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3.4.6 Number of books and chapters in edited volumes published per teacher during the last five years

3.4.6.1: Total number of books and chapters in edited volumes / books published, and papers in national/international conference-proceedings year wise during the last five year

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Semi-Automated System Based Defect Detection in Software Requirements Specification document

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Abstract— Software Requirement Specification is a document that defines capabilities of any software. Requirement phase plays an important role and it is the most critical phase among all SDLC phases as requirements about any software should be mentioned properly otherwise it will lead to incorrect product. Software requirement specification document consists of defects due to this and defects are need to be detected to save time and money. There are some reading techniques with the help of which defects can be identified. There are certain types of defects definitions on which basis defects are categorized accordingly. Previously defects are identified manually by reading document but this work is based on detecting defects semi-automatically which help in improvement of quality of document as well as developed software.

Keywords— Software Requirement Specification, Defect, Error, Checklist, IEEE standard

I. INTRODUCTION

The most important role in Software Development Life Cycle (SDLC) model is of requirement engineering phase. In this phase basically requirements are analyzed or customer needs are gathered. Success or failure of a project completely depends on this requirement engineering phase. Incomplete or wrong requirements leads to unwanted product by customer. Most of software projects cause failure due to insufficient requirements.

Requirement engineering phase includes requirement elicitation, requirement identification, requirement specification, requirement verification and validation. Our proposal is mainly considered with defect detection from requirement specification document.

Software Requirement Specification is a document which is prepared for the ease of customer as well as service provider to build a software project for describing requirement at a particular time prior to actual development of any software product. Software Requirement Specification is written in natural language to make easier to understand the defined functions and also constraints of a document. Software Requirement Specification is a document that consists of thorough description about how the system would perform. It consists of functional as well as non-functional requirements only; it does not contain any kind of design suggestions.

The requirement documents are written in natural language de-tailing about the developed software to be. It consists of all the external and internal requirements but it may consist defects. Previously detection of defects [9] from Software requirements specification document is done manually but it consumes lot of human effort and time, so there is need to build and maintain semi-automated system to detect defects from any document with the help of rules based classification to make it easier to perform.

This paper discusses about the proposal of semi-automation in detecting some defects for Software Requirement Specification documents needed to reduce the work done manually to save time as well as effort made by human being while inspecting any SRS document. This paper is divided in to five main sections: Firstly an introduction is done to make us understand about the area work and main concerns. Second, related work is carried out to give some knowledge about previous approaches. Third, proposed work is explained which is the main concern of this paper, how the work is performed, what dataset is used, how it is to be done etc. Then results are provided and finally conclusion of the work done and future scope is discussed to improvise further more.

II. RELATED WORK

A. Requirement Defect Detection Reading Techniques

There are some reading techniques with the help of which the defect detection is carried out in documents. Inspection is basic methodology which is basis of each technique while detecting defects from documents. The three main techniques which are known as main reading techniques are:

- *Checklist-based Reading technique* [4] [7]: M.E Fagan [4] described this CBR technique used in inspection methodology in 1970s. In this technique

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Smart Saline Level Monitoring System Using ESP32 And MQTT-S

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***Abstract*—Saline, one of the most popular intravenous (IV) therapy plays a major role in the management of patients who are critically ill. Surveillance of saline bottle level is very important because when the bottle is emptied and the needle is not removed from the vein then the blood flows outward into the bottle. In hospitals, the nurses or caretakers are responsible for monitoring the saline bottle level. Mostly, due to negligence and any unusual condition, the exact timing of removing the needle from the patient's vein is ignored which causes a serious casualty and may lead to death as well. Furthermore, remote monitoring is a need to provide telehealth services. To prevent the accident due to the ignorance of caretakers and to provide remote surveillance in telehealth services, we have proposed the cost-effective smart saline level monitoring device which includes the combination of sensor and Internet of Things (IoT) technologies. We have built this system by using load sensor and ultra-low power low cost ESP32 WiFi System on Chip (SoC) microcontroller. The load sensor converts the weight of the bottle to a specific voltage. The ESP32 microcontroller generates and publishes a specific message based on the voltage received from the sensor. To publish and present the messages to the devices(e.g. smartphone, tablet, laptop etc.) of subscribers like doctors, nurses or caretakers, we have used MQTT-S publish/subscribe protocol which runs over TCP. This proposed monitoring system fulfills the reliable delivery of messages to the subscribers which is very important for healthcare.**

I. Introduction

The latest report of Global Health Observatory (GHO) data on the density of physicians per population states that globally the ratio of physicians is less than 1 per 1000 persons [1]. Building smart healthcare [2] including telehealth is a need so that the care must be reachable. In order to make the healthcare system smart, it is required to automate the function of diagnosis, treatment, management, and decision, so that the services are available both for rural and urban people.

One of the important challenges related to the management of healthcare is to watch the saline level. Almost in all hospitals, a caretaker/nurse is responsible to keep an eye on the saline level and if they fail to monitor this, it is the patient who suffers. Saline bottle when emptied and if the needle is not removed from the patient's vein then due to the pressure difference, the blood flows outward into the bottle which may lead to serious casualty. So, it is the need to automate the surveillance in order to prevent such accident. Further, long distance monitoring by the clinician is also a requirement in telehealth [3] services.

Many authors [4], [5], [6] have addressed the above-discussed problem with the alert notification system. The authors [4] have used the buzzer sound to alert the nurse. Buzzer sound alert system creates noise which is not suitable for the hospital which requires a soundless environment. Moreover, this buzzer system is not expandable for telehealth. On the other side, the authors of [5], [6] have used SMS messaging system for sending an alert message to the nurses mobile number. This system has used GSM (Global System for Mobile Communications) technology [7], which is an open cellular technology, for transmitting data services.

However, the authors [8] have discussed that accessing cellular data is more expensive than WiFi. WiFi is a local area network (LAN) run in a local environment or in a distributed setting. WiFi network protocol is one of the leading communication technology used in the IoT world which supports low transmit power along with low cost [9]. For providing the cost-effective solution, we have proposed IoT based saline level monitoring system using ultra-low power low-cost WiFi technology. The components, we have used to build this system includes a load sensor [10] and ESP32 WiFi chip [11]. The load sensor converts the current weight of the saline bottle into a specific voltage. The ESP32 WiFi chip receives continuous voltage level from the load sensor and publishes notification message to the nurse station, doctor, nurse, caretaker etc., once the specified threshold saline level is reached. The application layer is responsible for message formatting and publication. Hyper Text Transfer Protocol(HTTP) [17] is a commonly used application layer protocol on the Internet for message formatting and presentation. However, the authors [9] have commented that the HTTP protocol is not suitable for resource-constrained environments because it arouses a large parsing overhead. They have discussed two alternative application layer protocols such as Constrained Application Protocol(CoAP) and Message Queue Telemetry Transport(MQTT) which have been widely used for IoT applications. CoAP [13] incorporates optimizations for constrained application environments. MQTT[13] is a lightweight protocol and is designed for ultra-low power and low-cost devices. It is based on topic-based publish/subscribe [12] protocol. In topic-

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A Comparison of Visual Attention Models for the Salient Text Content Detection in Natural Scene

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Abstract— **Visual saliency approaches have been acquainted to recognize the most noticeable object in the scene that are going to pull in human attention. These methodologies have been adequately utilized for the prominent region detection. The text or character detection as a salient region in image remains a challenging research problem. Intrinsically about the image, a text in the scene conveys vital information. This paper evaluates six state-of-art models of visual attention in context to scene content (i.e. text or characters). Saliency map generated by these models of visual saliency have been intended for facilitating salient text detection in a natural scene by highlighting text and concealing non-text regions.**

Keywords— visual attention model; saliency map; text detection

I. INTRODUCTION

A standout amongst the most difficult issues in Computer Vision field is that the detection of content (i.e. text or characters) in a scene having an assortment of various colour shading, textual style, size and orientation. Recognition of scene content may be a complex issue for Computer, yet people appear to distinguish content with no issues. The human visual system has the ability to easily visualize diverse assortments of data and centered about the captivating target, e.g. car number plate, road sign board, advertisement hoarding in the natural scene. Visual Saliency model primarily works on identification of attention points that a people would focus on at the initial glance. Visual saliency normally alludes to a property of a "point" in a picture (scene), which makes it liable to be focused. Most models for visual saliency are propelled by human vision and have a tendency to replicate the dynamic alterations of cortical connectivity for scene recognition.

In the recent years, a number of methodologies have been proposed for identifying salient or fascinating objects in the scene. These models of visual saliency can be extensively characterized into a) top-down b) bottom-up and c) hybrid model. These model elaborate various studies on identifying region-of-interest, the majority of these methodologies mean to spawn the saliency map and then segment the whole salient region from the image. Visual saliency model having "top-down" approach uses the methodology of finding a category specific objects which are known and learned a priori. These models are task oriented. Furthermore, humans search an object for some context in a scene. Visual saliency model having "bottom-up" approach [1], [2], [3], [4], [5] uses method that finds any object of interest based on visual stimuli, without any prior knowledge about its category. Visual saliency model having "hybrid" approach combines the methodologies of both the "bottom-up" approach and "top-down" approach.

The evaluations of six diverse models of visual attention have been accomplished for detection of content (i.e. text or characters) in common scenes. The significant addition of this assessment of various state-of-art visual attention models in context to the content (i.e text or characters) and finding out the outperformer model, that can do well in text saliency [6], [7] i.e. identification of text in the natural scene.

II. VISUAL ATTENTION MODELS

A. Itti's Model

The visual attention model proposed by Itti et al. [1] is having "bottom up" approach. This model is basically inspired by neurology and find salient image region using feature integration theory. The methodology used in this model is to segment a given scene image into different channels specifically Color (C), Orientation (O) and Intensity (I). A dyadic Gaussian pyramid is utilized for filtering and images are sub-sampled into 8 octaves, having scale different scales (scale 0 to scale 8).

"Center-surround" operations are utilized for evaluating the feature vectors, a distinction between center and surround scale implements the feature vector. The scale $k \in \{2, 3, 4\}$ used for center pixel and the scale $s = k + \mu$, with $\mu \in \{3, 4\}$ used for the surround pixel [1]. This model evaluated various channels of an image. Intensity channel uses the contrast. The color map with the specialized paired colors is generated by the color channel. Gobor filter at the orientations of 0, 45, 90 and 135 degrees used by the orientation channel and evaluate the reaction of these filters on image intensity. This model generates 42 feature maps: 6 for intensity, 12 for color and 24 for orientation. All these feature maps computed using different methods are having different dynamic ranges. Computing the final saliency map cannot be possible by simply merging the feature maps since it would suppress the scrawny

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Detection of RPE Region: Non-separated Inner and Outer Hyper-reflective Layer Using Neighbouring Pixel Connectivity Paradigm

Piyush Mishra and Charul Bhatnagar

Abstract The retina is composed of ten layers, with the retinal pigment epithelium (RPE) being the outermost layer tightly attached to the choroid. With the increased knowledge about the various functions performed by the RPE, the ophthalmologists have a better understanding of the various diseases leading to blindness. In this work, we propose a method to identify RPE region in optical coherence tomography (OCT) visualization of the retina. This paper focuses on detection of RPE region, the non-separated region between the inner and outer hyper-reflective layer (HRL). The proposed method comprises a bilateral filter for speckle de-noising while maintaining layer boundaries. Detection of inner HRL is a prominent research dimension having significant correlation with the human visual acuity. The proposed work validation is done with the ground truths (manually delineated by an expert panel). Evaluation of the proposed method is done on 220 images from 23 patients at different orientation styles with 90.45% correct detections.

Keywords Bio-medical imaging · Computer-aided diagnosis
Optical coherence tomography · Retinal image processing · Retinal pigment epithelium

1 Introduction

Retina is the light-sensitive, innermost layer of the eye. Eye focuses the image of the world on the retina, starting a series of chemical and electrical events within the retina. Retina then sends the electrical signals to the brain using the nerve fibres 1]. The human 1.

Over the years, retinal research has greatly benefited from advances in optical imaging techniques. Retinal optical coherence tomography (OCT) is a 3D imaging

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A Comparative Study of Various Color Texture Features for Skin Cancer Detection

Maurya Ritesh and Srivastava Ashwani

Abstract Detection of skin cancer gives the best chance of being diagnosed early. Biopsy method for skin cancer detection is much painful. Human interpretation contains difficulty and subjectivity; therefore, automated analysis of skin cancer-affected images has become important. This paper proposes an automatic medical image classification method to classify two major type skin cancers: melanoma and non-melanoma. In this paper, we have used the color and texture features in combination which gives better results than using color or gray-level information alone. We have used k-means clustering algorithm to segment the lesion. The features are extracted by seven different color texture feature extractors from the segmented images. Classification accuracy of our proposed system is evaluated on four different types of classifiers, and their values are compared with one another. The results of the proposed system are computed on fivefolds of cross-validation in order to perform better analysis of our proposed method.

Keywords Gray-level co-occurrence matrices · Support vector machine · Local binary patterns · Texture features · Color percentiles · K-means clustering · Co-occurrence matrix · Color features · Integrative co-occurrence matrix · Gabor features · Linear classifier · NN classifiers · NMC classifiers · Cross-validation

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Time of Arrival Positioning with Two and Three BTSs in GSM System

Atul Kumar Uttam and Sasmita Behera

Abstract In recent years, location-based services like emergency, rescue, and response, and location-based marketing are gaining popularity. In all such services, location of involved entity should be located accurately and timely. GSM system is the most popular communication network around the world. Hence, such location detection techniques which require very less or no modification in the existing infrastructure are required. This paper talks about two enhanced ToA-based localization methods using two and three base transreceiver stations. The comparative study between standard ToA techniques and proposed techniques shows encouraging results in various regions like urban area, suburban area, hilly area, and open area.

Keywords Location-based services (LBSs) · GSM network
Time of arrival (ToA) · Base transceiver station (BTS)

1 Introduction

Localization is the process of locating an unknown point location with respect to some reference points, whose locations are known. The major problem in location-
1]
are (1) emergency/rescue services, (2) navigation services, (3) monitoring logistic services, (4) location/context-based event services, etc. To provide these LBSs and several other services, it is very necessary to locate the MS accurately in a short

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An Approach For Fault Reconfiguration In QoS Based Service Oriented Architecture

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Abstract:
Observing last decade it is concluded that distributed systems have played a significant role in creating paradigms for software development. Web services as one of the important components of the distributed environment had laid a great trend of their usage for software development. These software may be the applications to serve the purpose with an intent of integration of web services. Service Oriented Architecture (SOA) is a principle set that supports the software development on the basis of web service integrations. In this web services of distinct functionalities developed around independent platforms are selected and integrated to serve a specific purpose. SOA deals with developing & casting in of web services provided from independent developers within a single module. The selection and integration of web services is done on the basis of some Quality of Service (QoS) parameters. These parameters may be the cost, response time and availability of web services as some of the examples. Considering the discussed scenario of web service integration for developing any software, there may be a situation that may lead to events of service failures resulting in the breakdown of complete software system. To avoid such discontinuity in receiving the services from an application there is always a necessity to tackle and overcome these faults as soon as possible with least overheads along by maintaining the required QoS. With the proposal in this paper we are proposing an algorithm to handle multiple faults in a system developed within QoS based service oriented environment.

Keywords: Service Oriented Architecture (SOA), Service Process Reconfiguration (SPR), Reconfigurable Region (RR), Web Service - Business Process Execution Language (WS-BPEL).

1. Introduction

SOA is a set of adapted principles to support building of a reliable, effective and synchronized distributed system to deliver the targeted services1. SOA supports software development on the basis of loose coupling of selected web services integrated to serve a specific need. Different web services are prepared & offered by various independent developers, to which they publish them globally over World Wide Web through some registry agents. On a specific requirement during the development of a software the developer's request for the required web services to these registry agent. This intermediate registry is supplied with the various features, constraints, costs and other parameters of the developed web service that may help a software developer (user) to understand the scope of the web services. These descriptions of the web services are depicted using Web Service Description Language (WSDL) for publish. Considering these published features of the web services by their developers through the registry agent a user decides to deal for a specific set of web service(s) to develop their software. The owner or the developer of these web services either offer their service to the users for specific time charging for it or they sell it out to the user as per their deals only if required by the user. This is how the web services are brought in for integration from their developers to the user who is targeting to develop any application. Web services proposed by various developers are made to be selected, integrated and prepared for an application for the application software development using Web Service Business Process Execution Language (WS-BPEL). There may be more than one independent developer that develop the same type of web service with different or same QoS and costs, this is how the software developer may opt from multiple web services available at registry, of same response that better fits the requirement, budget and other constraints.

There may be a situation when any operational failure of one or more web services integrated in application software takes place. And there comes a need to handle such fault & failure events with least overheads. There is only a single way to handle such faults that is to select the faulty web service(s) i.e. failed web service and replace them with new web service(s) of the same functionality available at registry. Such a process of selecting and replacing the faulty web service(s) with new ones is also termed as Service Process Reconfiguration (SPR). SPR begins with selection of web service(s) that are failed, this set of failed web services in a software system is named as Reconfigurable Region (RR). And, then replacing them with new available web service or a combination of them. The SPR is conducted in such a way that the required QoS of the overall system is maintained after final reconfiguration. One thing to be focused is that the Reconfigurable Region can be a set of one or more than one integrated web service(s) offering certain functionality in the overall system, but it can never contain all the web services of the system as replacing them all may be as same as developing a same new system

Compendious and Optimized Succinct Data Structures for Big Data Store

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Abstract:

Data Representation in memory is a one of task in Big Data. Data structures includes several types of tree data structures through system can access accurate and efficiently data in Big Data. Succinct data structures can play important role in data representation while data is processed in RAM memory for Big Data. Choosing a data structure for memory representation is very difficult problem in Big Data. We proposed some solution of problems of data representation in Big Data. Data Mining can be utilized to take decision by Data processing. We know the functions and rules for query processing. We have to either change method of data processing or we can change way of data representation in memory. In this paper, different kind of tree data structures are presented for data representation in RAM of computer system for Big Data by using succinct data structures. Data mining is often required in Big Data. Data must be processed in parallel or steaming manner. In this paper we first compare all data structures by table and then we proposed succinct data structures those are very popular now. Each tree presented for Data representation has different time and space complexities.

Keywords: SDS (Succinct data structures), Trees, Big Data, CDS (concurrent data structures).

1. Introduction

The Compressed demonstration of data has been a primary requirement nearly in the field of Computer Science for a long way. The main data structure used in Big Data is tree. Quad tree is used Graphics and Spatial data in main memory. Sub linear Algorithms are used to handle Quad tree which is inefficient. An efficient and simple representation is required in main memory of computer system. The purpose of this paper is that Optimized SDS can improve functionality of different SDS like Dynamic tree, succinct tree, and Suffix tree, rank and select, FM index Geometric data, Proteins data base, Gnome data, DNA data are large data bases for main memory. However overall quantity of storing area is not a vital problem in recent times, considering the fact that external memory can store large quantity of data and may be inexpensive, time needed to get access to information is a vital blockage in numerous programs. Right to use to outside memory has been conventionally lower than accesses to main memory, which has caused examine of recent compressed demonstrations of information which might be capable to save identical data in reduced area. Succinct data structures may includes Range Minimum query, Dynamic bit vector, Suffix tree, Suffix array, Dynamic tries, DFUD etc. Bit vector and Wavelet can represent protein data base. Aim of this paper is to provide three tree representations to support big data bases with minimum time and space complexities.

2. Related Work

Hassle of data proliferation is stimulating our capability to manipulate data. Standard algorithms such as greedy in terms of space utilization and not only access a simplest part of information. The investigators noticed them and gave evidence by recent troubles in streaming of data (S. Muthukrishnan, 2003) and sub linear algorithms (Bernard Chazelle, 2004). Dissimilar to these instances, various troubles need complete dataset to be saved in compressed format however it require to be enquired rapidly. In real world, compression may have a greater a long far- reaching effect than simply storing data concisely: we are able to know, and that which we will understand we are able to calculate," as detected in (Dekel, 2018). Comparative Study of sensible compendious data structures for Massive data store shows different SDS(Vinesh Kumar et al). In Analysis Compendious Sensible Data Structures for Top-p Completion in Big Data Store(Vinesh Kumar et al) shown complexities of SDS.

The Researchers have taken into consideration those troubles in numerous algorithmic contexts, which contain scheme of capable algorithms for handling highly-compressible data structures. They prudently deliberate exact resources required to signify Dynamic tree, Graph (Héctor Ferrada, Gonzalo Navarro,2017), sequences ,dictionary (Gilad Baruch, Shmuel T. Klein, 2017), permutations, features (Johannes Fischer, Daniel Peters, 2016), and textual content structures indexing (Arash Farzan, J. Ian Munro , 2013) Our Future Purpose is to plan writing pseudo code with strong time and space complexity. Nevertheless, Kolmogorov complexity is not decided yet for arbitrary data, so some compression technique is known to be suboptimal in this sense. It has shown SDS for nearest color node (Dekel, 2018). Yambin completed Succinct and practical greedy embedding for geometric routing. Rudolph did his work on succinctness

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An Architecture to identify Violence in Video Surveillance System using ViF and LBP

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***Abstract*—There are different varieties of Surveillance cameras used but it is still a challenge to detect violence. So the aim is to design a violence detection system which detects violence and generates an alert so that help will be available instantly. Researchers are prognosticating that the evolution of video surveillance technology will lead to a great demand for intelligent violence detection system. In coming years also, these technological advancement will continue by improving existing system and leads to generation of new methods and techniques for making better violence detection system. The proposed architecture includes mainly two steps: Object tracking and behavior understanding for detecting violence. By using feature extraction process key features (speed, direction, centroid and dimensions) are identified. These features help to track object in video frame. In our approach, we consider two feature vectors namely Violent Flows (ViF) and Local Binary Pattern (LBP) and then Linear SVM is used to classify video as violent or non-violent**

Keywords*—*Optical Flow, Violence Detection, Abnormal Activity, Motion Magnitude.

I. Introduction

Over the last few years, it has been observed that there is a rapid growth and an improvement in violence detection algorithms. The main purpose of video analysis is to detect the potential threaten events with less or no human intervention.

A. Introduction to Video Surveillance

Video surveillance is a wide area of research which includes recognition of human activities and their classification into usual (normal or non-violence) or unusual (abnormal or violence) activities. Video surveillance system is of three types:-

1) Manual surveillance system is fully dependent on human. It required manual labor to analyze behavior or to make difference between abnormal (violence) and normal (non-violence) behavior.
2) Semi-automatic system required less human intervention as compared to above.
3) The fully automatic does not require any human intervention for taking decision.

B. Introduction to Violence Detection System

Violence detection system is the ability of the surveillance system to detect violence in a video. It is used for the areas where quiet and peaceful environment is needed such as air station, school playing field, cinema halls, etc. It is also used to find out those movies which are having violent scenes so that minors could be prevented from watching such type of movies.

C. Need for Violence Detection System

According to current market research, corporations, government, public and private sector are investing huge amounts of money for protection of offices, building, shopping malls, homes, infrastructure etc. and this trend is going to accelerate in the future in automatic security industry.The basic purpose of violence detection system is to detect some sort of unusual behavior that comes under the category of violence.

An event is violent if its behavior deviates from what one expects. For example, one such anomaly would be a person hitting to the other person, kicking to the other person, lifting other person etc. Violent events also include object in unusual location, unusual motion pattern such as movement in disordered manner, sudden movements, dropped object, etc. to name a few.

Human monitoring the entire video stream is not possible due to monotonous job and too long time, so an automatic detection of violent event in real time is needed to avert such type of incidences. Optical flow is a good feature for tracking and detection of motion. It is extensively used for motion segmentation and tracking of object. Human actions are represented by the histogram sequence of magnitude and orientation of optical flow. We have used ViF feature vector from the histogram of magnitude of optical flow and LBP feature vector in our research work.

For evaluating the performance of violence detection algorithm, proper datasets should be adopted for comparison and benchmarking. Some of the standard datasets used in violence detection system are Hockey Fight database, Violent-Flows database, BEHAVE, CAVIER etc.

D. General Frameworks:

Object Detection: Object detection deals with the detecting of objects of a particular class (for example, humans) in videos and images.

Object Tracking: In Object tracking, selection of good features plays an important role. It is so because objects can be easily and accurately distinguished on the basis of features only. Different features are taken in account for object tracking.

