to be better compared to various presently existing cryptographic algorithm implementation methods for next generation secured applications in wireless communications. The main advantage of elliptic curve cryptographic algorithm when compared to other existing algorithms is that it gives equivalent security by using the smaller key size. This is the major factor behind its use in various multimedia applications and strong recommendation as al alternative security option for 5G and IoT era also. The simulation results of the implementation of the algorithm are shown mentioning the challenges with the other programming language like MATLAB and Python. The performance of the algorithm can be improved further by using pipelined architecture of the elliptic curve scalar multiplication.*

Key Words: ECC- Elliptic Curve Cryptography (ECC), Field Programmable Gate Array (FPGA), Point addition and Point doubling.

1. INTRODUCTION

The upcoming 5G wireless communication and IoT era is demanding requirements like design challenges, security, high performance, less number of resources consumption, least quantity of storage. ECC has a multiple advantages in terms of less bandwidth usage, low computational time and small key size and especially the software protection from piracy has set a new direction for ECC in security applications. In the year 1985 Elliptic curve cryptography proposal by Neal Koblitz and Victor S. Miller has given a wide scope for the secured cryptographic algorithm. These both have made an attempt for some future research ideas. ECC is gaining its importance when compared to other existing algorithms is mainly because of its cryptographic security and corresponding key-size or key length. Key size and key length factors play a very vital role in providing security of the algorithm. The strength of any cryptographic algorithm cannot exceed its key length. As ECC exhibits better level of security with a much shorter key length results to meet the application requirements and obtaining the implementation results practically successfully compared to other algorithms. A part from the advantages staged ECC also provides higher speed and better performance in terms of power consumption, memory, area, and size and storage space. In order to address the resource constraint environment of chip manufacturing unit of digital design security has become an important and additional factor. All these futuristic challenges initiated the necessity for an efficient approach of cryptographic algorithm. In this regard ECC is gaining wide acceptance around since 2004. Elliptic curve cryptography (ECC) is in huge demand in present days and is drawing more attention of research now a day's is mainly due to the advantages of elliptic curve approach based on the algebraic structure of over finite fields with projective co-ordinates from the implementation point of view. ECC is a public key cryptographic algorithm which strongly evolved significantly and is being proved as a powerful algorithm because of its cryptanalytic strength which is measured in bits and is roughly half of its key length.

Information retrieval under the context of data- driven design (d3) in big-data

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*Abstract-*The design information retrieval under the context of data- driven design (D3) during this big-data era. rather than retrieving information from particular data resources for specific design domains and activities in traditional design information retrieval, a stress on harnessing the facility of broad, noisy, real-world, large-scale data to facilitate the planning information retrieval from a general perspective. a stimulating point raised by this is often the way to utilize the info resources across domains under this big-data economy. In traditional methods, the info generated during a particular project or domain are going to be only utilized in this particular project and this particular domain. However, it might be valuable to explore ways of reusing the info from other seemly "irrelevant" domains or activities. One example is that the user behavior data are often applied into many domains like business, design, and healthcare. This raises the difficulty of knowledge sharing and reuse across domains.

keyword: *Big-Data, Data, Driven, and design, Natural Language Processing, Semantic Network.*

I. INTRODUCTION

Big data approaches are now reshaping methodology, research, technology and development in many different fields. So How about its impacts on design? How does the huge amount of data affect the design engineering field? What is its impact in design? Can we utilize the power of data in facilitating and helping with the broad area of design involving design process, design knowledge/information, user experience, conceptual ideation? The answer are positive and there are already many emerging research activities on this issue which is called Data-Driven Design (D3).

II. DATA-DRIVEN DESIGN

Data-driven design emerges with the increase of Big-Data economy, and it consists of three key components: Data, Driven, and style . Data refers to the large amount of knowledge resources we will utilize like user data, textual data, web data. Driven means the state-of-art data analytic tools and advanced technologies wont to gather, analyze, interpret, and visualize the info including machine learning, data processing , natural language processing, internet of things then on. Design points out the applications which involve different aspects of the broad design field like user experience, design optimization, and design information retrieval, on which we would like to contribute and make improvement. In one sentence, data-driven design is to utilize the large amount of knowledge with advanced data analytic tools to assist , improve and facilitate the various design aspects and activities.

Therefore, we will see that "big" data approaches have already been actively utilized and had impact within the design field. However, data-driven design remains a really broad concept that we cannot fully cover here. Before focusing and
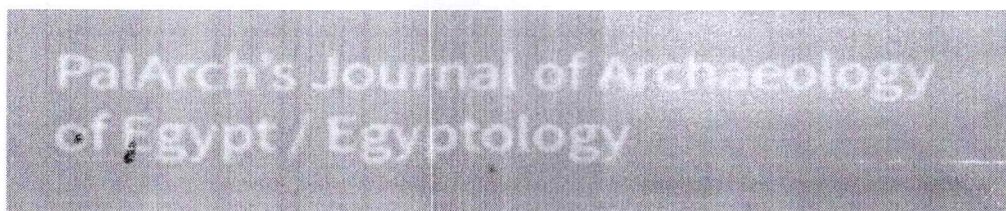
Ground Water Quality Assessment in Guntur district GIS data Using Data Mining Techniques

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Abstract:

Throughout this article we first attempted to analyse water quality research in the Andhra Pradesh district of Guntur. A thorough study of the consistency of groundwater was undertaken. 31 water samples of various physiochemical parameters, e.g. temperature, pH , electrical conductivity, totally dissolved solids , ammonium nitrates, total hardness, calcium, chloride, magnesium, sulphate, total alkalinity, potassium, total nitrogen, sodium , total phosphorus and dissolved oxygen have been collected and tested. The correlation analysis was also conducted as it is an outstanding method to estimate fair precision of parameter values. This research proposes a new methodological approach in conjunction with an ensemble model for data mining, through the use of the evidence-based confidence function and boosting the BRT regression tree GIS knowledge for groundwater quality visualization in Guntur. Spring areas for training and validation in individual and ensemble methods can be established and subdivided into two groups. Modeling results are drawn up to create potential maps for spring (groundwater). In order to evaluate groundwater content by taking different samples in various towns and cleanly synthesising water parameters that have been applied the diverse Data mining techniques.

Multi-Otsu's image segmentation for Mammograms using Artificial Bee Colony (ABC) Algorithm

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Abstract:

Clear-cut image segmentation of mammogram images is indispensable in malignant tumor detection. This paper is attempted to propose a nature-inspired optimized method for mammogram image segmentation by adopting Otsu's multi-level thresholding algorithm as a fitness function into the ABC algorithm. Moreover, in image segmentation, Multi-level thresholding algorithms come across with insufficient exploration and low exploitation on search space. Hence, to solve this problem a Metaheuristic optimized algorithm is leveraged. This is achieved by using the ABC algorithm to explore the population space and exploit the specified population space to select the finest threshold values. Thereafter, the output of ABC is used to segment the mammogram image using the multi thresholding method. In this work, the proposed method is exercised with a total of nine images from the MINI MIAS database. Besides, to assess the performance of the proposed method different threshold levels are used to segment mentioned images. It was witnessed that the performance of the wished-for method is effective and efficient to segment the mammogram images in terms of measures like PSNR, SSI, and computational time.

Keywords: Artificial bee colony, Otsu, Multi-level Thresholding, Mammogram, Breast cancer

1. Introduction

1.1 Medical Image Segmentation

Mammogram images are currently most widely adopted technique in clinical practice to detect the breast cancer as it is easily accessible and cost-effective. For early detection of malignant tumors in mammogram images, many methods have been proposed [12]. Breast cancer mainly affects middle-aged women for different reasons. Over the past twenty years, several methods are demonstrated to segment the medical images like X-ray, CT (computed tomography)-scan, Magnetic Resonance Imaging (MRI) Mammogram, etc. [1]. Homogeneous gray level values of pictorial muscle in preprocessed mammogram images exhibits effective intensity. Cancer detection false positive rate depends on the accuracy of image segmentation [16]. Image segmentation increases the visibility of microcalcification in processed mammogram images. In computer vision algorithms image segmentation plays a significant role [6]. There are six types of image segmentation methods, threshold-based, Artificial Neural Network (ANN) based, edge-based, clustering-based, watershed-based, region-based, and PDE-based methods[8]. Thresholding is the most popular segmentation method in medical image processing. In the bi thresholding method, the grayscale image is divided into two intensities i.e forefront and background. But, multi thresholding divides the images into many homogeneous regions [13].

1.2 Otsu's Multi Thresholding

In automatic global threshold case studies, gray level images can be effectively segmented into bimodal (foreground or background) or multi classes using a non-parametric and unsupervised Otsu's thresholding algorithm. It is centered on a very simple idea: exhaustively search for the threshold that reduces the weighted with in class variance defined as $\propto_w^2$ [22]. The class variances are given by (1) and (2) respectively

$$\propto_0^2 = \sum_{i=0}^n \quad (i - \mu_0)^2 Pr(i/C_0) = \sum_{i=0}^n \quad (i - \mu_0)^2 p_i/w_0$$

MRI BRAIN TUMOR SEGMENTATION WITH SLIC AND CONVOLUTIONAL NEURAL NETWORKS

Article *in* Journal of Critical Reviews · August 2020

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MRI BRAIN TUMOR SEGMENTATION WITH SLIC AND CONVOLUTIONAL NEURAL NETWORKS

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ABSTRACT: Brain tumor segmentation of MRI imagery is very essential in detecting and analyzing brain tumors. But it's a herculean task due to the presence of noise and intensity inhomogeneity in the MRI imagery. The main motive of this paper is to develop a useful and potent methodology for automatic brain tumor segmentation of MRI images that will aid the radiologists for better diagnosis. The proposed methodology involves two processes, first process is pre-segmentation of the MRI image using SLIC superpixel algorithm and second segmentation process is based on CNN. The proposed method is validated for both real-time datasets obtained from a radiologist and datasets from an online database. The results are shown in terms of the Dice index (DICE) and the Jaccard index (JACCARD). The evaluation of performance of the proposed methodology shows that it achieves higher average values of DICE and JACCARD, which indicates good segmentation performance and better accuracy compared to existing methods.

KEYWORDS: Brain tumor, CNN, MRI, Pre-segmentation, Region of Interest (ROI), Simple Linear Iterative Clustering (SLIC)

I. INTRODUCTION

Day-by-day there is a huge increase in the cases of brain tumors being reported around the globe. They have a very high mortality rate [1]. The growth rate of the brain tumor can vary significantly. So measuring the growth rate and identification of location of the brain tumor determines the affect it has on the brain and the central nervous system. Imaging tests offer useful details such as type, location, size and stage of the tumor, which helps doctor evaluate the brain tumor and plan treatment. There are many medical imaging tests but Magnetic resonance imaging (MRI) is the most widely used imaging test to provide images of brain cancer and help diagnose brain tumors [2].

MRI provides thorough images of the body with the help of radio waves and magnetic fields. MR imaging is the most preferred because of satisfactory soft tissue contrast and wide availability. Accurate brain tumor segmentation of MR imagery is very much essential for surgical scheduling, and treatment evaluation. Manual brain tumor segmentation of MR imagery by a radiologist is strenuous and prone to human errors. Manual segmentation also restricts the usage of accurate quantitative measures in medical practice. Therefore, it is very difficult for radiologists to consolidate the related information about brain tumor acquired from MRI imagery. So automatic segmentation methods, which offer precise and consistent measurements of the tumors, are required [3]. There exist different preprocessing methods in MRI brain images like enhancement [4], denoising [5] and with wavelets and PCA [6]. Precise automatic brain tumor segmentation is very essential for assessment of brain tissues.

Over the years, several research works have been conducted on segmentation of brain tumor in MR imagery. Wang. J, et. al. [7] and Anjali. W, et. al [8] has given a summary of works for segmentation of brain tumor in MR imagery. They found that the major challenges would be the accuracy and requirement of great computing power. There are also various different automatic segmentation approaches [9-14]. Automatic approaches using fuzzy c-means have been examined for segmentation of brain tumor [15-19]. Automatic approaches are broadly divided as supervised and unsupervised approaches. Supervised learning approaches for segmentation of brain tumor are examined [20, 21]. C. Ouchicha, et. al. [22] and B. Srinivas, et. al. [23] provides a detailed overview of unsupervised approaches for segmentation of brain tumors. Over the years, owing to the swift evolution of computing performance, numerous deep learning techniques for segmentation of brain tumors have been examined [24,33]. They have shown success in segmentation of brain tumors. These methods obtain complicated and intricate features directly from the data. Amongst the deep learning methodologies, the methodologies based on CNN have attained superior performance for brain tumor segmentation [25]. In the recent years, CNN has made huge progress in the field of computer vision [26]. This paper, motivated by the

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AUTOMATIC CLASSIFICATION OF MAMMOGRAMS USING 2D-DISCRETE WAVELET TRANSFORM AND FEATURE SELECTION METHODS

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Abstract: Breast cancer is the most common cancer among women. The survival rate due to breast cancer increases if detected in early stages. In this paper, we proposed an efficient method to classify abnormal and normal mammograms. The method uses 2D-discrete wavelet transform (2D-DWT) to extract texture features and further different feature selection methods such as neighborhood component analysis and relief-f algorithms has been used to select significant features which contain qualitative information for classification of mammograms into normal and abnormal. The method was tested on mammogram images taken from Image retrieval for medical applications (IRMA) database. The proposed method was validated with different classifiers and achieved accuracy of 98%.
Keywords: Breast Cancer, Mammogram, Feature Extraction, Feature Selection, Classification..

1. INTRODUCTION

Breast Cancer is one of the second most common cancer among women. It affects almost 2.1 million in the world. Nearly 627,000 women have died due to breast cancer In 2018 [1]. Early detection of breast cancer is very important to increase survival rate. A vast research has been done in the field of image processing to detect breast cancer in early stages.

Digital mammography is an efficient screening tool that is used to detect breast cancer. Radiologists diagnose breast cancer in early stages by looking into abnormalities such as masses and microcalcifications in the mammogram. Masses and fibrogalndular tissue are adjacent and have high density hence, it is very difficult to identify shape of the mass. In order, to detect abnormalities in breast radiologists go for computer aided diagnosis (CAD) system. CAD utilizes several image processing and machine learning techniques . Feature extraction is a prominent step in CAD system, to identify the prominent features from image. In this work, features are extracted using multiresolution analysis which is based on 2D-discrete wavelet transform (DWT) and feature selection methods. Feature selection method is used to select important features from the DWT features. In this context, several methods have been proposed to classify mammograms into normal and abnormal. Adaptive orthogonal transformation was proposed to classify masses into benign and malignant in mammogram images [2]. Fractal texture analysis and fast correlation based filter are used for feature extraction and feature selection to classify mammograms into normal and abnormal [3]. 2D-DWT and statistical features are utilized for classification of abnormalities [4]. Spherical wavelet transform is applied to extract features for distinguishing normal, benign and malignant mammograms in [5]. Transfer learning technique [6] is applied for automatic classification of breast masses. Local binary pattern and local terenary pattern [7] methods are used to extract features from mammograms. 2D-DWT [8] is applied on mammograms for segmentation and classification of mammograms,

From the above literature, we can observe that many feature extraction methods were proposed to obtain information from mammograms. However, the extracted features are huge in number due to which the computational complexity and time taken increases to classify mammograms. Hence, it is very much important to propose efficient method to extract features and select significant features to increase the classifier performance for normal and abnormal classification. In this paper features are extracted using multi resolution analysis based on 2D-DWT from regions of interest (ROIs) of mammograms. Further, neighborhood component analysis and Relief-f algorithms has been used to select important features from feature vector obtained from 2D-DWT. Figure.3 shows block diagram of the proposed model.

2. METHODOLOGY
2.1 Data Sets

Our proposed method is evaluated by considering ROIs taken from IRMA database. It consists of normal, benign and malignant mammogram ROIs. The proposed method is tested on 58ROIsout of which 29 are normal and 29 are

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Single Point Positioning Accuracy
of Combinations combined GPS/Galileo

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Abstract

GNSS provides the position information Geographical Information systems (GIS). The precise positioning capability ensure the successful application of GNSS and its demand for GIS applications. Single point positioning (SPP) is widely used for applications including surveying, Mapping (most common use of GIS) and vehicle navigation. The effect of ionosphere on the GNSS signals is the largest and most unpredictable source of error. The availability of new civilian coded signals on multi-frequency for Galileo (E1, E5a, E5b) and GPS (L2C, L5) systems have given an opportunity to utilize the code-phase measurements to form dual linear combinations to correct for refractive effects due to ionosphere. The advantage of ionospherefree linear model is that it can be used directly in least squares adjustment to obtain accurate position solution. Code-phase observations are used instead of using carrier-phase observations that are ambiguous. The attainable accuracies of stand-alone GPS and combined GPS/Galileo are evaluated by considering ionosphere-free combinations of civil codes on L1/L2, L1/L5 and E1/E5a frequencies. The results show that attainable positional accuracy of SPP solution is improved. The 3D positional accuracy of combined GPS/Galileo is less than 2 meters.

Keywords: **GPS, GALILEO, Ionosphere-free linear combination, Position domain Single point positioning and Position error**

1. Introduction

The modern GNSS receivers are designed to track more number of satellites corresponding to different constellations. The interoperability of GNSS and availability of multi-frequency signals of distinct center frequencies with new civilian codes, aid in removal of majority of refractive effects of ionosphere on these signals. The work reported by Cocard and Geiger (1992), Han and Rizos (1996), Odjick (2003) and Richert et al., (2017) is focused in measurement domain and that to using carrier-phase measurements. Taking the advantage of new civilian coded signals of GPS and Galileo, the analysis is carried out to evaluate how these linear combinations affect the positional accuracy. Table1 depicts broadcasting signals and their frequencies of these two systems (Hofmann et al., 2008).

TABLE 1: GPS and Galileo signals

S.No.	GPS	Galileo
1.	L1(1575.42 MHz)	E1 (1575.42 MHz)
2.	L2(1227.60 MHz)	E5a (1176.45 MHz)
3.	L5 (1176.54 MHz)	E5b (1207.14 MHz)

It is envisaged that that all receivers in the International GNSS (IGS) network will be capable of tracking modernized GPS signals (L2C and L5) and Galileo signals to ensure highest- quality of GNSS related standards (conventions), data, and products. Receiver developers are also less interested in codeless and semi-codeless tracking with the availability of new civilian codes on multiple frequencies with backward compatibility to L1C/A. "U.S Airforce intend to discontinue receivers with feature encrypted P(Y) code by 2020". Therefore, the evaluation of accuracy of point positioning using dual-frequency measurements is essential. Single point positioning (SPP) technique involves determining absolute 3D coordinates using standalone GNSS receiver, which is desired in applications such as surveying, geographical Information Systems (GIS), marine (port navigation requirement) and aviation. The main motivation behind undertaking the current research is to understand the reliability of GNSS positional accuracy for SPP with new civilian signals. The investigation aims at study of attainable accuracies due to dual frequency ionosphere-free combinations of new civilian code measurements of GPS and Galileo. The unsmoothed code phase measurements data obtained from receiver are utilized to perform standalone GPS and combined GPS/Galileo single point positioning (SPP) on epoch by epoch basis. An overview of GNSS systems and observation equations used by receiver to compute position are presented in subsequent sections.

Performance analysis of MIMO System capacity with various Receiver Architectures

R V Durga, A McLauchlin

Abstract

Progress is aspired by the present-day technologies. Due to such progressions various researches are performed in substantial improvement areas. In the wireless spectrum, end-users 'amount is increasing day by day that leads to the requirement of enhanced BER values and bandwidth usage. Furthermore, in these modern times, new technologies are proved as research's crucial point that increases the wireless systems' capacities. A comparison of their BER performance charts is used to evaluate different combinations of multiple user receivers for determining performance under normal working conditions. In order to use the increased capacity rates, which can be achieved using a MIMO (multiple input and multiple output) configuration, MIMO systems are combined into system. MIMO with technology's complete dissemination through key attributes and components' investigation regarding single user communications. Various MIMO receivers' BER (Bit Error Rate) performance is also investigated. Adding SIC (Successive Interference Cancellation) to the MMSE (Minimum Mean square error) as well as ZF (Zero Forcing) MIMO receiver gives some changes to enhancements of BER value, but such minor change is important while ordering is performed with SIC. This particular paper provides a typical MIMO system. Compared to above-developed user systems, modern systems adopt a multi-user scenario. The present requirement for higher data rates resulted in the various techniques use like OFDM by the industry and the additional use of MIMO capabilities in WIFI (Wireless fidelity) s and CDMA (Code Division Multiple Access).

The Mimo System Capacity Analysis with Various Detectors and Different Modulation Schemes

R V Durga, A McLauchlin

Abstract

Progress is aspired by the present-day technologies. Due to such progressions various researches are performed in substantial improvement areas. In the wireless spectrum, end-users' amount is increasing day by day that leads to the requirement of enhanced BER values and bandwidth usage. Furthermore, in these modern times, new technologies are proved as research's crucial point that increases the wireless systems' capacities. A comparison of their BER performance charts is used to evaluate different combinations of multiple user receivers for determining performance under normal working conditions. In order to use the increased capacity rates, which can be achieved using a MIMO (multiple input and multiple output) configuration, MIMO systems are combined into system. MIMO with technology's complete dissemination through key attributes and components' investigation regarding single user communications. Various MIMO receivers' BER performance is also investigated. In terms of the required transmission factors, the modulation scheme is chosen depending on the situation. For example, 16QAM as well as 16PSK send more as compared to BPSK and QPSK symbols. A 2x2MIMO system, based on the simple ZF detector, As total symbols transmitted per second increases, the total errors also increases as well as thus, there exists requirement for higher SNR values. the need for higher SNRs to be used for greater order modulation is shown.

This particular paper provides a typical MIMO system. Compared to above-developed user systems, modern systems adopt a multi-user scenario. The present requirement for higher data rates resulted in the various techniques use like OFDM by the industry and the additional use of MIMO capabilities in WIFIs and CDMA.

RESEARCH ARTICLE

ENERGY RESEARCH **WILEY**

Modeling and performance optimization of two-terminal Cu$_2$ZnSnS$_4$–silicon tandem solar cells

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Summary

A dual-junction Cu$_2$ZnSnS$_4$–Silicon (CZTS–Si)-based tandem configuration is modeled and analyzed for its viability as a solar cell. The top and bottom modules in the tandem structure are validated by comparison with experiment. Initially, the designed tandem structure yields very low efficiency of 3.18%, and the various loss mechanisms are identified and investigated. The current mismatch between top and bottom cells and parasitic absorption (photon losses) are suggested to be the major causes limiting the short circuit current and hence the efficiency of the device. We optimize the material parameters within experimentally achievable limits in order to obtain current matching, and the optimized thicknesses of copper zinc tin sulfide (CZTS) and silicon (Si) absorbers are found to be 150 nm and 250 μm, respectively. The simulation results revealed that the photon losses are reduced, and overall absorption in the longer wavelength region has enhanced with the replacement of cadmium sulfide (CdS) by zinc sulfide (ZnS) buffer and careful optimization of the front layers of the device. The maximum predicted efficiency of tandem structure is >20% by minimizing the recombination centers within the experimentally obtainable ranges and improving the carrier separation process.

KEYWORDS
current losses, CZTS, photon losses, silicon, tandem solar cell

1 | INTRODUCTION

Crystalline silicon-based solar cells conquered the photovoltaic market in the past decades. Nowadays, the tandem solar cells have gained popularity as it possesses the capability of surpassing the Shockley–Queisser efficiency limits. As a result, the recent technology focuses on combining the thin film technology with silicon in tandem structure where thin films act as top cell absorbers focusing toward the achievement of efficiency enhancement of the device. Blanker[1] reported a two terminal tandem configuration which utilizes copper indium gallium selenide (CIGS) thin film as top cell absorber and hydrogenated amorphous silicon absorber layers in bottom cell. The

tandem structures designed with cadmium zinc telluride (CdZnTe) and cadmium telluride (CdTe) in combination with silicon as a bottom cell absorber were reported by.[2,3] An analytical model has been developed for kesterite-based tandem solar cells in Reference 4. Also, researchers have studied the performance of perovskite-based tandem solar cells for various topologies and configurations.[5,6] Ferhati et al have studied the perovskite/CZTS tandem solar cell and reported efficiency of 17%.[7] Amran et al have reported a monolithic configuration of perovskite/silicon solar cell with efficiency of 29% by employing a special hole-selective layer in the perovskite module.[8] Zhao et al reported a bulk-passivation technique for lowering the band gap of perovskite absorber

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DESIGN OF AN AREA EFFICIENT 16-BIT LOGARITHMIC MULTIPLIER

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ABSTRACT

Digital signal processing applications often use major mathematical operations such as multiplication, which consume more power and time. Operations like Fast Fourier Transform, Convolution and correlation depends heavily on a large number of multiplications. There are many techniques available to perform multiplications. One such technique is logarithmic multiplication. logarithmic multiplication is achieved by adding the binary logarithms of two numbers and deriving the antilog of the result. In this paper, an efficient algorithm for logarithmic multiplication is presented with the use of adders, decoders, multiplexers and a few combinational circuits that effectively reduce the power and area of the multiplier.

Key words: Logarithmic number system, Digital Signal Processing, logarithmic multiplication, Verilog HDL, Multiplexer.

1. INTRODUCTION

Multipliers play an important role in today's digital signal processing and various other applications. With advances in technology, many researchers have tried and are trying to design multipliers which offer either of the following design targets– high speed, low power consumption, regularity of layout and hence less area or even combination of them in one

AUTOMATIC IDENTIFICATION OF BRAIN TUMOUR USING MATLAB BY FUZZYC MEANS CLUSTERING

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ABSTRACT

Image process is one in the entire foremost tough and discontinuous inflicting strange emotions and behaviour and distinguished field within the gift day. This paper describes the additionally loss of consciousness.

propounded strategy to sight & extract from the pictures of the Magnetic Resonance Imaging (MRI) could be a sophisticated brain. This technique adopts some noise removal provision, medical imaging technique accustomed turn out top of the range segmentation and morphological tasks that are the basic ideas of pictures of the components contained inside the body magnetic image process. Detection and extraction of tumour type magnetic resonance imaging is typically used once treating brain tumours, resonance imaging pictures of the brain is finished by the MATLAB ankle, and foot. From these high-resolution pictures, we are code.

Automatic defects detection in MR images is extremely important in many diagnostic and therapeutic applications. Due to high quantity data in MR images and blurred boundaries, tumour segmentation and categorization is enormously tough. These efforts have introduced one mechanical brain tumor detection method to expand the accurateness and give way and decrease the diagnosis time. The ambition be classify the tissues to 3 module of normal, begin and malignant. . In MR images, the quantity of knowledge is just too much for manual interpretation and analysis. Throughout precedent few years, brain tumour segmentation in resonance imaging (MRI) has turn out to be an rising research area within the field of medical imaging system. Exact finding of size and site of brain tumour plays an significant role within the diagnosis of.

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SMART GARBAGE MONITORING AND AIR POLLUTION CONTROLLING SYSTEM

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ABSTRACT

Garbage monitoring system helps to eradicate or minimize the garbage disposal problem and helps to manage unwanted material leftover in the various places in the city, hospitals, houses, public areas etc. This paper presents the design and implementation of smart garbage monitoring system. Monitoring of garbage level only is not sufficient to make city environment clean and odor free but also free from harmful gases. If level of garbage bin remains below threshold value for long period then it causes smell, and it is unhygienic to people living nearby. To avoid this, we need to monitor gases generated by the garbage bin. One of the objectives of design is sensing unit at garbage bin, which is battery operated, so that it can be portable and easy for connecting.

Key words: Limit Switch, Gas Sensor, Arduino-UNO, Smart Waste Collection Monitoring and Air Pollution alerting system.

Suboptimal Multi-user Receivers Detection Algorithms

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Abstract: Current innovation tries to consistently advance. This movement prompts a ton of examination in any critical region of progress. There is a developing number of end-users in the remote range which has prompted a requirement for improved transmission capacity and BER esteems. At the end of the day, new advancements which would expand the limit of remote frameworks are ending up being an essential purpose of examination in these cutting-edge times. Furthermore, in these modern times, new technologies are proved as research's crucial point that increases the wireless systems' capacities. There have been many multi-user detectors in which the MMSE conducts several linear detector as well as the *n-stage* PIC overcoming the SIC. The assessed detectors were investigated, taking into account even the correlative composition of MAI found in CDMA. In case of high users number as well as because it's basically a matched filters' bank, the limits in multipath and noise occurrence render its use redundant in complicated modern detectors like a traditional linear detector. The MMSE detector are used as a detector's improvement. Therefore, the combination of its collection as one of the linear detectors with other sensors types was investigated. The technology's new field today enables wireless networks to be interpreted as well as explored by many applications. Owing to its wide use within the industry, the software used to simulate this project is MATLAB.

Keywords- Multi User Detection, Single Input- Single Output (SISO) Systems, Successive Interference Cancellation, Parallel Interference Cancellation, Multiple Access Interference.

1 Introduction

Today's telecommunications industries' main goal is data, voice as well as their combination's information's reception and transmission; with higher data rates as well as providing considerably low interferences. Wireless networking is one of the fast-growing media largely due to the appeal it offers to end users: mobility. In terms of the development of technology, wireless communication's premature usage as a medium of voice communication must be re-assessed to meet the increasing market for multimedia and text messaging, as used by cell phones. This need created a demand for extremely high data speeds that cannot be provided solely because of the signal interference and finite radio spectrum. Even though wired networks give these preferential rates, connectivity and instantaneity lack the requisite advantages, so research into the achievement of these wireless systems has become a critical research field in today's world.

Excellence is strived by the present world. This feature allows to obtain the most network space, latency and low errors. The last feature of the identification includes multiple people. It is a mixture of methods used to minimize the errors in a contact system's 'receiving' end. The requirement for wider speeds and bandwidths produces the need for recipients that represent minimal errors is of significant importance to MUD. The multi-user scans are a blend of algorithms that easily detects the received multi-user signals. This functionality makes it possible to serially process various MUD combinations to obtain higher error rates and the more visual variations, the more difficult it is. In SISO systems for multi-user detection, the present work offers an overview of the most commonly used techniques. Various SIC, MMSE and ZF detectors combinations were evaluated in order to identify the detector combination.

DynMAC Based Optimized Spectrum Handoff Algorithm for Deterministic Multihop Industrial Networks Modelling

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Abstract

Cognitive Radio (C.R.) networks are being used in industrial wireless applications due to their inherent capabilities. The effectiveness of cognitive radio depends on the type of Medium Access Control (M.A.C.)and handoff algorithms used and measured by its deterministic reinstating of transmission channels. However,the applicability of C.R. algorithms for multihop networks is less explored. Hence,in this paper, a deterministic handoff algorithm for multihop networks is proposed with the help of C.R. based M.A.C. A Common Control Channel (CCC) free M.A.C. based on G.I.N.M.A.C. termed as DynMAC (Dynamic M.A.C.)is chosen for experimentation. Unlike conventional DynMAC, new functionality that makes Child Nodes (C.N.) aware of the Global Channel (G.C.) list generated by Sink Node (S.N.) is added in DynMAC of the proposed approach. This, along with the spectrum handoff algorithm, facilitates switching transmission channels on receiving three consecutive errors. DynMAC is evaluated employing network calculus to model its arrival and service curves theoretically. Simulations have been carried out inthe Integrated Development Environment (IDE) using DynMAC with and without the proposed spectrum handoff algorithm for both single and multihop networks.

IMPLEMENTATION OF SIMPLE PWM/PPM GENERATOR FOR MICROCONTROLLER USING VERILOG

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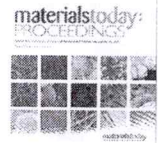
ABSTRACT

A Pulse Width Modulation (PWM) Signal is a method for generating an analog signal using a digital source. Now-a-days microcontrollers support PWM outputs. A PWM signal consists of two main components a duty cycle and a frequency. The PWM Generator block generates pulses for carrier-based pulse width modulation (PWM) converters using two-level topology. Most of the microcontrollers will have built in timers which helps in generation of PWM signal with various widths. PWM generator helps in controlling the brightness in smart lighting systems by controlling voltage to LED driver connected with LED bulbs. Also helps in controlling the speed of motors by varying voltage supply to it. It is also used as modulation scheme to encode message into pulsing signal for transmission. Pulse-position modulation (PPM) is a form of signal modulation in which M message bits are encoded by transmitting a single pulse in one of possible required time shifts. This is repeated every T-seconds, such that the transmitted bit rate is. bits per second. Used in non-coherent detection where a receiver does not need any Phase lock loop for tracking the phase of the carrier, Used in radio frequency (RF) communication. Also used in contactless smart card, high frequency, RFID (radio frequency ID) tags.

This project demonstrates how a simple and fast a pulse width modulator (PWM) generator and a pulse position modulator (PPM) can be implemented using Verilog programming. It is simulated using ModelSim, a multi-language (hardware description language) simulation environment from Mentor Graphics and tested on FPGA

Recent developments in code compression techniques for embedded systems

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ARTICLE INFO

ABSTRACT

Embedded applications software code is increasingly growing in size. Whereas the entire code of all control panels in a car provided for roughly a few 100 K code lines a decade ago, a single control panel such as the engine control can now have up to 1million code lines. With these help of good approach, common scenarios are developed for other, even for mobiles, embedded systems like PDA's, cell phones etc. However, increasing software size requires greater memory and can therefore raise the cost of an embedded system considerably. The starting of this pattern was already established in the early 1990 s. The compressed code is created by compressing the binary numbers using a code compression tool (at the time of design) is stored in the instruction memory of the embedded devices. The compressed instructions are decompressed and implemented by the processor at the time of startup. One of the serious challenges is that the tables will become wide in size and therefore decrease the benefits of compressing the code that could be accessed. Although the whole research in this area has mostly concentrated on improving greater code compression without specifically targeting the issue of wide look-up table sizes.

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1. Introduction

An extremely slower processor and limited memory sizes are commonly utilized by embedded devices to reduce costs. There is also an approximately 5 billion embedded microprocessors are being used now-a-days, as per the World Semiconductor Trade Statistics Blue Book. The major determinant for the rising prevalence of embedded device- driven portable devices like (Personal Digital Assistants) and web-platform mobile phones is the global expansion of their implementation, example the world demand for embedded devices will rise from about $1.6 billion in 2004 to $ 3.5 billion to 2009 a Average Annual Growth Rate(AAGR) of 16%. Because due to the requirements of the embedded industry,

the memory chip of the embedded device must be tiny, various techniques are utilized to minimize the size of the embedded software by encoding it inactive and then decoding it active. In the field of individual instruction problem use generally a RISC processor, the concept of utilizing code compression as a method for chip size mitigation in microprocessors has most triggered concern. Furthermore many developments in IC integration techniques to explore another direction which surely impedes the speed of processing[1-7].

The method of compression of code can be utilized when the ISA (Instruction Set Architecture) may or may not be defined. When the ISA ids defined, to create the decoders hardware, the code compression algorithm uses the data in opcode or instruction format. In this situation, the compression ratio will be increased, as the amount and type of operands can be minimized as according o the operation specified by the opcode in the instruction format. If the ISA is not defined, the code compression method implements

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DELIVERY COLLECTION OF PARCELS WITH SMART SHIPMENT CONTAINER USING ARDUINO

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ABSTRACT

The proliferation of online shopping has introduced a number of problems for the customer not present in what we might call the traditional shopping experience. One of the big new problems is how to handle the receiving of a parcel when not at home. A common practice by couriers is to leave a message indicating their failed attempt to deliver your package due to door lock or leave it in the care of the local neighbors (or not so local) post office. This then introduces a new problem of finding the time to collect your package from a place which is only open during the hours which most people work. What is needed is a way to receive a package at home even when no one is there. This would mean providing a secure location in which the package can be stored until someone gets home to collect it.

In our modern busy lifestyles, we are often not having enough time to respond to our routine activities like – answering a person at the door or collecting a door delivery. To handle such situations we propose a solution by automating the parcel collection unit. This system presents a low cost, less time-consuming, safe and effective implementation of Smart Box System through the wireless sensor networks. A special device, called a hardware kit is realized and designed for this purpose. When the parcel is placed inside the box, it is sensed through the optical (IR) sensors and the door will be automatically closed and simultaneously a message will be sent to the android device that the parcel is put in the smart box. In addition, a vibration sensor is also placed in

DESIGN OF SMART GARBAGE MONITORING SYSTEM

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ABSTRACT

Rapid increase in Urbanisation and Globalisation has led to an upsurge in the levels of solid waste production. The 21st century has notarised increased levels of garbage which not only degrades the environment but has severe implications at the societal level like deterioration of health of both human and animals in and around. Hence, it is the need of the hour to take time and build an efficient, effective and a well-organised mechanism to detect, monitor and manage the waste production. The traditional approach to waste management as we witness is time-consuming, cumbersome and heavily dependent on human effort which is not in sync with the updating technology. Smart Cities equipped with Smart Garbage Monitoring Systems can be one of the potential solutions to overcome these issues. A Smart City is assimilation of several integrated Internet of Things (IoT) Subsystems, of which Smart Garbage Monitoring System is one. One of the main applications is to eliminate the problems posed by the solid waste by designing a smart garbage monitoring system. The aim of this project is to design a cost-effective system which optimises waste collection and reduces fuel consumption thereby mitigating the cost requirement considerably. The system monitors the bin levels and informs the same via a web-page. This in turn conveys the information to the garbage collectors. Results thus produced verify accurate real time monitoring of garbage levels.

AGE PROGRESSION USING DELAUNAY TRIANGULATION

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ABSTRACT

Age is a factor which determines the changes that take place in a human body both physically and mentally. As the age increases, the features of human changes accordingly. That changes can be either for a period or entire life. Suppose the height of human, generally, increases up to a certain age of 18-21 and stopschanging later. So, age cannot be determined by the height. But few features like theelasticity of skin, hair nature, skin texture, etc., changes throughout the life. Age progression can be used extensively in several applications.

Age progression can be used to show the likely current appearance of a missing person from a photograph many years old. For example, it is widely used as a forensics tool by the law enforcement. In some cases, age and appropriate face image plays a crucial role. Suppose there's a criminal committing crime beencaught when he was 20 and subjected to an imprisonment. When he was 60, he was caught again committing crimes. In this scenario if the police suspected him to be behind certain crimes in the past 40 years and wanted to verify, then they will need pictures of the criminal at 30 years of age 40 years of age and so on.

This project will solve such issues by generating expected images of criminal at required age. Using the concepts of node points and triangulation, we morph the image and change the age in both the directions. The inputs to be taken are two images at different ages and output will be a video showing the transitions in age bymoving the shape and color blending sliders in the MATLAB

Key words: Age progression, Forensics, Node points, Triangulation, Morph, Blending sliders

A General Evaluation of Dermis Sores Identification using MOR-WAVELET Transforms

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Abstract: Dermis Canker detection is one of the significant image processing approach utilized in finding the Dermis sores, for example, malignancy and other pigmented sores. Because of the trouble and subjectivity of human understanding, mechanized examination of dermoscopy pictures has become a significant exploration territory. One of the most significant strides in dermoscopy picture investigation is the mechanized discovery of sore outskirts. In this paper we propose a novel approach for fringe recognition of sores in dermoscopy pictures. To begin with, the shading input picture is changed over into a dim level picture. At that point, the wavelet coefficients of dark level picture are determined. The wavelet coefficients are adjusted utilizing inclination of each wavelet band and a nonlinear capacity. The upgraded picture is acquired from the opposite wavelet change of altered coefficients. Morphology administrators are utilized to fragment the picture; lastly the injury is distinguished by a mechanized calculation. The outcomes show that the proposed technique has a low rate fringe error in a greater part of Dermis injuries.

Keywords: Discrete Wavelet Transform, Fringe error, Morphology, Dermis Sores, Malignancy

1. Introduction

A crucial difficulty the medical practitioners facing is to identify the frequent cause of deaths due to dermis diseases not identified at early stages. As indicated by the W.H.O, there are around one million dangerous malignancy cases and more than sixty thousands demise instances of harmful malignancy iaround the globe every year [1]. Dermis is the comparatively bigger organ in the human body, which comprises of the 3 principal layers: Dermis, epidermis, and hypodermis. The Dermis has a significant job in the soma securing about external influenced parameters, for example, microscopic organisms, heat changes, and presentation to bright radiation (U.V.R) [2]. U.V.R is one of the well-known grounds that take to dermis malignant growth. These U.V.R beams are sufficiently amazing to arrive at our slough layer in the dermis and harm the D.N.A which drives at last to Dermis disease. The postponement from the hour of harm and the malignant growth can be numerous years.

The expression "Dermis disease" refers to three distinct conditions that are recorded underneath in rising request of mortality:

1. Basal cell carcinoma (or basal cell carcinoma epithelioma)

2. Squamous cell carcinoma (the principal phase of which is called actinic keratosis)

3. Malignancy.

Malignancy is commonly the genuine type of dermis lymphoma since it will spread in general (metastasize) all through the body rapidly.

Dermatologists are confronting urgent issues in confirming the threatening malignancy by utilizing dermoscopy. The determination by utilizing dermis-surface microscopy is not exact and sets aside some effort to give the last finding. Timely malignancy discovery may expand the likelihood of testing threatening malignancy up to ninety percentage. In the year 1994, Franz Nachbaur [3] proposed a clinical dermoscopy strategy for malignancy identification known as *abcd* rule. This standard was surveyed by a scoring condition for every assessment technique. The *abcd* rule works just for melanocytic injuries.

As of late PC frameworks helped practitioners in malignancy recognition. The greater part of the identification frameworks comprises of five principal steps: picture securing, pre-processing, highlight extraction, arrangement,

SMART EXTENSION CORD USING NODE MCU

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ABSTRACT

With advancement of Automation Technology, life is getting simpler and easier in all aspects. In today's world automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade, made internet as a part and parcel of life. Internet of Things (IoT) is the latest and emerging internet technology. It is a growing network of everyday object-from industrial machine to consumer goods that share information and complete tasks while busy with other activities. Wireless Home Automation system (WHAS) using IoT is a system that uses computers or mobile devices to control basic home functions, facilitate automation through internet from anywhere around the world. Automated home is also called as Smart Home. It is meant to save the electric power and human energy. This paper is IoT based which works on internet to operate the Smart Extension Cord sockets individually from any part of world with ease using the application. The application is user friendly which will help the user to easily ON/OFF the sockets and can also set the timer for individual socket, which will notify after the time is complete.

This work is done with the help of Node MCU, Relays, Google Assistant, Firebase Cloud, MIT App Inventor and IFTTT. We implemented an application using which any user can operate it very easily with the help of active internet connection.

KEYWORDS

Firebase Cloud, Google Assistant, IFTTT, MIT App Inventor, Node MCU

Weed Detection Using Image Processing

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ABSTRACT

As the increase in the world population the demand of the Soya production and other is also increases. In order to increase the growth of the Soya in the Soya crop it is necessary to detect the weed in the Soya crop and the barren land to minimize the growth of weed so that the growth of the Soya can be improved. Weed detection is one of the important factors to be analysed. Unmanned Air Vehicle (UAV) is used to get data acquisition of Soya crop in different phases so that high quality of RGB images can be captured. The proposed method facilitates the extraction of weed, Soya, and barren land in the Soya crop field using background subtraction. The result shows that background subtraction method is good for detection the weed, barren land, and Soya.

Key words: UAV, RGB, CNN

INTRODUCTION

Weeds are an all too common occurrence in lawns and gardens. While some may be deemed useful or attractive, most types of weeds are considered a nuisance. Learning more about weed control and detection can make it easier for gardeners to decide whether these weeds should be welcomed or if they must go. Let's take a look at some common weed plants and when or what weed control methods may be necessary. By definition, a weed is known as "a plant in the wrong place." For the most part, these plants are known more for their undesirable qualities rather than for their good ones, should there be any. Weeds are competitive, fighting your garden plants or lawn grass for water, light, nutrients and space. Most are quick growers and will take over many of the areas in which you find them. While most types of weeds thrive in favourable conditions, native types may be found growing nearly anywhere the ground has been disturbed. In fact, they may even offer clues to your current soil conditions.

One of the newest and most researched technologies nowadays is deep learning. Deep learning is a technique used to create intelligent systems as similar as possible to human brains. It has made

Analyzing Patient Health Information Based on IoT Sensors with AI

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ABSTRACT:

The IOT devices utilizes the several sensor devices that are able to collect a large volume of data in different domains which are processed by AI techniques to make the decision about the assistance problems. Among several applications, in our project, IOT with AI is used to examine the healthcare sectors to improve patient assistance and patient care in the future direction. An IOT sensor with AI is used to predict the exact patient details such as fitness tracker, medical reports, health activity, body mass, temperature, and other health care information which helps to choose the right assistance process. The patient information which is shared in the cloud environment is accessed and processed by applying the optimized machine learning techniques. It further examines the patient's details from the previous health information which helps to predict the exact patient health condition in the future direction. In this system, doctor and care takers can observe patient without exactly visiting the patient actually.

We proposed a nonstop checking and control instrument to screen the patient condition and store the patient information in sever utilizing Wi-Fi Module based remote correspondence. And furtherly they can upload medicines and medical reports on the web server which after can be accessed by the patient anywhere at anytime. It is very much easy process and convenient for both the doctors and patients. The efficiency of IOT sensor with an AI-based health assistance prediction process is developed by using the MATLAB tool. Monitoring and recording of various medical parameters of patient outside hospitals has become widespread phenomena. The reason behind this project is to design a system for monitoring the patient's body any time using internet connectivity. The function of this system is to measuring some biological parameter of the patient's body like Temperature, Heartbeat, Blood pressure, by using sensors and the sensors will sense the body temperature, heartbeat and blood pressure of the patient and sends the values to IOT Cloud platform through WIFI-Module. All information about the patient health will be stored on the cloud .it enables the doctors to monitor patient's health, Where the doctor can contineously monitor the patient's condition on his smart phone. This system is based on client server application in which server stores data collected from client, role of client is to collect proper data from patient & transfer it to server. A remote health monitoring system using IoT is proposed where the authorized personal can access these data stored using any IoT platform and based on these values received, the diseases are diagnosed by the doctors from a distance. The

A Study of Deep Learning-Based Brain Tumour Segmentation Strategies for MRI Image

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ABSTRACT

The segregation of irregular tissues from normal brain tissues, such as brain tumour segmentation, is one of the most essential and fundamental activities of any brain tumour identification scheme. Interestingly, the tumor in tumor analysis domain has been effectively used in the principles of medical image processing to computerize the center steps, i.e. detection, segmentation and classification for a approximant brain tumor finding, particularly on Magnetic Resonance images. It is more invasive to study for its noninvasive properties for imaging. Identification or recognition systems assisted by computers are suitable complicated and are present an unbolt issue because of variations in tumor forms, areas, and size. Important study performance, mechanical brain tumor detection techniques based it's on previous completed works of various experts in biomedical image processing and flexible computing as well as classification and their combinations. Different methods are used to identify the brain tumor using images of Magnetic Resonance Image is analyzed in the article, along with robustness & problems found with every to notice different types of tumors in brain.

In the existing methods of classification/segmentation, detection be as well confer with heart on the merits and demerits of the approaches to biomedical imaging area in every mode the reason of the study provided at this point is to support the analyst to get the necessary quality of brain tumor type and identify different brain classification and techniques is which are very successful and for spotting brain tumor a choice is tumor brain diseases. The script covers the most applicable techniques, procedures, functioning system, preference, limitations, and possible MRI image tumor in brain detection snags. It is effort to recap the existing state of the art with admiration into various forms of tumors will assist researchers to pursue future directions.

Keywords: Segmentation, MRI, Deep Learning, CNN, ANN

I. INTRODUCTION

According to the World Health Organization's most recent figures, brain tumour disease is the most frequent form of cancer death worldwide. the advance diagnosis a mind tumor saves the patient from death and helps treat patients on time but this is not always accessible to people. Glioma can be considered the most dangerous tumors in the central nervous systems systems (CNS)is primary brain tumor. In present years the world health organization amend the edition 'LGG (Low grade glioma) and high grade glioma (HGG) glioblastomas will exhibit compassion propensities in 2016 adoptive the state of two forms of glioma tumours is LGG (Low grade glioma) and high grade glioma (HGG) glioblastomas.

A new tool is used for the field of biomedical engineering gives awareness about the various healthcare observations. A deep learning is a one of the part of AI system; it able of conduct advanced dimensional data and is capable in focused on the right features. Tumor it is a very complex disease; a multifaceted cell has more than hundred billion cells; each cell acquires mutation fully. Finding of tumor particles in experiment is easily done by using MRI or CT. Brain tumors can also be detected by MRI. however, deep learning techniques provide a better approach to do segmentation of the brain tumor images. Deep Learning models are roughly positive by in sequence managing and communication designs in biological nervous system. Classification plays a leading role in detection of brain tumor.

Neural network is creating a well-organized rule for classification. To achieve image medical data of neural network is trained to used the a convolution algorithm, for classification of an image Multilayer perception is proposed. In this review article, the brain images are categorized into two types: normal and abnormal. This article emphasizes the significance of categorization and characteristic selection approach for predict the head tumor. This classification is completed by machine learning technique acting are like support vector machine ANN, and Neural Deep network. It might be famous that more than one method can be practical to the segmentation of tumor.

The several samples images of a brain tumor are classified with deep learning algorithms, convolution deep neural network and multi-layer observation. Analysis imaging of tumor in brain it's to obtain the most major information, it help to medical identification of patient for good quality treatment, in imaging analysis errors come into view at feature extraction. image size and also display the enlargement to the brain tumor disease cells is unmanageable that type of disease is called as tumor. The tumor a variety of types and have more character these are cure with different type of therapy's' [in 2013, Guptha and Shringirishi]. MR image segmentation can be biological part of a person being in a body and such as blood vessel in the spine, heart, brain, , and knee and the segmentation is the procedure of removing reassuring detail from diagnostic photographs that are one-of-a-kind.

A key intend for segmentation is to split a image into uniform and no overlapping location of similar properties they are strength. Texture, color, and intensity that gives the segmentation results of on each image of label then

Improved Convolutional Neural Network Based Cooperative Spectrum Sensing For Cognitive Radio

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Abstract

Cognitive radio systems are being implemented recently to tackle spectrum underutilization problems and aid efficient data traffic. Spectrum sensing is the crucial step in cognitive applications in which cognitive user detects the presence of primary user (PU) in a particular channel thereby switching to another channel for continuous transmission. In cognitive radio systems, the capacity to precisely identify the primary user's signal is essential to secondary user so as to use idle licensed spectrum. Based on the inherent capability, a new spectrum sensing technique is proposed in this paper to identify all types of primary user signals in a cognitive radio condition. Hence, a spectrum sensing algorithm using improved convolutional neural network and long short-term memory (CNN-LSTM) is presented. The principle used in our approach is simulated annealing that discovers reasonable number of neurons for each layer of a completely associated deep neural network to tackle the streamlining issue. The probability of detection is considered as the determining parameter to find the efficiency of the proposed algorithm. Experiments are carried under different signal to noise ratio to indicate better performance of the proposed algorithm. The PU signal will have an associated modulation format and hence identifying the presence of a modulation format itself establishes the presence of PU signal.

Search

Brain Tumor Segmentation, Detection and Grading in MRI Images

Kethu Sneha Latha, Yepuganti Karuna, Saladi Saritha

ABSTRACT

The most common malignant brain tumours are gliomas, and they come in a variety of grades, each of which has a significant impact on the patient's chance of survival. Magnetic resonance imaging (MRI) tumour grading and segmentation are normal and crucial for treatment preparation and diagnosis. A deep learning approach was developed to meet this clinical need, that associates tumour segmentation using U-net which is a convolutional neural network (CNN) and tumour grading using transfer learning using a Vgg19 and a completely associated classifier. T1-postcontrast, FLAIR and T1-precontrast MRI images of 110 patients with LGG were used to train and evaluate. DSC for segmentation model's and tumour detection accuracy are 0.875 and 0.937, correspondingly. At the MRI image level, the grading model classifies LGG with specificity, accuracy, sensitivity, and of 0.922, 0.907, and 0.893, correspondingly. In MRI images this study shows conventional tool for automated and simultaneous LGG tumour segmentation, detection, and grading in clinical settings.