Behavior Understanding: Object behavior understanding is an important and most challenging task. Object behavior

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An analytical and comparative review of cohesion metrics

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Abstract

In the present scenario object-oriented paradigm (OOP) is the most popular paradigm due to its features like reusability, maintainability etc. Large software applications are composed of hundreds of classes which in turn encapsulate huge number of methods. Hence the application is usually organized into modules using the concept of packaging. The desired characteristic of OOP is high cohesion and lower coupling. This enables high understandability and low maintenance overhead of the application. This is because high degree of understandability lowers the time spent to comprehend the software and hence its testability and maintainability. A lot of cohesion metrics are proposed by software scientist at different level. In this paper, the state of art of cohesion metrics is presented and the future scope of research in the same is discussed. © 2018 Association for Computing Machinery.

Author keywords

Class; Cohesion ; LCOM; MC; Package; PCoh

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Abstract

In the present scenario, the technology revisions are making the market vulnerable to predict. This gives birth to the requirement of a new model which can stop loss of a production business by predicting the market using news analysis, associative rule mining, precise predicting techniques and context analysis. This paper presents a novel idea of dealing with manufacturers' problem of product dump due to the rapid change in technology and the changing demand of customers. Every new product launched with new features or with existing features but less price gives a tough competition to already existing products in the market. By the time the manufacturer comes to know that the demand has been decreased, the manufacturer is already in the loss and he has to dump already manufactured pieces due to rapid down sale. In this paper, a model is proposed with an algorithm to quickly identify the required number of pieces in a time frame.

Keywords

Analytics Associative rule mining Context mining Predictive analytics Manufacturing Product dump

References

Domain Classification of Textual Conversation Using Machine Learning Approach

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Abstract- This paper presents an approach for classification of textual conversation into multiple domain categories using support vector classifier. The feature reduction is done through Principal Component Analysis (PCA) to extract the important features from the feature vector. These features are passed to different configurations of SVM and the best one is chosen for the final process of classification. The domain's categories are defined on real life situations and conversation to train the system like education & research, personal, patriotism, terrorism, medical, religious, sports, and business. The experiment results show that the proposed method works effectively with more than 75% accuracy.

Keywords- Machine Learning, Support Vector Classifier, Domain Classification, Textual Conversation, Machine Intelligence.

I. INTRODUCTION

The text is the basic means of communication. It not only communicates informative contents, but also produces some additional information like feelings, emotions, sentiments and domain. The Domain recognition is different to sentiment analysis and emotion recognition. The objective of sentiment analysis is to sense positive, neutral, or negative feelings from text, whereas emotion plays an elementary role in our daily lives. Its objective is to detect and recognize the feelings through the text, such as anger, fear, disgust, happy, sad, and surprise[1]. Generally Ekman's six emotion class is used to detect the emotions. The Sentiment analysis can be classified into two categories; opinion mining and emotion mining. Opinion mining concern with the expression of opinions, for example neutral, positive or negative while emotion mining concerned with the pronunciation of emotions like sad, happy, excited etc.[2].

Domain recognition is one of the fields of affective computing. It refers to evaluating conversation towards different issues. If two persons are discussing their personal problem through text conversation then the category of domain is personal therefore; our system is capable enough to recognize its domain categories automatically for which the conversation has taken place while emotion recognition or sentiment analysis only reflect the mood or emotions. Classifying domain from the textual conversation can be applied to the various applications, based on human computer interaction. It is a relatively new classification and advancement in the field of affective computing and machine learning. It can also be useful to prevent miss happening or unwanted activities on the basis of text conversation. We can recognize different types of domains on the basis of communications or conversation. The categories of domain are defined on the basis of various real life situations and conversation. Every conversation or statement always may fall

Prediction of SGEMM GPU Kernel Performance using Supervised and Unsupervised Machine Learning Techniques

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Abstract- This paper proposes a novel approach for the prediction of computation time of kernel's performance for a specific system which consists of a CPU along with a GPU (Graphical processing unit). The prediction is done on the basis of 14 different configurations of processor such as local work group size, local memory shape, kernel loop unrolling factor, vector widths for loading and storing etc. A proposed system accomplished with multiple advanced techniques like PCA (Principal Component Analysis), backward elimination for feature reduction, and KNN Regression, and Random Forest Regression for making the predictions. Finally, the performance of the proposed system for predicting the running time of processors has the accuracy of 98.46% after using feature reduction techniques.

Keywords- Machine Learning, Backward elimination, GPU Kernel Performance, Random Forest Regression, KNN Regression.

I. INTRODUCTION

Traditionally, the computation ranging from small to large processing is performed using CPU (Central Processing Unit). Today, parallel computing or parallel processing or massively parallel systems are used for various purposes for example for performing matrix multiplication. The CPU takes high processing time for computation for example calculating multiplication of large matrices or convolution in image or video processing. This problem of time overhead was removed with the vector or super scalar processors such as GPUs (graphical processing units) [1]. It is also capable of performing various arithmetic and logical operations with more than two operands. It increases the computational speed and also reduces the computation time.

The increasing demand of GPUs for variety of multi-disciplinary areas such as image processing, predictive analysis, machine learning algorithms, etc leads to the analysis of running time of GPUs on computationally high vector operations [12]. The running time of a processor depends upon multiple factors such as bus interface, core clock frequency. The performance of a processor can be measured through number of operations performed per second. Through this factor one can easily compute the approximate computational time of a GPU. This will help engineers to decide the hardware configurations of a processing unit for the required computation time.

In this paper we propose an algorithm to predict the computational time of a SGEMM

Reliability Factor Based AODV Protocol: Prevention of Black Hole Attack in MANET

Prakhar Gupta, Pratyaksh Goel, Pranjali Varshney and Nitin Tyagi

1 Introduction

MANET stands for Mobile Ad hoc Network. It is also known as wireless ad hoc network. It is a network of mobile devices connected wirelessly without any infrastructure. Being wireless, it offers advantages such as reduces overhead of wiring and thus saves money, easy to establish and many more. But it also exhibits many disadvantages. It does not have any central administrator to manage all the nodes of the network. The nodes which are part of the network simply work using mutual understanding. Since MANET is self-configuring network, all the nodes which are part of the network possesses the ability to configure themselves. The absence of administrator allows any untrusted node to be the part of the network. Such nodes are known as malicious nodes and they can drop the packets, take the important information, and cause many more damages to the network. The main challenge of the MANET is to reduce attacks caused by malicious nodes or to detect such nodes at early stages. Black hole attack is a type of attack in which the malicious node simply becomes the part of the network and then absorbing everything coming to it. It can be seen as a hole in which packets which are coming are falling. Thus, desired destination node does not receive the packets, therefore, it affects the whole network. We have proposed an algorithm which is based on reliability factor approach. It calculates the reliability factor of the nodes in the path, through which packets are to be forwarded, and if the value of reliability factor is high then packets are forwarded. At some stage, it is possible that the node has a low value of reliability factor and also it is not malicious. Therefore, fake RREQ concept is used to detect the malicious node and if the nodes prove to be non-malicious the packets are forwarded. This algorithm greatly reduces the number of packets dropped.

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An Approach to Specify and Test the Control Algorithm in Focus Framework

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***Abstract*— Complex embedded real time systems used in autonomous guided automotive and aerospace vehicles depend on validated control system software for meeting safety and mission critical objectives. The code implementation of these control laws presents a validation challenge due to the complexity of converting mathematical control equations, feed forward and feedback loops into validated software. This paper outlines an approach for defining specifications of a control law using focus framework. A discrete time synchronous control law consisting of gain scheduler, feedback, adder, integrator and derivative is defined in focus specifications. A methodology is presented wherein the top-level architecture is defined using composite graphical, constraint and operator styles. Sub components are specified in elementary equational and relational styles. These theoretical specifications are implemented and verified using Autofocus tool.**

Keywords—Software Specifications, Focus Framework, Verification.

I. INTRODUCTION

Safety is an important criterion to be met for the life critical and mission critical systems. The systems requiring safety criticality assessment and certification need to adhere to the international standards like MIL-STD-882E[1] or RTCA DO-178B/C. Time scheduled and time synchronous systems interact with external environment and execute different functions across various execution cycles. Domain experts use various methods of reasoning and analysis to build the evidences of correctness. In terms of safety certification, this is called as building safety arguments as per ISO-26262. Considerable amount of effort is required to validate the embedded systems software using testing, analysis and code walkthrough for safety critical systems.

Testing the system under real time and non-real time test beds has been the main stay of verification. It is important to note that testing is known to show the presence of errors and not the absence of error. The techniques of static analysis remain language dependent and code walkthrough continue to be the forte of domain specialists. Though research of formal methods is being done for last fifty years, the practical application of formal methods has started playing an important role in last two decades due to demand of high assurance systems[2].

Methods of theorem proving and model checking are used based on their applicability and merits for a problem [3], [4]. The alternative approaches promulgated the 'correct by construction' approach using deeper analysis of requirements itself. Formal specifications and formal specifications languages started to play an important role in system design.

Writing formal system specifications into automatically verifiable properties is hard and error prone [5]. The technology of software tools is paving way for providing frameworks for not only building models graphically but also automatic generation of properties, integrated verification and code generation using the same IDE. NuSCR, a derivative of SCR tool is currently being practiced to specify the functional requirements of safety critical applications like nuclear plant protection system [6][7].

In this paper, formal specification of an embedded real time avionics control law is undertaken. We use the FOCUS framework [8] to develop a hierarchical set of formal specifications for a control law by using the concepts of focus stream theory. Focus specifications formulae can characterize the safety, liveness and causal properties. The control law is converted to control algorithm specifications and various properties are verified by structuring the specifications.

II. PID CONTROL SPECIFICATION

A PID controller is widely used in the closed loop control systems. PID stands for Proportional Integral Derivative. These three are combined in such a way that it produces a control signal. PID controller maintains the output such that there is zero error between process variable and set point/ desired output by closed loop operations. Proportional element provides stability but always maintains a steady state error. Integral element eliminates steady state error. Derivative controller anticipates the future behavior of error and adjusts the output to reduce the response time. The PID controller is mathematically designed and tuned during the system design process. Fig. 1. shows the control law as

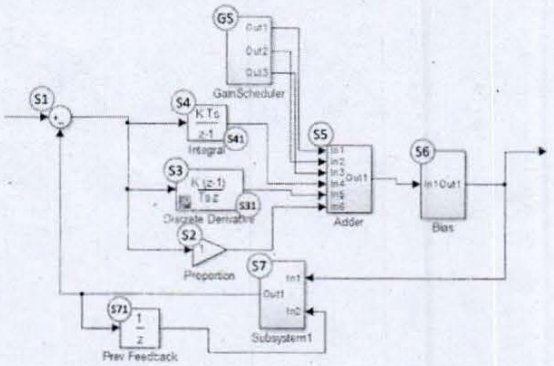

Fig. 1. PID Controller

designed and tuned in MATLAB/Simulink as in Fig. 1. The S1, S2….S7, S71 are the sub-components which are to be

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TempClass: Implicit temporal queries classifier

Pradhan R., Sharma D.K.

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Abstract

Information retrieval is a field that is emerging day by day as user needs are growing. Users nowadays are not satisfied with results that merely match the query textual words; they want the query to be understood well and then results to be retrieved. These changing requirements need the query to be processed and its hidden intent uncovered. The authors address this problem by creating a system that understands the hidden temporal intent of the query and classifies it into proposed classes. This chapter works on temporal expressions in the document and classifies the query with respect to the temporal expressions in the document. The work is not limited to just classifying the query but also explores how these classifications will help search engines to make modifications in their user interface, which helps users to reach their desired information faster. Temporal boundaries of queries can be found using this work, which will help to disambiguate certain queries . © 2018, IGI Global.

Indexed keywords

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Information Retrieval and Management: Concepts, Methodologies, Tools, and Applications Volume 2, Pages 1143 - 1165 5 January 2018

Temporalclassifier : Classification of implicit query on temporal profiles

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Abstract

Users issuing query on search engine, expect results to more relevant to query topic rather than just the textual match with text in query . Studies conducted by few researchers shows that user want the search engine to understand the implicit intent of query rather than looking the textual match in hypertext structure of document or web page. In this paper the authors will be addressing queries that have any temporal intent and help the web search engines to classify them in certain categories. These classes or categories will help search engine to understand and cater the need of query . The authors will consider temporal expression (e.g. 1943) in document and categories them on the basis of temporal boundary of that query . Their experiment classifies the query and tries to suggest further course of action for search engines. Results shows that classifying the query to these classes will help user to reach his/her seeking information faster. © 2018, IGI Global. All rights reserved.

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A comparative analysis of fuzzy logic based query expansion approaches for document retrieval

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Abstract

Query expansion is one of the techniques to find suitable terms for redefining the queries so that the document retrieval performance can be enhanced. This paper presents a comparative analysis of recently developed query expansion approaches using fuzzy logic to retrieve relevant documents from large datasets for a given user query . In this paper, two query expansion approaches are compared and analyzed in different manner for two benchmark datasets: CISI and CACM. Both the approaches are based on fuzzy logic and term selection methods. On the basis performance evaluating parameters such as precision, recall, MAP and precision-recall graph, it is found that the approach proposed in [13] improves document retrieval in comparison to the approach proposed in [32]. © Springer Nature Singapore Pte Ltd 2018.

Author keywords

Fuzzy logic ; Precision; Query expansion ; Recall; Term selection; Term weighting

Indexed keywords

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Multiple Anomalous Activity Detection in Videos

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Abstract

Due to exponential increase in crime rate, surveillance systems are being put up in malls, stations, schools, airports etc. With the videos being captured 24x7 from these cameras, it is difficult to manually monitor them to detect suspicious activities. So, there is a great demand for intelligent surveillance system. The proposed work automatically detects multiple anomalous activities in videos . The proposed framework includes three main steps: moving object detection , object tracking and behavior understanding for activity recognition. By using feature extraction process key features (speed, direction, centroid and dimensions) are identified. These features helps to track object in video frames. Problem domain knowledge rules helps to distinguish activities and dominant behavior of activities shows whether particular activity belongs to normal activity class or anomalous class. It has been experimentally proven that the proposed framework is capable of detecting multiple anomalous activities successfully with detection accuracy upto 90%. © 2018 The Authors. Published by Elsevier B.V.

Author keywords

anomalous activity ; Gaussian mixture model; rule-based classification

Indexed keywords

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Genetically Engineered Software Testing Through Mutants

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Abstract *– Software testing has acquired wider horizon and significance. Now a day, customers demand defect – free products. Authorities associated to testing phase go into the nitty – gritty of the tests to achieve the goal of software product. Along with many conventional testing methods, Mutation testing is also playing important role to define more number of test cases and finding more number of defects. Mutation testing is basically a fault based software testing technique which has been a subject undergoing intense study & research for over three decades. The key feature of mutation testing is to make some random changes throughout the program to find out more number of defects. These changes can be done by applying genetic engineering on test cases. Whenever a program is changed, it is called a mutated program and the change effected is called a mutant. This paper provides need of genetic algorithm in software testing. The paper also presents the execution of mutation testing along with its results. Through this paper the efforts are made to show the results of various mutants applied on a program apart from applying any functional testing. The basic idea is to make test suite tenacious to produce error free software.*

Index Terms – Mutation testing, Genetic algorithms, mutants, kill, survives.

I. Introduction

Mutation testing is inspired from the Genetic Algorithms (GA). Filliping or changing any bit in a string is called mutating the string. By which we may get new, updated and more effective string(s) having higher fitness value. In the same fashion, we can flip some random statements in the program. This exercise is done to design more test cases which can find the errors in the program. The changes in mutant program are done keeping in mind that changes should not affect the purpose of the program [6].

In mutation testing various copies of the program are made & each copy is genetically modified. These genetically modified copies are called mutants. If any test case is capable enough to detect any mutant then it is called as "killed" [1].

Mutation simply means flipping or changing the content or bit. The basic idea behind applying Mutation Testing is to evaluate & enhance the reliability of the test cases. These test cases are also supposed to be robust in nature to fail mutant code. As faults are created in programs (intestinally), the approach is also called the Fault based testing.

As per the available research; it has found that the term Mutation in software engineering paradigm was firstly coined in starting of 70's. But this term could not gain popularity worldwide due to number of reasons. One of the major reasons behind it is costly and time consuming procedure of mutation testing. Along with that, mutation testing is not fit for black box testing techniques as in mutation testing we use to change the source code; which is not permissible by black box testing. So, due to the limitations and procedures of mutation testing, it can be used by the software testing organizations itself.

II. Need For Genetic Algorithm In Software Testing

Genetic algorithm is a major component of soft computing. Genetic algorithm is based on Darwin's theory of Natural selection & works on genetics. Basically, GA is a heuristic search method which is widely used in AI (Artificial Intelligence) and other application domains of computer science. Genetic Algorithms are executed iteratively on a set of coded solutions, called population. GA is based on three basic operators as: selection or Reproduction, Crossover & Mutation. In fact, Genetic algorithms provide the best strategies to solve a set of problems for which very few information is available at the initial level [4, 5, and 7].

As the nature of software is purely based on the industry demands, the behaviors of testing procedure are also affected. Due to these ever changing requirement and technological era, there are many stumbling blocks in using manual testing as speed of performing test cases on various tools is technically limited and dependent on professionals; which obviously include high investment in terms of money, time & other resources.

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An Approach to Identify Blackhole Attack on AODV-based Mobile Ad Hoc Networks

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Abstract: In mobile Ad hoc network black hole attack is an earnest and thoughtful warn. A malicious node sends a forge message to source that it is having the route to destination. Based on the received information, source node builds up a route through the malicious node and propagate message to the malicious node. Every conservative system to find out such type of attack and after getting the wrong message by malicious node misjudgement in the detection. To pull around this abnormality our aim is to put forward a new detection technique, which depends on checking the blend in the Route Reply message by making utilization of another substance made by the destination node and furthermore by watching the engraving put crosswise over by the middle node in the route within the sight of the calculated threshold. Computer simulation issue the impact that our strategy has a better Average end to end delay, Packet delivery ratio and Normalized routing load, for finding malicious node than the other methods.

I. INTRODUCTION

Society is suitable gradually more dependent on present systems, everybody is getting benefit of e-commerce, many more systems. Now days most of the member of society is using and in touch with many handheld devices. Taking into consideration the sensitivity of computer system applications in our lives is tough to maintain the security services, Ad-hoc networks are suitable and popular, so ad-hoc network security is needed.

Security mechanisms can be categories into three-part[1] i.e. detection, prevention and recovery. In order to eliminate the accountability of attack prevention methods, intrusion detection used as a second wall of protection. Ordinarily, intrusion detection frameworks can be sorted into anomaly detection and misuse detection in light of their location methods [2]. Misuse detection can just identify already known attack is the disadvantage of misuse detection, based on their signatures; whereas in anomaly detection, attacks are recognized by their normal behaviour to abnormal behaviour.

In MANET the danger can also come from different types of attacks to interrupt and damage either host based or network-based systems.

II.ATTACKS ON ADHOC NETWORK

Ad-hoc networks area additional vulnerable compared to changed networks, thanks to their dynamic and distributed ad-hoc topology and dynamic nature, location awareness and multicast transmission. Ad-hoc networks are getting additional and additional helpful in our everyday lives furthermore as advances in their commercial/military uses. In these wireless networks, the general energy usage of

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Making Hindi Lexical Ontology Useful to Calculate Semantic Similarity between Pairs of Hindi Words

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***Abstract* - The measurement of semantic similarity between two concepts/words has always been a challenge in the field of document retrieval. As per current literature, there is no method to compute semantic similarity for Hindi words. Therefore, a new computational method is proposed to measure semantic similarity between Hindi words using lexical ontology. In this approach, Hindi WordNet is used which gives the relational information among various Hindi words/concepts. The performance of the proposed approach is tested on Miller and Charles's benchmark dataset, which is translated from English to Hindi. The semantic similarity is computed for 20 words pairs by using three different semantic similarity measuring methods. The accuracy of the results is also measured in this work using Correlation coefficient. The proposed method in this paper is focusing on the study and analysis of the results obtained from semantic similarity measuring methods on Hindi concepts/words.**

Index Terms* - *Hindi WordNet, Ontology, WordNet, Similarity Measures, Semantic Similarity.

I. Introduction

Semantic similarity is the measurement of similarity between two words/concepts, which are not necessarily lexicographically similar. It plays very important role in various applications such as information retrieval system, word sense disambiguation, text summarization, natural language learning, document clustering and classification, annotation and level segmentation etc. [1]. Nowadays, it becomes the challenge to determine semantic similarity between two words/concepts. In literature, it is shown that lexical ontology provides past historical knowledge to compute semantic similarity among concepts/ words [2]. This paper is focused on lexical ontology like WordNet [3].

Lexical ontology provides a means for mapping lexical concepts and reasons about concepts. WordNet [3] is a lexical ontology which is a lexical network of words present in a language. The nouns, adjectives, verbs and adverbs are gathered into a set of cognitive synonyms in WordNet, which is called synsets. Each synset represents one underlying distinct lexical concept. In India, IIT Mumbai has developed WordNets for Hindi and other Indian languages (Indo-WordNet).

In literature, researchers mainly focused upon document retrieval systems those are purely built for English and Cross Language Information Retrieval (CLIR). English WordNet has been used by many researchers extensively to compute semantic similarity [4]. But, very less work is reported for Hindi language in literature, especially in the field of semantic similarity. Therefore, a method is proposed to compute semantic similarity between concepts using lexical ontology such as WordNet.

The rest of this paper is organized as follows: Section 2 discusses the fundamentals of lexical ontology and semantic similarity. The description of the proposed method is presented in Section 3. The experimental results and discussion are shown in Section 4. Finally, conclusion and future work are drawn in Section 5.

II. Theoretical Background of Hindi Ontology

The word "ontology" is a special area of metaphysics, which deals "the study of being". There are many definitions of ontology like "it is a structured way of describing knowledge and a shared specification of conceptualization" according to Gruber [5].

WordNet is a lexical ontology which is a lexical network of English words. The nouns, adjectives, verbs and adverbs are gathered into different sets of cognitive synonyms [3]. These sets are called synsets, those are interlinked by means of variety of conceptual-semantic and lexical relations. WordNet gives following information, which can be used to measure semantic similarity between concepts/words:

- Generality vs. Specificity Concepts in WordNet Ontology,
- Thesaurus based information
- Relationship between words

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A fault tolerant secure data distribution technique for cloud storage

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***Abstract* - Storing the distributed data over multiple untrusted networks or cloud is being a challenging task in the area of cloud computing. We present a methodology for secure data storage in cloud computing. In the first step, a data segmentation algorithm is applied to split the data d into k sections, which ensures high security to the data by simplifying k equation solutions. Secondly, splitting algorithm generates coefficients that guarantee highly reliable data. Experimental results show that the proposed approach works better in terms of computational cost and secret sharing scheme and outperforms to the conventional secret sharing scheme.**

Keywords: Cloud Computing; Data partitioning; implicit security; fault tolerance, polynomial.

I. INTRODUCTION

Cloud computing has been a very popular paradigm from last few years. Cloud Computing delivers a broad range of resources to users through Internet like computational platforms, computational power, storage and applications. The most of the Cloud providers in the present market segment are Google, Amazon, Microsoft, IBM, Sales force, etc. With a rising number of organizations which contain the cloud resources to use, data security became the prime importance for various users. Cloud computing faces few challenges that is to protect, secure and process the user property i.e. data. There are two main states that embrace the data in the Cloud storage; firstly Data at the time of transition and secondly, where the data is much predictable to be more secure when the data is at rest. There are two important scenarios to understand the security of the data in the Cloud.

Consider a scenario, there, we link a local network to a Cloud network, where some part of the network data is disconnected from the local network and placed in the Cloud, but the significant data exist in the local network itself. In this case, the Cloud provider does not have any right of accessing the data physically which is in the local network. But in a number of cases, the Cloud requires to retrieve some information, at the time of that access; there may be a possibility of unauthorized access of the local network resources. It reflected the problem of network security that is comprised of active attack and passive attack. The active attacks include replay attack, masquerading, denial of service and modification of messages. Passive attacks include traffic analysis. The possibility of these attacks is likely to happen when the information leaves the user network to the Cloud network.