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Optimisation of Cloud Seeding Criteria Using a Suite of Ground-Based Instruments

P. Sudhakar, K. Anitha Sheela, and M. Satyanarayana

Abstract All fresh-water, whether on the surface or underground, comes from the atmosphere in the form of precipitation. Nevertheless, a large volume of water present in the clouds is never transformed into precipitation on the ground. This has prompted researchers to explore the possibility of augmenting water supplies by the use of "cloud seeding" technique to initiate and accelerate the precipitation process. The seeding technique is expected to provide an increase in precipitation from the cloud and provide rain almost immediately at the targeted region/ location. This is done by dispersing suitable substances into the cloud that serve as cloud condensation or ice nuclei. Although many projects around the world have successfully demonstrated a considerable increase in precipitation due to seeding, majority of the projects, however, yielded inconclusive results on precipitation enhancement [1]. The reason for this inconsistency is that the physical mechanisms of aerosol effects on cloud and precipitation development are much more complex than anticipated earlier. There are many ongoing operational cloud seeding programs and the number has been steadily increasing with time. Despite this, there is still a great need for more intensive FIELD experiments to standardize the cloud seeding technology for increased reliability and enhancement of precipitation from clouds. The technology of rain enhancement is based on the science of cloud physics with major linkages reaching

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COVID-19 Social Distancing with Speech-Enabled Online Market Place for Farmers

D. Mohan, K. Anitha Sheela, and P. Sudhakar

Abstract Corona virus (COVID-19) has been rampant in most countries across the world, leading to a global crisis, and it has been so dangerous because of its ability to spread through any medium especially when there is physical contact of any object. So, this puts many people including the farmers and the customers at a bigger risk when they sell or buy products physically in a market place. This is a major challenge to an Indian farmer today to sell the product at the right price at the right time. Moreover, social distancing is the need of the hour, and hence, it is an even bigger challenge to monitor the market place to avoid physical contact. Also, many initiatives by governments, local bodies, and cooperative societies to eliminate the intermediaries are not turning effective due to the non-awareness, non-accessibility, ignorance, and ease of usage difficulties. Keeping the current pandemic situation in mind and social distancing being the need of the hour, this paper proposes a speech-enabled interactive voice response (SEIVR) wherein the farmer and the customer can sell and buy products online, i.e., without any physical contact. In the current technology era, online market platforms like Amazon, Flipkart, and Oix are effectively cutting short these supply-chain overheads by establishing a direct connection between buyer and seller. Hence, the proposed implementation of a speech-enabled interactive voice response (SEIVR)-based online market place for farmers which even ensure social distancing will help to reduce the spread of the virus. The objective of this work is to build an agriculture-based mobile application with speech-enabled interactive voice response (SEIVR) based on speech recognition application with the Telugu language as a case study.

Keywords COVID-19 · Corona virus · Agricultural information system · Voice-enabled mobile application · Speech recognition · Speech-enabled IVR · Sphinx · Acoustic model · Language model · Photic dictionary

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Effective Utilization of Battery Banks in PV Based Novel Inverter Operated Induction Motor Drives

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Abstract— The three-phase squirrel cage induction motor is due to its many advantages, such as no maintenance, robust construction, etc., usually used for agricultural applications. PV induction motor drives are mainly used where no power is available. However, conventional two-level inverters that convert DC to AC do not provide a quality output. Therefore, this article describes an induction motor drive with a multilevel converter. In a home-based PV system, full use of battery packs is essential to reduce network dependency and improve reliability. To achieve this goal, it is important to keep the battery banks in an almost identical state of charge. This article proposes a technique for limiting battery banks by switching isolated panels. The selection of the isolated panels considers the irregularity of the position of the panels. In order to reduce network dependency and improve reliability, a switching model is developed for the photovoltaic system that considers the generation and load model. The proposed switching technique and model will be reviewed in the MATLAB / SIMULINK environment.

Keywords—PV panels, battery banks utilization, Multi-level inverters.

1. Introduction

It is increasingly laborious to meet the energy needs of the traditional generation. To meet the growing demand, distributed generation is the answer. Renewable energy systems are a source of clean energy. Among all renewable solar energy there is a lot. By reducing dependence on non-renewable energy sources and reducing greenhouse gas emissions, solar energy ultimately contributes to energy security. With the increase in the price of the network per unit, solar energy can equal conventional coal fuels [1]. The disbursement of solar energy is instantly really ambitious with conventional coal electricity and it is expected to reach parity of the grid by 2020; Many countries are committed to reducing greenhouse gas emissions and generating at least 20% of their energy use from renewable sources by 2020 [1]. In this context, the generation of photovoltaic energy (PV) plays an important role, since it is a source that respects the environment. The only emissions associated with the generation of photovoltaic energy are those in the manufacture of its components. After installation, they generate electricity from solar radiation without exhaling greenhouse gases. They can also be equipped in places where there is no other treatment, such as: Roofs and deserts, they can generate power for remote locations where there is no electricity grid. The latest types of equipment are known as out of-network equipment and, on occasion, represent the most economical alternative to accommodate power in far-flung areas. Solar energy offers an economically workable option to connect to non-electrified areas. Some of the renewable energy technologies used as decentralized systems in rural areas are solar lighting systems, solar lanterns and solar lighting systems for the home, solar water heating systems, solar cookers.

Since India lies in the equatorial belt, the bright sun is expected in most areas on 250 to 350 days a year. The total radiant energy varies between 1600 and 2200 kWh / m2 [2]. An annual potential of 6000 million GWh of energy [2]. The Ministry of New and Renewable Energy is planning to install 10 major solar projects and one off-grid GW solar project by the end of 2017 [3].

On the other hand, two-level power electronic inverters are commonly used in photovoltaic drives and practices for converting DC to AC voltage [1]. The main problem of two level inverters, however, is the harmonic component that is very high in this inverter [2] - [3]. These problems are minimized by the use of power electronic multilevel inverters [5] - [7].Even supposing accustomed multilevel inverters have many advantages, they have certain disadvantages, such as the problem of balancing the neutral point voltage [8], the requirement for a larger statistics of capacitor banks [9].] and isolated DC power sources [10]. To diminish these disadvantages of typical multilevel inverters, plentiful multilevel inverter configurations have been proposed in the literature. In [11], an intriguing five-stage inverter configuration is proposed in which only two-level inverters are used to generate a five-level voltage waveform. In addition, this power inverter operates on a single DC source. By using this inverter configuration, therefore, all the problems mentioned in the conventional multi-stage inverters can be minimized. The main drawback of this above configuration, however, is that it requires six additional bidirectional
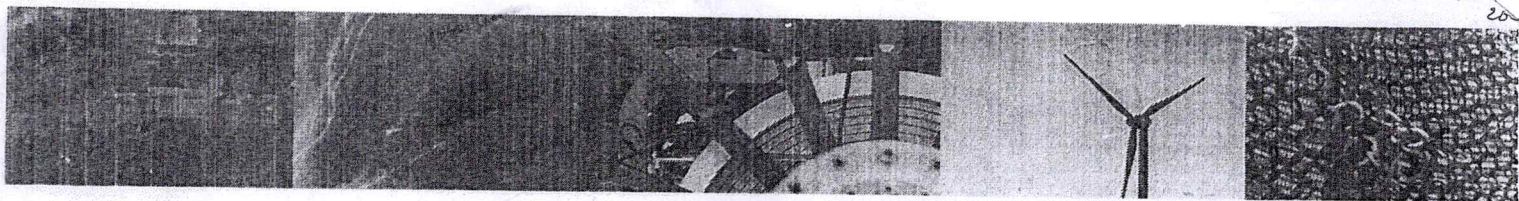
Research Article

Reverse harmonic load flow analysis using an evolutionary technique

B. Vedik[1] · C. K. Shiva[1] · P. Harish[2]

Abstract

In the present paper, a new approach to estimate the harmonic distortions is proposed by considering the existence of harmonic sources in the power system. The algorithm employs a differential evolution technique by formulating the reverse harmonic load flow problem for each harmonic order and by considering a limited number of phasor measurement units (PMUs) deployed across the power system. The technique utilizes the measured voltage and current harmonics obtained using synchronized PMUs with known transmission network as input data. The proposed technique estimates the harmonic voltage phasors at the unmonitored buses of the power system with reasonable accuracy. The effectiveness and efficiency of the proposed method is validated by applying it to five bus and IEEE 14-bus test systems by considering uncertainty in measurement noise. It is shown that the proposed approach yields optimum solution and provides reliable and accurate harmonic state estimates.

Keywords Differential evolution · Reverse harmonic power flow · Harmonic state estimation · Harmonic voltage phasor

1 Introduction

With the significant growth of power electronic devices has led to an increase in the harmonic distortion of power supply waveform [1]. Harmonic distortion can be defined as the voltages and currents having frequencies that are integer multiples of the fundamental frequency and further any deviation from the perfect sinusoidal waveform [2]. The penetration of these harmonics into the system not only affects the quality of power supply but also causes a severe problem in various power system components [1]. In order to maintain high-quality power supply, these harmonic sources should be assessed, monitored, and mitigated [3]. Because of this reason, harmonic analysis has become a vital factor in power system analysis and design.

Harmonic state estimation (HSE) is a reverse procedure to harmonic load flow analysis. In harmonic power flow analysis, response (harmonic distortion) of the power system is determined by injecting harmonic sources at one or more locations of the power system network. Whereas in HSE, harmonic sources (harmonic injections) are evaluated for the power system network response given by a set of harmonic measurements [1]. Although the measurement meters are becoming less costly, it is neither efficient nor essential to deploy phasor measurement units (PMUs) at every bus of the power system to perform state estimation. Consequently, various PMU placement methods have been developed to deploy these PMUs optimally across the power system network. In such circumstances, the HSE process is suggested when limited locations are selected for the installation of PMUs [4]. The HSE process utilizes a set of measurements obtained from PMUs along with the system configuration supplied by the topological processor, network parameters, PMU meter location, and measurements to estimate the harmonic states of the power system [4].

In [5], HSE is performed by using the least-square based state estimation to compute the frequency spectra at various buses that are suspected as harmonic sources. The

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An Assessment Of The Implementation Of Mppt Algorithm For Pv Pumping Based On Perturb And Observe Logic (P&O) Controller

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Abstract

Solar cells convert solar light into electricity, but their major drawbacks include high initial costs, low photo conversion efficiency, and unreliable power generation. The maximum power point (MPP) of solar cells depends on solar insolation level and temperature, which causes the current-voltage characteristics to vary. Utilizing an MPPT technique to maximize the production of power from solar panels is among the most interesting areas of research in photovoltaic (PV) systems.The main parts of the PV system consist of PV panel, converter, controller and load. Converter and controller play a major role in the system. Controller is used to extract the maximum power from the PV panel. In this paper, a suitable converter topology to extract maximum power is suggested and performance of the converter is also tested with P&O fuzzy logic controller. The performance of the proposed controller and converter topology is appraised with conventional boost converter topology in terms of output power. It confirms that the proposed topology performed better than the conventional boost converter. The results show that the designed MPPT controller improves the efficiency of the PV panel when compared to conventional charge controllers.

Key words: PV panel, MPPT, Boost converter, Perturb & Observe (P&O), Fuzzy logic controller and fuzzy logic controller

1. Introduction

Global climate change and the energy crisis calls for more renewable electricity to be generated by solar cells, which poses a major concern for today's civilized world.Solar panels face two major challenges: low efficiency and intermittency, making solar one of the most important renewable energy resources in the world. Because solar is inexhaustible and environmentally friendly, it has been used for light, heat, and electricity.Stand-alone solar photovoltaic systems are most expensive when it comes to the PV modules

Challenges of RES with Integration of Power Grids, Control Strategies, Optimization Techniques of Microgrids: A Review

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Abstract- The Conceptual views on renewable energy sources, the use of unconventional sources and integration, future challenges for "Renewable energy sources (RES)" and strategies for controlling different types of microgrids are specified in this paper. The importance of RES has increased in the electrical system power network due to their periodic nature. Its generation does not coincide with load point when need for Energy Management Systems (EMS) is created. In this lexicon, Energy management (EM) prefaces an includible challenge in operation of distributed renewable sources connected to grid. The challenge in this type of sources is due to factors such as the infrequent sources, the estimations in time of day, the size of the "solar panels", "battery", limits of the charging, discharging speeds of battery. The novelty of this paper is latest scenarios, potential of solar, wind energy in India is specified in a graphical manner and control strategies, optimization techniques of microgrid are discussed in an elaborated way. In this article, the concepts the basics of microgrid, challenges in integration of grid, optimization techniques and the concept of "Distributed Energy Resources (DER)'s" are discussed.

Keywords Renewable energy sources, Microgrids, Integration, Energy management system (EMS), Solar panels, Integration, Distributed Energy Resources (DER).

Nomenclature

RES-Renewable energy sources	LMT-Low, medium tension	AND-Active distribution network
EMS-Energy Management Systems	DN-Distribution networks	WPG-Wind power generation
EM-Energy management	ES-Energy security	AM-Active management
DER-Distributed Energy Resources	PCC-Point of Common Coupling	REN-Renewable energy network
CES-Conventional energy source	DG-Distributed generators	ESS-Energy storage systems
RRES-Reliable renewable energy sources	BESD-Battery Energy storage devices	EO-Energy cooperation (EO)
MG-Microgrid	DCMG-DC microgrid	PE-Power energy
SG-Smart grid	ACMG-AC microgrid	CS-Control strategies
LT-Low Tension	EST-Energy storage technology	DG-Distributed generation
DER-Distributed energy sources	SES-Solar energy system	MSU-Master-slave unit
PV-Photovoltaic arrays	PS-Partial shading	SMS-Stable micro sources
MWT-Micro wind turbines	SM-Solar modules	HICOS-Hybrid interactive communication
FC-Fuel cells	SE-Solar energy	RTO-Real-time optimization
ED-Energy demand	LCES-Large capacity energy storage systems	OPD-Optimal power dispatch
SES-Solar energy sources	CP-Communication protocol	MAS-Multi-agent systems
WE-Wind energy	TLC-Two-layer control	SAS-Single agent system
DPCA-Distributed predictive control algorithm	PSO- Particle swarm optimization	RDER-Renewable distributed energy resources
GO-Global optimization	POMMP-Probabilistic multipurpose microgrid planning method	VRE-Voltage regulation errors
MGSA- Microgrid scheduling algorithm	MMGS-Multi-microgrid system	VSSE-Voltage steady state error
ABC-Artificial bee colony algorithm	EO-Energy optimization	BVSC-Busbar voltage stabilizing controller
		PD-Power demand

SMART HOME SECURITY ENVIRONMENT SYSTEM ENVIRONMENT WITH HUMAN FACE RECOGNITION BY USING   REMOTE TECHNOLOGY

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Abstract: Smart home security system has become indispensable in daily life. Remote monitoring technologies are to be used since the invention of smart home security control system. In this paper, we described home environmental issues to authenticate people by the verification of wireless control system. We proposed verification techniques for the identification of visitors' faces, alert messages of home environment situations. System control issues can be authorized the system through user mobiles by receiving the commands with authentication. The complete system is controlled by using Raspberry Pi and testing the home environment.This new system can be implemented in the home environment to do authentication process. Normally Face recognition algorithms and wireless interfaces are used to identify the visitors and provide an email notification and/or an alert message about the current home environment through network facilities with the help of home owner's mobile phones. This system is more useful for more applications which are not having a physical presence at any time.

Keywords: Face detection, Raspberry pi, E-mail, Security.

1.   INTRODUCTION:

Now a days, Internet of Things (IoT) is an emerging area in an IT field. It is a network connection with physical objects which are accessible through the internet facilities. Yet things assign an IP address and collect the data transfer through network without human beings of participation. It provides different ways to increase efficiency and improving safety and it security [1]. Data analytics, security issues have improved the performance to achieve the best results. An efficient embedded door access control management techniques are used in face recognition process. It plays a crucial role in the security application. In those days implementation of security system was implemented in homes and workplaces [2]. Doors are open/close with the cards, security keys. It has the following advantages.

➤   Small surveillance capacity.
➤   Low efficiency in evaluating time.
➤   Human error in high security system.

Recent days, security gains are real high power of everything in the universe. In this paper, the authors have been focused for producing the comprehensive study, which is related to the many door locks and gate security systems that are mainly implemented [3].Customer can access the system by utilizing mobile phones [10].Previously some of the authors are focused on security issues. Krishna Reddy et al have focused on security issues in a cloud environment.[16]. Titupathy Reddy et al gives data sharing process by using secret keys.[17].Swapna et al described the website security threats[18]. Ravindra Nath etalhave been focused on different security issusses for data in cloud environment {19, 20, 21}. Jabbertal [22] provide a health care management system of government. Lakshmi Praneetha et al [23] demonstrate the automated leaf disease detection in corn species through image analysis. Mishraetal [24] gives performance analysis on architecture issues. Nagendrama [25] provides the Performance evaluation of wide area network issues. The major contribution of the paper is to provide the guidance to the users for improving door security of personal locations by using face detection and verification [1]. This system can be used to develop

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Reliability of Fault Tolerance in Cloud using Machine Learning Algorithm

S. Harini Krishna, G. Niveditha, K. Gnana Mayuri

Abstract—The basic fault tolerance issues seen in cloud computing are identification and recovery. To fight with these issues, so many fault tolerance methods have been designed to decrease the faults. However, due to the reliability and web based service giving behavior, fault tolerance in cloud computing will be a huge challenge. The present model is not just on tolerating faults but also to decrease the possibility of future faults as well[4].The fault tolerance deals with the exact and constant operation of the fault segments. The processing on computing nodes can be done remotely in the real time cloud applications, so there could be more possibilities of errors. Hence there lies an immense necessity for fault tolerance to attain consistency to the real time computing on cloud infrastructure. The "fault tolerance" can be explained through fault processing that have two basic stages. The stages are

(i) The effective error processing stage which is used to intended for carrying the "effective error" back to inactive state, i.e., before the error occurred

(ii) The latent error processing stage intended for guaranteeing that the fault does not get effective once again.

I. INTRODUCTION

Cloud computing provides numerous resources in the type of services to the end nodes on-need basis. It enables various businesses and users to utilize applications without installing them on their phones or laptops and allows the access to necessary resources over the Internet. It provides various features such as connectivity, high performance, reliability, pay-as-you-go, interactivity, ease of programmability, efficiency, scalability, elasticity and management of large amount of data and there by transforming Information Technology from a product to a service. [1]

Fault tolerance refers to a technique of system design that lets a system to keep working when one of its parts fails or it can be explained as a capacity of a system to react quickly to an unexpected equipment or programming break down. If the system is not completely operational, fault tolerance solutions may allow a system to continue operating at lower capacity rather than shutting down completely following a failure. [2]

II. BENEFITS OF CLOUD COMPUTING

Cloud computing decreases the response time and running time of a task. It also lowers the risk in deploying application, lowering cost of deployment, and reducing the effort and increasing the innovation.

Increased Throughput: *Cloud makes use of thousands of* servers to complete anassignment in less time unit compared to the time taken by a individual server.

Decreases infrastructure risk: Cloud can be utilized by the organizations to minimize the load of buying physical servers. The issues of higher investment and deployment of servers depending upon the workload can be resolved by considering investment on infrastructure for the applications whose attainment is short-lived.

Minimize cost of entry: Various characteristics which are mentioned earlier reduces the cost for organizations to enter new markets:

The capital investment is minimized to zero by renting the infrastructure instead of buying it and there by controlling the cost.

The rapid application development helps to minimize the time taken to get into the market, thereby giving organizations an edge against the competition.

Focus on innovation: Organizations dealing with the issue to infrastructure deployment can now focus on innovating things. [2]

III. STRATEGIES UNDER REACTIVE FAULT TOLERANCE

The strategies used for fault tolerance helps in regulating the cause and effect of failures on the application, these methods were very help full in cloud computing system on instances of failure occurrences. Based on these policies there are various techniques[3] :
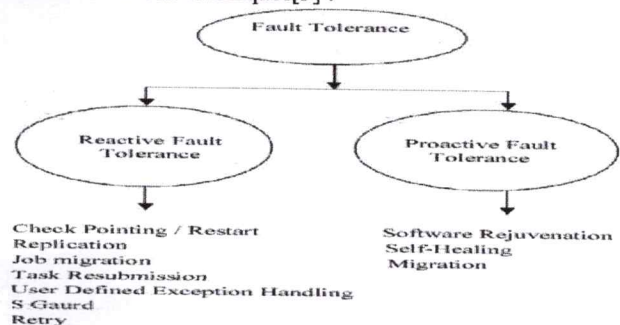

Check Pointing / Restart
Replication
Job migration
Task Resubmission
User Defined Exception Handling
S Gaurd
Retry

Software Rejuvenation
Self-Healing
Migration

Fig 1: Fault tolerance techniques

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Thermal Properties of Hybrid Natural Fiber Reinforced Polymer Matrix Composites with SiC as Filler

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Abstract

Scientists and technologists attracted towards natural fibers like banana, cotton, coir, sisal, hemp and jute for the application civil structures and consumer goods. It was identified the electrical resistance, thermal and acoustic insulating properties for possessing of these natural fibers in composites. Natural fibers have many benefits compared to artificial fibers, as an example less density, less weight; low cost, specific properties and they are recyclable and biodegradable. There aren't any skin effects because of high strength and stiffness, renewable. In alternative manner, there also are some limitations, as an example less thermal stability and wetness uptake. several of them studied a major improvement in properties of hybrid composites with reinforced with glass fiber in resin content however it's naturally hazard with usage of this glass fiber content. There are many publications on review of fiber reinforced composites, a notable research has been done on natural fiber polymer composites but research on jute, hemp, hybrid of jute fiber and hemp fiber, hybrid (jute/hemp) fiber with SiC particulates as filler at specific extent fractions primarily.

In this paper, hybrid (hemp and jute) fiber reinforced epoxy matrix composites were fabricated by using hand lay-up technique of different weight percentage of hybrid fiber and SiC particulates as filler have been studied and their thermal properties such as density, Thermal gravimetric analysis (TGA) and Differential Scanning Calorimetry (DSC) by which we can know thermal stability of the composites.

Keywords

Introduction

A composite is a structural material that consists of two or more combined constituents that are combined at a macroscopic level and are not soluble in each other. The reinforcing phase materials may be in the form of fibers, particles or flakes. The matrix phase materials are continuous. Composites Materials are classified into Ceramic Composites (CMCs), Metal Matrix Composites (MMCs), Polymer Matrix Composites (PMCs). When the polymer resin is used as a matrix material then it is called as polymer matrix composite. Polymer composites are having properties such as low density, good thermal and electrical insulator & low cost. PMCs and MMCs are most commonly used. The polymer matrix composites consisting of polymer (e.g., epoxy, polyester) reinforced by fibers. The metal matrix composites have a metal matrix. Metals are mainly reinforced to increase or decrease the properties. The glass is the most commonly fiber used in polymer matrix composites Because of its high strength, low cost, high chemical resistance and easy available fiber. Bhasker

Bommara et al. [1], discussed TGA and DSC of hybrid polymer matrix composites. Sathish Kumar S. et al. [2], studied the Palm fiber composite materials are fabricated and tested. The results of the materials are to be assessed with various results depending upon the properties it will be used for application. Thermal conductivity of palm fiber is best compared to the natural fiber such as cotton, hemp, sisal, flax, coir at the mean temperature of 55 degree Celsius. The thermal conductivity of the Palm fiber at various composition percentages can be determined and the optimum composition can be identified. Gaurav Agarwal et al. [3], Studied the effect of addition of silicon carbide (SiC) filler in different weight percentages on physical properties, mechanical properties, and thermal properties of chopped glass fiber-reinforced epoxy composites has been investigated. Malla Surya Teja, et al. [4] in his experimental investigation on Mechanical and Thermal properties of sisal fiber-reinforced composites and effect of Sic filler material observed that the tensile strength of composite with 10%SiC 2.53 times greater than that of the composite without SiC.

Performance of 4S-SingleDiesel Engine Using Jamun Seed Methyl Ester Oil (JSMEO) with different piston Configurerations and injection pressures

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ABSTRACT: Non acceptable oil crops are being grown solely for biodiesel creation. An irregular strategy is to raise a food yield and use the waste material for biodiesel. Jamun Seed oil (JSO) is regular non satisfactory oil that is introduced in dry land nations the examination around there to create as a substitute for petrochemicals in minute. JSO was set up from oil process extraction by using n-hexane. The transesterification strategy for production of Jamun Seed Methyl Ester Oil (JSMEO) has been researched. The assembling of far over the ground quality jamun seed biodiesel achieve from the transestification alongside methanol, KOH go about as impetus. The furthest utilized single chamber 4S fluid cooled unequivocal infusion diesel motor is chosen to test. The testing of JSMEO have been complete on three distinctive cylinder head geometry by shift the motor working boundaries. In this exploratory work, the motor execution are determinate by methods for JSMEO as the essential fuel and diesel has the optional fuel of the motor and the results are seen as the test examination.

KEYWORDS: Transesterification, JSO, Jamun Seed Methyl Ester Oil (JSMEO),

I.   INTRODUCTION

The normal Diesel includes an important venture in the evolved economic system of every state. The a ways over the ground power calls for in the enterprise international and ordinary usage of non-renewable electricity resources are usually vital to brisk intake of petroleum spinoff property just as nature corruption. The undignified air distinction to emanations which are primary ominous impact of oil associated energizes. In this angle require steady pursuit and continual improvement in sustainable energy supply initiation which are nature well disposed. Biomass causes, mainly eatable and non palatable oils, have captivated a variety of consideration rather vitality gracefully. In contrast with Diesel, biodiesel have no longer so much outflows but as a substitute greater effective ignitions. Discharges of carbon monoxide and smoke particulate trouble lessen via 45%, hydrocarbon emanations lessens by using 70% besides NOx contaminations marginally increment by using 10% with 100% of B100 as a fuel1. The obsession of carbon dioxide from biodiesel is little contrasted with Diesel gasoline. It indicates biodiesel decreases nursery effect while contrasted with mineral Diesel fuel2,three. Biodiesel has a hit glimmer point, which gives it greater cozy to preserve up. Agarwal et al.4,5 said that biodiesel affords fantastic greasing up homes that may lessen part wear and improve motor life. In excess of more than one explores have parted with, the analysis consequences of B100 residences can be upgraded with the aid of transesterification, and this approach is picked for modern research.

Transesterification is a compound manner of reaction on this liquor responds with the unsaturated fats triglycerides in nearness of an impetus KOH. The liquor responds with triglycerides and structures a glycerol and esters. The jamun seed methyl esters oil transesterification can be catalyzed by means of both homogeneous impetuses and heterogeneous impetuses. Homogeneous impetuses carries antacids and acids. The maximum generally applied salt impetuses are NaOH, KOH, carbonates and the touching on sodium and moreover potassium alkoxides, as an example, sodium methoxide, sodium ethoxide, sodium propoxide and sodium butoxidel 6,10. Freedman et al.7 explored the impact of various obstacles at the immaculateness of biodiesel delivered. Sulfuric corrosive, sulfuric corrosive and hydrochloric corrosive are normally utilized as impetuses in the corrosive

Experimental Anlysis Of Plasma Spray Technique With Zerconium Oxide Mixture On Ss304 Material As Thermal Barrier Coating

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Abstract: Porosity is vital in most engineering applications in plasma-spray coatings. Porosity has its strengths and demerits based on coating functionality and immediate working conditions. A thorough analysis of pore as is carried out in this work on plasma sprayed coatings. The formation and growth of porosity on plasma sprayed coatings is controlled by defined parameters of spray. Optimized parameters for set spraying were employed to produce the desired coatings with minimal defects. Problems such as porosity are still present with advanced set spray parameters. Here, we are discussing other ability to measure porosity in plasma-spraying coatings with emphasis on atmospheric plasma sprays (mixed with titanium-oxide and carbide) of zirconium oxide. Microstructures with XRD as a part of non- destructive testing methods had been used to check the structural values with thermal impact. A L16 orthogonal array used for optimise the parameters with Taguchi optimal method by segregating parameters for better optimal results.