The total data of the local network resides within the Cloud, where the local network and the authorized users can access their data physically in the Cloud. At that instant of time, a possibility may be arises of an unauthorized user entering into Cloud which can access the data in the cloud. For that purpose, virtual machines made available to the cloud users have valid logins. But these logins can be hacked and cracked. There are other perverted ways by which data can be hacked. Regarding this research area, normal traditional literature survey methods have followed by most of the research works. Few papers presented an innovative idea and security model. However, there are very few works, which considered the opinions of various security experts in Cloud Computing. With the help of this study, reader can be able to understand the importance of security practices which are used in the era of cloud computing. A very few papers emphasize on the security techniques for different applications. We are likely the exposure of some future threats and the solution of those threats faced by cloud computing.

Cloud computing can be considered as a composite infrastructure that contains hardware, software processing and storage for the purpose of providing them as a service .With Cloud computing, one can get an instant access to large numbers of the world's most complicated supercomputers along with their processing power, interconnected throughout world at various locations, offering speed in the hundreds of trillions of computations per second.

As per NIST, the Cloud model is characterized by five essential characteristics:

• On-demand self-service: It refers to a service which is provided by cloud service provider for automatically

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Rotation-invariant texture feature extraction for Palm Print Recognition

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Abstract— **Nowadays, Palm Print is a novel and one of the most reliable biometric traits of personal identification due to its highly stability and various unique and stable features like principal lines, minutiae points, singular points, ridges, textures etc. In this paper we present a new method which will make palm recognition rotation invariant using curvelet transform. We extract texture feature from palm print using Curvelet Energy Distribution Algorithm (CEDA), in which First, 2 level curvelet transform is performed over palm image and then energy distribution of each sub-bands will be calculated at both level of transform, collect them, sort them and use as a texture feature of an image. This feature vector generated after sorting does not change for input palm image of one person in any angle hence effectively achieve good recognition rate with rotation invariant property. Multi class SVM classifier is used for classification which is a less complex high performance classifier. Experiment will be performed over PolyU palm print database collected over 250 persons.**

Keywords— palm print recognition, rotation invariant, curvelet transform, SVM

I. INTRODUCTION

Human identification is now become a challenge for security system of an organization. Knowledge based Security system which include password, pin etc or possession based which includes key are considered traditional security system which can be easily faked, cracked and stolen. Identification of a person based on biometrics now becomes need for security system in recent years. Biometric identification utilizes behavioral and physiological characteristics of a person like fingerprints, palm print, face, ear, voice, signature, gait etc. Each biometric trait possesses various stable and unique features but also have some limitations which make them fail to be accepted widely. Fingerprint used by various organizations for identification of personnel but current sys-tem failed to identify fake & distorted finger [1]. Iris recognition systems are also reliable and accurate but costlier as well as it involves some hygiene related issues [2]. Among these biometric traits, Palm print is one of the most reliable and stable human physiological trait and it attract researchers because of its rich features like principal lines, ridges, delta points, curves, texture that uniquely identify a person. It also has several positive characteristics over other biometric traits like

- Palm print patterns consists rich and stable line and curve features that are unlikely to change over time and age. Even twins don't have same palm print pattern.
- Less intrusiveness,
- Low cost capturing device because even low resolution image covers enough feature to differentiate two persons. [3].

II. RELATED WORKS

There are various algorithms has been proposed for palm print recognition system in recent years. Different features such as line, orientation, delta points, minutiae, and texture were exploited for significant improvement the recognition performance.

Jiaa et al. [5] proposed a new Palm print recognition approach using line orientation code and enhanced finite Radon transform were used to extract line orientation feature. Line matching technique based on pixelto-area algorithm has been used for matching train images with test images.

J. You et al. [6] introduced a new dynamic feature selection scheme by combining global texture feature measurements as well as by locating interesting local points within ROI.

Zhang et al.[7] proposed online Palm print recognition system that reads online palm print images with low resolution. Input image will be pre-processed by Low passfilters and then boundary tracking algorithm applied. Circular Gabor filter used for feature extraction andc2-D Gabor phase coding used for feature representation. Finally after feature extraction hamming distance has been applied for matching .

Mona A. Ahmed et al. [8] introduced three different algorithms Vascular Pattern Extractor Algorithm, Vascular Pattern Marker Algorithm and Vascular Pattern Thin-ning Algorithm for recognizing Palm Vein Pattern of an individual.

Prasad et al. [9] proposed Palmprint Authentication Using Fusion of Wavelet Based Representations. For pre-processing low pass filtering has been applied and then ROI extracted using segmentation of location of invariant points. Texture and line feature extracted for matching.

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Autonomic Computing : Threats And Security Issues

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Abstract– Autonomic Computing frameworks are the self overseeing frameworks as indicated by the objectives outlined by the administrator of the system. Incorporation of new elements in framework supported by Autonomic Computing happens as simple as in human body a new cell recreats itself. Autonomic Computing Systems (ACS) are relied upon to accomplish an indistinguishable level of self-direction and inescapability from human autonomic frameworks. Due to the highlights of ACS, the customary security model can not be connected to ACS any more. The objective of our exploration is to build up a setting based security model and engineering for ACS. Our attention is on self-security highlight of ACS. The self- assurance include is implemented through security settings that we characterize. By considering security settings, security arrangements would dynamic be able to change so as to adapt to new condition.

Index Terms - Autonomic Computing, Security threats, Self-Healing.

I. Introduction to Autonomic System

The autonomic idea is propelled by the human body 's autonomic sensory system. The human body has great instruments for ensuring physical harms. It can viably screen, control, and manage the human body without outer intercession. An autonomic framework gives these offices to a vast scale complex heterogeneous framework. An ACS is a framework that oversees itself. As indicated by Paul Horn 's definition [1], an ACS is a self-administration framework with eight components. Self-arrangement implies that the ACS should powerfully design and reconfigure itself under changing the conditions. Self-recuperating implies that An ACS must distinguish fizzled segments, dispense with it, or supplant it with another segment without disturbing the framework. Then again, it must foresee issues and forestall disappointments. Self-advancement is the capacity of amplifying asset designation and usage for fulfilling client demands. Utilization of resources and administration of work load are two huge issues in self-improvement.

An ACS must distinguish and identify attacks and cover all parts of framework security at various levels, for example, the stage, working framework, applications, and so forth. It should likewise anticipate issues in view of sensor reports and endeavor to prevent them. It is called as Self-assurance. An ACS has to know itself. It must know about its segments, current status, and accessible assets. It should likewise know which assets can be acquired or lended by it and which assets can be shared. It is Self-mindfulness or Self-information property. An ACS must be likewise mindful of the execution condition to respond to ecological changes, for example, new strategies. It is called as setting mindfulness or condition mindfulness. Transparency implies that An ACS must work in a heterogeneous situation and must be versatile over different stages. At last, An ACS can envision its ideal required assets while concealing its unpredictability from the end client view and endeavors to fulfill client demands.
Self-arrangement, self-mending, self-enhancement, and self-assurance are considered as real qualities and the rest as minor attributes. As said over, the point of AC is to enhance the framework capacities.

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Efficient and Secure Authentication in VANET using Digital Certification and Cluster Identification

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Abstract. Vehicular ad-hoc network (VANET) becomes an eye catching area for industry and academician. VANET is going to provide tremendous benefits to future vehicle users. The communication among vehicle to vehicle, vehicles to RSU done over wireless network. For this reason all are concern about the safety of data used in VANET. Weaker in security may produce problem similar as denial of service attack, masquerading attack and many more. Till now various security mechanisms propose to secure the VANET but they suffer with the problem of certificate distribution and revocation, communication overhead etc. This paper efficiently overcomes these issues in the sense that each RSU maintain a cluster instead of a centralized authority. We propose an algorithm using cluster identification and low message passing. We also compare our protocol with the existing one on the basis of time and computational also, we present a comparison graph between our protocol and the existing one.

Keywords: Electronic digital Plate (EDP), Base station (BS), Network Attacks, Digital Signature, Message Digest, Certification, Bandwidth, Road side unit (RSU).

1 Introduction

Modern developments in WCT (wireless communication technologies) and VI (vehicle industry) have ongoing an important study attention in the arena of VANET concluded the previous years. A subclass of mobile ad hoc networks is a capable approach for forthcoming transportation system (intelligent). VANETs (Vehicular Ad Hoc Networks) have developed out of the demand to sustenance the increasing number of (wireless) equipment that can nowadays be used in automobiles [Raya, 2005] [Harsch, 2007]. It includes keyless remote entry equipment, PDAs (personal digital assistants), mobile telephones and PCs. As Wireless networks and mobile wireless devices become increasing significantly, the demand for V2V (Vehicle-to- Vehicle) and VRC (Vehicle-to-Roadside), V2I (Vehicle-to- Infrastructure) message motivation remain to raise [Harsch, 2007]. It can be exploited for an extensive variety of security and non-security applications, license for VAS (value added services) such as automated tax amount, traffic administration, vehicle security, navigation(enhanced), restaurant or travel lodge, position of area based facilities such as finding the nearby ATM [Gerlach, 2006] and providing permission to the Internet [8]. VANET increase experiments like revocation, certificate circulation, prevention of computation and communication jams, and decrease of the robust confidence on meddle-devices. In a VANET, vehicles will be dependent on the reliability of acknowledged data for determining how to present alerts to drivers.

1.1 Communication

1.1.1 RSU to Base Station Communication (RSU to BS): In RSU2BS communication, it offers communication between many RSU which comes under Base Station. Base station control all the RSU and provide necessary support

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Estimation of Software Reliability Using Goel - Okumoto Model

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Abstract **- In existing time, numerous software developing organizations are being appraising and testing the developed software product's reliability. The engineers are estimating that the developed software product is releasable at the last step of software development or not. The estimation of residual errors in the software is the prime feature by which one can decide whether the software is suitable to release or more testing is necessary. Various software reliability growth models are utilized for the accurate estimation of the residual errors. In this study Goel- Okumoto model has been opted. Its several estimates are conferred with a case study. A standard has also been appraised for the assessment of software reliability.**

Index Terms **- Software Reliability, Residual Errors, Reliability Factor, Software reliability growth model**

I. INTRODUCTION

Research on reliability of software has been carried out over the last decades. The growing important brunt lying on the software has altered our awareness to software reliability, due to the reality that expenditure of software development and penalty cost of software failure are fetching main outflows throughout the development phases of a composite system for a corporation. Most of the reliability of software based models can give approximate computes about reliability of software throughout software advancement practices [1,2].

Software reliability is a important extent to characterize software quality and conclude that at what time we are to end testing and make public software ahead the prearranged aims [3]. As the presence of software failure occurs ,the software can infer harsh outcomes, as the reliability of the software is a chief unease in case of all together software programmers and users. Due to this, the testing method that is established in last step of a waterfall-kind software advance is a significant action for identifying and eliminating the latent fault and increasing the reliability of the software. Though, as it is not possible to found and eliminate every faults suppressed in the software in a restricted testing phase, we required a convenient way for reviewing and investigating the reliability throughout the testing stage of the design. For resolving such problem, several growth models [4] [5] that entail the testing- and operational-environment issues have been presented until now. Particularly, it is raising the query that wherever the managers of project have utilized the reliability appraisal conclusions developed by reliability growth models so as to decide that at white time they are to end testing and launch the software. Because of assumption deviances, it is frequently complex to identify which model is to be relevant in practice. Here we have presented Goel -Okumoto Model [6].

II. GOEL-OKUMOTO SOFTWARE RELIABILITY GROWTH MODEL

The key intent of a software reliability model is to estimate failure trials of the software that will be felt when the software is prepared. Such supposed performance alters quickly which can be followed throughout the period during which the program is tested.

A. Basic Assumptions

- The times between the multiple failures are exponentially considered.
- The cumulative failures tracks a Non Homogeneous Poisson process (NHPP).
- The numbers of available resources are constant during a time period.
- The number of faults found in every of the particular periods is not dependent to one another.
- The mean value of function is relative to the anticipated number of unobserved errors. It is supposed to be vaulted, and non-falling function of time under the limit $t \to \infty$ $m(t)$ $N < \infty$
- Fault which causes failure is corrected instantly; or else reoccurrence of that failure is not counted.

$m(t) = F_E(1-e^{-bt})$ Where $E_E \geq 0, b = 0$

$m(t)$ = Predicted defects at time t

F_E = Total expected defects in the code in infinite time.

b = Roundness or shape factor which represents the

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A measure of VADER: An advanced Machine Learning algorithm

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***Abstract*— In an era of mass computation, we may have sufficient human resources and required equipment. Still, we are lacking somewhere, we need more accuracy in our work and a faster pace in work is on demand by IT industry. Artificial intelligence is one of the solution of this continuously growing problem. We propose to create some smart machines which are capable of learning the work to be done by Human worker, and do it itself. An idea in which Human creativity and machine capability will combine and create a powerful system will come into existence which will learn like a normal human being but at a faster pace. In addition, a demonstration of advanced technology based on Artificial Intelligence and machine learning. A Reinforcement learning Algorithm, which later becomes a self-learning AI, and performs up to the mark, Improves itself over time. We have proposed an algorithm called VADER, which can outsmart tradition methods to perform their specific task using Convolution Neural Networks and General Reinforcement Learning methods.**

***Keywords*—Convolution Neural networks, Reinforcement Learning.**

I. INTRODUCTION

Today, Artificial intelligence is one of the hottest topics in ever-growing computational industry. Almost every advanced software product or computer game have some integrated AI feature in certain sense.

VADER is one of the newest, experimental, Machine-learning algorithms. Which makes extremely complex and tactical computation tasks easier for computers and for human operator. VADER is more powerful than most of the AI products available in market.

We are demonstrating its vast potential by using it to play the game of Chess. And we will see, that how VADER became more powerful and is probably one of the strongest Chess engines ever made for computers.

Previous products of Chess engines initially trained on a huge dataset of professional games played and a lot of preexisting human knowledge to learn how to implement Chess game play. VADER removes this step from the procedure and masters the game simply by playing games against its own replica, starting from just some basic rules of the game of chess. After doing so, it quickly outsmarted human level of playing skills in this tactical game.

VADER is able to achieve this by making use of a better form of *reinforcement learning technique*, in which VADER becomes its own instructor. The system starts learning with a raw neural network, which knows almost nothing about the game of Chess. It then attempts several games against its replica, by combining untrained neural network with a powerful search algorithm (like Monte Carlo Tree Search). As it continues to play, the neural network is trained and updated to predict not only moves, but also the possible winner of the games just like professional Human Chess players.

This trained neural network is then attempted to recombine with the search algorithm again to create a new and, better version of VADER, and the process is repeated again. In each iteration, the performance of the Computer player improves by a small fraction, and the winning rate of the self-play games increases accordingly, leading to more accurate and indeed, powerful neural networks, thus even stronger versions of VADER.

However VADER also differs from previously existing models in several other notable ways.

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A Framework using Multiple features to detect Multi-view Human Activity

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Abstract: Dynamic natures of human activities are the cause of various factors that had been the target of research field to put it into decodable framework. This paper targets at Multi faceted interpretation of human image at a given instance through model. The Paper proposes to approach the given problem with the help of Hidden Markov Model (HMMs) which would proceed first by detecting and locating a specific logical image and then interpreting its logical arguments behind it. The approach involves three distinct concepts such as contour based distance signal feature, optical flow based motion feature and local binary pattern which is rotational invariant. The proposed method is verified in an effective manner using our own dataset. With the help of experimental result over the dataset, it is observed that the proposed framework is efficient to recognize multi-view human activity.

1. Introduction

Computer vision is having a prominent research field in the form of recognizing human activity. There are a lot of applications which depend on it such as application related to biomechanical, entertainment, surveillance, security as well as applications related to clinic. Human activities related techniques can be easily understood by the phenomenon of recognizing activities. In past few years a lot of work has been done in this area yet still it is an open and hot discussion area. Detailed surveys are elaborated in [1], where various techniques pertaining to recognizing human activities have been discussed. Some of the key observation which has been found in the survey is object occlusion, image scaling, fixed view point etc. The main and famous approach of human activity recognition is to extract image features from input frame and train the classifiers by using these features then does the recognition. So it is important to identify the robustness of these features of activities recognition in varying environments. Motion feature based activity is reported in papers [2-3]. The problems associated with these features are that these are not robust in identifying the velocity when motions of various actions are similar to the same body part. However, most motion-based techniques are not robust in capturing velocity when the motions of the actions are similar to the same body parts. A more refined application of this algorithm was proposed by J. Ben-Arie *et al.* [3] which used a set of the velocity vector to represent each activity and uses indexing to recognize activities. Shape-based activity identification has been reported in [4-5]. Cohen *et al.* [4] proposed a view-independent 3D shape feature for classifying the human posture using support vector machine (SVM) classifier. Carlson *et al.* [5] also proposed a method for activity using shape feature. In this method, the shape was represented by key-frames and edge data for each activity. Combined features of motion and shape based activity recognition have been reported by several researchers, such as [6-7]. In this work, author does not recognize all the action in front-normal view. Althloothi et al. [7] proposed an approach for recognizing activities using learning of multiple kernels. The main drawback of this approach is it is based on fixed view point.

Furthermore, LBP were successfully applied to obtain rotation invariance [8] and provide a more compact representation [9]. We contribute to this field, by proposing an intelligent system for recognizing human activities in videos. The framework is given in the following steps: (i) Using Background subtraction approach to detect People (ii) Extracting Contour based distance signal feature, optical flow based motion feature, and uniform rotational LBP and (iii) using a set of hidden Markov models (HMMs) to model activities.

2. Method and Models

All figures should be numbered with English numerals (1, 2, 3, ….). Every figure should have a caption. All photographs, schemas, graphs and diagrams are to be referred to as figures. Line drawings should be good quality scans or true electronic output. Low-quality scans are not acceptable. Figures must be embedded into the text and not supplied separately. In MS word input the figures must be properly coded. Preferred format of figures are PNG, JPEG, GIF etc. Please ensure that all the figures are of 300 DPI resolutions as this will facilitate good output. In the proposed method to recognize multi-view activity of an human being, we have combined contour based distance signal feature, optical feature and a local binary pattern which is rotational invariant (LBP) to model human activities. Firstly, statistical background model is used for subtraction of background. Secondly, contour based distance signal features, optical flow based motion features, and local binary pattern which is rotational invariant are extracted. Distance signal features based on contour extract the different positional activities of an human being such as walking, sitting etc.

Optical flow based motion features helps in representing the aggregation related to moving direction of body which can be effectively characterized by motion rather than other parameters, such as color and spatial features e.g. jogging, walking etc. The LBP provides a good discriminating ability. Finally the activities are modeled by using a set of HMMs. The use of a set of HMMs for modeling the activities provides view-invariant operation. This overall approach has never been used before in literature for human activity recognition. The block diagram of the proposed method is shown in Figure 1.

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A Method for Salient Region Detection by fusing Prior Information

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Abstract: Human visual system has tendency to concentrate on some region in an image. Such regions which draw most of the attention are known as salient region. Finding these regions from an image is known as salient region detection. Saliency maps are built to represent such regions. Because of the wide applicability in computer vision, pattern recognition and guiding robots, researchers have gained lot of interest in this field. Various parameters are used for salient region detection like color, contrast, frequency, location etc. In this paper, contrast based method is proposed and two facts are utilized that generally centre of an image gains most of the attention (centre prior) and salient region rarely touches the image boundary (boundary prior). Intermediate maps are built using centre prior and boundary prior. Final saliency map is obtained by combining two intermediate maps. The results of proposed approach are validated by performing experiments on MSRA dataset and comparing it with 3 state-of-arts.

1. Introduction

With the increase in demand for automated systems, where we have a system or machine which can behave like human, visual attention is gaining interest. The human visual system has an ability to concentrate on an object in an image while it ignores the background details, this is known as attention. Thus, those parts of an image which draws most of the human attention are known as salient regions. To represent the salient region, saliency maps are built. Saliency maps highlight the attention gaining regions of an image while suppressing the background. Fig. 1. shows the original images and the corresponding saliency map.

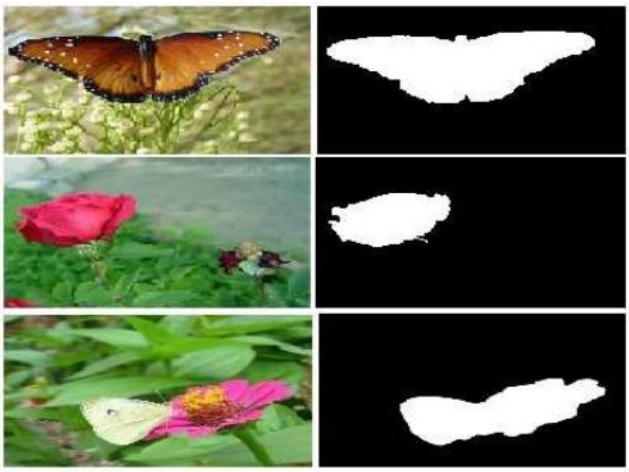

Fig. 1. Original Image and its saliency map.

As attention plays an important role in guiding robots and many other applications like object recognition, classification, image resizing, segmentation, video skimming and many more, the demand for finding accurate saliency map is increasing day by day. Due to its ample applications, the researchers have gained a lot of interest in this field. Thus, the challenge is to obtain saliency map which can accurately represent salient region. This task becomes intricate as the complexity of image increases. As color and contrast are the common visual cue, most of the salient region detection techniques in past has used these cues to obtain saliency map. Some other cues also include texture, frequency, motion etc.

The first saliency model was proposed by Koch & Ullman, which computes feature maps using color, intensity and orientation. Fusion of these maps produce final saliency map. Then centre surround approaches have been extensively used, where a window is used to predict the saliency of a centre pixel. Avraham & Lindenbaum identified pre-attentive segments and then mutual saliency is computed between them. A multi-scale centre-surround saliency map was proposed by Huang, Sang, Liu & Tang. Multiple scales are considered and saliency map is generated by taking into consideration the variation between centre and its surround. Vikram, Tscherepanow & Wrede computed saliency by considering various random regions of an image. Entropy is also used as a cue to find saliency map in Bruce & Tsotsos, Zhang, Tong, Marks, Shan & Cottrell and Lin, Fang & Tang's algorithms. Independent Component Analysis (ICA) and local contrast are used by Bruce & Tsotsos, to maximize mutual information between features. Another approach which used ICA was proposed by Zhang, Tong, Marks, Shan & Cottrell, image self information is used at each pixel to predict the probability of target. Lin, Fang & Tang obtained the saliency of a pixel by computing the entropy of centre versus its surround region. Boundary information is used by Zhu, Liang, Wei & Sun, where an image patch is considered as part of background if it shows strong connectivity with image boundary. As the humans are attracted by object and not by single pixel, the concept of super pixels came into existence. Achanta, Shaji,

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Energy Efficient Video Surveillance in Wireless Sensor Networks Under Grid Coverage over Barrier Coverage

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Abstract: The growth in hardware technology such as the availability of small-scale array sensors, low cost CMOS cameras and microphones has prompted the development of networks of sensor nodes equipped with multimedia devices such as Micro Electro Mechanical Systems (MEMS). However, for wireless video-based sensor nodes transmitting a video stream is difficult using the contemporary protocols. Camera based Wireless Multimedia Sensor Network (WMSN) behaves quite differently from the traditional networks in the sense that it involves a directional sensing model, a complex in-node processing and a need to transfer large amount of data. These generally results in high transmission time and the communication overhead is significant. To ensure longevity of applications, reduction in energy consumption is of prime importance. Hence, one of the simplest way to reduce the energy in video surveillance applications is to opt for barrier coverage instead of blanket coverage. However, the detection of the intruder and its success the rate ratio is highly dependent on the width of the barrier, the speed and position of the entering event. In this paper, we propose a novel energy conservation technique for video transmission in WMSN that toggles between grid coverage and barrier coverage. The objective is to achieve trade-off between energy consumption and reliability of detection. Simulations were performed and the results are presented which justifies the effectiveness of the approach.

Keywords—Wireless Sensor Network, Energy Efficient, Wireless Multimedia Sensor Network, Video Surveillance, Barrier Coverage, Grid Coverage.

1. Introduction

Rapid enhancements and developments in technology concerning to CMOS, microphone and camera have enabled them to be an indispensable portion of WSN. A wireless sensor network contains economical, low-power nodes, having potential of realizing different conditions related to environment like temperature, pressure, humidity, light, radiation, vibration, computation and wireless communication and other physical conditions, as presented by Kester, Chibueze, and Asisat (2006), Li and Chuang (2012). These networks are mostly implemented, in the environments where resources are limited, with the battery operated nodes running un-tethered. These limitations define that WSN problems are best described in a comprehensive manner by combining the physical, networking, application layers and devising major design modifications across the layers. Thus, it uses the strength of combined efforts to produce higher quality sensing in time and space as compared to conventional stationary and stable sensors. Hence, novel hardware architecture needs to be developed for this purpose along with new transmission methods, which are efficient. QoS (Quality of Service) requirements can be guaranteed in WMSN provided energy consumption is duly taken care of. In comparison to scalar data, the multimedia content requires more complex in-network processing in order to get meaningful information from the data packets. So, entire stream of traffic needs to be collected which requires significant amount of data storing and processing capabilities in intermediate nodes and in turn higher levels of energy to complete the entire task. However, providing sufficient power in battery dependent miniature sensor nodes is very challenging.

A. The Scope of Video Surveillance System

Video surveillance system is being popularly adopted in the following diverse cyber-physical applications targeted for:

- Traffic analysis
- Healthcare
- Public safety
- Wildlife tracking
- Environment monitoring
- Weather forecasting

WSN inherits the critical problems related to data transfer and data transmission using wireless communication. These are:

- Line-of-sight obstruction
- Signal attenuation and interference
- Data security
- Channel bandwidth
- Power limitations

A huge amount of survey and research work has already been proposed to deal with these issues, and most of them are being successfully utilized in practice and have become the benchmark for the industries. Moreover, for the video surveillance applications with concurrent demand, the

Improved the Network Lifetime through Energy Balancing in Depth Based Routing Protocol for Underwater Sensor Network

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Abstract: Underwater Wireless Sensor Network (UWSN) is a three-dimensional wireless sensor network which works under water and used acoustic signals for transmission. In underwater communication, energy efficiency in routing is play a vital role due to the distinctive characteristics, such as water currents, limited battery power, and long acoustic propagation delay. Due to the water undercurrents sensor nodes moves uninterruptedly and makes dynamic and complex network topology. Depth-based routing protocol (DBR) is much usable protocol in underwater scenario, because it uses only depth information only which is easier to obtain. However, in DBR, packets may be forwarded through multiple paths and some sensor nodes are frequently used to transmit data which is nearer to the surface sink, might cause energy waste as well as moderate the life of network. In this article, we propose an energy balancing scheme for DBR to provide energy efficient routing and to increase the life of network.

Keywords— Underwater Wireless Sensor Network, Acoustic Communication, Depth Based Routing Protocol. Energy Balancing, Energy Efficiency.

1. Introduction

Underwater Wireless Sensor Network (UWSN) is less explored area in the arena of Wireless Sensor Network. It is a 3d sensor network which was recently proposed to monitor underwater scenario like, to detect underwater oilfields, to monitor water currents and winds, locate danger rocks in shallow water, and submarine tracking [1]. The key idea behind the underwater sensor networks is to deliver or transmit data from underwater deployed sensor nodes to surface sink nodes, which is known as underwater routing. Efficient routing is much challenging task in underwater surroundings due to the distinctive features of UWSN. Acoustic communiqué is used in underwater sensor network, which often work in low bandwidth and high propagation delay. Constant movements of sensor nodes due to water flow and currents makes the topology dynamic. Under water sensor nodes are power-driven with narrow energy and due to hash surroundings, it is much harder task to restore or exchange batteries. Hence, the routing protocols in underwater network need much worry regarding energy efficiency.

Usually in underwater environment routing protocols are categorize in two categories as mentioned by Akyildiz, Ian F., Dario Pompili, and Tommaso Melodia (2005): location aware and location free routing protocols. Location aware protocols commonly usage the locality of sensor nodes to route the packets towards the sink or destination node. However, the locality of sensor node can be acquired through location services or GPS, which is also a problematic in case of underwater sensor network. Location free protocols works on flooding concept which require more energy and reduce the network lifetime.

Therefore, the depth based routing protocol DBR proposed by Yan, Hai, Zhijie Jerry Shi, and Jun-Hong Cui. (2008) is very prominent protocol for underwater wireless sensor network routing. DBR is not having need of full dimensional position of the sensor nodes. It is only requisite little cost depth sensor equipped with sensor node which designate the depth of the sensor nodes in the direction of the surface. In DBR the next hop selection is based on the relative depth of the node. Which node is closer to sink, act as the forwarder. To suppress the number of forwarder DBR utilize the concept of holding time, which node have less holding time, block other nodes and forward the data packets. But DBR is prone to blind zones. Some blind zone sensor node does not get the participation as forwarder, and some nodes are frequently used as forwarder. Which imbalance the energy depletion among nodes and shrink the lifetime of network.

Energy efficiency and energy balancing is much attentive field in underwater environment. In this submission, we propose an approach to enhance the network lifetime by balancing the energy among various sensor nodes.

The rest of paper is organized in sections. Section 2 discusses the proposals and literature of various researchers. Section 3 describes the proposal, and Section 4 analyse the performance of our proposal. Finally, Section 5 determines our work and deliberates the future guidelines.

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Function Point Based Estimation of Effort and Cost in Agile Software Development.

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Abstract: Estimation is essential and vital piece of software life cycle. . It is important to do exact estimation however much as could be expected. Today in IT Industry, Estimation in agile process is essentially in view of heuristic methodologies like expert opinion and planning poker. Without coordinated with experts, it is exceptionally hard to estimate in Agile Process. There is need of an algorithmic strategy in this area which can do accurate Estimation. It has been watched that these techniques don't consider the fundamental variables influencing the cost, size and effort for estimation. Without recorded information and experts, existing estimation strategies, for example, analogy, are planning poker end up noticeably erratic. In this manner, there is a solid need to devise basic algorithmic strategy that joins the variables influencing the cost, size and effort of projects. The Agile approach to software development differs markedly from traditional development approaches such as Waterfall. As such, Agile requires its own method of estimation. In this paper we have provided a brief introduction to Agile software development estimation and how stories can be sized using Function Point Analysis (FPA) and can be use to determine a project team's likely velocity.

Keywords— Cost Estimation, Function point analysis (FPA), story points(SP), velocity, conventional methods, agile development process(ASD).

1. Introduction

Agile methodology acknowledged to unpredictability [1] using iterative work process which is known as sprints. Nowadays Agile is the practice used by project developers to fulfill the primary goals of customer's satisfaction. Agile is both effective and maneuverable process which is light weight documentation [2] & sufficient. Many organizations adopt agile practice for software development process to deliver the project on time & faster than other approaches. [7].

Agile is a process to develop software that empowers a high level of client involvement all through the development procedure and changes to the product's prerequisites amid that process. There are many estimation approaches for agile software projects, a number of the estimation concepts presented here may also be applicable in other software projects that use more traditional development approaches. rather than illustrative determinations, more emphasis is needed on the conveyance of working programming to deliver software through a short span of time. The Agile approach is broadly utilized all through the world in various understood and powerful software process and conveyance strategies and techniques. The agile process is performed in different way as compare to conventional estimation methods. These methods are not the most proper or powerful method for determining and dealing with project scheduling. There are numerous estimation approaches for agile process, some of the estimation ideas introduced here may likewise be pertinent in other software projects that uses more conventional approaches. Remember that full details, stories and complexity of all the projects may not yet be known. Their story point sizes may change once that data is accessible. Also, in an Agile process new stories might be distinguished as the software development.

For Agile process measured utilizing Function Point Analysis, the effort and schedule assessments can be dictated by joining the function point estimate with its velocity of delivery and delivery rate, individually. For Agile process measured utilizing Function Point Analysis, the effort and schedule assessments can be dictated by joining the function point estimate with its velocity of delivery and delivery rate, individually

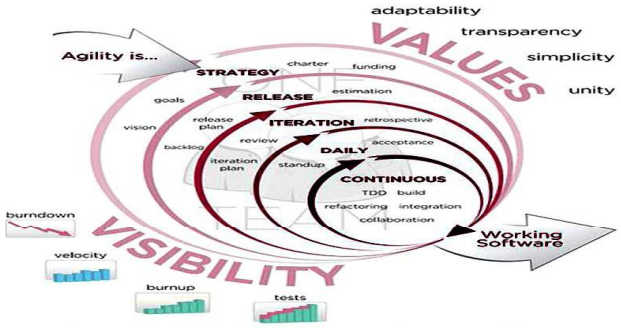

Figure 1.1 Agile Development Process

In Agile projects, Estimation includes deteriorating the project into the arrangement of components to be conveyed, instead of decomposing it into the arrangement of work breakdown structure, as is frequently done in the conventional bottom-up approach to project estimation. A development team performed in agile project as a progression of short settled iteration. Duration of iteration is regularly between 2 weeks and 2 months. Every iteration conveys a various stories. A key part of agile estimation is figuring out which and what number of stories can be conveyed by each iteration of a project. Estimation requires strategies for deciding: The relative size of each of the project stories .The development group's Velocity (that is, the manner by which rapidly the group conveys the project stories). Different strategies have been formulated for measuring and communicating project size and Velocity in Agile projects. In this paper, how stories can be measured utilizing Function Point Analysis (FPA) and can be used to decide a group's Velocity. The deterioration of an Agile Project into elements utilizing stories and after that measuring those stories utilizing story points can be seen as like the

Beyond 4G Networks: A Theoretical Framework

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Abstract:

Since evolution, the mobile technology has changed in many dimensions. Now the telecommunications has become the growth factor for the modern science & technology. To support this, mobile network infrastructures are being deployed at a all around the globe with a rapid pace, having the capabilities and bandwidth to deliver human requirements. Starting from the analog signals to digital signals and from first generation to the current fourth generation, the requirement of more is pushing the technology further. In this paper a framework for the future 5G mobile networks along with the technologies are discussed. The proposed framework uses most of the existing wireless and mobile technologies and is based on user-centric mobile environment.

Keywords: 5G; Advance Nanosuite; Wireless Networks

1. Introduction

Advancement in mobile communication has enabled the rapid development of various wireless technologies. The advances in wireless devices like laptops, palmtops, and cell phones, along with the progress in wireless access technologies, mobile middleware and data access mechanism and supportive tools have laid the way for the delivery of services beyond-voice-type while on the move. This ensures that the users are able to access high-speed data in both real as well as non-real time.

Today, we have different wireless and mobile technologies, like 3G mobile networks (UMTS, CDMA2000), WiFi (IEEE 802.11 wireless networks), LTE (Long Term Evolution), WiMAX (IEEE 802.16 wireless). Mobile devices include various interfaces, which are based on traditional circuit switching. Now a-days, all wireless and mobile networks are moving towards all-IP principle, i.e. all data and signals will be transferred by means of Internet Protocol on network layer (T. Janevski, 2003).

The term 4G is related with the current technology and to offer bit-rates in the access link, more than 1 Gbps for low mobility communication. A 4G system gives mobile ultra-broadband Internet access and dynamically share and utilize the network resources to support additional concurrent users per cell. One of the prominent features of 4G in the access and in the core network part is all-IP. Also, unlike 3G systems such as UMTS, 4G does not have circuit-switching.

Since, the 4G is already being used in communication world; it's time to move onto the next generation of mobile and wireless networks technology i.e. 5G. The 5G approach will be user-centric approach (T. Janevski, 2009), with mobile devices supporting more complex functionalities along capable of solving large computational problem with bigger memory space and longer battery life.

In this paper, we will be discussing a framework for the 5G of mobile communication along with the technology that are going to play an vital role in the development of the next generation mobile technology. The rest of the paper is organized as follows. In Section II, we describe Wireless technologies, Data Access mechanisms are described in detail in Section III, whereas Section IV describes Supportive tools. The Section V comprises of the future framework in detail, the conclusion of the paper is in Section VI.

2. Wireless Technologies

The word ``wireless" implies the radio communications transferred over wireless telephony. The foundation of wireless communication is on the properties of electromagnetic waves. These waves carry the signal for communication on the wireless medium. The wireless technologies have been quietly popular due to the user mobility provided by it. Some of the technologies behind the wireless technologies that provide user mobility is GSM, LTE and many more. We will be discussing some of the most popular wireless technologies of the third and fourth generation in this section.

2.1. Global System for Mobile Communications

GSM or Global System for Mobile Communications is a digital cellular communications system. GSM was developed with the intention of creating common European standard for mobile telephone but now is accepted worldwide. It was developed to offer services and features that were not available on the analogue cellular networks. The GSM system architecture normally has the Mobile Station, the Base Station Subsystem, and the Network Subsystem as shown in figure 1. Each subsystem in GSM includes functional entities which using specified protocols communicate with each other. The radio channels in GSM are based on TDMA that is implemented on multiple frequency subbands. In GSM, each base station is equipped with a definite number of these preassigned frequency channels (M. Rahnema, 1993).

The GSM provide various services to the user which includes some of the existing services like voice and data transmission besides providing new services like Call diversion, caller identification and encrypted speech.

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Efficient Document Classification using Phrases Generated by Semi Supervised Hierarchical Latent Dirichlet Allocation

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***Abstract* - There are many models available for document classification like Support vector machine, neural networks and Naive Bayes classifier. These models are based on the Bag of words model. Word's semantic meaning is not contained by such models. Meanings of the words are better represented by their occurrences and proximity of words in particular document. So, to maintain the proximity of the words, we use a "Bag of Phrases" model. Bag of phrase model is capable to differentiate the power of phrases for document classification. We proposed a novel method to separate phrases from the corpus utilizing the outstanding theme show, Semi-Supervised Hierarchical Latent Dirichlet Allocation (SSHLDA).SSHLDA integrates the phrases in vector space model for document classification. Experiment represents an efficient performance of classifiers with this Bag of Phrases model. The experimental results also show that SSHLDA is better than other related representation models.**

Index Terms—Text classification, Latent Dirichlet Allocation, Semi Supervised Hierarchical Latent Dirichlet Allocation, Bag of word model, Bag of phrase model.

I. INTRODUCTION

Document Classification is able to automatically sort a set of documents into classes or categories. It is a supervised learning assignment i.e. useful for transmission labels to documents. Many methods are available for document classification which produces satisfactory result. Support Vector Machine (SVM) [1], Nearest Neighbor Classifier [2], Rocchio [3] and Naive Bayes Classifier [4] are popular classifiers which are used for document classification. According to past researches, it is observed that performance of SVM is better than other classifiers. Few improvements may still be developed in this classification. Bag of words model is used by all the above classifier for representing the text documents. Document is the basic unit for classification of text. This model contains the unordered collection of words. In the vector space model a global dictionary is used to represent documents where the number of words in the dictionary is represented by dimension of the vectors. It provides the efficient way for the representation of a document but the discriminative power of semantic meaning of two or more words that form phrases is ignored in this model. Likewise, these are not interpretable and far reaching. To catch discriminative power of words as expressions we require a model which can incorporate such n-grams in the vector space show with no extra changes in classifiers in light of the vector space models.

Ordered sequence of words is known as phrase. It is observable that if one word is combined with another word then it produces completely different meaning. For example, the word "stream" if appears as "data stream", the document is related to sequence of data packets that used to send or receive information. If stream appears as "river stream" then it is talking about large natural stream, may be waterway. Similarly "data mining" and "gold mining", "human race" and "bull race" and "nuclear reactor" and "nuclear bomb" are few sorts of expressions that containing a some basic word yet demonstrates an entirely unexpected importance when joined with different words. Latent Dirichlet allocation (LDA) [5] is able to find phrases from the document. But as we know datasets often grow over the time and when it grows they bring new entities and new structure so LDA is too rigid in this regard. LDA is an unsupervised model; it cannot take any information from hierarchical labels. Therefore, to remove this problem, we used a novel way to deal with discover phrases from the documents utilizing a subject model, Semi Supervised Hierarchical Latent Dirichlet Allocation [6].

It captures the breadth of useful topics across the corpus with the objective of organization of topics in the form of hierarchy. Semi-supervised hierarchical topic model, i.e. Semi-Supervised Hierarchical Latent Dirichlet Allocation (SSHLDA), is able to explore and find the latent topics from the documents and also take the information from the hierarchy labels to build the corresponding topics. We utilized these expressions together with singular words for Vector Space Model portrayal of the archives which is abused in order. Analyses demonstrate that Bag of Phrases show with proposed procedure beats the traditional Bag of

Trust and Reputation-Based Model to Prevent Denial-of-Service Attacks in Mobile Agent System

Praveen Mittal and Manas Kumar Mishra

1 Introduction

Distributed system provides resource availability at various geographical locations. Mobile agent system uses this concept of distributed system as a key point and executes its line of code at various locations of resources. An agent is a program that assists people and acts on their behalf. Agents function by allowing people to [1]. This program migrates from one platform to another for the partial or full execution of its line of code. Not only that, but it can migrate from one platform to another for accessing various resources. A platform is nothing but a computer system, which can create number of mobile agents for various tasks.

In mobile agent system, deploying an agent on various platforms involves the possibility of denial-of-service attacks on agent. Hence, the mobile agent environment should be secure and reliable for agent to execute. The proposed model maintains reputation of the platform to which the agent will get executed and trust of the mobile agent. In the following section, we analyze some of the mobile agent's development kits available in market.

1.1 A Mobile Agent Kit

Mobile agent is a program that can be developed with the help of mobile agent development kits available in market such as Concordia, Jacada, Aglets, Voyager,

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Designing of Multiplexer and De-Multiplexer using different Adiabatic Logic in 90nm Technology

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***Abstract*- In this research paper we represented the design and evaluation of 8:1 Multiplexer using different adiabatic logics. For VLSI design engineers, high power consumption is the main factor in digital circuits. In this paper we are going to presents the CMOS-logic based new design in 90 nm technology for a low power and high speed adiabatic 8:1 Multiplexer and De-Multiplexer for following this trend. In which we focus on the characteristics of the CMOS and adiabatic logic families 2N2P, 2N-2N2P use a cross-coupled transistor structure for adiabatic operation and dual sleep approach. Normally Adiabatic logic families use multiphase clocks. Multiphase clock increases power dissipation on their clock distribution network. Some adiabatic logics are not effective for high speed operating design due to their clock skew issues and high complexity because of multiphase clocks. So in this research paper we are focusing on energy recovery with efficient power clock power consumption.**

Keywords: Adiabatic Logic, Dual Sleep technique, energy efficiency, 2N2P Logic, 2N2N2P logic

I. INTRODUCTION

Energy recovery is a favorable parameter for the design of VLSI circuits. Energy-recovery circuits achieve lower energy consumption by conducing currents and store energy across devices by slowly charging and discharging across their capacitive loads. This type of energy recovery circuits are called as boost logic or adiabatic logic circuits [1]. It means, adiabatic circuits operate with very effectively and efficiently at low operating frequencies and stop operating at high frequencies. Adiabatic logic is that logic which is used implements the low-power electronic circuits [2]. The other main benefit of adiabatic logic is that by using four phase trapezoidal power clock lines we can achieve the inherent pipelining of the circuits [3] [6].

In this research paper we are representing the different adiabatic logic techniques with multiplexer and De-multiplexer. Multiplexer is a circuit that has many inputs lines and a one output line [4] [5]. The select lines are use to find which input will come to the output, and It is also used to send the data from input to output parallel to serially by a data selector or select lines. De-multiplexer is a circuit that has one input line and many outputs lines. It is also used to send the data from input to output serial to parallel by a data selector [7] [8].

II. OVERVIEW OF ADIABATIC LOGIC FAMILIES

This paper focus on power dissipation of the CMOS logic and other adiabatic logics are 2N2P logic, PAL logic and 2N2N2P logic.

A. MUX-DEMUX USING CMOS LOGIC FAMILY

CMOS (complementary metal-oxide-semiconductor) is one of most popular logic style is using now a days. In this logic both PMOS and NMOS are used to realizing a circuit. It is the term which has pull up network and pull down network. Pull up network has

Analysis of Parallel Control Structure for Efficient Servo and Regulatory Actions

Aarti Varshney, Puneet Mishra and Vishal Goyal

Abstract This paper investigates an intriguing issue about the tuning aspects of the parallel control structures. This parallel control structure essentially decouples the servo action from the regulatory action and provides an opportunity to the control engineer for separately deciding the ability of the controllers for servo and regulatory action. This paper provides a thorough comparative study and thereby suggesting an appropriate combination of tuning rules for achieving better efficiency of the control structure. Three different well accepted tuning rules viz. Ziegler Nichols, Direct Synthesis (DS) and Gain Margin Phase Margin formulae have been considered and a critical analysis of the control tuning rules combinations have been performed. The performance of considered tuning rules combinations is assessed on the basis of a transient response criterion, i.e., overshoot, an error-based criterion, i.e., Integral of time-weighted absolute error for both setpoint and disturbance rejection, and a measure of controller output aggression, i.e., Integral of absolute rate of controller output. On the basis of performed studies for a first-order plus dead time system, it may be inferred that DS–DS tuning rule combination provided superior performance among all the considered cases for nominal as well as plant-model mismatch case.

Keywords PID · Parallel control structure · Tuning · Setpoint tracking Disturbance rejection

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Enabling Concurrent Clock and Power Gating in 32 Bit ROM

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Abstract: ***Gated Clock as well as Gated power have demonstrated to be very operative elucidations for Lessing active as well as leakage power, respectively. These method applied in the same circuit that the gated clock or transmission gated circuit is used to reduce dynamic power dissipation. Our main concern is to analysis of power dissipation of 32 bit ROM by applying the gating technique. This paper integrates both the method of minimizing power dissipation. Lessening the leakage power dissipation, gated power technique is used. On the other hand reducing the dynamic power dissipation gated Clock with transmission gate enabled & latch free technique are use. Starting from gated clock technique with low voltage complementary metal oxide semiconductor (LVCMOS) input-output standard in Xilinx. After that gated clock and gated power technique both are implemented by help of Tanner EDA tool.There is significant reduction in static as well as dynamic power have been seen by help of Tanner EDA tool***

Keywords- Transmission gate, latch free gated clock, Gated power, IOs.

I. INTRODUCTION

Lessening the power utilization is one of the fundamental objectives of today computerized framework design. Bringing down the power dissipation not just protracts the battery life in convenient frameworks, however likewise enhances the unwavering quality by lessening the temperature and variation.

$$P_{Total} = P_{Dynamic} + P_{Static}$$

$$P_{Total} = \frac{1}{2} C_L V_{dd}^2 \alpha f + I_{sc} V_{dd} + I_{static} V_{dd}$$

Gated clock is a ordinary technique utilized as a part of several synchronous circuits for lessening active power dissipation. Clock gating saves power by disabling the clock signal when not used.

Pruning the clock disables segments of the equipment with the objective that the flip-flop in them don't have to switch states. Exchanging states eats up power. Exactly when not being traded, the exchanging power use goes to zero, and just leakage current are stream.

At first various authors suggested using AND gate for Clock gating because of its fundamental logic. In successive circuit one two-input AND gate is embedded in logic for clock gating. One contribution to AND gate is clock and while in mind that the second input is a signal used to control the output(means it will control the sequential circuit's clock).Power gating is a system used as a part of coordinated circuit design to decrease power utilization, by halting the current to block of the circuit that are not being utilized. Also of decreasing stand-by or leakage power.