Key words: Plasma spray, TBC, Zirconium, Taguchi, SS304, SEM

1.0 Introduction

In advanced gas turbines thermal barrier coats (TBCs) are commonly used for shielding the metallic substratum from high temperature gas thermal dehydration [1, 2]. The use of TBCs will increase the efficiency and performance of turbines significantly. A standard TBC system consists of a container load, ceramic top-coat (TC), a metal bond-coat, and the heat oxide (TGO), the thermally developed oxide, forming between TC and BC. Temperature reductions in all TBC's are usually controlled by material and geometry, in particular thermal conductivity and thickness, of the TC layer in a specific work area. [3–9]. The thermal insulation potential of the coating's improvements with the increase in the TC thickness of a given ceramic material. The thermal mismatch stress of the coatings will nevertheless increase at the same time. The thermal insulation capabilities and the thermal stress level are well-recognized. Defining the required TC thickness for the hot components becomes a problem with optimization process.

2.0 LITERATURE REVIEW

The optimal TBC design will enhance the efficiency and performance of the coating with the thickness for gas turbine sheets. It is desirable for the layer design for engineering applications to be usable, easy and effective. Sadly, little work on this matter has been published. The substrate without TBC, for example the failure analysis of the blade [10–12], the simulation of heat transfer [13, 14, 15] etc, or the

Development of Hybrid Natural Fiber Reinforced Epoxy Matrix Composites with SiC as Filler

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Abstract

Now a day's waste becoming an environmental impact globally, the focus of the researchers have to admin the problem caused by the waste. The natural fibers mostly known as extracted fibers from plants which are available in large scale may solve the requirements of industrial components as well as automotive needs. The replacement of plastics with natural fiber components is one good choice to avoid large dump of thermo and thermo setting plastics. To attain the standards of solving desires of plastic thing replacements researches wished within the vicinity of natural fibers to obtain the comparative properties of plastics. To expand composites with good mechanical, chemical amendment of fibre achieved to reduce the hydrophilic conduct of fibers and the absorption of moisture. There are many publications on review of natural fiber reinforced composites, a notable research has been done on natural fiber polymer composites but research on jute, hemp, hybrid of jute and hemp fiber, hybrid (jute/hemp) fiber with SiC particulates as filler at specific extent fractions primarily based polymer composites are uncommon. The presence of SiC particulate as filler in the composite can significantly enhance the compressive strength, tensile strength and wear resistance of aluminum hybrid composite.

In this paper, hybrid natural fiber reinforced epoxy matrix composites were fabricated using hand lay-up technique with different weight percentage of hybrid fibers and SiC particulates as a filler have been studied and their mechanical properties such as tensile strength, and flexural strength have been reported. It is observed that the tensile and flexural strength increases with hybrid fiber reinforcement due to SiC particulates as a filler. Failure mechanism of hybrid fiber composites has been discussed using scanning electron microscopy.

Keywords

Introduction

Apart from energy, environmental protection is one of the top problems facing the current generation. Now more than ever strategies are needed to protect the environment or to protect products that are not harmful to the environment. Natural fibers have received much attention as potential alternative replacements for synthetic fibers, because of their properties as reinforcement of various resins for advanced applications, such as: low density, high specific strength and they are renewable, durable and environmentally friendly [1, 2, 3]. Natural fibers have unique characteristics, such as: low cost, abundant availability and their renewable resources absorb carbon dioxide, which reduces environmental pollution. During processing, natural fibers do not generate any harmful gases and they are not abrasive for processing equipment. The main concern of natural fibers is their hereditary hydrophilic character and they are highly flammable which limits their success in polymer reinforcement. Their hydrophilic character results in high moisture absorption, poor matrix - fiber interfacial adhesion, and poor fiber dispersion. An important research has been done on the surface treatment of natural fibers to overcome these limitations [1, 2, 4, 5]. It can be argued that a tremendous success has been achieved on the surface treatment of natural fibers to improve the overall properties of composite materials discussed in these review studies [1, 2, 4, 5]. Synthetic / synthetic fibers are worth, however, of particular interest due to their superior properties compared to natural fibers. It is believed that various aspects such as growth conditions, harvesting methods and maturation often affect natural fiber properties. Limitations of synthetic fibers include their accumulation in environmental and / or landfill sites, high costs and they are derived from finite resources, ie. Fossil Fuels [1]. Processing of fossil fuels alone produces various gases (eg CO_2, methane, nitrous oxide and many others), which contribute to unwanted environmental pollution. In addition, during overall production, harmful gases are released, which causes terrible diseases, e.g. Cancer and again, they can be abrasive to processing equipment. On the other hand, synthetic fibers have a longer lifespan, providing greater advantages towards

Design, Aerodynamic Analysis, and Fabrication of Agricultural Drone

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Abstract

In the present era adding technology and innovations in agriculture will help in increasing crop productivity. The motive to use development in agriculture is not only to increase productivity but also to take care of our farmers and future generations and one such way to achieve it is by using agricultural drones. One of the main sources (around 70%) of income in India is agriculture. The production rate of crops in agriculture is based on various parameters like temperature, humidity, rain, etc. which are natural factors and are not in farmer's control. The field of agriculture also depends on some other factors like pests, disease, fertilizers, etc. which can be controlled by giving proper treatment to crops. Pesticides may increase the productivity of crops but they also affect human health. The WHO (World Health Organization) estimated one million cases of ill effects when spraying the pesticides in the crop filed manually. Agriculture drone can be used as a form of precision agriculture by managing to spray the fertilizer as per requirement. The main aim of our project is to design an agricultural drone which is Hexacopter which has high load capacity, more thrust, and power generation, flying at high wind speeds, and can also be operated if a motor or propeller is damaged and land safely. Involves designing an aerodynamically stable prototype which is monocoque design, multipurpose use by providing universal payload bay, water-resistant, damage proof, and affordable. It may be further developed by automating drone flight patterns and also by introducing artificial intelligence.

Keywords

Introduction

Unmanned Aerial Vehicles (UAV) also commonly known as Drones are regarded as pilotless aircraft systems that are widely perceived as gadgets of leisure that are sent to the skies to shoot impressive aerial photographs and high-definition video. While they're commonly used for entertainment, our study reveals that there's also a range of business applications for drones across various industries, resulting in a significant potential market that can be expected to grow exponentially. Figure 1 shows one of the applications; pesticide spraying drone. By implementing drone technology, farms and agriculturebusinesses can improve crop yields, save time, and make land management decisions that'll improve long-term success [1]. Farmer's today has a variety of complex factors that influence thesuccess of their farms. From water access to changing climate, wind, soil quality, the presence of weeds and insects, variable growing seasons, and more.

Agricultural drones allow farmers to obtain access to a wealth of data they can use to make better management decisions, improve crop yields, and increase overall profitability.

Drones can be used to collect data related to crop yields, livestock health, soil quality, nutrient measurements, weather and rainfall results, and more. This data can then be used to get a more accurate map of any existing issues, as well as create solutions based upon extremely reliable data.

The agriculture industry is no stranger to embracing changing technological trends to streamline the business. The use of drones in agriculture is the next technological wave that'll help agricultural businesses meet the changing and growing demands of the future [2]. Agricultural drones help to achieve and improve what's known as precision agriculture.

- In recent years the cost of agriculture drones has rapidly declined, which has not only led to the explosion of drone use cases in agriculture but has made it a no-brainer investment for modern farmers.

- The agricultural drone market is expected to grow by over 38% in the coming years. Driven by growing population levels and changing climate patterns, the need for efficient agriculture is only going to become more important.

Evolution of Phenolic Formaldehyde Based Hybrid Polymer Matrix Composite (PMC) Reinforced with Silicon Carbide and Fly Ash

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Abstract

Flyash and Silicon carbide reinforced phenolic formaldehyde-based hybrid polymer matrix composites (PMC) were fabricated with various weight ratios such as 8%, 12%, and 16%, respectively followed by their mechanical characterization such as tensile, flexural, density, impact and hardness properties as per the ASTM standards. The hand layup method was used to fabricate the PMC. The tensile behavior of PMC has revealed that it is highly dependent on the weight fraction of resin i.e. followed a consistent reduction with the increment in the flyash and silicon carbide contents. Whereas the density, impact and hardness behavior have observed a gradual enhancement upto 12% weight ratio of flyash and silicon carbide but thereafter it has been decreased. Similarly, the flexural behavior of PMC has decreased due to the addition of flyash and silicon carbide. Further, the scanning electron microscopy (SEM) analysis was carried out to study the monography of the fabricated specimens with various weight ratios at varying layers with magnification in the range of 550X to 10kX.

Key words

Flyash, Silicon carbide, SEM, PMC, Density and Flexural

Introduction

Polymer matrix composites (PMCs) are comprised of a variety of short or continuous fiber bound together by an organic polymer matrix. Unlike a ceramic matrix composite (CMC), in which the reinforcement is used primarily to improve the fracture toughness, the reinforcement in a PMC provides high strength and stiffness. The PMC is designed so that the mechanical loads to which the structure is subjected in service are supported by the reinforcement. The function of the matrix is to bond the fiber together and to transfer loads between them.

Polymer matrix composites are often divided into two categories: reinforced plastics, and "advanced composites." The distinction is based on the level of mechanical properties (usually strength and stiffness); however, there is no unambiguous line separating the two. Reinforced plastics, which are relatively inexpensive, typically consist of polyester resins reinforced with low-stiffness glass fiber. Advanced composites, which have been in use for only about 15 years, primarily in the aerospace industry, have superior strength and stiffness, and are relatively expensive. Advanced composites are the focus of this assessment. Polymer matrix composites (PMCs) are comprised of a variety of short or continuous fiber bound together by an organic polymer matrix. The PMC is designed

so that the mechanical loads to which the structure is subjected in service are supported by the reinforcement.

In this case so many experiments are carried out using that glass fiber reinforced polymer composites are one of the most widely used composite materials. The addition of Coal ash to polymer matrix dramatically increases the overall mechanical strength of the composite material as compared to the polymer composite [1]. In the other study Polymer composite provokes a new alternative material to engineering and domestic application. Polymeric nano composite has been intensively investigated due to the performance improvement when a small amount of nano sized particulates is added to matrix. The distinguished properties of SiC particulates influence to make a polymeric composite. This composite material has many applications such as mechanical, automobile, marine, appliances and packaging [2]. fly ash was added to nylon in 5,10,25,30,35 and 40 % wt/wt ratio and dispersing agent 1.5 %, antioxidant 1%, and heat stabilizer 1 % added,The composite granules prepared by using twin screw extruder. The temperature profile in barrel were 200°C,220°C,230°C and 250°c from the hopper to die it is prepared using an injection modeling machine, The large particle size of fly ash improvement in mechanical properties [3].

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20-21-⑤

Microwave Assisted Synthesis of 3-Chloro-N-(2-(5-chloro-1-tosyl-1H-benzo [d] Imidazol-2-yl) ethyl)-N-Substituted Quinoxalin-2-Amine Derivatives Using DCQX

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Abstract: The microwave assisted synthesis of 3-Chloro-N-(2-(5-chloro-1-tosyl-1H-benzo [d] imidazol-2-yl) ethyl)-N-substituted quinoxalin-2-amine derivatives is described. 2,3-dichloro quinoxaline (DCQX), as a starting compound and propargyl bromide, as an efficient alkylating agent are used in the synthesis of N-substituted quinoxalin-2-amine derivatives. We realized that microwave assisted synthesis is efficiently replacing conventional method of synthesis.
Keywords: 2,3-dichloroquinoxaline, quinoxaline, imidazoles, alkylating agent, microwave assisted synthesis

1. Introduction

There are several reported methods for the synthesis of quinoxaline-2-amine derivatives. Nevertheless, synthesis using 2,3-dichloroquinoxaline (DCQX) with nucleophilic species such as aryl amine has become a feasible substitute because of the presence of two chlorine atoms at C2 and C3 of DCQX. 2,3-dichloroquinoxaline (DCQX) is a reagent, extensively used as a synthetic intermediate in pharmaceutical industry as well as materials science [1,2]. Furthermore, this reagent is easily prepared from low-cost starting materials and commercially available.

One of the major advantages associated with the reactions of DCQX with nucleophiles is the possibility to control single or double substituted products. This exceptional feature of DCQX makes it significant in the synthesis of specific products that can be used in a variety of applications [3-7]. Propargyl bromide, an efficient alkylating agent is used for the N-alkylation of aryl amides. It is also used in enyne metathesis of propargylic amines, propargylation of spiro ketones, synthesis of allylic alcohols and enone complexes [8, 9].

The effective approach for the synthesis of quinoxalin-2-amines is the reaction between 1,2-diamines with aldehydes and isocyanides using CeO_2 nanoparticle catalyst. Also 3,4-dihydroquinoxalin-2-amines were synthesized by reactions between 1,2-diamines, ketones and isocyanides [10].

Reaction between 2,3-dichloro quinoxaline and anilines is a convenient method for the preparation of N-aryl substituted 3-chloroquinoxalin-2-amines, particularly, 2-(N-aryl amino)-3-chloroquinoxalines that are further converted into N-substituted 3-chloro-N-(2-(1-tosyl-1H-benzo [d]-imidazol-2-yl) ethyl) quinoxalin-2-amine [11]. This method is facilitated by $AlCl_3$ on forming C-N bond [1]. These target molecules were found to be potential inhibitors of phospho diesterase 4 (PDE-4) and have apoptosis inducing properties in an animal model (zebrafish) [12, 13]. Further, the reaction is facilitated in more effective way using an alkylating agent, propargyl bromide.

2. Results and discussions

All the compounds were synthesized using microwave irradiation. The synthesis of new compounds is described according to synthetic Figure 1. Compound 2 was synthesized from the starting materials, 2,3-dichloroquinoxaline (DCQX) and aniline, substituted at 4th position. Then compound 2 is irradiated with an alkylating agent, propargyl bromide in presence potassium carbonate and DMF to acquire compound 3 The final compound 3-Chloro-N-(2(5-chloro-1-tosyl-1H-benzo [d] imidazol-2-yl) ethyl)-N-substituted quinoxalin-2-amine (4) is obtained, when compound 3 was reacted with a

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Subadra, N., *et al.*: Heat and Mass Transfer Effects of Peristaltic Motion of ...
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S185

HEAT AND MASS TRANSFER EFFECTS OF PERISTALTIC MOTION OF A JEFFERY FLUID IN A TUBE

by

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The impact of heat and mass transfer were analyzed in the present investigation by considering the peristaltic transport of a Jeffery fluid with nanoparticles in a uniform tube. Lubrication theory hypotheses have been considered and expressions have been defined for axial velocity, pressure drop, frictional force, heat and mass transfer effects. The patterns of the stream line and trapped bolus were graphically depicted at the end. It is found that with regard to the modification of various parameters, pressure drop and frictional force exhibit identical behavior. By increasing/decreasing the local temperature Grashof number, Brownian motion parameter and local nanoparticle Grashof number, pressure drop and axial velocity can be regulated.

Key words: *Jeffery fluid, peristaltic transport, temperature profile,*
nanoparticle phenomena

Introduction

Peristalsis is a common transmission process of fluids from the area of lower pressure to the region of higher pressure. It occurs in the body for the transport of physiological fluids from one part of the body to another part of the body. Many researchers contributed to this field. To name few of them are, Shapiro *et al.* [1], Chu and Fang [2], Maruthi and Radhakrishnamacharya [3], and Prasad *et al.* [4].

Now a days nanotechnology has considerable attention by the researchers because of its applications to biomedical and industrial fields. Choi and Eastman [5] was the forerunner to do research in the nanotechnology. Eastman *et al.* [6] experimentally proved that thermal conductivity of the base fluids can be enhanced by 60% by adding the nanoparticles to the base fluids. Many more researchers also done their research in this field. Prasad *et al.* [4], Ellahi [7], Subadra *et al.* [8] contributed significant to this field of research.

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Research Article

EXISTENCE OF (Φ⊗Ψ) BOUNDED SOLUTIONS FOR FIRST ORDER KRONECKER PRODUCT SYSTEMS ON TIME SCALES

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ARTICLE INFO	ABSTRACT
	In this paper we unify results recently established for linear differential equations and linear difference systems on time scales and deduce the existing results as particular case.

INTRODUCTION

It is a well recognized fact that mathematical models or equations that describe physical or biological phenomena are in most cases linear differential/difference equations of first order. In recent years the theory of difference equations is gaining greater attention in many disciplines. In spite of this tendency or inter dependency there is a striking similarity or even duality between the theory of continuous and discrete systems. This paper unifies both continuous and discrete systems in a single frame work by using time scale dynamical systems. In this paper, we shall be concerned with the dynamical systems

$$x^{\Delta}(t) = A(t)x(t) + f(t), x(t_0) = x_0 \qquad (1.1)$$

where $x(t)$, $f(t)$ are in time scale T and A is a continuous/discrete (kxk) matrix and all scalars are assumed to be real. The calculus of time scales was first initiated by Stefan Hilger [15] in order to create a theory that unify discrete and continuous systems. The use of time scale dynamical systems was first extended to boundary value problems by Murty and Rao in a remarkable paper published in 1994 [12]. Later, more than one hundred and fifty papers came into light during the last 30 years. For more information and recent investigation on time scale dynamical systems, we refer Martin Bohner and

Alan Peterson [2]. Existence of Ψ-bounded solutions for linear system of differential equations are established in [1] and Ψ-bounded solutions for linear system of equations on timescales were established in a remarkable paper by Kasi Viswanadh *et. al* [6]. Qualitative properties of first order difference systems are taken from [8,10,11]. A new approach to the construction of a transition matrix and application to control system are established in the conference paper [13].

The general idea which was the main goal of Bohner and Peterson was to prove a result for a dynamic equations where the domain of an unknown function is so called time scale or Δdifferentiable function. If $T = \mathbb{R}$, the general results obtained yields the same result concerning differential system of first order and $T = \mathbb{Z}$, the result is the same result concerning a difference system of first order. However there are many other time scales that may work besides the real and the integers, one has a more general result.

The present paper unifies the results of $\Phi \otimes \Psi$ bounded solutions of linear differential equations established by Kasi Viswanadh *et.al* [7] and for linear difference equations established by Kasi Viswanadh *et. al* [5] and by Charyulu L.N. et.al [3]. The results established on initial value problems associated with first order linear difference and differential

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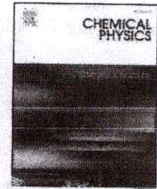Department of Mathematics, Jawaharlal Nehru Technological University, Hyderabad, Telangana, India

Effect of annealing on photoluminescence of $MgAl_{1.8}Y_{0.14}Eu_{0.06}O_4$

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ABSTRACT

$MgAl_2O_4$ and $MgAl_{1.8}Y_{0.14}Eu_{0.06}O_4$ powders were prepared by sol–gel method and annealed at 600, 800, and 1000 °C. X-ray diffraction patterns confirm the cubic spinel phase with space group O_h^7 ($Fd\bar{3}m$). Increasing the annealing temperature (T_a) resulted in increased octahedral bond lengths and bonding angles resulting in the crystalline phase of the samples. Scanning electron microscopy reveals the micron size flakes morphology and agglomerated grains. The presence of elements such as Mg, Al, Eu, and Y was confirmed by Energy dispersive x-ray spectra. Photoluminescence (PL) was not observed in $MgAl_2O_4$ but in the excitation spectra of $MgAl_{1.8}Y_{0.14}Eu_{0.06}O_4$ at emission wavelength 615 nm, both f orbital transitions of Eu^{3+} ions and charge transfer bands were observed. The intensity of the peak at 392 nm corresponding to the $^7F_0 \rightarrow {}^5L_6$ transition is strongly dependent on annealing and it is increasing with T_a. Out of $^5D_0 \rightarrow {}^7F_{J(=0, 1, 2, 3, 4)}$ characteristic transitions of Eu^{3+} ions, the electric dipole transition - $^5D_0 \rightarrow {}^7F_2$ (618 nm) is prominent in the PL emission spectra. Annealing has further increased the intensity of PL emission spectra. The presence of Eu^{2+} ions is evident from the broad peak observed around 340 nm (assigned to the $4f^6 5d$ to $4f^7$ ($^8S_{7/2}$) transition) in the excitation spectra at emission wavelength 480 nm. The intensity of this peak is decreasing with increasing T_a.

1. Introduction

$MgAl_2O_4$ (MAO) spinel is being investigated for several decades and has been used as an effective refractory and ceramic material due to its potential applications [1–3]. MAO has cubic spinel structure space group O_h^7 ($Fd\bar{3}m$). The unit cell of MAO contains eight formula units. The unit cell of MAO contains two cationic sites: (i) tetrahedrally co-ordinated A-site (T_d symmetry), surrounded by four O^{2-} ions and (ii) octahedrally coordinated B-site (D_{3d} symmetry) surrounded by six O^{2-} ions. Mg^{2+} ions occupy 8 out of 64 available A-sites, and out of 32 available B-sites, 16 are occupied Al^{3+} ions [4–6].

Several research groups have made significant efforts and widely studied MAO. It exhibits several optical properties such as phosphorescence, luminescence, absorption, etc when Mg^{2+}/Al^{3+} ions are substituted by transition elements or rare-earth ions [7–15]. Jing Lin et al. have observed a broad green emission band centered at 568 nm, assigned to $^4T_1 \rightarrow {}^6A_1$, in the photoluminescence (PL) spectrum upon doping Mn^{2+} in MAO [13]. In addition to green emission, Vijay Singh et al. [14] have reported a red emission band at 650 nm which is due to charge-transfer de-excitation associated with the Mn^{2+} ions. Głuchowski et al. have investigated the significant dependence of grain size of nanocrystals and annealing on the luminescence of properties of

Cr^{3+}:$MgAl_2O_4$ [15]. The Eu doping has many interesting properties [16–22]. Biswas et al. [16] prepared Eu and Eu-Al co-doped silica glasses by impregnating the pores of base-catalyzed tetra-ethylorthosilicate gels with the nitrate salt of Eu and Al and subsequent densification at 1125 °C and 1150 °C. These researchers discovered that Eu^{3+} ions were spontaneously reduced to Eu^{2+} in the presence of Al^{3+} during glass sintering. Hu et al. [17] prepared Al co-doped SiO_2 xerogels with Eu^{2+} ions by sol–gel reaction in the air without reducing heat treatment. The doped Al decreased the basicity of silica and increased the electron donation ability of oxygen in AlO_4 tetrahedron around Eu^{3+}, thereby reducing Eu^{3+} to Eu^{2+}. Kim et al. [18] prepared blue-emitting $(Hf_{1-x}Eu_x)P_2O_{7-\delta}$ ($0 \leq x \leq 0.14$) phosphors by the liquid-phase method in air. Trivalent Eu^{3+} ions in the hafnium pyrophosphate phosphors were reduced to divalent Eu^{2+} ions in the air at high temperatures. Alessandra S. Maia et al. have observed broadband around 280 nm assigned to $^5D_0 \rightarrow {}^7F_2$ transition of Eu^{3+} ions, in $MgAl_2O_4$:Eu,Dy emission spectra. It was also reported that according to chromatic coordinates the color shifts from blue to red with increasing temperature [19]. Many researcher have reported that the most hypersensitive emission corresponds to the $^5D_0 \rightarrow {}^7F_2$ transition is the strong and intense red emission centered ~615 nm, which obeys the selection rule of $\Delta J = 2$ [3,20–22]. Here in this paper, the effects of

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ATTENUATION EFFECT IN ALIPHATIC ACIDS EXTENDED TO ALKANES THE CARBON ACIDS VIA THE ALIPHATIC ALCOHOLS: AN EDUCATIONAL PERSPECTIVE IN CHEMISTRY

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Abstract. A simple, new, lucid and an improved version of a protocol over Andrew William's treatment is presented in this article for the evaluation of the attenuation effect of methylene group on the deprotonation process of aliphatic acids $RCOOH - RCOO^- + H^+$ and extended to aliphatic alcohols and alkanes; the carbon acids.

Keywords: attenuation effect; methylene group; aliphatic acid dissociation equilibriums, Taft r*

Introduction

Aliphatic acid dissociation equilibriums and their chemical reactivity is well explained on the basis of well established acid and base catalyzed hydrolysis of substituted aliphatic ester derivatives by Taft equation (Taft, 1952a; 1952b; 1953) in terms of two parameters the Taft substituent constant (s*) and the Taft reaction constant (r*). Thus the Taft equation in terms of only polar sensitivity factors in aliphatic acid dissociation equilibriums is:

$$\log K_x = \log K_{CH_3} + \rho^* \sigma^* \tag{1}$$

K_x and K_{CH} K_{CH} are the acid dissociation constants of substituted acids and acetic acid respectively. The Taft reaction constant (r*) is a measure of the magnitude of the polar effect of structure on the aliphatic acid dissociation equilibriums. The steric effects are assumed to be negligible because the distance between the dissociable hydrogen and the substituent is quite appreciable.

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Comparison of Substituent Effects in Benzenes (XC₅H₅C), Pyridines (XC₅H₄N) and Phosphorines (XC₅H₄P) and their Protonated Species
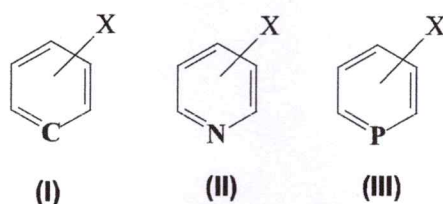
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Abstract Collection of interesting and stimulative data led us to construct Hammett plots for different properties like proton affinities, gas phase basicities, solvation free energies of free and protonated benzenes (I), pyridines (II) and phosphorines (III), and for pK_a values of protonated pyridines and phosphorines. Trends in Hammett reaction constants (ρ) for all these processes were discussed.

(I)   (II)   (III)

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1. Introduction

Acuity of work in chemical education and chemical research that took a shape from literature reported data on several chemical and physical aspects like phase transition temperatures, dipole moments, surface tensions, attenuation effect, associative and non-associative behavior of liquids, stability and lifetimes of reactive intermediates, LFER, effect of hybridization of carbon on Hammett (ρ) and Taft (ρ*) reaction constants, prediction of pK_a values of unstable arenium ions and benzenes, from our group has been ever increasing in recent times [1-63]. In the present work to go a step ahead we have tried the comparison of substituent effects on pK_a, proton affinities, gas phase basicities, solvation free energies in benzenes (C₅H₆C), pyridines (C₅H₅N) and phosphorines (C₅H₅P) and their protonated species.

2. Methods

All the linear correlations were done using the KaleidaGraph software, Reading, PA, USA. All chemical structures were drawn using chemdraw software. All Hammett σ values are from reference 64.

3. Discussion

Hammett reactions constants (ρ) and pK_a data of arenium, pyridinium and phosphorinium ions are given in Table 1. The corresponding plots are shown in Figure 1, Figure 2 and Figure 3.