Low Voltage Complementary Metal Oxide Semiconductor (LVCMOS) In today scenario the demand of low power device is increase because it reduce the area of the device. Low power also makes the system more realible.If the supply voltage is increase them temperature of device increases.so failure of circuit is increase. LVCMOS is very useful I/Os for utilization of low power. It gives better execution in lower costs, semiconductor producers diminish the gadget geometries of integrated circuits. With decrease in the related working voltage should likewise be lessened in order to keep up a similar essential operational attributes of the transistors. When the various work on Semiconductors and nanotechnology material. The voltage range of LVCMOS is high. LVCMOS preferred different level of voltage i.e LVCMOS 10, LVCMOS 12,LVCMOS 15,LVCMOS18,LVCMOS25,LVCMOS33

Environment Friendly Frequency Scaling based Counter design

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***Abstract* — In this paper a counter is designed using Xilinx ISE design suite 14.2, Verilog. An environment friendly FPGA based counter is designed which will dissipate the minimum amount of power. Here we are using LVCMOS based SPARTAN-3 technology which makes our design highly energy efficient. Analysis is done on different I/O block properties and Spartan-3 family and amount of power consumed is calculated using XPower analyzer. Frequency scaling is done on different frequencies to reduce the amount of heat and select best design from it. In this work counter is synthesized and simulated on FPGA (field programmable gate array) board by using different Input-Output Standard techniques.**

***Keywords – Counter, FPGA, LVCMOS, Spartan-3, Verilog, Power Efficient*.**

I. INTRODUCTION

A counter is a device which performs counting operation. Counters have many applications ranging from everyday lives to commercial purpose. When it comes about everyday lives of people, environmental friendly counter proves to be valuable. Counting is believed to convey valuable information about the complex relationships existing between health and physical activities [1].Counters provide a means to be used in various applications such as for fast counting operation, triggering of pulses, clocks etc. The paper presents the design, operation and test results by various means of energy efficient counter. The work is implemented using voltage scaling and frequency scaling technique. The counter is implemented in FPGA (field programmable gate array) device. In high speed and low power VLSI applications, there is requirement of low power dissipation counters. The proposed circuit has been designed using Xilinx ise design suite 14.2 CMOS technology. The frequency scaling technique reduces the power consumption significantly in the designed circuit and overall there is an improvement in power consumption which makes the device energy efficient and environment friendly [5].Low power requirement has become the most significant factor of modern era. The most important factor to consider while designing SOC for portable devices is 'low power design'. It is achieved through various techniques which includes combining low power components in conjunction with low power design techniques. Leakage current also plays a major role in designing low power consumption circuitry. At process nodes below 100nm technology, power consumption due to leakage has joined switching activity as a primary power management concern. Also three degrees of freedom in VLSI design space were noted which included voltage, physical capacitance and data activity in which voltage reduction offered the most effective means of minimizing power consumption. Few power minimization techniques were also adopted to minimize the power at different levels. It included reducing chip and package capacitance, voltage scaling, technology selection, CAD methodologies and techniques and low power management in physical design. Different analyses were done to observe the changes that take place in circuit design using power dissipation and a conclusion was made that effective power management is possible by adapting various strategies at various levels in VLSI. Hence, an intelligent approach is required by designers for optimizing power consumption in designs. Xilinx has optimized the work by providing different FPGA's with specific features and integration size of 28 nm with Artix 7 and Kintex 7, 40 nm with Virtex 6, 45 nm with Spartan 6, 65 nm with virtex 5 and 90 nm with Spartan 3. These FPGA's comprise of different basic units including Logic blocks, Input-Output blocks, clock buffers, switch matrix, wire segments and LUTs.

II. LITERATURE SURVEY

Energy efficiency and low power consumption is the basic requirement for a design in VLSI technology nowadays. Every electronic device needs to be designed in a way such that it gives the best of itself either it is in terms of power consumption, its efficiency or any other parameter related to device performance in one or the other way. Counter is one of the devices used for many applications which can be a digital clock, processors, timers etc. Many counters have been designed before by researchers, we have discussed about them in short. Garima Bhargave had designed a 4bit Johnson counter using power gating logic. In the design there power dissipation came out to be (16.3µW, 10µW, 9.2µW, 5.6µW and 10.9µW for frequencies 5MHz, 10MHz, 20 MHz, 50 MHz and 100MHz respectively [9]. In this manner they saved good amount of power. Himal Pokhrel also made a 4bit synchronous counter on 65nm technology in which average power reduction was around 44.9% in SST and 70.1% in FST as compared to CMOS [10]. All these designs were efficient but in account of large surface area. Here in this paper we have designed an energy efficient 4-bit counter using Xilinx Tool. Spartan-3 family has been used for analysis purpose and calculation of power using XPower

LVCMOS Based 4-Bit Register

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***Abstract* — In this paper, a 4 bit register is designed using Xilinx ISE design suite 14.2. The language used is Verilog. The 4 bit register designed is FPGA based and will be dissipating the minimum amount of power. The I/O standard used here is LVCMOS (Low Voltage Complementary Metal Oxide Semiconductor) and mobile_ddr which will help us in achieving the goal of minimum power dissipation. The scaling is done on frequency and the frequencies used are 1 Ghz, 2 Ghz, 3 Ghz, 4 Ghz and 5 GHz.**

***Keywords – 4 bit register, FPGA, LVCMOS, Mobile_ddr, Energy efficient*.**

I. INTRODUCTION

LVCMOS stands for Low Voltage Complementary Metal Oxide Semiconductor which is a low voltage class of CMOS technology of integrated circuits. CMOS stands for Complementary Metal Oxide Semiconductor. A technology used for fabricating integrated circuits is CMOS. CMOS technology is widely used in static RAM and various digital logic circuits like microprocessors, microcontrollers, etc. CMOS circuits provide very high immunity against noise and have very low consumption of power. The sequential circuits use memory; therefore they are capable of using the previous output along with the present input to give the final output. For example- Flip-Flop, Registers, etc.

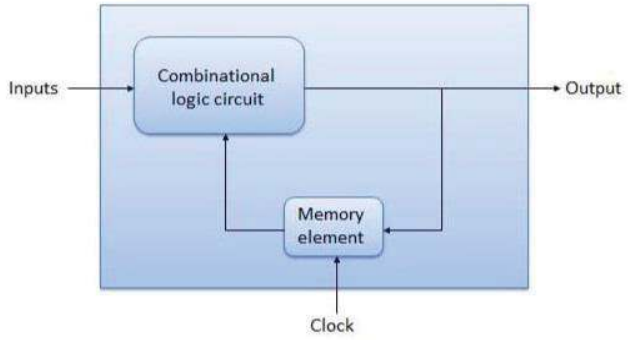

Figure 1 Architecture of Sequential Circuit

Registers are data storing devices that are suitable for holding binary information. A group of flip flops are cascaded together to form registers. A Shift Register is a 4-bit register with 4 flip-flops cascaded in unison, using a common clock-pulse. The cascaded flip-flop's output is coupled to the next flip-flop's data input resulting in a circuit capable of shifting the stored one bit array by one position.

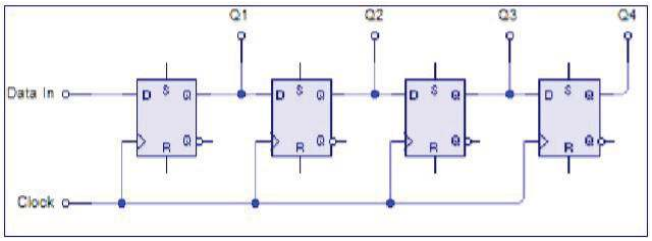

Figure 2 Diagram of Serial-In-Parallel-Out Shift Register

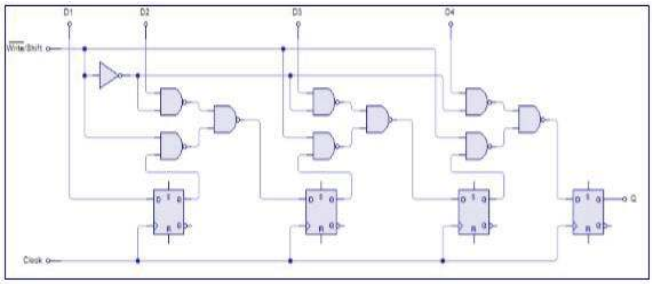

Figure 3 Diagram of Parallel-In-Serial-Out Shift Register

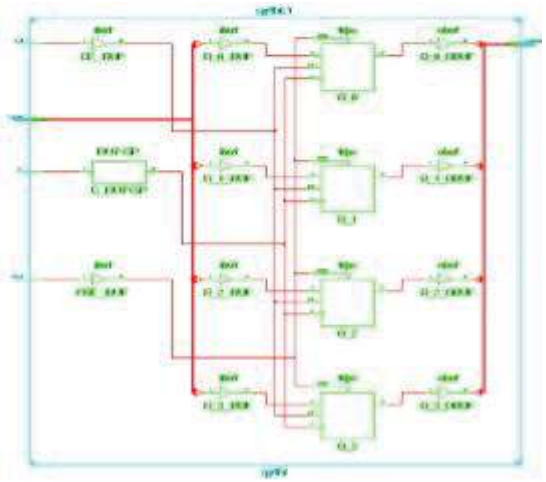

Figure 4 Technology Schematic of 4-bit Register

FPGA stands for Field Programmable Gate Array. It is an integrated circuit that is intended to be manipulated by a person after fabrication. The FPGA's configuration is specified by using a Hardware Description Language (HDL).FPGAs consist of programmable logic block arrays, and a system of interconnections allowing the blocks to be tied together.

Analysis of Low Power Reduction Techniques On Cache(SRAM) Memory

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ABSTRACT—This paper proposes the single-bit cache memory architecture with its peripherals like write driver circuit, a precharge circuit, SRAM Cell and Charge-Transfer Sense Amplifier. Then, low power reduction techniques such as Forced –Stack Technique, Sleep-Stack Technique, Variable Body Biasing technique etc. is applied over SRAM cell.Furthermore, SRAM cell along with low power reduction technique i.e. with Forced Sleep results in 40% reduction in Power and 43% reduction in PDP.
In a single-bit cache memory architecture, SRAM with Forced Sleep Technique and with Charge-transfer sense amplifier is designed which consumes 5% reduction in power, 42% reduction in Read Delay, 20% reduction in Write Delay and 7% reduction in PDP.

Keywords — SRAM (Static Random Access Memory), VBBT (Variable Body Biasing Technique), FCT(Forced Stack Technique), WDC (Write Driver Circuit), PCH (Pre-Charge Circuit), CTSA (Charge-Transfer Sense Amplifier), PDP (Power Delay Product).

I. INTRODUCTION

Recently, a lot of focus has been paid in the design and implementation of high-speed "SRAM" because of its incredible requirement as a cache memory which plays an essential role in the processing of information and in modern portable devices like PDA and cellular phones [1]. The area of every device on a chip reduces but the density of the chip increases with scaled down in submicron technology. This way of scaling results in various challenges such as power dissipation and reliability [2]. Sense_Amplifier is one of the important circuits which used to read the stored information from the selected memory [3]. Its performance affects the time required to access the memory as well as power dissipation. Conventionally, sense_amplifiers circuit utilized in three configurations such as voltage, current and charge transfer. The voltage mode sense_amplifier used in memories results in speed limitations because of high bit_line capacitances [4]. However, current mode sense_amplifiers sense the cell current directly and show a significant improvement in speed as compared to the conventional voltage mode sense_amplifier [5]. The charge-transfer sense_amplifier offers high performance and low power solutions. It also results in the reduced bit_line swing which leads to lower bit_line energy compare to the conventional voltage mode sense_amplifier. In proposed work, we have carried out an implementation of single-bit "SRAM" cell architecture with current sense and charge transfer sense_amplifier to optimize delay and power dissipation using cadence virtuoso. The write driver circuit, a pre-charge circuit, and "SRAM" are designed and implemented. Furthermore, all the sense_amplifiers are designed and implemented with equal width.

II. LOW LEAKAGE POWER REDUCTION TECHNIQUES

This section includes the basic operational methodology of leakage power reduction techniques such as MTCMOS and footer stack which have been implemented in sense_amplifier circuits to perform the analysis of power dissipation and delay.

A. Sleep Transistor Technique

In this approach, a P_MOS is connected between VDD and "SRAM" cell and N_MOS is connected between "SRAM" Cell and GND [6]. In "active-mode", the N_MOS and P_MOS (i.e. sleep-transistors) both are turned 'ON', because of this there is no change in operation as there is a path between VDD and GND. In "sleep mode" the N_MOS and P_MOS (i.e. sleep-transistors) are turned 'OFF' due to this there is shutting down of power supply to the "SRAM" cell creating virtual VDD and GND path. This approach is also known as "MTCMOS Technique or Power Gating Technique" [7].

B. Dual Sleep Technique

In this technique, there are two pairs having one P_MOS and one N_MOS which are connected in parallel to each other. As one pair is connected between VDD and "SRAM" cell series and another pair is connected between "SRAM" Cell and GND in series. In "active-mode", the N_MOS and P_MOS (i.e. sleep-transistors) are turned 'ON', due to this there is no change in operation as there is a path between VDD and GND. In "sleep mode" the N_MOS and P_MOS (i.e. sleep-transistors) are turned 'OFF' due to this there is shutting down of power supply to the "SRAM" cell creating virtual VDD and GND path [8].

C. Dual Stack Technique

The Dual Stack technique has two extra MOSFET's parallel to sleep transistors. Due to these extra MOSFET's, there is no change in state which is important for the operation of "SRAM" cell. Leakage Power reduces because retention transistors are stacked. Its operation is similar to the case of

Core i7 Specific Energy Efficient RAM Design for IoT Application

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Abstract- Fundamental memory has turned out to be one of largest contributors to overall energy consumption and offer many opportunities for power reduction. Power dissipation plays important role in portable products that can store, receive and transmit data because in each operation cycle the power is consumed by the operator. The goal of this paper is to use Frequency scaling approach in Random Access Memory to minimize power dissipation by the help of High Speed Transceiver Logic (HSTL) input output standard. These techniques cover RTL coding. This research suggest that there is 75% reduction clock power 66.66% reduction in Signal power ,(35.20% to 47.77%) reduction in IOs power when the frequency are minimize . This design is implemented on Artex-7.

Keywords:- HSTL I/O standard, RAM, FPGA, i7 processer frequencies.

1. Introduction

In present world the main focus of research points is to design low power gadgets. Due to the rampant usage of portable battery powered gadgets. The proposed random access memory (RAM) design outfits an approach towards reducing the hold power dissipation. Memory is a basic part of programmable logic device. Random access memory (RAM) is viewed as volatile memory, which implies that the put away data is lost when there is no power. Along these lines, RAM is utilized by the central processing unit (CPU) when a PC is going to store data that it should be utilized rapidly, however it doesn't store any data for all time .Where does the power go in RAM memory?

i. Control & address laches
ii. Row decoder
iii. Column decoder
iv. Bit line

Apart from that there are generally two sources of power dissipation
(i) Standby mode power dissipation
(ii) Active mode power dissipation

So to minimize the power dissipation Input Output standard (I/O) have used. There is different type of I/O standard: LVCMOS, SSTL, HSTL, LVDCI, but in this paper HSTL are used. The basic role of utilizing HSTL I/O standard is to maintain a strategic distance from transmission line reflection by coordinating the impedance of transmission line, gadget, input port and yield port. The choices of HSTL IO standard assume a noteworthy part in general power dissipation of our design. There are numerous assortments of HSTL I/O guidelines accessible in FPGA. High-Speed Transceiver Logic (HSTL) is yet another standard that was created to address the process technology trend. HSTL is intended to be voltage versatile and technology independent. Like SSTL, HSTL utilizes differential amplifier for the input. Like SSTL, HSTL gets out a detail for the yield supply voltage and the gadget supply voltage and enabling those two voltages to be different. In this work we have to use different temperature (25 &55) degree centigrade for analysis of power dissipation at different frequency .The frequency range is taken from i7 processor.

2. Literature review

In past few year there are enormous research had been done in the design and implementation of RAM. ROM, Comparator on FPGA. In this regard work [3] by Menakshi Bansal et. al. present a ROM design on FPGA by using HSTL I/O FOR Low power design .The main focus of use of HSTL I/O standard is to overcome the transmission line reflection coefficient and by the help of Xilinx tool to analysis the power dissipation. The work in [1] feature the value of RAM based FPGA testing and proposed an ordinary approach applicable to test the structure of RAM based FPGA announcing its configurability deftness while making the system. A few approaches with particular destinations are stood up to and afterward contrasted and established bus, results uncovers that as it were three test gets up to the mark, guaranteeing 100% blame non redundancy.

A ROM design on FPGA [6] by the help of LVCMOS I/O standard for low power by lakshay kalra et. al, discuss about the power dissipation and conclude that LVCMOS12 has the most energy efficient I/O standard.
Paper by Neha Bansal et al.[4] discuss the ROM design FPGA by SSTL I/O standard at 65nm technology and SSTL18_I are more energy efficient as comparison to other SSTL I/O standard. Paper [6] discuss about the comparator design on 28nm technology using LVCMOS I/O standard with different temperature. power dissipation increase as increase in temperature.
Generally dynamic power dissipation is greater than static power dissipation but as the technology scale down from 90nm technology static power dissipation is more as compare to dynamic power dissipation [9].
HSTL is a development independent interface standard for cutting edge ICs that alters the information signal to a reference voltage rather than to ground[3].This modification engages a humbler I/O swing and upgrades execution. HSTL was made for voltage-adaptable and innovation free input output structures. The apparent rationale exchanging range is 0.65 to 0.85V for 1.5V HSTL, bringing about speedier yields with lessened power-dissemination and signal respectability issues.
HSTL is a fast trans-beneficiary Logic .It has of two different form unidirectional and bidirectional.

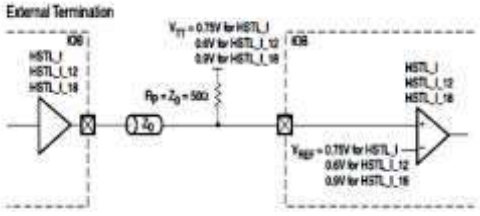

Figure 1-(a): Uni-directional linking HSTL I/O Standard

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Unsupervised Blood Vessel Segmentation Using Iterative Adaptive Thresholding Method

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Abstract: This piece of work proposed a classical unsupervised algorithm for segmentation of retinal fundus image. Retinal fundus image is first enhanced by removing artefact and noises using mask and some spatial filters. An inverted green channel image is further enhanced by Tophat reconstruction method. The tophat image is then segmented using global thresholding algorithm. Residual image after extracting major vessels are further enhanced and new vessels pixels are identified iteratively. These newly identified pixels are merged with major vessels by image growing techniques. A modified stopping criterion is proposed to prevent over-segmentation. Proposed algorithm is robust in terms of datasets variability. Algorithm has been applied on three datasets DRIVE and STARE and achieve accuracy of 95.06% and 95.65% respectively with area under ROC curve (AUC) as 0.969 and 0.967 respectively.

Key words: Region of convergence (ROC), iterative algorithm, morphological tophat reconstruction, vessel segmentation.

I. INTRODUCTION

Retinal blood vessel segmentation is the first step to analyse to diagnosis various cardiovascular disease that can lead to blindness like diabetes retinopathy, glaucoma, vein occlusions, retinopathy of prematurity etc. [1]. According to the survey, presently 40.9 million Indians have diabetes and by year 2030 it will rise to nearly 79.4 million which is very alarming. Therefore, accurate blood vessel segmentation plays very important role for designing automated screening system.

A large number of algorithms are reported by eminent researchers in literature. These algorithms are broadly classified into two categories namely (i) Supervised algorithm and (ii) Unsupervised algorithm. Supervised algorithm is a rule for vessel extraction by training the algorithm with ground-truth image which is marked manually by an expert ophthalmologist. Artificial neural network are extensively used in supervised techniques. On the other hand, unsupervised algorithms are those where structural properties of images are exploited to detect any pixel are on vessel or not. An elaborate and comparative survey of these two categories is reported by M. Fraz et al. [2]. S. Roychaudhury et al. [3] reported an comparative analyses these two categories of algorithms. Performance of supervised vessel detection algorithm are depends on the ground truth or gold standard, hence prone to false detection. On the other hand, unsupervised algorithms are based on structural properties. In this category, prominent methods are matched filter, line detector, morphological transformations, model-based methods, multi-scale segmentation etc. Matched filter first demonstrated by S. Chaudhary et al. [4]. Latter matched filter has been used to detect blood vessels by A. Hoover et al. [5]. U.T.V Nguyen et al. [6] exploited the line like properties of blood vessels. He could achieve accuracy of 94.07% for DRIVE dataset and 93.24% for STARE dataset. Mathematical morphological transformation is another strong algorithm which has been exploited extensively by researchers to detect blood vessels. A. Mendonca et al.[7] combines the detection of centreline and morphological reconstruction in his vessel detection algorithm. Another algorithm based on mathematical morphology and curvature evaluation for the detection of vessel-like patterns in a noisy environment has been proposed by F. Zana et al.[8] and A. Miri et al.[9] used curvelet transform and multistructure elements morphology by reconstruction. K.A. Vermeer et al. [10] proposed a model base vessel segmentation algorithm and this techniques are also exploited in [11] J. Staal using ridges of blood vessels. B Lam et al. [12] and [13] proposed another algorithm based on the divergence of vector fields and regularization based multi-concavity modelling respectively. A. Budai et al. [14] and [15] demonstrated the multiscale segmentation algorithm and M. Palomera et. Al. [16] combines parallel multiscale feature extraction and region growing technique to vessel segmentation. Some the unsupervised vessel segmentation algorithms mentioned are computationally complex and not viable to real time portable screening system. Some of them gives good accuracy for healthy fundus image but low segmentation accuracy for image with pathology. Hence, an algorithm with a low

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Implementation and analysis of low power reduction techniques in sense amplifier

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***Abstract*— In proposed work, low power reduction techniques such as footer stack, MTCMOS (Multi-Threshold CMOS), sleepy stack and sleepy keeper have been implemented in voltage-mode, current-mode and charge-transfer sense _amplifiers in customary gpdk 90nm technology documents using Cadence tool. Observations are mainly focused on power dissipation of different sense amplifier configurations. The simulation results show that the charge-transfer sense_amplifier consumes less power i. e 11.069 µW as compared to the power consumed by current sense and voltage sense amplifiers 54.245 µW and 86.66 µW respectively. Furthermore, proposed implementation of MTCMOS technique in current mode sense amplifier leads to a dramatical reduction i.e. 10-98% in power dissipation considering power supply voltage of 1.2V.**

Keywords*—VMSA(voltage-modesense_amplifier),CMSA (current-mode sense_amplifier),CTSA(charge-transfer sense_amplifier),*SRAM StaticRandomAccessMemory)

I. INTRODUCTION

Now a day's high-speed "SRAM" has initiated it's method into nearly every integrated circuit as a rooted element [1]. Conventionally, SRAM consist of an array of four or six transistors which play an important role in the processing of information [2]. SRAM design becomes more essential due to sturdy demand of low leakage power and low noise margin in memory [3].The speed of operation of "SRAM" is one of the crucial parameter which require a use of Sense_Amplifiers [4], have a strong implication on the pace of caches utilised in microprocessors as well as power burning up of IP's in 'low power' structure on chips. There are different types of sense amplifier designs have been proposed such as voltage, current and charge mode sense amplifiers [5]. The performance of VMSA is limited by the time required to develop a differential voltage on high capacitance "SRAM" bit_lines [5]. However, the bit line swing decreases in current mode sense amplifier during read operation as compared to voltage mode sensing technique which results that current sensing technique is faster than voltage mode technique and comparatively insensitive to the bit line capacitance.

In proposed work, low power reduction techniques such as footer stack, MTCMOS (Multi-Threshold CMOS), sleepy stack and sleepy keeper have been implemented in voltage-mode, current-mode and charge-transfer sense _amplifiers in customary gpdk 90nm technology documents using Cadence tool.

II. LEAKAGE POWER REDUCTION TECHNIQUES

This section includes the low power reduction techniques which have been implemented in different sense amplifier configuration such as voltage mode, current mode and charge transfer sense amplifiers.

A. MTCMOS

This technique [6] can be realized either st_tically or dyn_mically. In st_tic realization, critical path devices are allotted to low threshold voltage value which improve their speed while the non-critical path devices are allotted high threshold voltage value for leakage power optimization. In dyn_mic realization, operational block connected to the virtual GND line, are allot lower threshold voltage value. This line pursued the main GND rail through High threshold voltage transistor called sleep transistor. In active-mode, the sleep signal is 'ON' thus the 'low V_{th}' permits the performance of operational block at the higher speed. But in standby-mode, sleep signal revolve off the 'high V_{th}' transistor due to which virtual GND line floats and the design cycle is generally shorted to limit the leakage current. This technique is also known as power gating technique [7].

B. Sleepy-Stack Technique

The sleepy-stack approach combines the sleep and stack approaches. This technique divides the single transistor into two half-size transistors [8]. Between the divide transistors, one of the sleep transistors will be added in parallel. It also adds sleep transistor to disconnect the power supply and ground from the network so that there is no power consumption in off mode. The stack transistor in the sleepy-stack approach suppresses outflow current. Even though the sleep transistors are revolving 'OFF', the sleepy-stack emergence keeps exact logic state. The outflow depletion of the sleepy-stack emergence happens in two ways. First, outflow 'power' is subdue by high-transistors, which are appealed to sleep transistor and the transistors parallel to the sleep transistor.

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A Comparative Analysis of Modern Interleaving Schemes in IDMA Communication System for Future Wireless Requirement

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Abstract— **During recent past, the demand of bandwidth has emerged to surpass the accessibility in wireless communication system and that is the reason, at the present time, Interleave-Division Multiple Access (IDMA) is one of the well-linked manifold access scheme in wireless communication, instead of CDMA Since IDMA not only accedes to all the advantages of CDMA scheme but also it overcomes the major restrictive factor of CDMA similar to multiple access interference (MAI) and Inters Symbol Interference(ISI).In IDMA, users are separated *by user specific interleaver rather than by spreading sequence like in CDMA. The objective of this paper is to give brief overview of various interleaver such as Random interleaver (RI), Tree-based interleaver and Chaos based interleaver in IDMA communication system. The simulation outcome shows the well behaviour of Chaos based interleaver that has good bit error rate (BER) andlect offers less computational complexity rather lthan Random interlever as well as Tree based interlever. This technique takes over much compensation from CDMA, in the manner that the multiplicity contrary to fading and mitigation of the wickedest-case user interference complications.*

Keywords: *IDMA, Random Interleaver, Tree-based interleaver, Chaos based interleaver.*

I- INTRODUCTION

The purpose for the succeeding stage of wireless communications networkis, to smoothly provide a large variety of communication services to everybody, at all places and time, i.e., high voice quality, higher data rates etc. and recently the requirement of wireless communication has been increased. The immediate development of this technology from first –generation to second generation,, the analogue stage has preceded to the digitize stage by using TDMA (time division multiple access) and CDMA (code division multiple access) techniques. The next generation is the third generation (3G) and at the present time it is required to manage the challenges using multiuser detection [1].

Theoretically, the requirement of modern wireless communication system is providing:

- higher transmitting power
- improvement of signal to noise ratio
- Bandwidth which are not feasible solution in the past. [2].

The problem of fading in wireless communication, managed by befitting diversity technique with efficient utilization of communication resources .The IDMA is improved form of CDMA. IDMA supports many advantages:

- interferences elimination across cell
- Asynchronous (decentralized control) transmission
- Increased diversity in opposition to the fading.
- Low receiver cost
- Low computational complexity using MUD strategy [3]
- sharing of dynamic channel

This paper's ultimate goal is study and performance analysis of various interleaver used in IDMA communication system. Brief introduction and schemes of IDMA system is explained in section - II and Section -III introduces concept of various interleaver like RI (Random Interleaver), TBI (Tree- based Interleaver) and Chaos Based Interleaver used with IDMA. The section IV provides performance analysis and the final conclusion is provided in Section V.

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NIR Cross-Sensor Based Gender Classification from IRIS Biometrics: A Review

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***Abstract*—Soft biometric information based authentication systems which used to classify persons based on gender, skin, hair, ear, voice etc. has persistent to grow over a decade. Iris recognition as a biometric is very prevalent and gained lot of attention in the past because of its rich information content and was applicable in various fields like security prone areas, industrial areas, medical institutes etc. It seems to be most secure and accurate in authentication methods because of its unique characteristics. A large number of researchers have reported verification of identity based on these soft biometric characteristics but very few researchers have reported that human attributes such as gender can also be determined with biometric measures like iris. As gender comprises extensive range of characteristics difference between male and female an effective gender prediction approach can be critical for many applications such as man-machine interface, surveillance systems and computer aided psychological systems. The core objective of this literature is to be accustomed with state-of art approaches for classification of gender from iris images. The emphasis has been put on mentioning applied methodology, experimental data in terms of prediction accuracy, and shortcomings.**

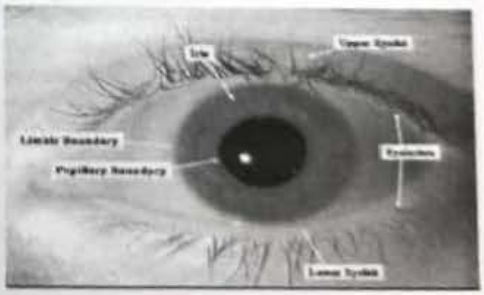
Keywords: Iris Biometrics, feature selection, classifiers, gender prediction

I. INTRODUCTION

These days biometric system that uses an individual's physical and behavioral attributes to authenticate a person are very popular because of its uniqueness and accuracy. One of the most active and expanding research area under this category is Iris Biometric which can recognize an individual from potentially large pool of enrolled persons[1-2]. India is currently using this technology to develop a project named as 'Adhaar' for the identification of more than 1.2 billion people.

As gender carries distinguishable information concerning male and female social activities an Automatic Gender prediction is receiving increasing attention. In the field of artificial intelligence gender prediction is considered to be one of the most substantial applications of pattern recognition. The advancement of gender prediction based research is driving many potential applications where a gender recognition functions can be incorporated in a computer systems which leads to its applicability in essential and realistic research areas including: (a)Human Machine Interface (HMI), (b) demographic data collection, (c) surveillance and authentication systems where if unauthorized persons who are not enrolled may seek an entry to a restricted area, (d) high speed gaming (e) commercial development, (f) marketing search and e-marketing where products offered in retail stores is based on person's gender etc. One of the most advanced research trait in this category is 'gender from iris' which is very reliable and potential problem. In the past very few authors have investigated and examined iris images for gender classification although it is applicable in many real time systems. For instance in authentication systems search space can be ordered and average search time can be reduced if the gender is recognizable from the enrolled databases and also in commercial and social environment where screen entry is based on gender but without recording entry. Authors [3-5] have explored that from the analysis of iris texture lot of relevant information about a person can be extracted which is of great value in many of these applications.

This literature draws a comprehensive overview to comprehend the existing research challenges, progress, and gaps under gender classification from iris, by systematically summarizing and comparing the existing gender classification methods which are based on the texture and geometric characteristics of iris biometrics. These characteristics or features are highlighted in several aspects, including distinctiveness, universality, perpetuity, and collectability to perform gender classification.



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Low Leakage Sequential MTCMOS Shift Register For Mitigation of Ground Fluctuations Noise During Complete Reactivation Process.

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Abstract: Multi-threshold CMOS (MTCMOS) is a well known strategy to diminish the standby current when the circuit is non operatory mode . However conventional MTCMOS strategies for limiting standby current can't be specifically utilized as a part of sequential circuit for two reasons (i) Present ground fluctuation noise during standby mode to dynamic mode move and (ii) Absence of information maintenance ability during standby mode . Here an analysis of ground fluctuation noise because of active mode move in sequential MTCMOS design is proposed. An inventive information saving MTCMOS configuration is proposed, which not only focusing on the lessening of peak amplitude of ground fluctuation noise during mode change will likewise give an approach to control the sub-threshold current in standby mode. The proposed MTCMOS design will have stepwise turning on capabilities and also an extra hardware to additionally decrease the quick current moving through high V_{th} transistors during move from Dream mode to Dynamic mode. Its extra current control circuits give higher decrease in peak amplitude of ground fluctuations noise (up to 98.4%) when contrasted with other comparative techniques.

Keywords—Stacking power gating; MTCMOS; Ground fluctuation noise; Leakage current; data retention; Shift register.

1. Introduction

The most generally utilized used sub-threshold leakage power reduction strategy in cutting edge integrated circuit is Multi-Threshold CMOS (also termed as power gating). Information preservation in standby mode is something critical in sequential MTCMOS circuits. Very few MTCMOS circuit strategies exist to keep up information while bringing down the leakage power consumption and ground distribution network noise in idle sequential circuits. [1]

The possibility of MTCMOS is straight forward for combinational circuit design however same circuits cannot be straight forwardly used in view of the way that the state of the circuits is lost in standby mode and can't be recovered when returning to dynamic mode.(active mode) [1], [2]. So we require MTCMOS flip-flops or latches that can hold the state without expanding leakage current during standby mode or compress during dynamic mode. [1] At the point when a Multi threshold circuit changes from the standby mode to the dynamic mode, huge voltage changes occur on both ground rail and power rail, known as ground fluctuation and power fluctuation noise respectively on account of high streams current through the high threshold sleep transistors.[1]This ground fluctuation noise engendered during a sleep to active mode transition is transmitted by the common ground and power sharing rails to the circumventing circuit blocks. [3] The ground bounce noise produced during wake up event is a important reliability concern in upcoming deeply sized multi-threshold combined circuits with deteriorating noise margins. [1], [2] The desideratum of new noise-vigilant consecutive Multi-threshold designs with small leakage information preserving in standby mode is very much desirable.

In our work, a multimode strategy predicated on adjusted stacking is proposed to broadly reduce ground fluctuation noise induced by a consecutive multi-threshold circuit during the wake up moves. In the proposed design, top sufficiency of ground fluctuation noise is suppress by up to 98.4% when contrasted with the anteriorly Mutoh Multi-Threshold shift register

The work is systematized as follows. Section II describes different a foretime sequential MTCMOS circuit strategies with information retention ability. Section III outlines how proposed Multi-Mode MTCMOS circuit procedure gives an approach to control ground fluctuation noise. section IV describes simulation results and correlation of various information preserving MTCMOS design. Section V finishes up the paper.

2. Previously Published Technique

In existing Information Saving MTCMOS Shift Register Circuit exclusive Multi-threshold designs are needed to retain a information while decreases the sub-threshold current in inactive sequential Multi-threshold circuits. [4] Different anteriorly sequential MTCMOS design with information pre-serving capability in standby mode is briefly discussed in this segment.

2.1. Mutoh Multi-Threshold CMOS Technique

In this technique leakage current can be reduced by eliminating all sneak leakage current path by making utilization of scattered and localized high threshold upper and lower sleep transistors in both slave latch and master latch as shown in figure 1. [2] The Mutoh MTCMOS technique (Mutoh-FF [2], [5]) is the first-ever published technique with information storing capability and it withal provides a low sub-threshold current standby condition and the information is retained in the master latch. [9] Though the Mutoh Multi threshold CMOS technique is able of retaining the Information while decreasing the sub-threshold leakage current in the standby condition, but during the mode transition high fluctuation (GBN) is en-gendered which affects the reliability of circumventing active circuitry [6]. This technique withal suffers from high circuit area overhead because of distributed header and footer sleep transistors. [10]

Designing of Power Optimized down Counter using Low Voltage CMOS I/O Standard Technology.

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Abstract: The designing of a 4-bit Down Counter has a simple but robust specification, but it allows N- number of energy and power efficient implementations. The designs are basically analysed on the basis of area, response time and power consumption [2]. In this paper, we have focused on the use of power efficient LVCMOS I/O standard for the VLSI design of Down- Counter. We have validated our circuit at 4 different I/O Standards, namely – LVCMOS 15, LVCMOS 18, LVCMOS 25; and for 3 technologically advanced families – Artix 7 (28 nm), Virtex 6 (40 nm) and Spartan 6 (45 nm).There is a 7.136% and 25.085% reduction, in power consumption, when LVCMOS 15 is used instead of LVCMOS 18 and LVCMOS 25 respectively; and a 84.18% and 34.88% reduction when ARTIX-7 is used in place of VIRTEX-6 and SPARTAN-6 respectively. It was also observed that at 25°C, there is a reduction of 20.69 %, 30.79%, 39.96% and 47.10% in power utilization when the circuit is operated at 1GHz instead of 2GHz, 3GHz, 4GHz and 5GHz respectively at 50% Duty Cycle.

1. Introduction

With the advent of chip designing using large scale integration techniques, there has been a constant motivation for the researchers and scholars to develop a more power efficient design, day by day. VLSI industry has been working for quite a time to achieve it, and with the introduction of Low Voltage Complementary Metal Oxide Semiconductor (LVCMOS) I/O Standard technique, efficiency of circuits have increased drastically. Each LVCMOS offers a particular operating voltage and a wide range of operating frequency to work on. As there is a trend in low power VLSI, means low power consumption, size of device is to be compact, VLSI Engineer is interested in reducing the size of transistor, according to Moore's Law [1]. Xilinx has optimized the work by providing different FPGA's with specific features and integration size of 28 nm with Artix 7 and Kintex 7, 40 nm with Virtex 6, 45 nm with Spartan 6, 65 nm with virtex 5 and 90 nm with Spartan 3. These FPGA's comprise of different basic units including Logic blocks, Input-Output blocks, clock buffers, switch matrix, wire segments and LUTs. In this paper, we have implemented a 4-bit down-counter using Xilinx's Verilog HDL Software, which provides a facility to analyze the designs on different Logic Families, different I/O Standards and the results can be obtained on different operating frequencies and temperatures. Finally, we have compared various results of our experiment and inferred out the efficiency of LVCMOS I/O standard for the designing of a 4 bit counter.

2. Literature survey

John Segers, Jo C. Ebergen [2], explained that in designing a Down Counter the basic concern to be taken care of, was to consider the effects of size and complexity in designing the counter circuit. The operating frequencies and temperature effects the working conditions of the circuit. Moreover, [4] Anu Singla, Amanpreet Kaur & Biswajeet Pandey, broadly articulated that LVCMOS is one of the trending I/O Standard which consumes low power when implemented properly can result in significantly power efficient circuit design. [3] Kanika Kaur and Arti Noor, has also explained various strategies for successfully designing different VLSI components with low power consumption

2.1. Down counter design

Flip-Flops are the basic building blocks of sequential circuits and in electronics they can be easily used to make memory units via implementation of registers. A counter circuit can also be implemented using a register (Synchronous / Asynchronous) with a clock pulse. It can be constructed or manufactured as a separate integrated circuit using VLSI technology. As the name suggests, a down- counter counts down, one-by-one, from a pre- defined value to a pre-set value only under a control unit. In this paper, we have designed a 4 bit down counter using Register Transfer Logic. Then we have processed it with 3 different I/O Standard techniques.

1. LVCMOS 15 – working at 1.5V
2. LVCMOS 18 – working at 1.8V
3. LVCMOS 25 – working at 2.5V

under 3 different families namely
1Artix-7
2 Virtex-6
3 Spartan-6.

Fig 1.Depicts the RTL Schematic Diagram of Down Counter. It comprise of input output buffers and look-up tables.

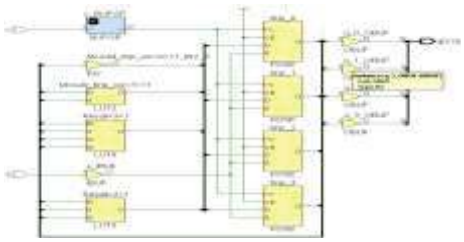

Figure 1 RTL Schematic

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Performance analysis of Logistic Map Interleaver for IDMA Communication System

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Abstract **- Recently, the world community has observed the Interleave Division Multiple Access as an alternative to Code Division Multiple Access scheme due to improved MAI performance and better spectrum efficiency. In IDMA scheme interleavers are used to distinguish the different users and related to system throughput. Random interleaver (RI) is fundamental and popular matrix pattern, which is commonly used for interleaving. However, computational complexity, storage requirement of RI limits the system throughput. In this paper, the analysis of chaos based logistic map interleaver (LMI) is suggested for IDMA communication system. Further, objective of this paper is to find the LMI as an optimum Interleaver in IDMA scheme due to its BER performance superiority over Random interleaver (RI) and Tree based Interleaver (TBI) without the need of extra memory resources and computational complexity. The simulation experiment is performed in MATLAB and results show that chaos based LMI interleaver design can achieve the better performance.**

Keywords **-** ***Chaos, spread spectrum system, bifurcation, IDMA, LMI.***

I. INTRODUCTION

The Code Division Multiple Access (CDMA) systems has been widely used in the third generation of mobile cellular systems due to better bandwidth efficiency, processing gain[1].However it has been observed that, Multi-User detection (MUD) complexity, Intersymbol interference(ISI) and multiple access interference (MAI) are the major constraints, which impediment the use of CDMA in future radio communication(FRC) [2].To conquer above stated problems, Interleaver-division multiple-access (IDMA) scheme has been proposed, in which the limitations of CDMA have been curtailed by using chip level interleavers as an optional way to distinguish different users in multi user environment. The use of interleaver is generally to rearrange the ordering of binary sequences or codeword which alleviate the large burst noise into small bursts over several bits instead of a single coded symbol, and thus provide more noise immunity and better error rate performance. The main performance criterions of interleavers can be listed as [3-4]:

- ✓ Interleaver sequences should not collide to each other.
- ✓ Less computation complexity.
- ✓ Less memory and bandwidth resources requirement.

Chip level interleavers are basically used for distinguishing the users in IDMA system so the same interleavers is also required at the receiver side for proper decoding the data and hence receiver complexity can also be the performance criterion for Interleaver generation [5]. Many interleavers are suggested by researchers such as random Interleaver, orthogonal interleaver, pseudo random interleavers and tree based Interleaver etc. Although all of these interleavers ensure good interleaving performance, less memory requirement. But some limiting factors motivate for further research [5].

So, this paper provides a comparative study of recently proposed interleaving algorithms such as random, tree based and chaotic interleavers in IDMA communication system. Section 2 presents the IDMA system description. Section 3 defines random, tree based and chaotic logistic map interleaver. Next the performance analysis and comparisons are made among above said interleavers in section 4 and section 5 discusses the conclusions drawn on the basis of BER performance analysis and computational complexity.

I. IDMA SYSTEM DESCRIPTION

In Fig 1, the Interleave Division Multiple Access (IDMA) system with K users is considered. At the transmitter, a n-length input data sequence $b_k = [b_{k1}, b_{k2}, \ldots, b_{kj}, \ldots, b_{kn}]$ of k^{th} user is spreaded and encoded into chips $c_k = [c_{k1}, c_{k2}, \ldots, c_{kj}]$, where j is the chip length and chips are interleaved with a specific interleaving pattern based on chaotic maps to produce transmitted chip sequence $x_k = [x_{k1}, x_{k2}, \ldots, x_{kj}]$. For

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An Optimezed Low-Noise Amplifier with Mutually Coupled Load for Ultra-Wideband Application

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Abstract— **This paper presents a cascaded complimentary gate (CCG) stage, wideband low noise amplifier (LNA). CCG stage save DC power using current reuse technique. A biasing metric is also used to optimize power consumption by keeping trade-off between efficiency, intrinsic gain, and operating frequency. To optimize noise figure and chip area a mutually coupled transformer feedback is used in which source inductor and gate inductor is coupled with coupling coefficient k. The proposed LNA is simulated in 90-nm CMOS process and measured maximum voltage gain is >10 dB, minimum NF <2.0 dB, S_{11}< −10 dB, maximum available power gain (GA) is 11.2 dB and measured 3dB frequency range is 3.5GHz to 8.9 GHz.**

Keywords— wide band Input matching, low-noise amplifier (LNA), noise figure (NF), matching network, transformer, cascade complimentary gate (CCG).

I. INTRODUCTION

A front end wireless sensor network is always required in the field of healthcare, agriculture, industrial circuit and image processing, which consume low power for high battery backup, and provide low noise figure for high signal to noise ratio(SNR). In wideband (3.1GHz-10.6GHz), Low Noise Amplifier (LNA) design become a challenging task due to reduction of CMOS Technology with the passes of time, which limit the usable circuit topology and degradation in the velocity saturation and mobility [1]-[4], but it is beneficiary in the direction of low supply voltage and low power consumption hence improve in the battery backup. In the literature survey, a lot off well known techniques are suggested for design of the wide band LNA such as a distributed amplifier topology as shown in Fig.1 (a), in which internal gate to source capacitance (C_{gs}) resonate with external inductor at high frequency and hence provide large bandwidth. Apart from this it also provide high gain because in there a no. of stages are connected in cascade. So resultant gain is the multiplication of individual one. But this technique has a problem with large power consumption and large chip area due to a no. of transistor connected in cascade [5]-[8].

Next one is the common gate (CG) technique as shown in Fig.1 (b). A 50Ω wideband input impedance matching can be obtained by setting the value $g_m = 20mS$ because looking from source terminal, input impedance is given by $R_s=1/g_m$ and best part of technique is that input impedance is resistive and independent from other circuitry parameter and frequency.

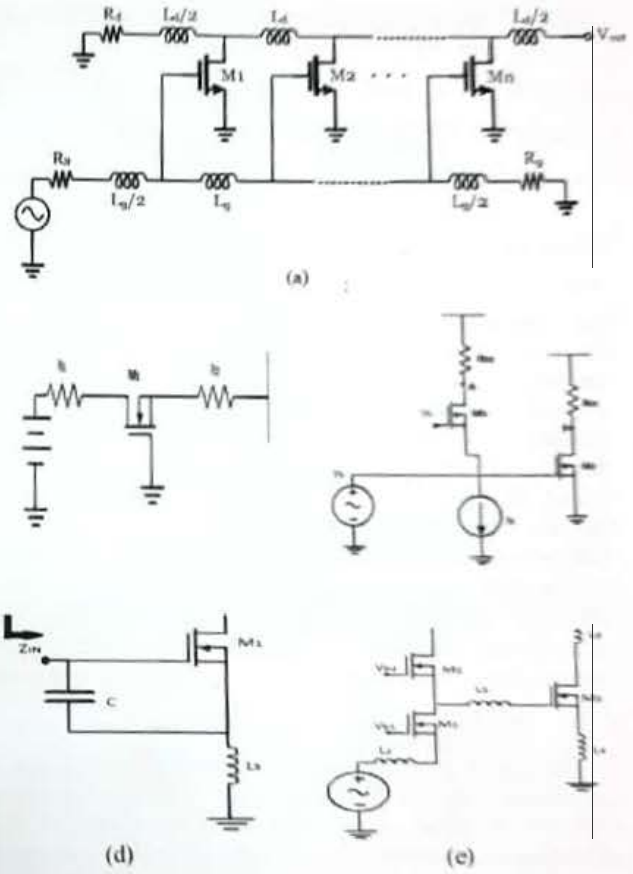

Fig.1. Different architecture topology used in Wideband LNA (a) Distributed Amplifier (b) CG amplifier (c) Noise Cancellation (d) Source degeneration (e) CG-CS structure

But this technique still suffer by the problem of minimum Noise Figure which is given by $(1+\gamma g_{d0}/g_m)$, where γ is thermal noise coefficient and g_{d0} is output conductance.

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Implementation and analysis of Differential-Type and Latch-type Sense Amplifier Circuits with Low Power Reduction Techniques in sub 90-nm

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Abstract— In proposed work, low power reduction techniques such as footer stack, MTCMOS (Multi-Threshold CMOS), sleepy stack and sleepy keeper have been implemented in latch-type sense amplifier circuits and differential-mode type sense amplifier circuits in 90nm technology gpdk using Cadence tool. It has been observed that voltage-mode sense amplifier and voltage-latch sense amplifier consume 86.66 µW and 419.502 µW power respectively. Furthermore, current mode sense amplifier and current latch sense amplifier consume 54.245 µW and 152.899 µW power respectively. These results show that differential mode sense amplifiers consumed less power as compared to latch type sense amplifier. Moreover, it has been also found that implementation of low power reduction technique such as footer stack in voltage differential mode and in voltage latch results 39% and 38% reduction in power consumption respectively. However, implementation of MTCMOS results 57% reduction in power dissipation in current latch sense amplifier.

Keywords*—VMSA(voltage-mode sense_amplifier),CMSA (current-mode sense_amplifier),VLSA (Voltage-latch sense_amplifier), CLSA (Current-latch sense_amplifier) ,*SRAM StaticRandomAccessMemory)

I. INTRODUCTION

Now days, in microprocessor "SRAM" used as cache memory which utilized to increase the speed of processor and also has the advantages of consume low power [1-2]. "SRAM" contains memory array and peripheral circuits (decoder, sense_amplifier, etc.). Array is the core part of the "SRAM", but its structure is relatively fixed because of constraints at technological level. Thus, the performance of the "SRAM" is improved mainly through improving the peripheral circuits [3]. Sense_Amplifier is one of the essential circuits among the all peripheral circuits. It mainly determined the power consumption and access time of memories [3]. Sense_Amplifier is utilized to access data fast by sensing and amplify the small difference in signal on the bit_lines [4]. It can be classified by circuit types such as differential and non-differential and by operation modes such as voltage, current and charge transfer amplifiers [5]. In proposed work, both the latch-type and differential-type sense_amplifier circuits have been implemented along with the low power reduction techniques to minimize the power dissipation.

II. LEAKAGE POWER REDUCTION TECHNIQUES

This section includes the basic operational methodology of leakage power reduction techniques such as footer stack, MTCMOS (Multi-Threshold CMOS), sleepy stack and sleepy keeper which have been implemented in both the latch-type and differential-type sense_amplifier circuits to perform the analysis of power dissipation.