Since the Hammett ρ can not be determined for the dissociation equilibriums of arenium ions $XC_6H_6^+ \rightleftharpoons XC_6H_5 + H^+$ as they are highly unstable, an alternate and lucid method was adopted by us based on the attenuation effect [26]. Figure 1 shows the determination of the Hammett ρ for the dissociation equilibriums of arenium ions $XC_6H_6^+ \rightleftharpoons XC_6H_5 + H^+$ from the study of attenuation effect of methylene group (-CH₂-) on the dissociation equilibriums of anilinium ions, benzyl ammonium ions and 2-phenylethyl ammonium ions [26] and using the Andrew Williams' empirical equation $\rho = m1^{(2-i)}$ [65] where m1 is an arbitrary constant "i" is the number of atoms between ionizable proton and the ring carbon.
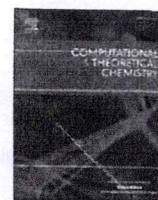
Application of Hammett equation to hydrogen bond interactions of benzoic acid in chloroform/water system and explanation for non-linear Hammett relation to partition coefficients for the same system

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A B S T R A C T

It is well known that benzoic acid distributes itself between chloroform and water. The partition coefficients (K_p) of seven different benzoic acids in chloroform/water are documented in the literature. Plausible hydrogen bonded structures of these seven benzoic acids with the two immiscible solvents were envisaged and the DFT calculation for these hydrogen bonds were carried out. Further, the conformity of Hammett relation to the hydrogen bond interactions was assessed. Application of Hammett equation to the hydrogen bonding of distribution of different *para*-substituted benzoic acids to these immiscible solvents is done for the first time. Further, an explanation for non-linear plot of partition coefficients logK_p of *para*-substituted benzoic acids in chloroform-water system versus Hammett σ value has been explained for the first time.

1. Introduction

Partition or distribution coefficients has a wide range of applications in the fields of pharmacology [1–3], pharmacokinetics [4–6], pharmacodynamics [7–9], environmental science [10,11], agrochemical research [12], metallurgy [13] and consumer product development [14]. Octanol is believed to have the lipophilic character of the biological membranes. The *n*-octanol/water [15] partitioning system resembles the lipid membrane/water systems in the body. Hence most of the partition studies appearing in the literature were carried out in octanol/water system. Over the last century numerous studies on partition of organic solutes have appeared in literature. To quote them is beyond the scope of this article as they run in several hundreds.

It is a well-established fact that Hammett [16,17] and Taft [18–21] equations are good mechanistic tools in physical-organic chemistry [16–21]. We have carried out several studies in our laboratory with regard to their application. Non-Linear Taft Relationship is applied to surface tensions of aliphatic acids: Inter-molecular hydrogen bonding versus intra-molecular hydrogen bonding [22], Non-Linear Taft Polar Free energy Relationships (TPER), reactions of *N*-substituted benzyl amines with benzyl bromide [23], dipole moments and melting points and their unsolved miracles on the application of Hammett equation [24] and application of non-linear Hammett relationship to surface

tensions and dipole moments in estimating the associative behavior of phenols [25]. It is known that benzoic acid distributes itself between chloroform and water. We have considered the distribution of seven *para*-substituted benzoic acids. In the present study we envisaged the plausible hydrogen bonded structures (Scheme 1) and found the interaction energies in them. Further, we assessed the conformity of Hammett relationship to these interactions. To comprehend Hammett equation, let us suppose a reaction is performed on a substrate molecule [26] that can be represented as XGY where Y is the site of the reaction, X a variable substituent and G is a skeleton group to which X and Y (in our Scheme 1, X = OH, OCH$_3$, CH$_3$, H, Cl, Br and NO$_2$, Y is hydrogen bonding between COOH moiety of substituted benzoic acid and solvents, G is C$_6$H$_4$) are attached and we observe that changing X from H to CH$_3$, results in the change in the rate of reaction. The change in the rate of the reaction might be due to factors like mesomeric effect or inductive effect of the substituent X. The first attempt of quantitative treatment of X on the reaction site was given by Hammett. For the cases of meta and *para*-XC$_6$H$_4$Y, Hammett set up the equation log (k/k$_o$) = σρ and this equation is known as Hammett equation. Here k$_o$ is the rate or equilibrium constant for X = H, k the rate or equilibrium constant for group X, ρ is a constant known as Hammett reaction constant for a given reaction under a given set of conditions, and σ is a constant known as Hammett substituent constant. Hammett substituent constant σ reflects

Investigation on Natural Convective Flow of Ethylene Glycol Nanofluid Containing Nanoparticles Fe$_3$O$_4$ In a Porous Cavity with Radiation

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Abstract: This paper addresses free convection in cavity filled with ethylene glycol(EG) nanofluid containing Fe$_3$O$_4$ in the presence of radiation. Galerkin's method of finite elements is employed to solve the governing differential equations. Numerical results are computed for certain pertinent parameters: Rayleigh number (10-2500), radiation parameter (1-10) and nanofluid volume fraction (0-0.3), and presented in the graphical form. The results reveal that flow intensity and heat transfer rate in EG-Fe$_3$O$_4$ nanofluid are increasing functions of Rayleigh number and radiation. It is noted that high Rayleigh number and radiation are needed to affect flow intensity.

INTRODUCTION

Nanofluids are often intended as an applied method to enhance heat transfer. "Nanofluid" was the term initiated by Choi [1]. Sheikholeslami et al. [2] studied free convection of Fe$_3$O$_4$-ethylene glycol nanofluid. They revealed that Nusselt number is an improving function of Darcy number. Gholinia et al. [3] examined the convective C$_2$H$_6$O$_2$ nanofluid flow over a vertical permeable circular cylinder. Simulation of water and EG based nanofluid convective flows are studied by many authors [4-10]. Sheremet et al. [11] exemplified the unsteady ferrofluid flow in a cavity using the finite difference method.

Thermal radiation is immensely vital in heat transfer governing high temperature and flow control factors. Bakier [12] studied the radiation on mixed convection through vertical surface in a porous medium. Zeeshan [13] reported convective Poiseuille flow of Al$_2$O$_3$-EG in a porous wavy channel with thermal radiation. The radiation on the flow and thermal boundary layer has been noticeably investigated [14-19]. In recent times, nanofluid flow is documented by many researchers [19-28].

The present study is focused on the impact of thermal radiation in a porous cavity containing ethylene glycol based nanofluid with iron oxide nanoparticles. The numerical results are exhibited in the form of streamlines, isotherms and averaged Nusselt number.

MATHEMATICAL FORMULATION

Let us consider EG-Fe$_3$O$_4$ nanofluid flow through a porous cavity under the influence of thermal radiation. The velocity of the fluid is component as u and v in X and Y directions respectively.

Mathematical Approach to Study Heat and Mass Transfer Effects in Transport Phenomena of a non-Newtonian Fluid

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Abstract: The paper deals with a theoretical investigation of the peristaltic transport of a couple-stress fluid with heat and mass transfer effects. The velocity, pressure drop, time averaged flux, frictional force, mechanical efficiency, temperature profile, nanoparticle phenomena, heat transfer coefficient and mass transfer coefficient of the fluid are investigated, when the Reynold's number is small and wave length is large by using appropriate analytical methods. Effects of different physical parameters like couple-stress fluid parameters, Brownian motion parameter, thermophoresis parameter, local temperature Grashof number as well as local nanoparticle Grashof number on pressure drop characteristics, frictional force, mechanical efficiency, heat transfer coefficient, mass transfer coefficient, steam line patterns and velocity profiles of the fluid are studied. The expressions for velocity, temperature profile, nanoparticle phenomenon, heat transfer coefficient and mass transfer coefficients are sketched through graphs in two as well as in three dimensional views. The streamlines are drawn to discuss trapping phenomenon for some physical quantities.

INTRODUCTION

Peristaltic transport is very important mechanism in the biological systems for the transport of bio fluids like blood, urine etc. It has numerous applications in physiological systems as well as in mechanical systems. The phenomenon of peristaltic transport is used in the manufacturing of nuclear reactors and also in roller and finger pumps.

Many investigators contributed to the study of peristaltic transport in mechanical as well as physiological situations. (Fung & Yih, (1968), Shapiro et al., (1969), Pincombe et al.,(1999), Maruthi Prasad et al.,(2015)).

V. K. Stokes (1966) was the first person who developed the couple-stress fluid as a special case of non-Newtonian fluids. The important point in introducing the couple-stress fluid is to establish a size dependent effect that is not there in the viscous theories.

In 1986, L. M. Srivastava considered couple-stress fluids for his study and studied peristaltic transport in it. Maruthi Prasad & Radhakrishnamacharya (2009) considered a two fluid model with couple-stress fluid in the core region and Newtonian fluid in the peripheral region and studied the peristaltic transport. Rathoda et al., (2012) considered uniform and non-uniform annulus and investigated peristaltic motion of couple-stress fluid in the presence of porous medium. Maiti et al., (2012) done a theoretical investigation on peristaltic motion of a couple-stress fluid in a porous channel. The influence of Hall effect on peristaltic flow of a couple-stress fluid in a vertical asymmetric channel was examined by Kumar et al. (2017).

Nanofluid is the next exciting leading edge in technology. The applications of nanofluids are huge because of its enhanced thermal conductivity. Nanofluids used in Nano drug delivery, Cancer therapeutics, Nuclear reactors etc.

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A new approach to the construction of transition matrix with application to control systems

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Study of Microstructure and Dielectric Properties of PbTiO3 based Glass Ceramics

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Abstract. Glass samples with composition (35- X) B_2O_3 - (40 +X) PbO - 25 TiO_2 (where X= 0, 2.5,5, 7.5 and 10 mol %) were prepared using conventional quenching technique. It was observed that as PbO content increases the values glass transition temperature (T_g) and crystallization temperature (T_c) decreases. The replacement of boron by a bigger Pb ion expands the network there by reducing the glass transition temperature (T_g). These glass samples were converted to glass ceramics by following two stage heat treatment schedule. The density(ρ) values of glass ceramic samples are higher than those of corresponding glass samples. It was observed that there was good correlation between the density and Coefficient of Thermal Expansion (CTE) results of the glass–ceramics. The XRD results in the glass ceramics revealed the formation of tetragonal lead titanate ($PbTiO_3$) as a major crystalline phase and lead borate (PbB_2O_4) as minor crystalline phase. The microstructure of glass ceramic samples contains nano crystallites of lead titanate embedded in a borate glass matrix. As the content of glass former (B_2O_3) is reduced, the $PbTiO_3$ crystals precipitated in glass matrix are observed to increase. The dielectric constant values of glass ceramic samples are higher than those of corresponding glass samples.

Keywords: glass, glass ceramics, ferroelectrics, dielectric constant.

INTRODUCTION

$PbTiO_3$ (PT) is a tetragonal perovskite with a c/a ratio of 1.063 at room temperature, which is the largest known for lead-based perovskite compounds. Single crystal data have shown that the large ionic displacements in $PbTiO_3$ lead to a particularly large spontaneous polarization (>53 $\mu C/cm^2$) and strain (c/a ratio = 1.06) at room temperature [1]. $PbTiO_3$ exhibits large pyroelectric coefficients and low relative permittivity (~100-200). However, these excellent properties are not yet fully realized in bulk polycrystalline samples due to difficulty in fabricating undoped $PbTiO_3$. $PbTiO_3$ ceramics when prepared by conventional route generally have micro cracks and fracture on cooling below Curie temperature (T_c) as a result of the large spontaneous strain generated when the structure changes from cubic to tetragonal.

Glass ceramics are the polycrystalline materials prepared by the controlled crystallization of glasses. A wide variety of applications of these versatile materials have been developed as a result of their many outstanding properties and the distinct advantages of the glass ceramic method, in certain circumstances, over conventional ceramic processing routes. Of particular importance in many applications is the high uniformity of the microstructures of glass ceramics, the absence of porosity and the minor changes in volume during the conversion of glass into glass ceramic [2].

Ferroelectric crystalline phases investigated include $SrTiO_3$[3-4], $BaTiO_3$[5-6], $LiTaO_3$[7],$LiNbO_3$[8],$PbTiO_3$[9-11] and (Pb.Sr,Ba)Nb_2O_6[12]. The ferroelectric and dielectric properties of glass-ceramics mainly determined by major crystalline phase and the residual glass or secondary phase(s). However, the excellent adjustability of the composition and microstructure of glass-ceramics promises some advantages of high-permittivity glass-ceramics over the crystalline ferroelectric ceramics (viz. adjustable thermal expansion, dielectric properties, and processing temperature). They also offer the benefit of process compatibility with ceramic substrates and metallized

Quenching Effect of co-dopant Pr^{3+} on Red Emitting Yttrium Vanadate Phosphor Doped with Eu(III)

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Abstract: $Y_{1-x}VO_4$: $Eu_{x-y}{}^{3+}$: $Pr_y{}^{3+}$ with x = 6 mole % and y = 0, 2, 3 ,4, 5, 6, mole % phosphors have been prepared by solid state reaction. The dopant Eu^{3+} concentration was optimized along with the co-dopant Pr^{3+} concentration in the yttrium vanadate host lattice with the help of photoluminescence (PL) spectra. The phosphors have displayed red color under UV source. Pr^{3+} acts as quencher and quenching effect of co-dopant Pr^{3+} on Red Emitting Yttrium Vanadate Phosphor Doped with Eu(III) using luminescence Studies on $Y_{1-x}VO_4$: $Eu_{x-y}{}^{3+}$: $Pr_y{}^{3+}$ systems are presented in detail in this paper. The emission intensities were determined and the relative fluorescence intensities have been estimated. The richness of the red color is verified by determining the chromaticity coordinates (X, Y) from the CIE standard charts.

INTRODUCTION

The crystal field of the monazite characteristics makes YVO_4 a very attractive laser material with dopants Eu^{3+}, Tm^{3+}, Tb^{3+}, Er^{3+}, Ho^{3+}, Ce^{3+} and Pr^{3+} [1-14]. Of these Red Emitting Yttrium Vanadate Phosphor doped with Eu(III) is found to be very attractive potential laser material. . YVO_4 is an important host lattice for phosphors [5-6] due to its application in TV screens and high pressure mercury vapor (hpmc) lamps. Among the rare earth ions, praseodymium (Pr^{3+}) has drawn the attention of several researchers due to the capability of emitting efficiently [15]. Examples Pr^{3+} as a sensitizer, which enhances the excitation resulting in transfer of energy to dopants through a non-radiative process and Pr^{3+} as quencher which quenches emission of energy of dopants through non-radiative relaxation of the system are available in literature i.e. in some hosts it demonstrates energy transfer between Pr^{3+} and dopants [16–24] while in some other hosts it demonstrates a lack of energy transfer between it and dopants [25,26]. Photo luminescent (PL) properties of Pr^{3+} co-doped phosphors especially in crystalline hosts have been reported by many researchers [16–29].

The YVO_4 crystal is tetragonal, belonging to space group D_{4h}. The dopant rare earth ion substitutes on Y^{3+} ion sites the local site symmetry will be D_{2d} and it is surrounded by eight O^{2-} ions [30,31]. The information on the red luminescence under ultraviolet excitation of rare earth vanadate was first reported by Van Uitert et al [32]. Europium doping gives red emission in YVO_4 with four main groups of emission lines of peaks at 700nm, 655nm, 621nm and 595nm and has been assigned to $^5D_0 \rightarrow {}^7F_4$, $^5D_0 \rightarrow {}^7F_3$, $^5D_0 \rightarrow {}^7F_2$ and $^5D_0 \rightarrow {}^7F_1$ transitions respectively, for Eu^{3+} ion. The luminescent properties and the crystallographic data on all rare earth vanadates are available in literature [30,31]. The development by Levine and Palila [33,] of europium activated yttrium orthovanadate as a highly efficient red emitting cathodoluminescent phosphor and its adoption for color television aroused interest in other lanthanide activated orthovanadates. Bixner et al [34] investigated $Ca_3(VO_4)^2$ and found it to be moderately efficient as a host of Eu, but simultaneously inferior to YVO_4. The systems more efficient than $Ca_3(VO_4)^2$ based on were described by Palila et al. [33], who showed that the exciting energies are absorbed by the $VO_4{}^{3-}$ ions and is transferred to activators.

In the present work an attempt has been made to vary the concentration of Pr^{3+} and study the efficiency of red emitting YVO4: Eu^{3+}: Pr^{3+} phosphor. Initially, Eu^{3+} concentration in the lattice was optimized at 6 mole % with the help of PL studies and this composition has been taken further to study the effect of Pr^{3+} as co dopant. . Prepared powder phosphors were characterized by XRD and PL spectra. The results are reported and discussed in this article.

Enhanced electrical properties of Sr(Bi$_{3.9}$La$_{0.1}$) (Ti$_{3.975}$Zr$_{0.025}$)O$_{15}$ ceramic with the doping of Nd

B. Mamatha, K. Ashok, G. Neeraja Rani, and A. R. James
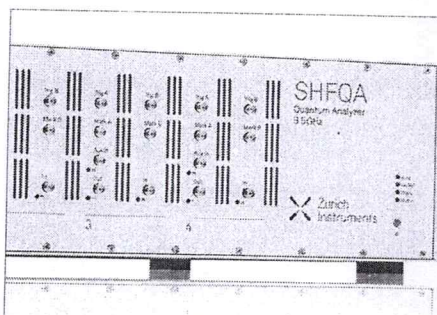
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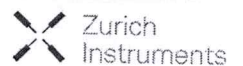
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WEB 2.0 TOOLS: USE OF KAHOOT TO REDUCE THE SPELLING MISTAKES AMONG B.TECH LEARNERS OF COMMUNICATIVE ENGLISH

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Abstract:

BTech learners of Communicative English are inclined towards technology and hardly focus on spellings in their writing. Today, students are called as netizens or net generations (Educause.edu, 2016) due to their over usage of web tools. My paper explores strategies to reduce spelling mistakes in BTech learners of Communicative English by introducing games using Kahoot, in the class. In the empirical design approach, the questions framed by the teacher would help the learner identify the correct spelling through game based learning. Though the learners face technical challenges, learning through games is very interesting.

Key Words: Net Generation, Kahoot, Undergraduates of Engineering , Spellings

Hypothesis:

The Engineering undergraduates who are interested in anything with internet would learn correct spelling through game based e-learning.

Introduction:

Most of the teachers find it challenging to teach spellings to students at undergraduate level. Due to heterogeneous educational background, many students are unable to spell the words right in their academic writing. This has affected their career growth. As technical students are inclined towards technology, teaching-learning process using web 2.0 tools becomes more compatible. Introducing Quizzes through Kahoot which is a game based LMS motivates and engages students and a positive impact develops in the learning process in them.

Rabail Tahir in his research investigated the effect of using Kahoot in his classroom.He focused on learning performance, classroom dynamics, students' and teachers' attitudes and perceptions, and student anxiety. Through his qualitative and quantitative research with 93 students, he found Kahoot to have a positive effect in teaching and learning process. He felt technical hitches, time stress and fear of losing the game were the challenges the students faced.

The method is to design a game based questionnaire where students would respond using the Kahoot! Kahoot! is a game-based student response system (GSRS) where the classroom is temporarily transformed into a game show where the teacher is the game show host, and the students are the contenders (Wang, 2015)[1].The teacher frames some quiz questions and creates the game using Kahoot! The students would respond to them. Some conceptual questions that would test their retention and spelling ability will be asked in the game as a quiz. The students have an option to redo their wrong questions. In this process the students identify their mistakes and learn the correct spelling. Kahoot! The game-based application is very interesting and easy to create and motivating to play games in the classroom. Multiple choice questions or true or false type questions can be asked using Kahoot. The background music while playing the game not only triggers enthusiasm in students but also keeps them alert throughout the game.This enhances students' concentration and keeps them focused on what they are supposed to do. Above all, playing games break the monotony of the traditional classroom and makes a learner centred class.The results would be based on score of every individual. It would be number of questions answered correctly in the given time. Based on the score the ability of the student would be analysed and the teacher would plan further quizzes based on the responses.

Samples/Population:

40 students of III year Mechanical Engineering of whom only 19 could participate.

Method:

To test the spellings, I have framed 10 questions on the topic Presentation skills. The questions were to review the lesson and also to test the spelling ability in the learner. Four options were given to answer each question. Three of the four options had wrong spelling that would sound similar. The learner needs to comprehend the question, recollect the answer and identify the answer with its correct spelling. Of 40 students in the class only 19 could participate as few did not have an extra device to play, few had problem with the connectivity and few others had no technical knowledge. Of 19 participants only 17 were able to answer as the other two could not match the speed of the game as the game has fixed time to answer each question. This gave

A simple rule of thumb for the explanation of d-orbital splitting in complexes

R. Sanjeev¹ V. Jagannadham² and R.Veda Vrath³

Abstract

In chemistry at pre-university level and freshman engineering (non-chemistry discipline) classrooms at universities in India, the splitting of the energy levels of d-orbitals in complexes is an important concept to be learnt, but is not explicitly explained in the standard books used. In the standard books such as 'Concise Inorganic Chemistry' by J.D .Lee and 'Theoretical Inorganic Chemistry' by Marion Clyde Jr. Day and Joel Selbin, they have explained the splitting of d–orbitals in octahedral, tetrahedral, square planar etc., complexes very well. The same is the case with the latest pre-university NCERT chemistry textbook (Volume I) written for the Indian audience. The reason why the energy levels of certain d-orbitals are above the barycenter and why some are below the barycenter, however, is not explained explicitly in any of the books (including the latest books). This short communication outlines a simple rule of thumb that allows this phenomenon to be explained to students. Further, an important graph in the standard books is plotted, but the trend of the curve is not explained. This simple rule is also helpful in explaining this graph and the chemical phenomenon represented.

Una simple regla para la explicación de la división del orbital d en complejos

Resumen

En las aulas de química a nivel preuniversitario y de ingeniería (disciplina no química) de primer año en universidades de la India, la división de los niveles de energía de los orbitales d en complejos es un concepto importante que debe aprenderse, pero no se explica explícitamente en los libros estándar usados. En los libros estándar como 'Química inorgánica concisa' de J .D. Lee y 'Química inorgánica teórica' de Marion Clyde Jr. Day y Joel Selbin, han explicado la división de los orbitales d en octaédricos, tetraédricos, planos cuadrados, etc. ., complejos muy bien. Lo mismo ocurre con el último libro de texto de química preuniversitario NCERT (Volumen I) escrito para la audiencia india. La razón por la que los niveles de energía de ciertos orbitales d están por encima del baricentro y por qué algunos están por debajo del baricentro, sin embargo, no se explica en ninguno de los libros (incluidos los últimos libros). Esta breve comunicación describe una simple regla empírica que permite explicar este fenómeno a los estudiantes. Además, se traza un gráfico importante en los libros estándar, pero no se explica la tendencia de la curva. Esta sencilla regla también es útil para explicar este gráfico y el fenómeno químico representado.

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Heat and mass transfer on unsteady magneto hydrodynamic flow through porous medium in a rotating channel

G. Padma, and Sk. Nuslin Bibi

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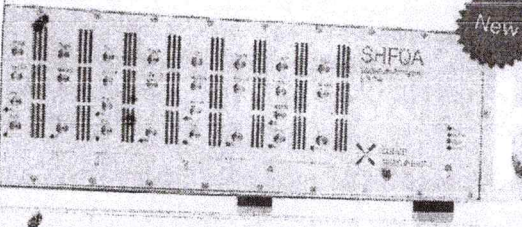
Chemical Reaction and Soret, Dufour Effect on Radiation-Convection Flow with Porous Medium

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Abstract: This work reports the numerical study of unsteady laminar boundary layer flow of viscous, electrically conducting. incompressible, fluid in a channel filled with a porous medium along with a semi-infinite vertical plate in the presence of uniform mass diffusion and transverse magnetic field. The finite element method, Galerkin is used to solve the governing equations. The flow phenomenon has been calculated with the help of flow parameters such as velocity, temperature and concentration profiles for different parameters such as. Schmidt number, Prandtl number, Magnetic field, Chemical reaction Parameter, Permeability parameter, Chemical reaction, Soret number and Grashof number. The velocity, temperature, and concentration are observed graphically. The coefficient of skin-friction, Nusselt number, and Sherwood number are calculated.

INTRODUCTION

The important engineering application in Radiation effect with porous medium in combustion heat exchangers for high temperature applications, including regenerators, solar collectors and recuperates, packed and circulating bed combustors, insulation systems, and reactors manufacturing. Considerable interest has been shown in chemical reaction with sorect effect on an unsteady MHD free convective flow past an infinite vertical plate with constant suction, in the presence of new parameters chemical reaction, soret and Dufour number . Combined heat and mass transfer problems are important in many processes and have therefore received a considerable amount of attention. In many mass transfer processes, heat transfer considerations arise due to chemical reaction and often due to the very nature of the process

El-Hakiem [1] studied HD Oscillatory Flow on Free Convection-radiation through a Porous medium with constant suction velocity. Ghosh [2] derived Thermal Radiation of an optically – thick gray gas in the presence of indirect natural convection. Helliwell [3] studied Radiative heat transfer in horizontal MHD channel flow with buoyancy effects and an axial temperature gradient. Larson [4] derived Transient combined laminar free convection and Radiation in a rectangular enclosure. Young J.K[5] Unsteady MHD Convective Heat Transfer Past A Semi-Infinite Vertical Porous Moving Plate with Variable Suction. Mohammed [6] studied the Double–Diffusive Convection-radiation interaction on unsteady MHD flow over a vertical moving porous plate with heat generation and Soret effects. Muthucumaraswamy et al [7] derived the Radiative heat and mass transfer effects on moving isothermal vertical plate in the presence of chemical reaction. Samad [8] discussed the Thermal Radiation interaction with unsteady MHD flow past a vertical porous plate immersed in a porous medium. Seddeek[9]studied the Effects of Radiation and Variable Viscosity on MHD Free convective flow and mass transfer over a stretching heet with chemical reaction. Srinivasa raju, R. and Anand Rao. J[10] Effects of hall current ,soret and dufour on an unsteady MHD flow and Heat transfer along a porous flat plate with mass transfer. Zueco [11] find the Network

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Structural and microwave behavior of Dy^{3+}-substituted $Ni_{0.5}Zn_{0.5}Dy_xFe_{2-x}O_4$ ferrites

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ABSTRACT

The enhancement of microwave absorbing properties in dysprosium ion (Dy^{3+})-substituted nickel–zinc ferrites ($Ni_{0.5}Zn_{0.5}Dy_xFe_{2-x}O_4$; $x = 0.00$, 0.01, 0.03, 0.05, 0.07 and 0.09) has been investigated in this work. The ferrite powders were synthesized by microwave-hydrothermal method and then powders were densified at 900 °C for 40 min using microwave furnace. The samples' structural and morphological properties were studied using X-ray diffraction and scanning electron microscopy (SEM), respectively. The structural result confirms the spinel phase under low Dy^{3+} content, like the pure Ni–Zn ferrite, while a secondary phase of $DyFeO_3$ appears after the content of Dy^{3+} exceeds a certain limit ($x > 0.07$). Morphological analysis from the SEM images reveals the formation of spherical grains of the samples. DC resistivity of the samples has been measured using two-probe method. Magnetic hysteresis data confirm the soft magnetic nature of the samples. The vector network analyzer results show that adjusting the content of Dy^{3+} is significant in changing the magneto-dielectric properties and microwave absorption capacity of the materials. The composition $x = 0.07$ sample showed a reflection coefficient of -33.24 dB at the frequency and bandwidth of 10.31 GHz and 2.59 GHz for an absorber thickness of 2.5 mm for losses less than -10 dB. This acquired result indicates that the investigated samples could be used as a microwave absorber application in X-band.