A. MTCMOS

This technique [6] can be realized either st_tically or dyn_mically. In st_tic realization, crucial path devices are allotted to low 'Vt' value to improve their performance while non-critical path devices are allotted to high 'Vt' value for leakage power optimization. In dyn_mic realization, operational block allot to lower 'Vt' value which connected to the virtual GND line. This line pursued the main GND rail through high 'Vt' transistor called sleep transistor. In active-mode, the sleep signal is 'ON' thus the 'low V_{th}' permits the performance of operational block at the higher speed. But in standby-mode, sleep signal revolve off the 'high V_{th}' transistor due to which virtual GND line floats and the design cycle is generally shorted to limit the leakage current. This technique is also known as power gating technique [7].

B. Sleepy-Stack Technique

The sleepy-stack approach combines the sleep and stack approaches. This technique divides the single transistor into two half-size transistors [8]. Between the divide transistors, one of the sleep transistors will be added in parallel. It also adds sleep transistor to disconnect the power supply and ground from the network so that there is no power

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Analysis of Low Power Reduction Techniques On Cache(SRAM) Memory

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ABSTRACT—This paper proposes the single-bit cache memory architecture with its peripherals like write driver circuit, a precharge circuit, SRAM Cell and Charge-Transfer Sense Amplifier. Then, low power reduction techniques such as Forced –Stack Technique, Sleep-Stack Technique, Variable Body Biasing technique etc. is applied over SRAM cell.Furthermore, SRAM cell along with low power reduction technique i.e. with Forced Sleep results in 40% reduction in Power and 43% reduction in PDP.
In a single-bit cache memory architecture, SRAM with Forced Sleep Technique and with Charge-transfer sense amplifier is designed which consumes 5% reduction in power, 42% reduction in Read Delay, 20% reduction in Write Delay and 7% reduction in PDP.

Keywords — SRAM (Static Random Access Memory), VBBT (Variable Body Biasing Technique), FCT(Forced Stack Technique), WDC (Write Driver Circuit), PCH (Pre-Charge Circuit), CTSA (Charge-Transfer Sense Amplifier), PDP (Power Delay Product).

I. INTRODUCTION

Recently, a lot of focus has been paid in the design and implementation of high-speed "SRAM" because of its incredible requirement as a cache memory which plays an essential role in the processing of information and in modern portable devices like PDA and cellular phones [1]. The area of every device on a chip reduces but the density of the chip increases with scaled down in submicron technology. This way of scaling results in various challenges such as power dissipation and reliability [2]. Sense_Amplifier is one of the important circuits which used to read the stored information from the selected memory [3]. Its performance affects the time required to access the memory as well as power dissipation. Conventionally, sense_amplifiers circuit utilized in three configurations such as voltage, current and charge transfer. The voltage mode sense_amplifier used in memories results in speed limitations because of high bit_line capacitances [4]. However, current mode sense_amplifiers sense the cell current directly and show a significant improvement in speed as compared to the conventional voltage mode sense_amplifier [5]. The charge-transfer sense_amplifier offers high performance and low power solutions. It also results in the reduced bit_line swing which leads to lower bit_line energy compare to the conventional voltage mode sense_amplifier. In proposed work, we have carried out an implementation of single-bit "SRAM" cell architecture with current sense and charge transfer sense_amplifier to optimize delay and power dissipation using cadence virtuoso. The write driver circuit, a pre-charge circuit, and "SRAM" are designed and implemented. Furthermore, all the sense_amplifiers are designed and implemented with equal width.

II. LOW LEAKAGE POWER REDUCTION TECHNIQUES

This section includes the basic operational methodology of leakage power reduction techniques such as MTCMOS and footer stack which have been implemented in sense_amplifier circuits to perform the analysis of power dissipation and delay.

A. Sleep Transistor Technique

In this approach, a P_MOS is connected between VDD and "SRAM" cell and N_MOS is connected between "SRAM" Cell and GND [6]. In "active-mode", the N_MOS and P_MOS (i.e. sleep-transistors) both are turned 'ON', because of this there is no change in operation as there is a path between VDD and GND. In "sleep mode" the N_MOS and P_MOS (i.e. sleep-transistors) are turned 'OFF' due to this there is shutting down of power supply to the "SRAM" cell creating virtual VDD and GND path. This approach is also known as "MTCMOS Technique or Power Gating Technique" [7].

B. Dual Sleep Technique

In this technique, there are two pairs having one P_MOS and one N_MOS which are connected in parallel to each other. As one pair is connected between VDD and "SRAM" cell series and another pair is connected between "SRAM" Cell and GND in series. In "active-mode", the N_MOS and P_MOS (i.e. sleep-transistors) are turned 'ON', due to this there is no change in operation as there is a path between VDD and GND. In "sleep mode" the N_MOS and P_MOS (i.e. sleep-transistors) are turned 'OFF' due to this there is shutting down of power supply to the "SRAM" cell creating virtual VDD and GND path [8].

C. Dual Stack Technique

The Dual Stack technique has two extra MOSFET's parallel to sleep transistors. Due to these extra MOSFET's, there is no change in state which is important for the operation of "SRAM" cell. Leakage Power reduces because retention transistors are stacked. Its operation is similar to the case of

Analysis of Cache(SRAM) Memory for Core i™ 7 Processor

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ABSTRACT— This paper presents the implementation of single-bit SRAM cell architecture along with its peripherals in standard gpdk 90nm technology library using Cadence tool. Different sense_amplifiers such as current mode and charge transfer sense_amplifiers have been implemented along with the low power reduction techniques in single-bit SRAM cell architecture. We have mainly focused on read, write delay as well as average power. It has been observed that single-bit SRAM cell architecture consists of charge transfer sense_amplifier results in a reduction of 30-35 % in average power dissipation as well as 1.5 % reduction in read delay and 15% reduction in write delay as compared to single-bit SRAM cell architecture implemented with a current sense amplifier. Furthermore, the single bit SRAM cell architecture along with CMSA implemented with MTCMOS techniques results in 1-5 % reduction in average power dissipation. However, single bit SRAM cell architecture along with CTSA implemented with MTCMOS and footer stack techniques results in about 1% reduction in average power dissipation.

Keywords — VMSA (voltage-mode sense_amplifier), CMSA (current-mode sense_amplifier), CTSA (charge-transfer sense_amplifier), SRAM(Static Random Access Memory), PCH (Pre-charge Circuit), WDC (Write Driver Circuit).

I. INTRODUCTION

Recently, a lot of focus has been paid in the design and implementation of high-speed "SRAM" because of its incredible requirement as a cache memory which plays an essential role in the processing of information and in modern portable devices like PDA and cellular phones [1]. The area of every device on a chip reduces but the density of the chip increases with scaled down in submicron technology. This way of scaling results in various challenges such as power dissipation and reliability [2]. Sense_Amplifier is one of the important circuits which used to read the stored information from the selected memory [3]. Its performance affects the time required to access the memory as well as power dissipation. Conventionally, sense_amplifiers circuit utilized in three configurations such as voltage, current and charge transfer. The voltage mode sense_amplifier used in memories results in speed limitations because of high bit_line capacitances [4]. However, current mode sense_amplifiers sense the cell current directly and show a significant improvement in speed as compared to the conventional voltage mode sense_amplifier [5]. The charge-transfer sense_amplifier offers high performance and low power solutions. It also results in the reduced bit_line swing which leads to lower bit_line energy compare to the conventional voltage mode sense_amplifier. In proposed work, we have carried out an implementation of single-bit "SRAM" cell architecture with current sense and charge transfer sense_amplifier to optimize delay and power dissipation using cadence virtuoso. The memory array is generally large, like for stand-alone SRAMs, the array covers as much as 60-70% of the total area of a chip, and for high end embedded SRAMs it is about 50% [6].
The write driver circuit, a pre-charge circuit, and "SRAM" are designed and implemented. Furthermore, all the sense_amplifiers are designed and implemented with equal width [7].

II. LOW LEAKAGE POWER REDUCTION TECHNIQUES

This section includes the basic operational methodology of leakage power reduction techniques such as MTCMOS and footer stack which have been implemented in sense_amplifier circuits to perform the analysis of power dissipation and delay.

A. MTCMOS

This method [8] can be realized either statically or dynamically. In a static mode, critical path devices are allotted low 'Vt' evaluation which boosts its speed whereas the non-critical path devices are allotted high 'Vt' value for optimization of leakage 'power'. In dynamic approach, functional block connected to the virtual GND line, are allotted lower 'Vt' value. This path chases the GND through high 'Vt' which control the active-mode/standby mode. In active mode, the sleep signal is 'on', so that low 'Vt' allows high-speed performance of working block. But in standby-mode sleep signal turns 'off' the high 'Vt' transistor which results in virtual GND path floats and the

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High Gain Bulk-Driven down Conversion Mixer with Improved Noise Figure for UWB System

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***Abstract*—This paper presents a high gain, high linearity and improved noise figure double balanced mixer at 3.432 GHz RF frequency using 180 ηm CMOS technology. To improve the performance of the circuit, LC matched bulk driven technique with biasing transistors in sub threshold region is utilized in this paper. The simulation results shows the maximum gain of 8.748 dB at 3.432 GHz RF frequency, double sideband noise figure of 4.586 dB and (IIP3)of 14.65 dBm.**

***Keywords*— Down-Conversionmixer, UWB, CMOS, Gilbert mixer.**

I INTRODUCTION

Down conversion mixer assumes a vital part in wireless communication system. It up converts and down converts the input frequency. Up conversion mixer depends on the idea that output frequency is higher than the frequency at input and converse is followed by the down conversion mixer. The double balanced Gilbert cell mixer is preferred due to higher gain, good port-port isolation, high linearity and low even order distortion. Gilbert mixer consist of three stage switching stage (LO), trans-conductance stage (RF) and output stage. In this paper bulk driven technique [11] is used. LC Differential matching is used at both LO and RF stages to enhance the gain of the Gilbert cell mixer.

The circuit design of proposed is mixer is given in segment II, Results and discussion are given in section III and conclusion is discussed in Section IV.

II CIRCUIT DESIGN

While designing a mixer, the core of the mixer is preferred as double balanced Gilbert cell mixer due to its advantages of high linearity, good isolation and reduced even order distortion, Gilbert mixer has three stages namely LO stage, RF stage and output stage as shown in Figure 1 [12].

In Gilbert mixer, RF transistors are worked in saturation region and LO transistors are worked at quite recently above pinch off region [5].

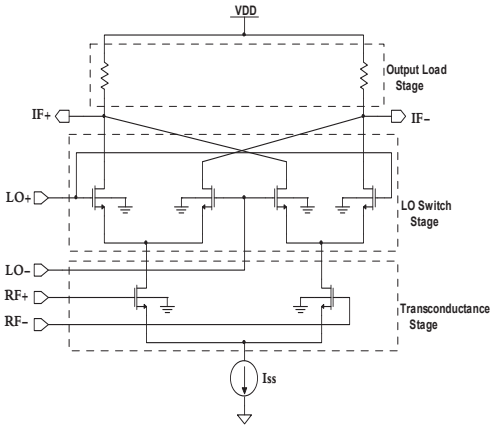

Fig.1 Circuit of basic Gilbert cell mixer [12]

In basic Gilbert mixer as shown in figure 2 [11] six transistors are used and with this technique there is a need of only four transistors by applying RF signal directly to the bulk of LO transistors.

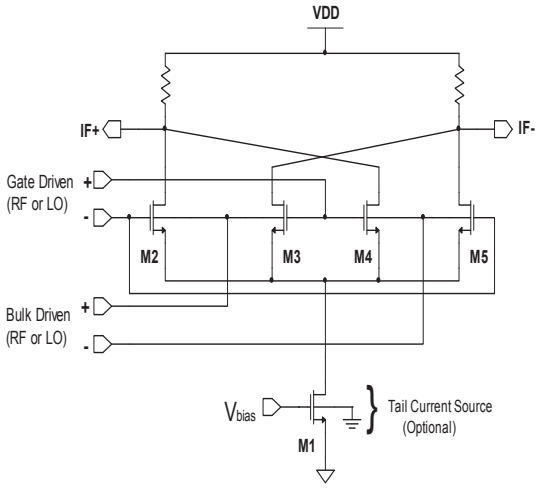

Fig. 2. Core of the bulk driven mixer [11]

New improved Design for Low Leakage and high performance SRAM cell in ULP Applications

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***Abstract*— In present day electronic industry, the device size is day by day shrinking and memory is an integral part of present day battery operated and hand held electronic gadgets. So with the reduction in device size, memory is also scaled down and this increases the demand for low power devices. The utmost requirement is long battery for the devices capable of performing complex functions. Most of the devices use SRAM for cache memory and require low leakage in standby mode. This paper presents 6T SRAM designed using two fingers which shows reduction in leakage power. The simulations and layout are done on Cadence tool using UMC 55nm technology. It is shown that leakage current and delay can be improved by this technique.**

Keywords—CMOS, SRAM, sub-threshold leakage, fingering

I. INTRODUCTION

Semiconductor industry is advancing at a great pace to meet the demand of users. There is need for portable devices that can perform large number of complex functions and have a long battery life. The devices also remain in standby mode for considerable amount of time. Memory is a major part of these electronic devices and hence leakage in memory is the critical issue that must be taken into account for their design. Device size is day by day shrinking so does the memory in the devices. Now with the scaling in technology there is serious concern of leakage power. In most of the devices static random access memory (SRAM) is used for cache memory. Static (or leakage) power affects all kinds of Complementary Metal Oxide Semiconductor (CMOS) circuits but is particularly critical for Static Random Access Memories (SRAMs) since memories have been designed as performance being the primary figure of merit and also memories are accessed in small portions, there by leaving vast majority of memory cells not being accessed for large fraction of time. As reported in International Technical Roadmap for Semiconductors (ITRS), transistors devoted to memory structures in microprocessor based system contributes to significant percentage of the total area occupied by the circuit. Different techniques for leakage reduction in SRAM have been proposed at various levels of abstraction device, circuit, architecture and layout. At lower technologies stand by leakage is a major concern. With the scaling down in technology, in submicron regime leakage current becomes more significant and is comparable to dynamic power dissipation. The full chip leakage power dissipation based on ITRS is shown in Fig.1 [1,2]. For long devices, the non-conducting current mainly originates from reverse bias between drain and source while for short channel devices, the supply voltage is scaled down to obtain low power dissipation as it is proportional to the square of the supply voltage. This leads to reduction in threshold voltage so as to meet the high speed operation but this straightaway leads to exponential increase in sub threshold leakage.

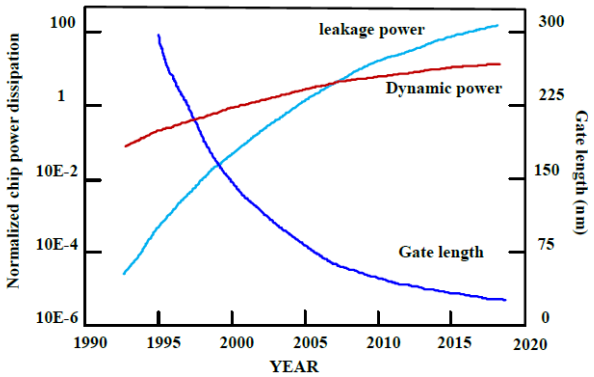

Fig. 1 Full chip power dissipation based on ITRS[1]

There are various leakage current components and sub-threshold leakage is the most significant. Sub threshold leakage current is strongly dependent on threshold voltage of MOS transistor, as normally the device is designed with low threshold voltage transistors so that it can be operated on lower supply voltages without degradation in delay. But this results in high sub threshold leakage current. This paper uses fingering technique to achieve reduction in leakage power of CMOS 6T SRAM cell.

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Control and Techno-Economic Analysis of PV-Diesel-Battery based Hybrid Microgrid System

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***Abstract*—Standalone system based on renewable energy ensure reliable energy supply in rural areas. Research in the field of renewable energy based on various renewable sources like solar, wind etc. are emerging solutions for uninterrupted power supply not only to grid connected loads demands but also to stand alone system specifically in rural areas. This paper discuss the hybrid renewable system for village electrification near Gwalior city of Madhya Pradesh, India. A small area model is simulated using a software Homerv2.68, and a comparative study is done to optimize the system, with affordable power cost per kWh.**

Keywords—PV, HOMER, hybrid Microgrid

I. INTRODUCTION

During recent years photovoltaic (PV) system and wind power are widely used as renewable power generation for dreaming a decontaminated green world. Modern world's enhanced commercial activities and rapid industrialization are increasing the peak demand of electricity in a significant way. Furthermore this increase in demand need to be compensated by increasing power generation, major part of power generation in India is dependent on the fossil fuels like Coal, diesel, Natural gas etc. However efficiency of the thermal power plants using fossil fuels are very low and thus a large percentage of the energy is wasted and harmful gases exhaust, this results in various environmental problems like climate change, melting of glaciers, global warming, rise of sea level and its associated consequences [1]. Fossil fuels are a finite and increases pollution in the environment, thus many countries are moving toward the renewable, green and alternative sources of energy.

Power generation through renewable energy sources like PV, wind etc. are becoming more prevalent for domestic as well as commercial power supply by utilizing them in microgrid, nowadays increasing exponentially. The microgrid is a small interconnected system in which loads are connected to distributed generation and a self-governing control system to deliver electricity locally [2]. This idea support to make a new hybrid microgrid model which define the new microgrid operation [3]. It can react within fraction of seconds so as to meet the required power needs of the connected grid transmission lines and distribution networks, the microgrid meets the local demand of power, increases the reliability of power system and maintain the local voltage level to a permissible limit [4], by the use of abundant heat and wind power available in the environment to provide good efficiency, also reduces the voltage drop and provide stable power to the local users as to ensure uninterrupted power supply or the provision of the improvement in the system [5].

Hybrid energy system is are one of the best so1ution for rural electrification wherever the grid connection does not achieve power demand. Economic aspects of the renewable technologies are the major parameters in deve1oping countries for power generation [6]. These types of challenges gave rise to use renewable sources for generating power. Stand-a1one system suffers with some constraints to feed the peak demand and uninterrupted power supply [7], thus hybrid system provides the viable solution. Hybrid microgrid holds the capability to save the fossil fuel and to reduce the environmental emission to a great extent. The developing technology of hybrid microgrid systems connected with renewable energy power sources represents a new phase towards distributed power generation. Hybrid microgrid systems are commonly used as a single phase system or three phase system for distribution of power in rural or remote areas [8]. A hybrid microgrid can function independently or in connection with lines of the main grid or public grid, also known as Grid connected [9]. The independent operation of microgrid is known as standalone system or off grid system. In standalone operating mode of microgrid is independent operating mode, a distributed generation is connected to the local loads and power demand is meet by the locally available sources of energy. The power generating units should share the whole active and reactive power demand in the microgrid, and they also have to maintain the stability of the microgrid.

This paper organized as follows, in section II the environmental and climatic conditions of the case study area is discussed. Microgrid design and its classification is dealt with in section III. Simulation of the case study is done in section IV and conclusions are drawn in section V.

II. CASE STUDY

This paper attempt to deve1op a genera1 mode1 to find an optima1 hybrid microgrid system among different renewab1e energy combinations for a rura1 area near Gwalior city. A study of hybrid-system is done, using solar radiation

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A 3.432 GHz Low-Power High-Gain Down-Conversion Gilbert Cell Mixer in 0.18 µm CMOS Technology for UWB Application

Gaurav Bansal and Abhay Chaturvedi

Abstract This work presents low-power- and high-gain CMOS down-conversion Gilbert cell mixer for ultrawide band application, designed in 0.18 µm CMOS technology. Inductive source degeneration is used at the RF trans-conductance stage of Gilbert cell mixer to increase its linearity. Differential LC matching is used at RF and LO stage to increase the conversion gain of mixer. Output buffer is used at the load to achieve 50 ohm impedance match to improve the return-loss of the mixer. The proposed mixer shows low reflection coefficient up to −19 dB for entire band ranges from 3.168 to 3.696 GHz frequency. The proposed mixer works at DC supply of 1.5 V with low power consumption. Simulation results show that the mixer achieves the conversion gain of 10.60 dB, 1 dB compression point of −10.596, IIP_3 is +0.056 dBm and matched RF (input) port impedance of 50.7 ohm.

Keywords Differential LC-matching network · Gilbert mixer · Down-conversion mixer · CMOS

1 Introduction

Federal communication commission introduced the ultrawide band (UWB) technology in the frequency range of 3.1–10.6 GHz. The UWB plan is shown in Fig. 1.

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PROCEEDINGS PAPER

Prediction of electronic and optical properties of ZnAl2Te4 defect chalcopyrite semiconductor: an ab-initio study

Author(s): Rishikanta Mayengbam; S. K. Tripathy; B. P. Pandey

FORMAT	MEMBER PRICE	NON-MEMBER PRICE
PDF	**$17.00**	**$21.00**

Paper Abstract

In this paper, we have investigated the structural, electronic and optical properties of ZnAl2Te4 defect chalcopyrite semiconductor using generalized gradient approximation (GGA) within density functional theory (DFT). We have calculated the optimized lattice constants (a and c) and compared with the available experimental values. The optimized lattice constants have been used to calculate the energy band gap and found to be 1.57 eV. The partial density of states and total density of states have been discussed in detail. The frequency dependent dielectric constant and refractive index have been calculated and plotted in the energy range 0-13 eV. All the above parameters have been compared with the available experimental and theoretical values and found good agreement between them.

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Power Efficient SAR ADC Designed in 90 nm CMOS Technology

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***Abstract*—A 8-bit Successive Approximation Register (SAR) Analog to Digital Converter (ADC) is designed using non redundant SAR structure and sequencer/code Register structure for low power operation. The designed ADC structures provide optimum results for all three circuit design challenges: speed, area and power. Among the two designed SAR ADCs, non-redundant SAR structure ADC and sequence/code register SAR structure ADC is power efficient than SAR ADC designed for the same feature size. Design and simulation of various SAR ADCs has been done in 90 nm CMOS Technology.**

Keywords—SAR, DAC, ADC, Comparator,Power dissipation.

I. INTRODUCTION

Analog to digital converter can be realized in various ways, such as counter type ADC, Flash ADC, Dual slope ADC. Apart of these ADCs, only SAR ADC is the one widely used for précised and accurate, medium speed conversion of Analog signal. It uses a feedback scheme to approximate each analog sampled signal to digital equivalent value. It contains Sample and hold circuit, Digital to Analog Converter (DAC), SAR and a voltage comparator. The accuracy of ADC is mainly depends on the precision of DAC matching component and comparator's ability to resolve small change difference between input and output of DAC. The speed of ADC is directly depends on settling time of both DAC and comparators. Speed of SAR ADC depends on the size of ADC i.e. number of bits required to represent the output.

ADC is used in interfacing various analog systems to digital system in mixed signal Design environment. These SAR ADCs are used to generate accurate result in various Digital System processing systems where conversion time is not the major concern.

During last few years various techniques have been introduced to support the reduction in supply voltage and power dissipation in signal processing systems. This is primarily important to increase battery life of the device and continued scaling of feature size. For low voltage operation, there are three major challenges. First one comes from when we are going to deep submicron technology, the device feature size such as channel length, gate oxide thickness continued to scale down. The supply voltage has to be reduced [1] to ensure device reliability. Second issue is due to increasing the number of component on single chip. As per semiconductor physics, the Si chip dissipate a specific amount of power per unit area. Since the increasing density of component allows more function of electronics per unit area. To prevent over heating of chip, the power of the electronic circuit should be limited .The third problem is related to the battery powered system due to portability in order to have good functionality the supply voltage and supply power have to be reduced.

Designing of low supply voltage ADC is a great challenge because the threshold voltage of MOSFET devices cannot reduce at the same rate as supply voltage. Therefore, at low voltage level there must be a trade-off between speed and power dissipation due to small available headroom. To compensate these problems different technique has been used to realize ADC's such as Boot Strapped Technique [2], high Performance Driver [3]. In [4] a 8–bit 250MS/s SAR architecture with novel comparator has been reported.

In this paper presents two different SAR ADC design with different SAR logic and DAC. These ADC's are design for medium resolution and low power application such as data converters. The sub block of ADC discussed in section 2 and section 3 describes the circuits simulation and results are given in section 4.