1 Introduction

Spinel ferrites are the most attractive magnetic oxides due to their diversified fundamental and technical applications [1–3]. The general formula of the spinel ferrites is MFe_2O_4, where M represents the divalent metal cation like Ni, Co, Zn, Mg and Mn. The unit cell of these ferrites has a cubic symmetry and contains eight formula units of MFe_2O_4. The relatively large-sized oxygen ions form a face-centered cubic structure and each cubic unit cell consists of '64' tetrahedral (A) sites and '32' octahedral (B) sites; out of these

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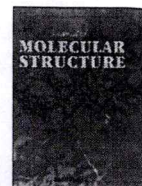
Influence of hydrogen bond networks in Glycerol / N-Methyl-2-Pyrrolidone mixtures studied by dielectric relaxation spectroscopy

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ARTICLE INFO

ABSTRACT

In this paper, we report the dielectric permittivity of the Glycerol (Gly) with N-Methyl-2-Pyrrolidone (NMP) binary mixtures in the microwave frequency region at different temperatures. The dipole moments of Gly, NMP and their equimolar binary mixtures are calculated by using Higasi's method in the temperature range 298.15K-323.15K. The dielectric relaxation spectra of the binary mixtures are calculated using Cole-Cole and Cole-Davidson equation and shows an unsymmetrical relaxation behaviour. The excess parameters of volume, permittivity, refractive index, polarization and relaxation times are fitted with Redlich-Kister polynomial equation. The molecular association and their hydrogen bond interactions between the components in the mixture are discussed in terms of Kirkwood correlation g^{eff} factor and excess Helmholtz energy (ΔF^E) equation. The mean molecular polarizability (α_M) of the individual and their binary mixture are calculated using Lippincott δ- function potential model and compared with the LeFevre method of polarizability values. The enthalpy of activation ΔH^*, entropy of activation ΔS^* and Gibbs free energy of activation ΔG^* are also evaluated and the results are discussed in terms of the orientation of the dipoles. The presence of hydrogen bonding between Gly and NMP is confirmed from the FT-IR spectra.

1. Introduction

The non-destructive characterization of biological samples/liquids, polymers and gels have stimulated the use of dielectric relaxation spectroscopy (DRS) at a broader frequency range at different temperatures [1]. The DRS is one of the sensitive methods to interpret the structural dynamics, molecular association and orientation of the dipoles in the liquid medium [2]. The dielectric relaxation spectroscopy is well suited for to observe the changes in the electrical properties when liquids mix up at different concentrations and also the hydrated studies of proteins/gels with the change in temperature. Therefore, temperature-dependent dielectric relaxation studies of liquid mixtures are of growing interest [3-9]. The investigation of dielectric permittivity of the mixtures by varying concentration of liquid samples helps to ascertain the structure of the complexes formed in the solution [10-15]. The presence of the hydrogen bond between components present in the mixtures that affect the dielectric permittivity, polarization and its relaxation behaviour properties. The understanding the nature of hydrogen bond remains a complex task due to the type of bonds and components present in the given liquid system [16-22]. The dielectric permittivity studies of hydrogen-bonded polar liquids/polymer nanocomposite materials at broader frequency region are very much interesting and these results are quite useful in the field of biological, medical, and shielding applications [23-32].

Glycerol is a simple polyol compound; due to its antimicrobial and antiviral properties, it is extensively used in wound and burn treatments, effective marker to measure liver diseases, the sweetener in the food industry and as a humectant in pharmaceutical formulations [33-39]. NMP is a good polar solvent with magnificent properties. It is having a wide range of applications due to its higher boiling point, lower freezing point and ease of handling [40,41]. It is used as a solvent for engineering polymers, coating resins, paint stripping, oven cleaners, automotive and industrial cleaner formulations. The dielectric permittivity of the Glyc-

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ENGAGING ONLINE CLASSES THROUGH JAM BOARD- A WEB 2.0 TOOL

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stract

Technology has created a flexible learning environment. Technological innovations have made learning possible at anytime l anywhere. Online education is the buzz word and in fact, the order of the day. It is playing a vital role in changing the educational dscape. However, student retention and engagement is a major challenge to be addressed by the educators and the teachers. Many earchers have suggested several strategies to enhance student engagement and involvement during online education. The use of b 2.0 tools while teaching online is one method the teachers can adopt to engage the students meaningfully in online learning. Web tools are called participatory tools as they enable student participation and enrich peer learning. The present paper presents the use AM Board, a lesser known and used Web 2.0 tool.

ywords: Flexible Learning Environment, Technological Innovations, Student Engagement. Peer Learning, Web 2.0 Tools.

roduction

Technology has brought in revolutionary changes in the way we are living today. Technological advancements have made ming possible beyond classrooms and learning at the comfort of home. Technology is vital to stay connected with students and lore various teaching and learning opportunities. Owing to the pandemic, there is a paradigm shift in the teaching. Online teaching dopted. There are several video conferencing platforms like Google Meet, Slack, Discord, and Microsoft Teams etc., which allows acher to familiarize the learners with the theoretical aspects of the subject. However, when the students work on projects, there is a d for a common platform which allows them to post their work, queries and suggestions. There are several and popular web 2.0 ls for the students to work collaboratively. Jam Board is a less known and used white board, popularly known as Google iteboard. Till recently, Jam board is available as a separate app in the Gmail along with other apps like Google Docs, Google ssroom, and Sheets etc. Recently, it has also been incorporated in the Google Meet, a popular and widely used video conferencing form. The key feature of any web 2.0 tool is, it allows collaborative learning, team work and promotes peer learning. Going by the inition, Jam Board can be called as a web 2.0 tool. Jam Board offers an interesting and collaborative experience for heterogeneous ns and classroom projects.

vigation of the tool

Jam board is available in the Gmail as one of the apps in the Gmail. Click on the dotted box icon for Google apps. Scroll vn to find jam board. A new frame pops up on the window with the following instructions. 'You don't have a Jam yet. Tap + to ite one. The + symbol is on the bottom left corner of the window. Tap the + icon

After opening the new jam, on the top right corner you find untitled jam. Click on it to rename.
The background of the Jam board can be made interesting by clicking on the background option. There are six options apart n the white background.
The share option on the top right corner enables it to share to other educators and to students.
On the Jam Board, towards the left corner, you find icons of a pen, erasers, select, sticky notes, add image, circle and a text . Several Jam Boards can be created by clicking on the icon expand frame bar available on the top middle of the board.
If your school or college is using Google Meet Platform for online classes, then Jam Board is available within the meet. Next he icon 'Share Screen' click on the three dotted line to find the Jam Board. If the Jam Board is used in the Google Meet, the her can present the Jam Board to explain difficult concepts.

Some of the few crucial skills that are ubiquitous for the students to face the Industry 4.0 revolution are virtual collaboration, gn mindset, social intelligence and adaptive thinking. The road map to take up Industry Revolution 4.0 is possible by developing Twenty First Century Skills such as collaboration, learning through peers, team work, critical thinking and ability to identify and e problems.

antages of a Jam Board

Jam board can be used in flipped classroom teaching. A Jam Board can be used for assigning a group project to promote boration, peer learning and to promote creative thinking skills. A jam board can be used to brainstorm and develop ideas. Jam d can be used in pre-learning, during learning and post learning. The teacher can create a group gmail id for the class and share im board with instructions on completing any group task.

Existence of Ψ^α Bounded Solutions of Linear First Order Fuzzy Lyapunov Systems- A New Approach

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1. Introduction

This paper presents a criteria for the existence of Ψ^α bounded solution of the linear first order Fuzzy Lyapunov system of the form

$$(T^\alpha)'(t) = A(t)T^\alpha(t) + T^\alpha(t)A^*(t) + F(t), (1.1)$$

where $A(t)$, $A^*(t)$ are square matrices of order (nxn) and F(t) is a square matrix of order n and $T^\alpha(t)$ is an (nxn) continuous matrix and $\alpha \in [0,1]$. The homogeneous system corresponding to (1.1) is

$$(T^\alpha)'(t) = A(t)T^\alpha(t) + T^\alpha(t)A^*(t). (1.2)$$

Lyapunov first order system plays an important role in the theory of differential equations and has significant impact on control engineering problems. Recently, much attention has been paid by many authors to study qualitative properties of linear systems and Ψ-bounded solutions of linear first order systems. Among them the results established by Kasi Viswanadh, Yan Wu, K. N. Murty, Rompicherla, Anand, Divya and Pagilla [2-10, 14, 15] need a special mention. Kasi Viswanadh in fact initiated [3] the idea of fuzzy first order systems and his co-authors Narayana S. Ravada, Murty K.N established Ψ-bounded solutions Linear systems on time scale dynamical system needs a special mention [4], as it unifies both continuous and discrete systems in a single framework. In fact the existence of Ψ^α bounded solutions was first initiated by Kasi Viswanadh V. Kanuri [3] and ($\Phi \otimes \Psi$) –bounded solutions by Rompicherla, Anand [14] on Kronecker product linear system of differential equations. Motivated by these ideas, we investigate ($\Psi^\alpha, \Psi^{\alpha*}$) bounded solution of Lyapunov linear system of first order fuzzy differential equation (1.1). This paper is organized as follows: section 2, presents basic results on fuzzy sets and systems and develop variation of parameters formula for (1.1). We study existence of ($\Psi^\alpha, \Psi^{\alpha*}$) bounded solutions in section 3. We also establish stability criteria for the Lyapunov homogeneous fuzzy system and deduce existing results as particular case.

Recently much attention has been paid by many authors on the existence of (Φ, Ψ)-bounded solutions of linear first order systems [14,16]. The use of Ψ^α bounded solutions for fuzzy first order systems is due to Kasi Viswanadh [3] and based on this kronecker product systems were studied by Rompicherla, Anand et.al [14]. In fact the results established in K.V.K. Viswanadh [] are very useful to understand α–level sets and have significant impact on characterization of soils and thereby increasing production on food grains to farmers [15].

2. Preliminaries

In this section, we present basic notions on fuzzy sets and systems and define α –level sets for understanding the use of fuzzy sets. Most of the results presented in this section form a clear understanding of our main results. For, let X be a non-empty set. Fuzzy set A ∈ X is characterized by its membership function A: X→ [0,1] is used to represent intermediate degree of membership. The mapping A is also called the membership function of fuzzy set A. the integrals of fuzzy-number-valued functions is obtained as a natural generalization of set valued functions and have been discussed by Puri and Ralescu [17], aleva [1] and other co-authors in [16].

FeF₃ MEDIATED SYNTHESIS OF 3,4-DIHYDRO-3-PYRIDYL-2*H*-NAPHTHA[2,1-*E*][1,3]OXAZINE DERIVATIVES

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ABSTRACT
Biologically active 3,4-dihydro-3-substituted-2H-naphtho [2,1-e][1,3]oxazine derivatives were synthesized using environmentally benign and economically feasible Lewis acid FeF₃. They are characterized by FT-IR, HNMR and Mass spectroscopic methods.

INTRODUCTION
1,3-oxazine derivatives, especially, when they were condensed with aromatic rings displayeddiverse biological properties, such as antibacterial, anticancer, anti-fungal, analgesic, anticonvulsant and anti-tubercular activities.[i,ii] Moreover, trifluoromethyl-1,3-oxazine-2-one is highly active against various HIV-1 mutant strains, since, they are non-nucleoside reverse transcriptase inhibitors that have an ability to bind and block HIV reverse transcriptase. Further, naphthoxazine derivatives showed high-level potential for the treatment of Parkinson's disease.[iii,iv] They wereshown to be anti-inflammatoryagents. They were also used for treating allergies, ulcers, asthma, diabetes, and arthritis. 1,3-Oxazines have been used as key intermediates in the synthesis of thrombolytic agents, chiral auxiliaries in organic synthesis and liquid crystal devices.[v]In a comprehensive survey of literature, it was found that naphth-1,3-oxazine derivatives were conventionallyprepared using 2-naphthol, and various substituted aryl and heteroaryl aldehydes in the presence of dry methanolic ammonia. Further, the multi-component condensation of phenols or naphthols with primary amines (or ammonia) and two equivalents of aldehydes led to these target molecules. Similarly,condensation of derivatives of Betti base with aromatic aldehydes led to the formation of the corresponding 1,3-oxazine with varied biological properties.[vi] Yet another method involves using the condensation reaction of salicylaldehyde with a primary amine, followed by reduction and then cyclizationreaction with a suitable aldehyde. The oxazines containing six-membered ring nitrogen and oxygen was constructed by a type of Mannich reaction, in which zirconyl(IV)
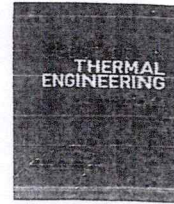
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Chemical reaction impact on MHD natural convection flow through porous medium past an exponentially stretching sheet in presence of heat source/sink and viscous dissipation

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ABSTRACT

This study investigates the viscous dissipation impact on free convection MHD flow through a porous medium over an exponentially stretching surface in presence of chemical reaction. The basic governing PDEs are converted into non-linear ODE's by using similarity transformations and then using the Keller-box method, numerical solutions are obtained. The flow features of boundary layers along with the bounding surface are identified and analysed using diagrams. It is noted that the increase in the Eckert number, Radiation and Magnetic parameter (M) increases the temperature profiles, while the increase in the chemical reaction parameter, porosity and Schmidt number decreases the concentration profile. To validate the results, a comparative study between the present study and previously published results for a particular case is conducted and good agreement is found between them.

1. Introduction

Engineering and Industrial procedures such as in extrusion processes, the movement of biological fluids, hot rolling, glass-fiber production, the cooling of metallic plates, rubber sheets, the performance of lubricants and paints, wire drawing, melt-spinning, manufacture of plastic, the extrusion of polymers, and aerodynamic plastic sheet extrusion, etc., is needed, has received considerable attention over the last few decades, to research flow on a stretching sheet. Many researchers are researching the movement of fluid over the stretching surface [1–5].

The influence of thermal radiation on convective fluid flows has an abundance of uses in physics and engineering for instance gas-cooled nuclear reactors, gas turbines, propulsion systems, hypersonic flights, space vehicles, solar power engineering, nuclear power plants, and lots of industrial areas, and so on. Several researchers [6–10] are attracted the thermal radiation.

In modern metallurgical and physical procedures, the research of the magnetohydrodynamic (MHD) flow of electrically conductive fluid is actually of great significance as a result of the effect of the magnetic field on the regulation of the boundary layer flow control as well as the effectiveness of numerous systems utilizing electrically conductive fluids. its application in many engineering problems, this kind of flow has attracted the focus of several researchers [11–15] such as plasma studies, geothermal energy extractions, MHD generators, nuclear reactor safety, and furnace structure. Hydromagnetic strategies are employed for the decontamination of

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An efficient synthesis of novel anti influenza viral and cytotoxic derivatives of 4-oxothiazolidin-3-yl)-3-hydroxyquinoxaline-2-carboxamide

Shashikala Kethireddy, Thirumala Chary Mariganti, and Srilalitha Sapram

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Recent Trends in Noble Metal Nanoparticles for Colorimetric Chemical Sensing and Micro-Electronic Packaging Applications

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Abstract: Noble metal NPs are highly attractive candidates because of their unique combination of physical, chemical, mechanical, and structural properties. A lot of developments in this area are still fascinating the materials research community, and are broadly categorized in various sectors such as chemical sensors, biosensors, Förster resonance energy transfer (FRET), and microelectronic applications. The related function and properties of the noble metals in these areas can be further tailored by tuning their chemical, optical, and electronic properties that are influenced by their size, shape, and distribution. The most widely used Au and Ag NPs in dispersed phase below 100 nm exhibit strong color change in the visible range which alters upon aggregation of the NPs. The chemical sensing of the analyte is influenced by these NPs aggregates. In this article, we have summarized the uniqueness of noble metal NPs, their synthesis methods, nucleation and growth process, and their important applications in chemical sensing, microelectronic packaging, and Förster resonance energy transfer.

Keywords: colloid; nanostructure; microelectronic systems; crystalline; hydrothermal; nucleation and growth

1. Introduction

Nanomaterial is defined as a material in which the maximum value of one dimension can be 100 nm, which can be further defined as one billionth of meter or 10^{-9} m [1–6]. It is approximately 10 H or 5 Si atoms in a line. It is continuing to be the most rapidly growing R/D sector in last decades, which is evident from more than several billion dollars of annual investment in this particular field [7,8]. Due to its unique features, nanomaterials and NPs allow them to be used for a wide variety of applications in nanotechnology covering medical science, chemical, bio-network, applied physics, materials, microelectronic and metallurgy science, and engineering. There are lots of investments in the area of medical science, in particular, theragnostics, which refers to two kinds of word therapeutics and diagnostics [9]. It is an advanced technique in which cancer diagnosis and therapy is done simultaneously, for early detection and cure of the cancer [10,11]. To achieve this, some special metals in the periodic table include alkaline to alkaline metallics, rare metallics, and noble metallics used for theranostics application [12]. Compared to these metals, noble

Flip -Flop with ICT

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ABSTRACT

English Language Teaching is always a challenging task. It has become more challenging these days, as the teacher has to keep pace with the changing methodologies and techniques, especially while teaching the digital literates. Technological innovations have brought in perceptible changes to the way we live, learn and also teach. It is in this context that the concept of flipped classroom techniques blended with ICT makes learning environment engaging and enthusiastic.

The present paper focuses on the advantages and disadvantages of using flipped classroom techniques with ICT. The paper is based on research conducted using flipped classroom techniques using Web 2.0 tools namely PADLET and EDMODO. Integrating technology in teaching English Language is sin-qua-non, mainly because English Language teaching is restricted to the limited time given on a particular day in the time table. It is found that using technology in teaching has augmented the physical classroom space and learning time.

Key Words

E-learning, Flipped Classroom, Collaborative Learning, self-learning, personal responsibility.

Introduction

The indispensable feature of e-learning provides access to information and is primarily strengthened on its communicative and interactive aspects of language learning and teaching. The main premise of e-learning is a blend of diversity and connectedness into a vibrant and intellectually stimulating learning environment. E-learning provides adequate opportunities (both freedom and control) within a dynamic and ebullient learning community. E-learning identifies and assimilates the personal

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RESEARCH ARTICLE

Impact of Soret and Dufour on bioconvective flow of nanofluid in porous square cavity

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Abstract

This article addresses the bioconvection in a porous cavity associated with Soret and Dufour effects. The bioconvective flow in a porous medium is based on Hillesdon and Pedley's model and is governed by nonlinear partial differential equations. These equations are transformed into a dimensionless form with suitable nondimensional parameters. The finite element method is employed to solve the dimensionless equations. The outcomes of the study are presented by streamlines, temperature distributions, iso-concentrations of solute, nanoparticles, and micro-organisms. Furthermore, the tendency of average Nusselt number and average Sherwood number and the influence of Soret parameter, Dufour parameter, Peclet number, and bioconvective Rayleigh number is interpreted. Thermophoresis and Soret number show a strong effect on the concentration of nanoparticles. Brownian motion and thermophoresis exhibit a significant effect on the density distributions of micro-organisms. The novelty of the paper is to combine the effects of Soret–Dufour and oxytactic bioconvection. The present study can be useful in the following applications: microbial-enhanced oil recovery, toxin removal, antibiotics, and modeling of microfluidic devices.

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Enhanced microwave absorption properties of $Ni_{0.48}Cu_{0.12}Zn_{0.4}Fe_2O_4$ + polyaniline nanocomposites

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ARTICLE INFO

ABSTRACT

Nanocomposites of $(1-x)$ $Ni_{0.48}Cu_{0.12}Zn_{0.4}Fe_2O_4$ (NCZ) + x Polyaniline (PANI), ($x = 0$, 0.1, 0.2, 0.3, 0.4, 0.5, 1) with varying composition were successfully prepared from nanopowders of $Ni_{0.48}Cu_{0.12}Zn_{0.4}Fe_2O_4$ synthesized by microwave hydrothermal method. The samples were characterized using X-ray diffraction (XRD), scanning electron microscopy (SEM) and Fourier Transform Infrared spectroscopy (FTIR). The characterization studies revealed the confirmation of spinel and polymer phases in the composite samples. The dielectric, magnetic and electromagnetic properties were studied over frequency range of 8.2–12.4 GHz (X-band) and 12.4–18 GHz (Ku-band). It was found that the addition of PANI filler in ferrite matrix enhances the microwave absorbing properties with the increment of dielectric and magnetic losses. The nanocomposite sample with 50 wt% PANI was found to exhibit minimum reflection loss of −42.10 dB near 9.35 GHz with the effective bandwidth of 3.8 GHz and −39.34 dB near 14.05 GHz with effective bandwidth of 2.8 GHz. The current results indicate that the present materials can be selected to design microwave absorbing filters both in X-band and Ku-band frequency regions for electromagnetic interference applications.

1. Introduction

In recent years there is an increase in demand for the development of absorbing materials in microwave frequencies region to suppress the effects of electromagnetic interference (EMI). Due to the fast development of advanced technology in several fields such as electronic wireless communications, military, commercial and medical applications, there has been widespread use of microwave devices in GHz frequency range [1–3]. These devices are capable of producing electromagnetic interference which can cause severe interruptions on functioning of several electronically controlled devices resulting in decrease in performance. Moreover, over exposure to microwave energy may lead to potential health hazards to the human body [4,5]. Hence, while using high frequency electronic devices EMI becomes a matter of serious concern. In order to control these problems created by electromagnetic interference the devices have to be shielded by the materials which can suppress the unwanted electromagnetic radiation and reduce the noise level of signals. Traditionally, conducting materials can shield the devices by reflecting the electromagnetic radiation. However, in the case of conducting shields the main drawbacks are heaviness, lack of flexibility,

high cost of processing, etc. Electromagnetic shielding through absorption instead, offers an effective means to solve these problems. Hence, shielding materials capable of absorbing unwanted electromagnetic waves were investigated by many researchers [6–11]. In order to acquire excellent microwave absorbing properties, the shielding materials should possess mainly two important characteristics, viz., the wave attenuation through the material layer, called attenuation characteristic and the impedance matching, the impedance of the material medium should match the impedance of free space. In addition to these, the other parameters such as light weight, thickness, mechanical strength, miniaturization, wider absorption bandwidth, environmental resistance, should be taken care of while producing and designing the microwave absorbing materials [12]. Over the past decades ferrite absorbers have been developed to study the microwave absorbing properties and found that they exhibit excellent magnetic and dielectric properties though they are heavy and expensive [13]. Polymers were designed to be used for microwave shields due to lightweight, flexibility and cost effectiveness. However, polymers are insulating materials and are transparent to electromagnetic waves. In order to suppress electromagnetic waves effectively by the materials with enhanced microwave absorbing

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PREDICTION OF BIOACTIVITY OF PHYTOCHEMICALS IN *Anethum graveolens* – AN *in silico* APPROACH

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Original Research Article

ABSTRACT

Anethum graveolens is a popular herb widely used as flavouring agent and it yields essential oil. It is rich in polyphenols which exhibit antioxidant and carminative properties. In this work, phytochemical screening is performed to establish the presence of terpenoids, flavonoids and tannins etc. In food products, lipid peroxidation is common and to prevent it synthetic antioxidants like butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT) are used and they are carcinogenic in nature. So, there is an increasing demand for plant derived antioxidants. *Anethum graveolens* is a plant rich in antioxidants and the present study predicts the antioxidant and bioactivity of Limonene, Carvone, α- Phellandrene, Dillapiol, Geraniol and p-Cymene. *Insilico* studies were carried out using PASS prediction tool and the bioactive compounds were predicted with Pa> 0.7. For these compounds, the bioactivity score is calculated and their potential medicinal value is discussed using Lipinski's rule of 5 analysis. From the study, it is observed that all the compounds have bioactivity and are potential antioxidants that may be used in health care, cosmetic and food and beverage industry.

Keywords: *Anethum graveolens*; bioactivity spectrum; phytochemical screening; bioactivity score; Lipinski rule of 5.

INTRODUCTION

Anethum graveolens (Dill) is an herb that belongs to the family of apiaceae. The genus name *Anethum* is originated from the Greek word aneeson or aneeton, i.e strong smelling. It originates from the Mediterranean and West Asia [1]. *A. graveolens* is popularly known as Dill or

shapt. It is cultivated across the world and is known for its flavouring and curative properties. The experimental studies demonstrated the antimicrobial, stomachic, antioxidant, and carminative properties of Dill [2-5]. Flowers and leaves have high content of polyphenols when compared to fruits and hence are used for extracting essential oil.

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Developing Creative Writing Skills among the Students at Secondary Level through Authentic Materials

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Abstract

The present research has adapted the qualitative approach in the process data collection. To draw the qualitative data of the study many things have been observed when the study was going on. The level of the requirement of the students was taken as a parameter to teach the creative writing skills. Creative writing skills are the most desirable achievement of present generations. So the need and importance of creative writing skills is taken in this study. All the factors were considered in this study such as medium of the study, gender, background of the students, the opinion of the students on creative writing skills.

Keywords: Creative Writing, Qualitative Approach, Parameters, Authentic materials, Research methodology.

Introduction

The present research has been done in the area of English language education. In the part of research it was taken a chance to study the problems of non-English medium learners in learning to write perfectly. It is a challenging task to do research in communicative English. The aim of the research is to develop the creative writing skills among the secondary level learners through the intervention of activities based on the authentic material. The authentic materials are used to teach the language skills for non-native speaker of English. Most of the study focused on the new techniques and activities by using authentic materials as scaffolding device in teaching writing skills of the students. As it went on a systematic and significant way of research to deal with the problems that diagnosed in the learners, the need of
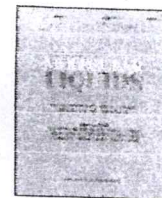
Hard core proof of the polyvinyl alcohol as a reducer for the formation of gold nanoparticles

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ABSTRACT

In this paper, we report the direct synthesis of water dispersed gold nanoparticles encapsulated in polyvinyl alcohol (PVA), which acting as reducer to gold ion to gold metal and capping agent. The syntheses of the gold nanoparticles were carried with the direct addition of the aqueous HAuCl. solution to aqueous PVA solution at 50 °C. Initially, the PVA solution was prepared by using 2 g of PVA per 100 ml of distilled water in a round bottom flask which was placed in oil bath placed over the magnetic stirrer. Subsequently, the aqueous solution $HAuCl_4$ was added drop-wise to the PVA solution. Afterward, the solution was made viscous by heating at same temperature and casted in form of nanocomposites films. Various compositions of $HAuCl_4$ (0.2 wt%, 0.5 wt%, 1.0 wt% and 1.5 wt%) with respect to PVA (films of Au-PVA nanocomposites) were prepared. Upon drying in ambient condition these films were analyzed with XRD, SEM, EDX, TGA, UV–Visible, and IR techniques. The XRD analysis reveals the fcc crystal structure with crystallite size nearly 22 nm. The crystallite size is in agreement with that obtained by SEM analysis which is in range of 25–30 nm and particles are nearly spherical in shape. Furthermore, the UV–visible analysis showed the surface plasmon resonance (SPR) band at ~ 550 nm which confirmed the formation of gold nanoparticles. It is further supported by the EDX analysis that showed the gold peaks in the spectrum.

1. Introduction:

Noble metal nanoparticles had an increased attention over the last decade and still fascinating the researcher to greater extent due to their unique photochemical properties [1–7]. In particular the gold nanoparticles have been unique characteristics such as tunable localized surface plasmon resonance enable them wide variety of application such as Förster resonance energy (FRET) sensor, photo-thermal therapy (PTT), catalysis, electronics, and energy storage devices [5–9]. For instance, spherical gold nanoparticles have extensively used in the FRET process because of no dipole moment it can interact with the donor from all faces in the visible region [9]. On the other hand the gold nanorods had been used as the sensor over wide range from visible to near infrared region due to their tunable wavelength spectrum. Moreover, the PTT application of gold nanoparticles is due to the exceptionally high absorption cross-section through surface plasmon resonance (SPR) compared to the bulk gold that result in increase the localized temperature which is essential principle of the cancer treatment process [10]. All these properties are dependent on the size and shape of the nanoparticles, therefore, to control the size and the shape of the gold nanoparticles many methods have been used [11]. For instance, the chemical reduction method in which the gold ions are reduces to gold atoms with the application of suitable reducing agent. Commonly, used reducing agents are $NaBH_4$, hydrazine, and gaseous hydrogen [11–15]. Moreover, green synthesis process has also been developed in which the nature of the reducing agent was mild and the sources of the reducing agents were green plants [16]. Additionally, in a polyol process the reduction of the metal ions to metal were achieved by using the different molecules containing the OH functional group such as ethylene

BMC Chemistry

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Synthesis, biological evaluation and docking studies of 1,2,4-oxadiazole linked 5-fluorouracil derivatives as anticancer agents

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Abstract

Background: 1,2,4-oxadiazole derivatives exhibited significant anti-cancer activity when they were evaluated, against human cancer cell lines. They also showed anti-inflammatory, analgesic, diabetic, immunosuppressive, α,β_3-receptor antagonist, antimicrobial, anti-helminthic, histamine-H3 and antiparasitic properties. A pyrimidine analog, 5 fluoro-uracil is a chemotherapeutic drug used for treating multiple solid malignant tumors. But its application is limited, as it has side effects like low bioavailability and high toxicity. Molecular docking is an exemplary tool, helps in identifying target and designing a drug containing high bio-availability and minimum toxicity.

Results: A set of 1,2,4-oxadiazole linked 5-flururacil derivatives (7a–j) were synthesized and their structures were confirmed by ^{1}HNMR, ^{13}CNMR and Mass spectral analysis. Further, these compounds were investigated for their anti-cancer activity towards a panel of four human cancer cell lines such as (MCF-7, MDA MB-231), lung cancer (A549) and prostate cancer (DU-145) by using MTT method. Among them, compounds 7a, 7b, 7c, 7d and 7i demonstrated more promising anticancer activity than standard.

Conclusion: Synthesized derivatives (7a–j) of 1,2,4-oxadiazole linked 5-fluorouracil and investigated for their anticancer activity towards a panel of four human cancer cell lines.

Keywords: 5-Fluorouracil, Ataluren, Pyrimidine, Oxadiazole and anticancer activity

Background

Over the past few decades, heterocyclic rings containing nitrogen atoms have played a significant role in medicinal chemistry. They are considered as key templates for the development of new therapeutic agents [1]. Among all the nitrogenated compounds, pyrimidines are a more privileged class of six-membered heterocyclic organic units. They occupy a unique position in medicinal chemistry due to their wide range of biological applications [2–12]. Pyrimidines exist as an essential component in several nucleic acids and therapeutic drugs, such as 5-Fluorouracil (**1**, 5-FU, Fig. 1) [13–16]. The USFDA-approved drug, 5-FU, is one of the most distinguishable chemotherapeutic drugs available. It was first synthesized by Heidelberger and co-workers [17]. It shows antitumor activity by inhibition of thymidylate synthetase enzyme leading to prevention of DNA synthesis [18], and has been used frequently for the treatment of various solid malignant tumors [19–21]. However, it has limited clinical applications because of several side effects, including poor tumor selectivity, toxicity, lower drug-resistance, gastrointestinal toxicity, and adverse effects on central nervous system [22, 23]. Previously, many researchers have developed several 5-FU contained compounds to overcome

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The pK_a of Pentazole (HN$_5$)

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Pentazole having the molecular formula HN$_5$ is an archetypical five-membered homocyclic inorganic aromatic molecule consisting of five nitrogen atoms. A hydrogen atom is bonded to one of the nitrogens. Even though the molecule does not contain a carbon it appears last in the series of the heterocyclic azole family; the family containing one to five nitrogen atoms. This series of heterocyclic azoles is pyrrole, imidazole, pyrazole, triazole, tetrazole, and the last one is the pentazole. Barring pentazole, the rest of the members of the azole family are heterocyclic organic molecules. The pK_a of N(1)H-acidity values of all the azole members are known, except for that of pentazole. In the present work we endeavoured to determine the pK_a of pentazole by a graphical method and by performing theoretical DFT calculations.

Keywords: pentazole, pK_a, DFT.

Introduction

The chemistry of pentazole has a long debatable history.[1–11] A century ago, the preparation of its silver salt AgN$_5$ was reported by Lipschitz[1] and later it was refuted by Curtius et al.[2] Though the X-ray crystal structure of a related compound, 4-dimethylaminophenylpentazole was reported,[3] the synthesis of pentazole HN$_5$ was not.[4] Subsequently, several papers appeared in the literature regarding pentazole and its substituted compounds reporting on their various aspects like their stability and its existence.[5–11] The pK_a of pentazole has not been reported either by experiment, owing to its instability, or by theory in any of the earlier research articles. The only small report that appeared regarding the pK_a was by Katritzky et al.[12] Owing to the difficulty in the synthesis of pentazole (if at all synthesised it is in a metastable state), the experimental pK_a has not been reported so far. This was the motivation to carry out theoretical studies. The theoretical study reported here sheds light on the fact that the pK_a determined by extrapolation method might not be correct. Further it is proposed that the pK_a values determined by SMD$_{sSAS}$ (a solvation model based on a density–scaled solvent-accessible surface model) appear to be correct.

It is known that pK_a is the negative logarithm of K_a, the equilibrium constant of the acid dissociation reaction HA $\rightleftharpoons$ A$^-$ + H$^+$ in aqueous solution. In any graduate laboratory, experimental methods, like potentiometry, conductometry, and UV-visible spectroscopy, are available to determine the equilibrium constant K_a. The acid dissociation constant K_a is the quantitative measure of the strength of an acid in solution; yet the symbol pK_a, which is the negative logarithm of K_a, is more commonly used. At equilibrium, in the acid dissociation reaction

HA $\rightleftharpoons$ A$^-$ + H$^+$ the concentrations of HA, A$^-$, and H$^+$ will not change with the passage of time because the rates of the forward and backward reactions are equal.[13] The acid dissociation reaction HA $\rightleftharpoons$ A$^-$ + H$^+$ for pentazole is shown in Eqn 1, the equation for K_a is given in Eqn 2, and the subsequent equation for pK_a is given in Eqn 3.

$$\underset{\underset{H}{|}}{\overset{N-N}{\underset{N}{\parallel}}}N \ (aq) \xrightarrow{K_a} \overset{N-N}{\underset{N}{N \, N}} \ (aq) \ + \ H^-(aq) \quad (1)$$
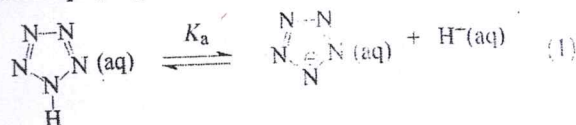
$$K_a = \frac{[A^-][H^+]}{[HA]} \quad (2)$$

$$pK_a = -\log_{10}K_a = \log_{10}\frac{[HA]}{[A^-][H^+]} \quad (3)$$

Methods

All the linear correlations were done using the *KaleidaGraph* software (Reading, PA, USA). The chemical structures were drawn using *Chemdraw*. *Gaussian 09* software was utilised for theoretical calculations.[14] Density functional theory (DFT) was used to calculate the pK_a values. The reactant and the products were optimized and frequency calculations were performed using the wB97XD[15] and B3LYP functional with 6-311+g(d,p) basis set. pK_a values were determined using the SMD continuum model. The pK_a values were determined by both default SMD (solvation model based on density) and SMD$_{sSAS}$ (scaled solvent-accessible surface). Here the

VARIOUS TECHNOLOGICAL PROCESSES

Enhanced Optical and Electrical Properties of Graphene Oxide-Silver Nanoparticles Nanocomposite Film by Thermal Annealing in the Air

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Abstract—Here, we report the enhanced optical and electrical properties of graphene oxide-silver nanoparticles (GO-AgNPs) nanocomposite due to thermal annealing in air at different temperatures (150, 250, and 350°C). Our findings show that the optical properties of the GO-AgNPs film strongly depend on the annealing temperature. With an increase in annealing temperature, the optical absorption band and photoluminescence (PL) band are monotonically shifted towards a longer wavelength with a slight increase in absorbance. Interestingly, annealing of the nanocomposite film at 350°C in the air results in the nitrogen-doping from air into GO lattice. Unlike the PL bands in the near-ultraviolet (UV) range in cases of GO-AgNPs annealed at 150 and 250°C, this film exhibits pronounced multiple PL bands in the visible range, which are attributed to optical transitions associated with the localized nitrogen defects incorporated from air under thermal annealing and charge transfer between AgNPs and carbon. Mechanisms of the observed optical properties are also discussed. Furthermore, thermal annealing of the film also affects its electrical properties. The sheet resistance of the film reduces with the increase of annealing temperature and its lowest value ~ 21 Ω/□ with transmittance ~ 82% at 550 nm is achieved at 350°C.

Keywords: Thermal annealing in air, nitrogen-doped graphene oxide-silver nanoparticles, transparent conductive electrode, photoluminescence

INTRODUCTION

Graphene has been recognized as a promising material that could be utilized in many areas that include electronics, optoelectronics, energy, and biochemistry [1–10]. However, experimentally synthesized pure graphene has some limitations such as lack of band gap in sp^2 hybridized structure, high sheet resistance [1], and less pronounced luminescence [11]. Modification of graphene structure is therefore needed to extend its effective utilization in various application sectors. Chemi-cally synthesized graphene oxide (GO), in this scenario, has been an attractive and basic material. GO consists of sp^2 bonded carbon atoms with a large fraction of sp^3 hybridized carbon atoms bound to oxygen-related functional groups. GO is an insulator and reduction of GO is demanded to make it conductor or semiconductor which are key materials used in electronic and optoelectronic devices. The reduction of GO indicates the increase of sp^2 contents and materials tend to transform from insulating GO to conducting graphene structure [12]. Ag nanoparticles (AgNPs) have been widely used to fab-

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...w trigonometrical method for solving non-linear tran-...ental equations

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...paper presents a new algorithm to find a non-zero positive real root of the transcendental equations. The proposed ...based on the combination of the inverse tan(x) function and the Newton-Raphson method. Implementation of the ...method in MATLAB is applied to different problems to ensure the method's applicability. The proposed method is ...number of numerical examples and results indicate that our methods are better and more effective as compared to ...n methods. Error calculation has been done for available existing methods and the new proposed method. The errors ...reduced rapidly and obtained the real root in less number of iterations as compared to renowned methods. Certain ...examples are presented in this paper to show the effectiveness of the proposed method. The Convergence of the ...method is discussed and shown that the method reduces to Newton-Raphson method that is quadratic convergent. ...ach will also help to produce a non-zero real root of a given non-linear equations (transcendental, algebraic, and ...l) in the commercial package.

Nonlinear equation, iteration method, transcendental equations.

65H04, 65H05.

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...inding methods have enormous applications in many fields such as Finding Methods Applied ...Maximum Power Point tracking of sustainable photovoltaic energy generation, computation of ...etention times in liquid chromatography, for solving non-linear differential equations, in circuit ...analysis of state equations for a real gas, mechanical motions/oscillations, weather forecasting, ...ation and many other fields of engineering designing processes. Root finding methods can also ...l in the discrete stochastic arithmetic (DSA) to validate the class of multi-step iterative methods ...he optimal numerical solution of non-linear equations.
...Gemechu used derivative estimations up to the third-order (in root finding, some new initia-...pplied in Taylor's approximation of a non-linear function/equation to achieve efficient iterative

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Research Article

Molecular docking studies of *Chenopodium album* Linn with Lanosterol synthase enzyme

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Abstract

Cardiovascular diseases (CVD) are the major cause of death among people across the globe. Hypercholesterolemia is one of the major contributing factors for CVD. Molecules that bind with Lanosterol synthase enzyme, can be potential drug targets. Statin group of compounds like Simvastatin, cerivastatin, Atorvastatin etc., used for treating hypercholesterolemia have side effects and hence there is a growing demand for plant derived flavonoids. This work focusses on studying the compounds quercetin-3-O-(2",6"-di-O-α-L-rhamnopyranosyl)-β-D-glucopyranoside, kaempferol-3-O-(2",6"-di-O-α-L-rhamnopyranosyl)-β-D-glucopyranoside, rutin; quercetin-3-O-β-D-glucopyranoside (Iso quercetin); and kaempferol-3-O-β-D-glucopyranoside (Astragalin) present in *Chenopodium album* Linn to inhibit Lanosterol synthase. Bioactivity score, drug likeness character was assessed *in silico*. Based on bioactivity spectrum, it is observed that the molecules are biologically active and the probability of these compounds to be biologically active is ranging from 0.784 to 0.992, suggesting that these compounds are effective for treating hypercholesterolemia. In the molecular docking studies, the compounds binding affinity score was in agreement that the molecules have the potential to be used as an alternative to the statin group of compounds in treating cholesterol.

Keywords: Bioactivity, *Chenopodium album*, Hypercholesterolemia, Lanosterol synthase enzyme, Molecular docking

INTRODUCTION

Ethnomedicinal plants remain largely unexplored and there is a good scope for researchers and food processors to bring out these economical, easily grown plants to the mainstream food basket (Pala *et al.*, 2019., Salmerón-ManzanoEsther *et al.*, 2020). *Chenopodium album* Linn, is one such plant with good nutritive value (fibre, fatty acids and minerals). In India, it is called as Bathua and it belongs to Amaranthaceae family and Chenopodium genus (Bajwa Ali *et al.*, 2019). *C. Album* is rich in flavonoids that play an important role in its pharmacological and therapeutic properties.

Flavonoids are phenolic compounds possessing a wide spectrum of biological activities and are studied for anti-cancer and reducing the risk of cardiovascular diseases caused by oxidative stress (AlexanderVictor *et al.*, 2016, Thilakavathy Thangasamy *et al.*, 2009). *C.Album* has been found to possess the bioflavonoids, Quercetin and Kaempferol derivatives (Gohar and Elmazar 1997,

Cutillo *et al.*, 2006, Laghari *et al.*,2011) Hypercholesterolemia is considered as one of the factors for coronary heart diseases. Chemically synthesised drugs used to treat hypercholesterolemia contain statin group that on prolonged use causes muscle weakness, memory loss and inhibits coenzyme Q10 important for electron transfer in mitochondria (Wagstaff *et al.*, 2003, Jamolowicz Al *et al.*, 2015). In this context, it is highly relevant to focus on plant derived flavonoids that are effective in treating hypercholesterolemia.

Lanosterol synthase, also known as lanosterol cyclase, is a microsomal enzyme and a target for drugs lowering cholesterol (Telford *et al.*, 2005, Vanessa *et al.*, 2018). The potential anti-cholesteremic drug binds to the active sites of the Lanosterol synthase enzyme and inhibits it. To establish a plant derived flavonoid as a potential bioactive compound, it is important that we screen it theoretically and know its pharmacological and binding properties.

In the present work, we carried out *in-silico* calculation
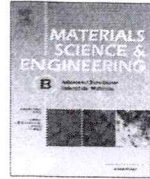
Effect of BaTiO$_3$ phase on frequency dispersion characteristics of Mg$_{0.48}$Cu$_{0.12}$Zn$_{0.4}$Fe$_2$O$_4$ + BaTiO$_3$ nanocomposites

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ARTICLE INFO

ABSTRACT

Multiferroic nanocomposites of ferrite and ferroelectric phases with systematically varying composition (100-x) Mg$_{0.48}$Cu$_{0.12}$Zn$_{0.4}$Fe$_2$O$_4$ + xBaTiO$_3$ (MCZBT) (where, x = 0, 20, 40, 50, 60, 80, 100 mol%) were prepared for the first time by mechanical milling and sintering method. The presence of ferrite and ferroelectric phases in nanocomposite samples were confirmed by X-ray diffraction (XRD) while microstructural characterization was carried out by scanning electron microscopy (SEM). The average grain size, from SEM, was found to be in the range 80 nm for ferrite and 86 nm for BaTiO$_3$ nanopowders. The complex permittivity and the complex permeability variations as a function of frequency in the range 100 kHz – 1.8 GHz, were investigated using LCR meter and Impedance analyzer. The resonance and relaxation phenomena were observed by all the samples around 1.18 GHz from the permittivity studies. From the studies of microwave absorbing properties in X-band (8–12 GHz) frequency region, it was found that the minimum reflection loss of −24.61 dB with bandwidth of 0.38 GHz was obtained by sample with 20% ferroelectric phase. The studies on reflection loss and transmission loss indicated that the effective absorption of incident microwave was found to be above 80% and the composite sample with 80% of ferroelectric phase absorbed more than 91% of the incident wave. The results suggested that the present sample materials can be used for making microwave shielding devises for EMI applications.

1. Introduction

Multiferroic composite materials that display coexistence of ferroelectric and ferromagnetic responses attracted the current interest due to their magnetic and dielectric properties that are appropriate for several novel device applications such as high frequency Multi Layer Chip Inductor (MLCI) applications, electromagnetic interference (EMI) filters and sensors etc [1,2]. Dielectric and magnetic property studies and their dependence on composition and structure of nanocomposites lay the foundation for developing the new materials with predetermined properties since the interrelationship of properties of filler and matrix phases of composites help in the design of devices for applications. The frequency dispersion characteristics of ferrite and ferroelectric composites are deciding parameters while using these materials as microwave absorbers and EMI shielding materials in various applications [3,4]. The advanced technological developments in the field of telecommunications and several industrial sectors demand not only effective EMI shields but also materials that satisfy certain requirements for each engineered design such as light weight, corrosion

resistant, flexibility, processing easiness, tunable morphology, and inexpensiveness [5]. Another priority is developing radar absorbing materials for military stealth applications in X-band (8–12 GHz) frequency region. A significant research has been done over recent years on microwave absorption performance of various nanomaterials [6,7]. However, these absorbing materials cannot satisfy all requirements simultaneously, such as absorption, wide bandwidth, light weight, etc. [8].

In the current work ferrite ferroelectric nanocomposites are selected to synthesize and study properties, the reason being due to the fact that spinel ferrites and perovskite ferroelectrics show good phase compatibility through magnetoelectric coupling and the interconnectivity of the phases can be controlled by their relative amount and processing methods. Moreover, there exists good lattice match between perovoskite ferroelectric, BaTiO$_3$ (lattice constant, a $\approx$ 4.03 Å) and spinel ferrite (lattice constant, a $\approx$ 8.33 Å), with ferrite lattice constant close to twice the perovskite lattice constant, which is expected to have excellent wetting between two phases resulting in strong interface adhesion in composites [9]. Due to their excellent dielectric and magnetic

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IMPACT OF THERMAL RADIATION AND CHEMICAL REACTION ON MHD HEAT AND MASS TRANSFER CASSON NANOFLUID FLOW PAST A STRETCHING SHEET IN PRESENCE OF HEAT SOURCE/SINK

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ABSTRACT

The purpose of present study is to analyse the influence of chemical reaction on MHD Casson nanofluid flow on an elongating sheet taken into the account of radiation and heat absorption/generation. The governing nonlinear PDE's are changed into a nonlinear ODE's by using similarity transformations. The converted equations are solved using numerical technique is notable as Keller box method. The consequence of heat source/sink, Prandtl number, Casson parameter, magnetic field, Brownian motion, thermophoresis, thermal radiation and chemical reaction parameters on velocity, temperature, and concentration profiles are depicted and elucidate in physical terms. A resemblance with previously issued results shown a perfect agreement. Numerical values of physical quantities, such as velocity gradient, heat transfer rate and the mass transfer rate are arranged in tabular form.

Keywords: thermal radiation, heat source/ sink, stretching sheet, casson nanofluid, MHD, chemical reaction.

INTRODUCTION

The study of nanofluids have fascinated because of its remarkable applications in industry such as solar cells, electronics, solar stills, communication, solar cooling systems, computing technologies, solar collectors, optical devices, water heaters, lasers, absorption refrigeration systems, and medicine, synthesis of various solar devices because of their higher properties over the conventional fluids. A nanofluid, consisting of a base fluid and nanoparticles, is a modern division of heat transfer fluids. The utilization of supplement is an approach to intensify the performance of heat transfer in base fluids. The heat conductance of conventional heat transfer fluids does not encounter the demands of modern cooling rate. Nanofluids are suspensions of ultrafine-grained solid particles (nanoparticles) and it improves the convective heat transfer and heat conductivity in common fluids. Choi and Eastman [1] analysed the increased thermal conductivity of nanoparticle fluids. S. K. Das et al. [2] investigated the Heat Transfer in Nanofluids. Natural convective heat and mass transfer nanofluid boundary layer flow through a vertical plate with convective boundary condition was studied by Aziz and W.A. Khan [3]. D. Srinivasacharya and Ontela Surender [4] examined the non-similar solution by considering double stratification on natural convection heat transfer of a nanofluid in a porous saturated medium over a vertical plate. Elsheikh et al. [5] studied the various applications in solar energy with nanofluids.

Magnetohydrodynamic (MHD) nanofluids perform an important part in several manufacturing procedures such as in hybrid fuel generation, modulator, economy fuel in modern power generation plants, gratings, coolant in continuous metallurgical sheets, fiber filters, vehicle cooling, loud speakers, plastic sheet extrusion and processes of polymers, and magnetic cells, etc. Rizwan Ul Haq et al. [6] analysed the magneto-hydrodynamic stagnation point Nanofluid flow in presence of radiation on a stretching sheet with slip conditions. A.S. Dogonchi et al. [7] discussed heat transfer and thermal radiation MHD nanofluid flow between parallel plates. A. Kamran et al. [8] observed Magneto-hydrodynamic Casson Nanofluid with velocity slip and Joule heating. Jawad Raza et al., [9] investigated MHD heat and mass transfer Nanofluid flow past a nonlinear permeable stretching sheet with multiple slips. Saeed Islam et al. [10] examined the influence of thermal radiation and hall current between two surfaces on MHD micropolar non-Newtonian hybrid Nanofluid flow.

Thermal radiation plays an important role in dissipating heat from the surface. It has applications in manufacturing industries such as chopper, space vehicles, reliable equipment design, satellites, atomic furnaces, missiles, space technology and procedures related to high temperature. Yanala Dharmendar Reddy et al., [11] analyzed thermal radiation and suction effects on MHD Nanofluid boundary layer flow on a non-linear stretching sheet. Kothandapani and J. Prakash [12] observed peristaltic transport in a tapered asymmetric channel of a Williamson Nanofluid in the presence of thermal radiation. C.Sulochana et al. [13] analysed effects of soret and suction/blowing on MHD stagnation point flow of a radiative Carreau nanofluid on a stretching surface. Yap Bing Kho et al., [14] investigated impact of radiation on MHD heat and mass transfer Casson Nanofluid flow on a porous stretching sheet. Jawad Raza [15] discussed impact of radiation and velocity slip on magnetohydrodynamic stagnation point flow of Casson fluid with convective boundary conditions through a linear elongated sheet.

Molecular interaction studies of hydrogen-bonded N-Methyl-2-Pyrrolidone /Ethanol binary mixtures by dielectric relaxation spectroscopy and their temperature dependence

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A R T I C L E   I N F O

A B S T R A C T

Complex permittivity of the binary mixtures of N-Methyl-2-Pyrrolidone (NMP) with Ethanol (ETH) has been studied in the microwave frequency range at various temperatures. The binary liquid system NMP-ETH is selected to interpret the effect of carbonyl (-C=O) group of NMP and hydroxyl group (-OH) of ETH on the volumetric, thermal and dielectric properties. The dipole moment (μ) and relaxation time (τ) is evaluated from Higasi's method and Havriliak-Negami equation. The excess molar volume (V_m^E), excess permittivity (ε^E), excess refractive index (n_D^E), excess inverse relaxation time ($1/\tau$)^E are fitted with the Redlich-Kister equation. The results obtained from Polarizable Continuum Model (PCM) and Integral Equation Formalism Polarizable Continuum Model (IEFPCM) solvation theories using DFT methods are correlated with the experimentally determined parameters. The molecular association and chemical stability of the system is interpreted in terms of single-point energy, HOMO-LUMO calculations. The existence of a hydrogen bond within the NMP-ETH system is confirmed from the FT-IR, UV–Vis's spectra.

1. Introduction

Dielectric Relaxation Spectroscopy (DRS) is one of the prominent methods to explore the molecular structure in the liquid systems by determining the relaxation dynamics of the molecules, dipole moment, and interfacial polarization properties [1–8]. The investigation of molecular interactions in the liquid binary systems is one of the challenging tasks and their change in properties with respective frequency and temperature is very much useful in practical engineering and technological applications [9–15]. The investigation of dielectric relaxation properties of the different solute and solvent systems in the broader frequency range (10 µHz- 300 GHz) describes the strength of the molecular interaction, the existence of multimers in the mixtures, the alignment of the dipoles, and their conduction mechanism. The theoretical and experimental studies on the dielectric studies of complex fluids such as aqueous proteins/tissues in an alcohol medium, liquid mixtures are interdisciplinary and increasing demand in the research

field [15–24]. It provides relevant information for the applications of binary liquid mixture systems in the field of pharmaceutical, petrochemical, nuclear, and green industry [25–37].

NMP is an adaptable water-soluble polar aprotic solvent. Due to its multifunctional properties, it is used as a drug solubilizer, penetration enhancer in humans and animals. Also, it is used as a good solvent for many engineering and pharmaceutical utilization by its larger boiling point, lower freezing point, and easy to operate. Ethanol is also one of the good solvents and it has many useful properties that allow it to be used by a range of different industries such as beverage, pharmaceutical, medical, and fuel industry [27–29,38–41]. There are several research papers are available on the frequency-dependent dielectric studies of ethanol with different liquid compounds at various temperatures in the recent past [42–56]. The majority of the dielectric studies on ethanol include calculating the dielectric relaxation time in a different solvent medium at various temperatures and also fluctuations of hydrogen bond networks in the different liquid medium. Further, computational

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OFFERING HUMAN HAIR- A DONATION OR POLLUTION?

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Abstract
Human hair is considered to be a waste material causing many environmental problems; however, it has many known uses. Preventing accumulation and wastage of human hair in environment may automatically reduce pollution. This issue may be addressed by developing a better human hair utilization system, identifying and popularizing the versatility of human hair as a resource and preventing pollution due to human hair.
The scope of this article is to popularize the comparatively newer sectors of business where human hair is used as a resource. Hopefully this will trigger newer ideas among entrepreneurs with employees ranging from unskilled to highly technicians.

Key words: Human hair, Donation, Human hair utilization system, Versatility of human hair, Resource, Pollution, Offering hair, Preventing pollution, Human hair waste, Hair auction, Human hair export, Human hair exporting companies, Horticulture, Soil engineering, Nutrient source for plants, Suturing material, Hair protein extraction, Wound healing, Reinforcement of Concrete, Supply chain of human hair

Introduction:
The motive behind writing this article was to find an answer to the question, "How can offering of one's own hair be a donation?" Hinduism in India believes that offering hair to God is auspicious. It is a ritual. This article assumes that an offer to almighty is actually an offer to society. In this context the motive of this article was to identify how an offer of human hair helps the society, or simply how is human hair a useful resource?
Human hair is considered to be a waste material causing many environmental problems; however, it has many known uses. Preventing accumulation and wastage of human hair in environment may automatically reduce pollution. This issue may be addressed by developing a better human hair utilization system, identifying and popularizing the versatility of human hair as a resource and preventing pollution due to human hair.
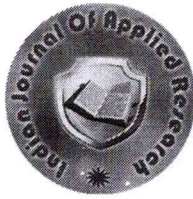
REVIVAL STRATEGIES FOR FORGOTTEN PLACES OF IMPORTANCE IN TELANGANA: A TOURIST REVIEW OF CHALUKYA NAGAR ALAMPUR

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ABSTRACT This article is written to encourage tourism in Telangana, India. Tourism showcases the local monuments, religious places, nature's beauty, trade and merchandise, food, culture and tradition. India's rich heritage is hidden in it. World looks at India for a holistic lifestyle. Sadly, most of the Indian's need to be reminded of their history, rich and varied heritage, customs, culture and traditional lifestyle. Encouraging tourism helps in understanding one's own culture, it is a window which shows a great deal of technology which existed then but is now lost. Everything old is not worn-out and rotten. Technology which once existed is neither known nor recreated. However this article intends to apply concepts of visual merchandise to popularize a "place". Its objective is to improve marketing for a tourist destination. As a sample, Jogulamba temple of Alampur, Telangana, India has been considered in this paper. Visual merchandise is normally applied in retail sector. This article borrows its concept and tries to apply to tourism. This article assumes that if local tourism improves, its economy improves, standard of living improves, scope for employment improves and ancillary industries may also improve. It could mean improvement in connectivity, logistics and more.

KEYWORDS : Tourism, Alampur, Jogulamba temple, Visual merchandise, World travel and tourism council, Nava Bhramma temples, Shakti peetha, multi-sensory experience, Lighting, Food, Training, Policy making.

Introduction:

India is called "A Land of Mystery". Though its people travel West in search of Science, people all over the world travel towards India for wisdom and spirituality. Management and Technology has redefined itself in the present era. Total quality finds its new definition in satisfying one's internal self before meeting a quality standard or set norms. In this context, digging into our own history to know and inspire ourselves is not strange but obvious. It could be a gateway to identifying or rediscovering ourselves. Encouraging tourism may therefore be considered to be a need and not just a business.

The word "tourism", reminds of monuments and temples, natures beauty, people and food. This study considers Alampur as a sample because Alampur is an important place with a "place value" and a message to convey to the society at large. It hopes to identify scope for improvement in showcasing it and marketing for it.

Some of the reasons for under developed tourism include poor transport, few hotels, lack of connectivity, unstructured human resources, poor hygiene, poor health facilities and others issues such as inadequate infrastructure, beggars, slum, language and tourist harassment.

But Alampur's glory is beyond this. It has many anecdotes and messages to convey.

Literature review:

According to the World Travel and Tourism Council, India is on track to build the world's fourth-largest travel and tourism industry by year 2027 AD. It is trailing behind China, the United States and Germany.In fact, in 2016, India's travel and tourism industry outperformed its economy as a whole, and in 2017, the sector generated more than $230 billion. The country has 36 World Heritage sites and 103 national parks. Visitors visit India for a plethora of reasons, including medical tourism, eco-tourism, natural beauty and religion. The government aims to realize a one percent share in global international tourist arrivals by year 2020, and a two percent share by year 2025. Moreover, India's 2018–19 budget allots nearly $184 million for the integrated development of tourist circuits. The country also plans to expand its e-Visa program, through which tourists from select countries can apply for visas to visit India entirely online. India's government aims to double the nation's tourist inflow by simplifying the visa application process.

Smriti Chand in her article titled, "Growth of Tourism in India: Its impact on Employment and Economic Development", writes that the root of tourism in India can be traced to pilgrimage. Places of pilgrimage provided a firm ground to tourism in the beginning and still continue to be one of the most effective factors of promoting tourism in India. Further, Domestic tourism is an important segment of the overall tourist scenario although no reliable data are available in this regard.

Anushree Banerjee (2014) stated that the major issues that are restraining the industry fromachieving high economic value are shortage of qualified personnel, shortage of tourism training institutes, shortage of well qualified trainers, working conditions for the employees. Policies which can help the employees to work in supportive environment are also a point of concern.

Profile of AlampurJogulamba temple:

Alampur is a town located at JogulambaGadwal district of Telangana state. It is about 210 kms away from Hyderabad. It is situated on the left bank of the river Tungabhadra . Sacred rivers Tungabhadra and Krishna are in confluence near Alampur, mentioned as DakshinaKashi (also known as NavabrahmeshwaraTheertha). The reason for calling Alampur as southern Kashi is because Krishna and Tungabhadra rivers meet in this holy town, just like 'trivenisangamam' in Kasi. It is considered to be Western Gateway of Srisailam.

Alampur is home to the very ancient Navabhramma temples, which date back to the 7th century AD. Nava Bhramma temples of Alampur are dedicated to Lord Shiva. The Nava Bhramma temples are TarakaBhramma, SwargaBhramma, Padma Bhramma, BalaBhramma, Kumara Bhramma, ArkaBhramma, ViraBhramma and the VishwaBhramma. Each of the Shiva Linga in these temples has an aushadha (ancient medicinal herb) installed along with them. One can see Lord Brahma's sculptures in this temple which is not commonly found in other holy places. Puranas also state that the ashram of Jamadagni was located here. It is also said that the head of Renuka, Jamadagni's wife, was severed, and the torso was immortalized and placed in Brahmeswara temple after Parashuram, Renuka's son asked his father Jamadagni to immortalise his mother Renuka as 'Yellamma' by making her the village deity. People come here to offer prayers to Goddess Yellamma to be blessed with progeny. It is believed that people visiting this place will be freed from all sins (paapanaasini), as this is the fifth of the 18 shaktipeethas in India.

The temple's sacredness is mentioned in the SkandaPurana. The prime deities at Alampur are Lord Brahmeswara and Goddess Jogulamba Devi. It is surrounded by the Nallamala hills.

BadamiChalukyas build the Nava Bhramma temples, who ruled for 200 years from the middle of the sixth century. They built many other temples in Karnataka and Alampur in Telangana. There are many beautiful carvings on the temple walls which show perfection of the sculptor and the meticulous efforts made by the invaders to destroy them. The archaeological remains of the temples exhibit a hybrid style of architecture – dating back to the 6th-7th centuries. Each of them narrates a story.

After the defeat of the Kakatiya dynasty, Muslim saints and pahelwans had come to propagate Islam in this region. One of them was Shah Ali Pehelwan, who came along with his followers to Kurnool. After

RESEARCH ARTICLE

ANALYTICAL STUDY ON THE MERGER OF BANK OF BARODA, VIJAYA BANK AND DENA BANK, ON THE BACK DROP OF THEIR NPAS

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Manuscript Info

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Abstract

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Banking Industry in India witnessed a large-scale merger in recent times, which was earlier often sought out solution in the corporates to improve the efficiency and profitability. Bank mergers and acquisitions are more often witnessed across Europe and America. We have witnessed few acquisitions/mergers in the past few decades after liberalization. Present situation of mergers in the Banking Industry is primarily due to the failure of some banks with respect to recovery of loans. This would result in incurring losses and failing to meet the liquidity needs of the deposits side. There have been mergers both in Public Sector Banks and Private Sector Banks. It is also observed that some private banks have been acquired by public sector banks in the interest of depositors and investors.This research paper focuses on and analyses the factors that lead to the merger of Bank of Baroda, E-Vijaya Bank and E-Dena Bank. The possible advantages and disadvantages are inferred.   Seven years financial data before the merger decision of the three banks is collected for this analysis. Data analysis is done using the financial tools such as Ratio Analysis and Trend Analysis. Various ratios indicating the health of Advances side of the bank and its profitability are calculated. The trend of NPAs and the recovery patterns are studied. The suitability of merger decision with its after effects are proposed to be concluded.

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Introduction:-

Banks have emerged as intermediaries for the flow of money to cater the needs of public. They accept funds from the surplus by providing them return on investment as interest.   On the other hand lend these funds to the needy and gain interest from it. The primary component of profit is the spread between interest income from lending and interest expense on deposits. History speaks about banks which couldn't properly manage the Assets side due to lack of efficacy in recovery. This, in turn would lead to the gap in liquidity to meet the requirements of depositors leading to bankruptcy. Therefore, the recovery wing of the bank should be strong which can give a smooth flight to the bank through tough times as well.

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1A Study on Impact of Working Capital Management on Profitability: A New Dimension from Indian Top Five Cement Companies' Perspective

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Abstract

Management of working capital is considered as a "three faces' coin" with each of inventory management, debtors (debtors + receivables) management along with credit suppliers and short-term lenders management. Still there exists a big tragedy between allocation of permanent (fixed) capital and circulating (working) capital. Even from the inception to incredible operations, firms are undergoing the mismatching status of working capital with respect to operational requirements. The present study encompasses the practical guide of WCM to the small cement producing firms in India, as this study has narrated the working capital policy management of largest cement companies in India. The results revealed that, in order to be considered as biggest companies in the Cement world, the selected firms need to strengthen their working capital position to reap more profits. From the analysis, it is clear that there exist a positive relation exist between profitability and components of WCM.

Keywords: *return on capital employed (ROCE), current ratio, inventory holding period (IHP), debt collection period (DCP), debt payment period (DPP), and net working capital*

1. Introduction –

1.1 Cement Industry [1]India is the silver medalist in production of cement on the globe. Indian cement industry is catering as one of the major industry to the economy and generating employment to more than 10,00,000 people. Since its deregulation, it has attracted a huge amount of FDI from multinational investors. India has a wider scope for its development especially in infrastructure building with the assistance of cement industry. Recent growth prospects like making 98 selected smart cities will push the cement industry in an upward direction.wcm ## working capital management

1.2 Introduction – Working Capital

It is a contest between the fixed capital and working capital allocation. In general lose-lose situations mostly observed repetitively in many of the firms irrespective of the industry nature and size with failure of predicting future conditions of the firm.

Allocation of excessive working capital or conservative working capital leads to collapse of reaching objectives. Hence it is very important to become considered as a financial manager, the optimum allocations by predicting future requirements of the firm along with conditions internally and externally.

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RESEARCH ARTICLE

AN ANALYTICAL STUDY ON NPAS OF STATE BANK OF INDIA

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Manuscript Info

Abstract

Objectives: The main objective of this paper is to make an attempt to analytically study the basic reasons for increase in NPAs/analyze gross NPAs in SBI group and the measures taken so far and their impact.
Method: Data is collected for the Variables namely Net Profit Margin, Return on Equity and Return on Assets, Gross NPAs to Gross Advances, Net NPAs to Net Advances, Cost to Income and Provision Coverage Ratio. Secondary data is collected for a period of 5 years i: e from 2014-15 financial year to 2018-2019 Financial Year. Statistical tool like percentage analysis is used to identify the reasons for increase in NPA's of State Bank of India.
Result: It was found in the study that, the major sectors contributed for the increase in NPAs in SBI are mid and Large corporates and not the priority sector. NPAs are increasing from the last five years as shown in the ratios calculated. This is due to change in the method of projecting NPAs and stringent norms by RBI.
Conclusion:The present paper analyzed and identified the reasons for increasing trend of NPAs in SBI group. SBI is in hope that it could see the development in coming years as they are expecting the resolutions for pending cases from the National Company Law Tribunal (NCLT).

Introduction: -
Public banks in India had been facing the problem of stressed assets over the period of time in spite of many resolutions. Recently, Reserve Bank of India came with revised framework for the functioning of banks with respect to stressed assets. RBI has made some stringent norms for the treatment of bad loans. Now it is also planning to ease certain norms (for small and medium enterprises) without diluting the spirit with which it has initiated resolutions. SARFAESI - Securitisation, Reconstruction and Financial Assets and Enforcement of Security Interest Act 2002[2] was a significant step in the reforms in financial sector in India.
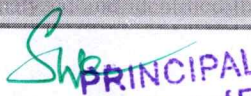
As per the reports of Standard and Poor, April 2018, India is in 55th place among the top 100 largest banks in the world in terms of total assets held.

Union cabinet in India has approved the merger of State Bank of India (SBI) with five of its associates in 2017 with an aim to reduce the cost to income ratio, to help Indian economy to rank higher in the global banking rate, to rationalize more resources etc.

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COMPARATIVE STUDY ON LOANS AND ADVANCES OF INDIAN PUBLIC AND PRIVATE SECTOR BANKS.

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ABSTRACT: *This Paper studies the loans and advances of public and private sector banks. Banks are mostly engaged in lending loans and advances and accepting deposits. It acts as an intermediary between the depositors and borrowers. The present study makes an attempt to analyse the financial performance of the public sector banks and private sector banks and the impact of loans and advances towards financial performance of banks. Banks are mainly make income from difference loans and advances while collecting interest received and loans paid. In this study analyse the credit functioning of banks. In this paper we have focused on the movement of loans and advances of selected public and private sector banks. by analyzing the data from the year 2014 to 2019.*

KEYWORDS: *Loans and Advances, Credit Functioning, Financial Performance, Efficient and Management of resources.*

I. INTRODUCTION

In banking system, Loans and Advances are considered as the major part of income source. Previously, Banks were restricted for lending loans to everyone.They were allowed to lend only for particular people who can repay the loan amount and deposit securities. But now the banks are focussing on each and every ends of the world. Banks are providing many types of loans to fulfil thefinancial requirements for people, such as agricultural loans to farmers, home loans to borrowers and educational loans to students. In every aspect, it is trying to meet the capital requirements of the needy people and satisfying the borrowers by providing various types of loans and advances. They provide loans and advances along with some interest rates.Banks are continuously putting efforts to make convenient and ease for borrowers to repay the loan amount within a specified time period with the interest rates charged.Loans and Advances has two aspects i.e., positive aspect and negative aspect.

- Positive aspect is that the borrowers can improve their lifestyles by meeting their requirements.

- Negative aspect is that if the borrower is not in a position to repay the loan amount or failsto do so, then the banks will recover the borrowers personal assets also.

II. OBJECTIVES OF THE STUDY

1. To know the performance of loans and advances of Public and Private sector banks of India

A STUDY ON BEST PERFORMING SELECTED GOLD ETFS IN INDIA

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Abstract: The main purpose of the study is to know gold ETFs performance in India. Investment is good opportunity to increase the liquidity for the better market efficiency. Investor can choose Gold ETFs to increase the liquidity. Mutual Fund is a trust that pools money from a group of investors sharing common financial goals. This study is to determine and analyze risk in the emerging security in the stock market i.e. Gold ETFs. This research study on Gold ETFs brings a strong and attractive investment option for investor. Performance evaluation techniques like Treynor's performance index, Sharpe's performance index and Jensen's performance index are used to calculate alpha, beta and standard deviation of the selected ETFs.

Keywords: Gold Exchange traded funds, Net Asset Value, Rate of return, Standard deviation, MF performance evaluation techniques.

INTRODUCTION:

An ETF is termed as an Exchange Traded Fund and is traded in stock Exchanges just like normal shares. There exists different types of ETFs in the market to invest but the one we are focusing on is Gold ETF's. Gold ETFs are open-ended mutual fund schemes that will invest the money collected from investors in the standard gold bullion of 99.5% purity.

From 2007 the Gold ETFs are traded in stock exchange and the Gold ETFs Net Asset Value (NAV) is decided on the price of gold. Here the investor can purchase 1gm or 10gm or even more gold based on his acquiring needs. For investing in gold ETFs the investor should and must have a De-mat account in order to do so. He can sell/buy gold ETFs just like a normal share. In gold ETF we have an option of taking the gold (physical delivery), but with few conditions. Mostly the holding position of gold should be 1 kg for the delivery of gold. In gold ETF the purity standards are 99% thus the investor has no theft concern or storage concerns if one decides to invest in gold ETF.

The investor has option of doing SIP (Systematic Investment Planning) on gold ETFs through gold funds and even the gold market prices fluctuates thus giving more opportunity to the investor in reaping out benefit of intraday trading of gold ETF shares just like normal equity shares.

"A safer portfolio is considered when 10% - 15% of capital investment value is invested in gold"

IMPORTANCE OF THE STUDY

The topic is mainly focused on Gold Exchange Traded Fund which are issued by Mutual Fund companies and are listed in National Stock Exchange (NSE).Gold ETFs is one of the way of investing in Gold, though they are offered under Mutual Fund but they provide facility of trading the Gold ETFs just like a normal share in securities market or Stock Exchanges. So, the study of performance evaluation of Gold ETFs is undertaken to know which performs better using performance measure index and to know which Gold ETF yields more return.

OBJECTIVES OF THE STUDY

* To understand the concept of Gold Exchange Traded Funds in the securities market.
* To evaluate returns of Gold ETFs on daily basis and to study the Risk-Return relation.
* To rank the Gold ETFs based on their performance measure index i.e. Sharpe, Treynor and Jensen.
* To find out which Gold ETFs is performing better in order to assist the investors in selecting best Gold ETF based on their investment decision.

PROBLEM STATEMENT

In India investment in Gold happens mainly through physical purchase. People are not known to various ways to invest in Gold and very few know about Gold Exchange Traded Funds. In recent times Gold ETFs are becoming popular as the investors evolved and showed more interest in digital gold to get more benefit out of their trade.

The main purpose of this study is to provide more awareness about Gold ETFs performance and their returns and make investors to invest in it or include Gold ETFs in their portfolio for diversification of risk.

SCOPE FOR THE STUDY

The main reason for having constant demand for Gold is because of its security, liquidity and its ability to build a diversified portfolio. A detailed study has been undertaken to analyze daily returns of 1 year period for the NSE listed Gold ETF companies

EQUITIES RISK AND RETURN OF SBI AND AXIS BANK

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Abstract: **The primary objective of every investor who prefers to invest in the securities of different organizations on the stock market is to obtain maximum possible returns, for the investment made. Among all the portfolios that are available on the stock market, 'Equities' are given prior importance, as they possess the character of generating higher returns, than any other security. Apart from giving higher returns, possibilities of high risk do exist for equities. For the purpose of 'analyzing the performance of equities of different organizations', 'when to invest', 'what analysis is required to know the risk and return parameters', are all answered by 'Equity Analysis'. Analysis of equities helps the investors to invest in right kind of organization, basing on the equity performance, for fetching higher returns. This study pertains to the Indian Banking Sector, considering two major banks, namely, State Bank of India (SBI) and AXIS Bank, from the NIFTY Bank, a sectorial index. Banking sector is considered vital, as any country carries out its economic activities with the help of banking activities. The study is carried out for a period of 2 years, i.e. 2018 and 2019.**

Keywords: **Banking Sector, Equity Analysis, Beta**

1. INTRODUCTION:

The term 'Equity' is one of the principal asset classes. It provides investors, a right to ownership. 'Equities' are one of the most preferred financial instruments, investors choose to invest, the reason being that, they are capable of giving high returns. Although they generate huge returns, high risk possibilities do exist.

The in depth process of analyzing different sectors and organizations with the intention to advise and give a complete picture to the investors regarding the prevailing risk and return of equity shares is known as 'Equity Analysis'.

Investors make a number of investments in different financial securities with an ultimate motive of maximizing their wealth. In this context, Equity Analysis helps the investors to invest in the right kind of securities, which are 'Equities'.

The Banking Sector is one of the fast growing and prominent sector, contributing to the growth of Indian economy. On this basis, a study is carried out to analyze the Equity Shares of State Bank of India (SBI) and AXIS Bank in the Indian Stock Market.

NEED FOR THE STUDY:

1.   The purpose of the study is to make a detailed financial analysis of equities in the Indian Stock Market. The equities possess considerable amount of risk, along with generating satisfactory returns.

2.   The study relates to the banking sector.

3.   Additionally, the study provides adequate information for the potential investors to make a rational decision regarding their investments.

OBJECTIVES OF THE STUDY:

1.   To understand the analysis of risk and return of selected banks (SBI and AXIS).

2.   To provide adequate information to investors to judge their investment decisions on the   basis of Beta.

3.   To impart knowledge to the investors with conceptual clarity of equities for investment.

RESEARCH METHODOLOGY:

Data Collection:

The data used for the study is secondary data collected from the website of NSE, equities of SBI and AXIS Bank.

The Research Methodology is carried out as follows:

STEP 1: ARTICLES AND LITERATURE REVIEWS FROM PREVIOUS STUDY:

Reviewing an article that is already existing is known as 'Literature Review'. Literature reviews and review of various articles give a brief knowledge about any particular idea or topic to bring it into actual existence. It is the starting step in order to initiate the study.

STEP 2: EQUITY ANALYSIS:

From the review of literatures, the topic 'Equity Analysis' is chosen to carry out the study. Equity Analysis is the process of analyzing the equity shares of different organizations listed on the stock market, and suggesting the investors to invest in the equities that give high returns.

STEP 3: EQUITY ANALYSIS OF SBI AND AXIS BANK:

Basing on the topic 'Equity Analysis', the study is carried out considering the data of SBI and AXIS Bank from the websites of NSE and various journals, pertaining to a time period of 2 years. The objectives of the study are:

1 . To understand the analysis of risk and return of selected banks (SBI and AXIS Bank).

Impact of Capital Structure Components Analysis on Selected IT Companies in India

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Abstract: **Optimal capital structure is always a major concern of an organization. There are many scientists who drawn theories in order depict the optimal structure based on different conditions and beliefs. Both the classification of capital structure (Equity and Debt) are at their own advantages and disadvantages. The equity is more favourable in the growing phase of any organization, whereas debt is beneficial in reducing tax burden and which enhances returns to the shareholders These two can be as a double edged sword and it is the organization which has to take the decision to hang over such sword in order to have a cutting edge against its competitors. This study intend to identify some basic ratios as the determinants or components to capital structure formation decision. Those are Equity Ratio, Long Term Debt Ratio, and Leverage Ratio, Earning Per Share, return on Equity and are divided into dependent and independent variables for the purpose of analysis. The data of top five IT companies in India based on market capitalisation for a period of three years (2016-18) has been considered. The use of mean, standard deviation, correlation and regression(multiple) has been done to find out the effects and relative changes among the variables selected. The results specified that the IT companies are mostly equity oriented but, if we observe the company with both equity and debt at a balance level are the one which gain the top position in the market with high returns.**

Keywords: **Optimal capital structure, Determinants, Components, Leverage, Profitability, Earning per share, Return on equity, Equity capitalization.**

1. Introduction

Capital structure plays a vital role in determining the risk level of the company and also the fixed financial charges. The risk level and fixed financial charges should be kept low in order to cope up with the uncertainties. The basic element is how long we can keep constantly low and to what extent it effects the EPS. The term capital structure is the proportion between debt and equity, where equity includes paid-up-capital, share premium and all reserves and surplus. Debt consists of bond issues or any other type of long term payables.

The assets of the company can be financed by owner or the loaner. The owner claims increases when the firm raises funds by issuing ordinary shares or by retaining the earnings which belong to the shareholders, the loaners claims increases when the company borrows money from the market using some instrument other than shares. Various means of financing represent the financial structure of the enterprises. Capital structure is a composition of debt and equity. The financing or

capital structure decision plays an important role in financial planning and managerial decision making which influences the shareholders return and risk. All the companies will plan their capital structure initially at the time of its promotion / inception stage and subsequently, whenever there is a need for the fund raising. A demand for raising funds generates a new capital structure which involves a critical analysis. This study attempts in finding the determinants of capital structure and the effect of capital structure composition on overall Return on Equity and EPS.

A. Need for the study

The need for this study is to understand the factors affecting the capital structure and find the relation between the capital structure and the firm's performance.

B. Scope of the study

The scope of the study is confined to only one sector (i.e., Information Technology industry) in India. In IT sector, the first five companies only which are on the list of top ten Information Technology industries based on the market capitalization.

C. Objectives of the study

1. The major objective of the study is to examine the pattern of debt-equity mix by few IT companies and the influence of the various factors affecting their capital structure decisions.
2. To identify and analyze the capital structure of selected companies of IT industry in India.
3. To interpret changes in EPS due to components of capital structure.

2. Literature review

1. Divya Aggarwal, Poorna Chandra Padhan (2017), in their study titled, "Impact of Capital Structure on Firm Value: Evidence from Indian Hospitality Industry", Theoretical economics letter, 2017, volume 7, 982-1000: Revealed significance in relationship between firm value with firm quality, leverage, liquidity, size and economic growth. Here, the BSE listed Indian hospitality firms over a time frame of 2001-15 are taken. The variables considered are Altman Z score, leverage, size, profitability, tangibility, growth, liquidity along with GDP and inflation growth.
2. Bhushan Singh, Dr. Mohinder Singh (2016), in their study