II. ARCHITECTURE OF SAR ADC

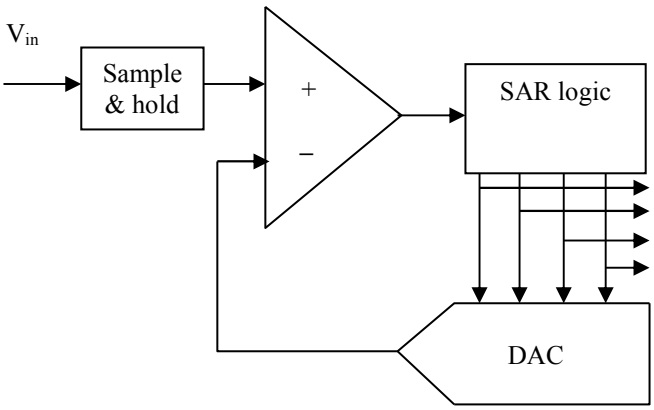

Fig. 1: Block Diagram of SAR ADC

Temperature- and Color-Based SDSS Stellar Spectral Classification Using Automated Scheme

Amit Goyal, Jayash Kumar Sharma, Darpan Anand and Manish Gupta

Abstract Automated techniques minimize the complexity, saving time and efforts in the object classification and their analysis. Sloan Digital Sky Survey (SDSS) is one of the spectroscopic surveys releasing large data sets. Astronomers are looking for some automated techniques so that they can analyze these massive data sets which are now publicly available. We use Feed Forward Back Propagation (FFBP) Neural Network for automatic classification. Classification of stars is performed on the basis of two parameters that are temperature and color. 1500 SDSS spectra are classified into 4 spectral types, and around 2359 SDSS spectra are classified into 7 spectral types ranging from A to K and O to M type stars by using color and temperature, respectively.

Keywords Stellar spectra · Spectral type · Sloan digital sky survey (SDSS) Neural network

1 Introduction

Tools of data mining have found applications in various fields like object classification, data compression, etc. They are now being used in star-galaxy classification, stellar classification, etc. In astronomy, databases are getting larger day by

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Experimental Investigation of Optimum Wind Speed for Material Dependent Temperature Loss Compensation in PV Modules

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Abstract— **Energy is the key factor for the growth of any nation; it is important to analyze the true potential of energy. Worldwide societies are searching options for sustainable development. Recently solar energy has contributed a lot in the renewable energy; Sun light is available in abundant amount at maximum places on the globe. Solar Photovoltaic Systems are used to convert sun light in to electricity, which are static generators require least maintenance. It is estimated that 70% of the world total energy consumption can be provided from renewable; hence renewable energy is a choice for sustainable development and economic growth. The performance of Solar Photovoltaic Systems is site dependent, manufacture indicate the efficiency of conversion in STC (1000W/m^2, 25 °C, A.M. = 1.5) at the back side of the module. Although many researchers have contributed in the area of performance improvement of solar PV Systems since last three decades, however yet it is difficult to generalize the performance considering different parameters like irradiance, ambient temperature and wind velocity. Generally natural wind speed effect is omitted, which leads to significant amount of energy neglected at windy locations. Earlier solar PV systems were of small ratings but now days; these systems are installed in large ratings. Thus true potential is not estimated by project planners hence over estimation of system size and long payback period is observed.**

In present work it is tried to analyze experimentally that up to what extent, wind velocity can reduce the thermal losses. During experiment it is observed that for average good wind speed 2-4 m/s even at low irradiance, Solar PV systems could be as efficient as that in STC because temperature losses can be brought down below 5% by natural wind cooling.

Keywords— Solar module; wind cooling; Thermal losses; Material, efficiency;

I. INTRODUCTION

Indian government has set the target to achieve 175 GW from renewable energy sources by 2022, out of which 100 GW must be produced by solar energy as shown in Fig. 1. Solar energy can be converted in to electrical energy by solar PV generator or solar thermal power plant. Roof top power plant is based on solar PV technology [1]. To generate the large amount of power, a number of modules are connected in series and parallel. Solar cell is the basic unit of modules; these cells are made of semiconductor materials. The performance of solar cell is mainly affected by irradiance and ambient temperature; since power temperature coefficient of solar cell is negative hence its output power drops with increase in temperature. Various types of modules are available having different power temperature coefficient as shown in table 1[2], [3] and [4].

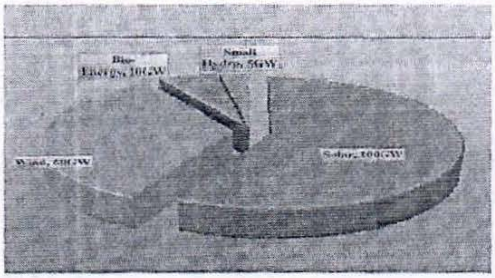

Fig. 1. Renewable Energy Targets by 2022.

TABLE I. DIFFERENT TYPES OF MODULE TECHNOLOGY, EFFICIENCY AND POWER TEMPERATURE COEFFICIENT.

S. no.	Module Technology	Efficiency	Power temperature coefficient(β)
1	Mono Crystalline silicon	18.4 %	(- 0.48 % / °C)
2	P-crystalline silicon	14.1 %	(- 0.45 % / °C)
3	A silicon	6%	0.19 % / °C
4	Thin Film	10.7%	0.25% / °C

Efficiency improvement is always a concern for researchers, since power drops with increase in temperature hence temperature dependant electrical efficiency is given by D. L. Evance [5]. C-silicon and M- silicon are two most mature technologies having maximum efficiency among all available technology but they suffer from power drop at higher temperature due to high power temperature coefficient. Other less power temperature coefficient technology for manufacturing the solar cell are available but on the cost of low efficiency [6]. Although the performance of solar cell is primarily affected by the material used, performance ratio decrease with latitude because of temperature, but higher altitude regions have better performance [7]. The operating

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Z Source Inverter Application and Control for Decentralized Photovoltaic System

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Abstract—**Renewable energy sources and technologies are increasingly gaining popularity in developing countries as their increasing energy demand can be met by the unexplored potential of renewable energy. With help of decentralized system the power can be directly used at local load centers which will ease centralized grid. The Impedance Source Inverter (ZSI) has many unique advantages as compared to normal Voltage Source Inverter (VSI) and is suitable for both centralized and decentralized applications. This paper elaborates the distinguishing feature of ZSI which makes it suitable for isolated and grid integrated applications for a source whose nature is highly intermittent. Operating principle, steady state analysis, different carrier modulation techniques to control shoot-through (ST) states are described. ZSI is able to maintain the constant load bus voltage when connected to a highly intermittent PV panel with help of suitable control technique. Its superiority in decentralized photovoltaic (PV) application is verified with help of MATLAB/Simulink environment. An insight of interdependency of semiconductor device voltage stress, boosting factor (B) and modulation index (M) for sinusoidal pulsewidth modulation (SVPWM) control techniques is also presented.**

Index Terms—**Renewable energy, Decentralized generation, Impedance Source Inverter (ZSI), Shoot-through (ST), SVPWM**

I. Introduction

In recent years the energy demand in developing and developed countries had increased at a rapid pace. As the rate of electricity consumption at user end is growing faster than the growth of the energy generation hence there is a need of more generation for whole of the world. US energy information administration (EIA) has projected a 48% increase in world energy consumption from 2012 to 2040 and major increment is shared by developing nations as major challenges for them will be, energy access to all, increasing population and increasing energy demand, rapid urbanization [1]. In OECD (Organization for economic cooperation and development) nations, where infrastructure are more mature and population growth is relatively slow or declining, electric power generation will increase by an average of 1.2% per year from 2012-2040, where this number is 2.5% per year for non-OECD nations [1]. Contribution of renewable energy in total electricity generation is eagerly welcomed by all nations, renewable generation facilities are growing at fastest rate due to increased global public awareness, dependency on fossil fuel (increasing cost), combined heat and power (CHP) operation, protocols for reduced carbon emission, government policies and incentives.

Some of the promising renewable energy resources are wind, photovoltaic (PV), micro hydro, biomass, geothermal, ocean waves and tides. Global installed capacity for solar powered electricity has seen an exponential rise reaching around 227GW (at the end of year 2015), which is 1% of total global electricity generation [1], [2]. Due to a common consensus on increase of renewable power generation in total energy production by each nation and an aggressive central/state policy to full fill the annual targets had favored renewable energy market as a result there is a decline of 80% in price of solar PV module since 2007 (from US$4/Watt in 2007 to US$1.8/Watt in 2015) [2], as a recent example in 2017 Solar power tariffs in India have plunged to a new low of Rs 2.44 per unit for a 500 MW solar park at Bhadla, Rajasthan. Some of the PV technological barriers which can be improved in future are low capital investment, high conversion efficiency, long module life (> 35 years) and low degradation (< 0.3% per year).

In past two decades extensive research has been taken place in renewable energy worldwide, including feasibility report, site selection, policy making and suitable technology selection [3]–[5], as a result PV and wind technologies are penetrating market at a much faster rate. But due to intermittent nature of solar it can be used in coordination with other renewable sources or conventional sources forming a microgrid. The hybrid system can be grid connected or can act in standalone, in both cases a decentralized power distribution is possible. Characteristics of a decentralized power distribution is generation near load center, as cost of delivering electricity to remote areas can be minimized using distributed generation and also grid extension is not a cost effective solution. Decentralized systems operates at low power scale (few kWh), globally there is an increase in percentage share of such systems in past decade [6]. The performance of a decentralized generation will be entirely based upon the geographical location, nature of load, size of population, integration schemes, extent and objective of coordinated control [3]–[7].

In a decentralized PV system inverter is an integral part, the traditional inverters are mainly voltage source inverters (VSI)

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Sliding Mode Controller Based Quadratic Boost Converter For Fuel Cell System

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Abstract—**Electric vehicle provides better performance in comparison of an Internal Combustion engine based vehicle. Conventionally, application of FC is as primary source of energy in electric vehicle as it provides better efficient and pollution free source of energy, unfortunately FC has slow dynamics response. As FC continues supplies power to load so control technique for FC system is required. For boosting output voltage of FC a power converter should be designed to meet some requirements such as regulated DC bus voltage and asymptotic stability of system. Switching frequency of conventional boost converter is limited which results reduction in voltage profile of dc bus, so for eliminating problem of switching frequency components of two boost converters are combined using a single switch, new converter is termed as quadratic boost converter. This will improve switching frequency and output voltage of boost converter. This paper presents control technique for boosting output voltage of FC using a quadratic boost converter and for controlling DC bus voltage under load variation condition sliding mode controller is used.**

Keywords— fuel cell; quadratic boost converter; pi controller ; sliding mode controller; routh-hurwitz method.

I. INTRODUCTION

Electric vehicle is a vehicle that uses electrical energy for rotation of propulsion system. As it uses electrical energy resulting in pollution free energy for automobile industry. Internal combustion engine uses petrol, diesel for its propulsion system which produces air pollution as well as high emission resulting in global warming.

Electric vehicle uses battery, ultra-capacitor, Fuel cell (FC) as energy source for propulsion system. FC is unable to respond alone in sudden change in load that is why an ultra-capacitor is used for propulsion system during transient condition. Ultra-capacitor also charge during regenerative braking. As FC is conventionally used as primary energy source for hybrid electric vehicle so it is necessary to handle FC management for electric vehicle [1]-[3].

FC is a pollution free source of electrical energy as it never produces any dangerous gases. Normally application of FC in electric vehicle as primary source, which can supply uninterrupted power to propulsion system. FC will continuously provide energy on change in demand continuously until the fuel and oxidants are provided [4].

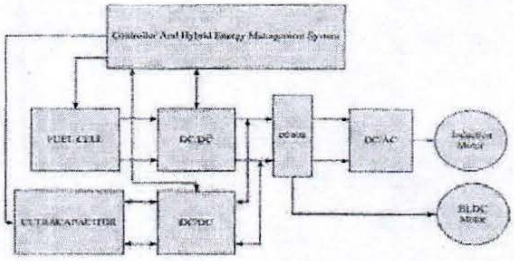

Figure 1. Block diagram of FC based hybrid electric vehicle.

Some different types of FC are already in market like Alkaline Electrolyte FC, Molten Carbonate FC Direct methanol FC, Phosphoric Acid FC, solid oxide FC and Proton Exchange Membrane FC (PEMFC). Out of all these FC PEMFC is most suitable and effective FC for conversion of energy in electric vehicle. PEMFC's has higher efficiency, low operating temperature (50°-100°) and it never produces any dangerous gas so it is eco-friendly nature. PEMFC can't offer fast response due to slow electrodynamics and chemical reaction in it, therefore it cannot reply to unforeseen modification in load [4]-[6]. Another disadvantage is Starvation development. Lack of Fuel or oxygen cell can cause voltage drop during unforeseen energy demand.[7]-[9].

As FC is primary energy source; so it provides regular power to propulsion system that is why it is necessary to regulate the output voltage of FC. As voltage profile of FC is less, a quadratic boost converter interface the FC and dc bus. A control technique is designed for quadratic boost converter to maintain dc bus voltage in proportion to load change. This paper presents a quadratic boost converter for boosting the voltage profile in load change condition and for controlling voltage profile of dc bus a sliding mode controller is used.

II. ELECTRIC POWER MANAGEMENT SYSTEM

The hybrid electric vehicle consists of FC having efficient and less emission of dangerous gasses comparatively to different supply of oil energy. Generally hydrogen and air are used as fuel for FC; it will help to decrease the utilization of typical (non-renewable) source of energy. A quadratic boost converter is interfaced in FC and dc bus. Input control

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Particle Swarm Intelligence based Dynamic Economic Dispatch with Daily Load Patterns Including Valve Point Effect

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Abstract—**The main aim of a power engineer is to develop a highly reliable power supply system. The goal of a Dynamic Economic Load Dispatch (DELD) problem is to establish a generating schedule of power generating units corresponding to the most economical point of operation keeping the change in daily load patterns into considerations over a given time horizon. This also attempts to lower the operating cost and the fuel consumption. This research work makes a contribution in finding an optimal solution of DELD problem by using the proposed solution technique, based on Particle Swarm Optimization (PSO) technique. PSO is used to find the optimum generation schedule for all the power generating units to supply power to the load at the minimum possible running cost and the fuel consumption, at the same time satisfying all the system constraints like: Valve point effect, Ramp rate limits and transmission losses. Th simulation is carried out on a system of 5 generating units over the time horizon of 24 Hours with the proposed PSO and the results are compared with the results obtained from other methodologies such as Simulated Annealing (SA), Differential Evolutionary (DE) and Heuristic Algorithm (HS).**

Index Terms – **Dynamic load dispatch; Daily load patterns; Particle swarm optimization; Ramp rate limits; Transmission losses; Valve point effect.**

I. INTRODUCTION

The main objective of any power engineer is to design a reliable, optimum and efficient power generation system at minimum possible cost of product and services. Therefore it is necessary to establish an economical and reliable power generation plan. In coming future the need of energy will definitely rise causing more complex interconnections of the electric networks worldwide, therefore it is necessary to lower the running cost of electrical power generation systems to meet the continuously soaring prices of energy. Small savings in the system operational costs reflects a substantial reduction in the overall cost and a large saving in the fuel consumption. So to meet the highly dynamic power demand, Constraints of supply systems becomes a challenging task for the power engineers. Therefore it becomes a challenging job to continuously monitor the power plant operation. We put all efforts to make sure to feed at least the committed units to the load while keeping fuel cost at minimums per the uncertainties in load demand forecast in all the different time intervals in a feasible and acceptable manner [4, 5].

Dynamic Economic Load Dispatch is another optimization problem in the power system operation. The main objective of DELD problem is to find out the optimal solution for the most economic operating point of the generation schedule for a given frame of time. The goal is to supply power at minimum possible running cost thus the problem in hand is a dynamic problem of optimization with the constraints like ramp rate limit and valve point effects [1]. The static approach of Economically dispatch of power considers that the amount of power supplied by the Online set of generating units to be fixed for a given horizon of time and simultaneously tries to reduce the cost incurred in supply of electric power under the constraints applied over the static power generating units. The thermal gradient inside the turbine is also a constraint that has to be kept within the safe limits so that any possible damage to the generating units or the boilers can be avoided. This constraint is technically termed as a ramp rate limit, it is a mechanical constraint that expresses incremental or decrement rate of the output power during fluctuation in the power demand. This ramp rate limit constraint discerns a Dynamic ELD problem from a Static ELD problem moreover; because of this constraint the DELD problem is not applicable to a single value of load but it is the most precise methodology to find a solution of ELD problem.

In general, to solve a DELD problem, the total dispatch time is sub divided in small time intervals and then solved as per the static ELD problem for each individual interval assimilating the ramp rate limit constraint. Earlier, conventional approaches such as lambda iterative method [6], gradient projection method [7], linear [8] and dynamic programming [9] methods were used for solving the DELD problem. In these methods, computational time increases with the increase of dimension of the problem. In order to get the qualitative solution, Gradient type Hopfield neural network [10] was used to solve DELD problem. The Hopfield network have a problem that it takes a long computational time and energy to find optimal solution if the function is not a suitable sigmoid function [11]. Stochastic search optimization techniques such as genetic algorithm (GA) [12], evolutionary

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Study and Implementation of Boost-Derived Hybrid Converter With Simultaneous DC and AC Outputs

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Abstract— In this paper a work is done on the new topology of converter that can convert concurrently into DC and AC outputs from a solitary dc input in a single stage. This topology can be achieved by using VSI bridge network in place of controlled single switch of step-up converter. This paper investigates the use of single step-up (boost) stage architecture to supply hybrid loads. This new hybrid converter topology needed less switches in respect of conventional method. The suggested topology will also improve the reliability, which is an outcome of its inherent property of shoot through at the VSI stage. The strategy of controlled PWM is being analyzed and modified in accordance to achieve the desired duty cycle to examine the behavior of BDHC topology. The integration of solar panel and fuel cell stack as a dc input source has been prepared in Matlab/Simulink and its execution is done to authenticate the working of BDHC topology. The comparison of various Simulink models has been performed for different duty cycle to study the output nature of different types of loads.

***Keywords*— boost derieved hybrid converters (BDHC); voltage source inverter (VSI); pulse width modulation (PWM).**

I. Introduction

Over the last two decades, there are lots of new renewable energy technologies have been introduced and being utilized in rural as well as in urban areas. Amongst the several, some of the renewable energy systems and devices are commercially available in the markets. A planned series of future events on the renewable and sustainable energy holds the entire gamut of upcoming technologies, with the enhanced versions of solar thermal and solar photovoltaic system, hydrogen energy, fuel cell powered system, electric vehicles systems etc. [8]. With the increase in demand for the electrical energy due to technological developments and increase in population, decaying of fossil-fuel and environmental concerns such as urban air pollution, global climate change are boosting up rapidly.

Modern advancements being done in the field of hydrogen powered applications unveil the hydrogen as a requisite energy carrier for the hydrogen economy. As the hydrogen economy is being boost up in the future, the forthcoming energy models might consist of renewable energy sources which will be utilized to generate hydrogen, and energy requirement might be satisfied using renewable energy sources and fuel cell systems in hybrid topologies.

In current scenario, for professionals like technicians, engineers and scientists, the photovoltaic technology presents an exciting and bright future [8]. The concept of nano or micro grids is increasingly incorporated and implemented in modernized smart power systems. The foregoing systems have various types of loads i.e., DC and AC loads, which are capable

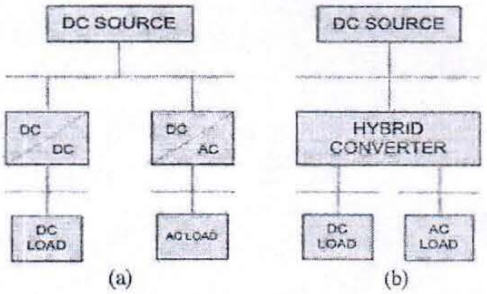

Figure 1. Block diagram Representation: (a) Conventional Converter topology (b) New BDHC topology to drive DC and AC loads concurrently.

of being interfaced with different conventional or non-conventional energy sources [1]. This interfacing is achieved by using the power electronic converters. With this in mind, to drive dc and ac loads concurrently from a single dc input in a single step, a new topology of BHDC can be implemented [1]. The schematic diagram of a hybrid system is shown in Figure 1(b), where there is only a solitary dc source (V_{dcin}) which supplies both DC (V_{dcout}) and AC (V_{acout}) loads. The input dc supply can be a battery, solar panel, fuel cell stack etc. The schematic shown in Figure 1(a) utilizes separate converters in every conversion stage (i.e. DC-DC conversion and DC-AC conversion) on the other hand Figure 1(b) shows the utilization of single conversion step to execute each conversions. The aforementioned topology is known as hybrid converter having improved reliability due to its inherent property of shoot through at the VSI stage. The aforesaid topology has high density for power processing as compared to the two conversion stage converters. All these improvements in new hybrid topology make it a compact system to drive DC and AC systems concurrently.

II. BDHC

A. Modification of Conventional Circuit

Conventional Step-up (Boost) Converter is modified by changing the controlled single switch with a Conventional VSI network [2]. This topology is helpful to improve the realization of renewable energy system in rustic areas and built it as a compatible system to sync with various input sources.

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Robust Quadratic Boost Converter For Fuel Cell Application

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Abstract—**Conventional automobiles uses petroleum product as fuel for its propulsion system. This petroleum product are going to be finished within next few decades, as well as emits greenhouse gases and air pollutant which are responsible for global warming. Efficiency of petroleum based automobiles is also low. The issues of the conventional automobiles can be overcome by replacing it with electric vehicle. An electric vehicle uses fuel cell as primary source of energy. For this application there is requirement of high power dc-dc boost converter, which step-up load voltage as per as vehicle requirements. Switching frequency of conventional boost converter is limited which results reduction in voltage profile of dc bus, so for eliminating problem of switching frequency components of two boost converters are combined using a single switch, known as quadratic boost converter. This paper introduces a sliding mode controller based quadratic dc-dc boost converter for fuel cell system. The stability of the proposed controller is determine by Routh-Hurwitz and robust loop shaping criteria which decides the range of K_p and K_i in which the close loop system always operate in stable region. The testing of the designed controller verified by simulating whole system in MATLAB/Simulink 2013a.**

Keywords— fuel cell; quadratic boost converter; pi controller ; sliding mode controller; routh-hurwitz method.

I. Introduction

Internal combustion engine uses petroleum product like petrol and diesel for its rotation system which produces greenhouse gasses as well as high emission resulting in global warming. Electric vehicle is a vehicle that uses electrical energy for rotation system. Use of electrical energy makes automobile industry pollution free.

Electric vehicle uses energy source such as battery, ultra-capacitor, Fuel cell (FC) for propulsion system. FC is unable to respond alone in sudden change in load that is why an ultra-capacitor is required for propulsion system during transient condition. Ultra-capacitor also charges during regenerative braking of motor. As FC is conventionally used as primary source of energy for hybrid electric vehicle so it is required to handle FC management for electric vehicle [1]-[3].

FC is a pollution free source of electrical energy as it never produces any harmful gases. Normally application of FC in electric vehicle as primary source, which can supply uninterrupted power to propulsion system. FC will continuously provide energy on change in demand continuously until the fuel and oxidants are provided [4].

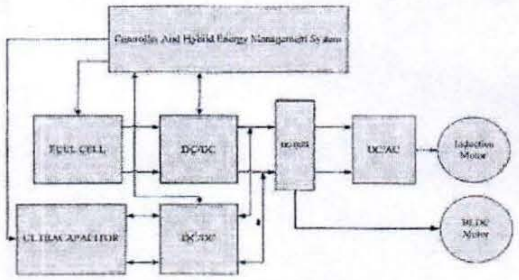

Fig. 1. Block diagram of FC based hybrid electric vehicle.

Some different types of FC are already in market like Alkaline Electrolyte FC (AEFC), Molten Carbonate FC (MCFC) Direct methanol FC (DMFC), Phosphoric Acid FC (PAFC), solid oxide FC (SOFC) and Proton Exchange Membrane FC (PEMFC). Out of all these fuel cell PEMFC is best and effective FC for conversion of energy in electric vehicle. PEMFC's has better efficiency, low operating temperature (50°-100°) and it never produces any dangerous gasses so it is eco-friendly in nature. PEMFC never offer fast response due to slow electrodynamics and chemical reaction in it, therefore it cannot reply to unforeseen modification in load [4]-[6]. Another disadvantage is Starvation development. Lack of Fuel or oxygen cell can cause voltage drop during unforeseen energy demand. [7]-[9].

As fuel cell is primary energy source; so it have to provide regular power to propulsion system that is why it is necessary to regulate the output voltage of FC. As voltage profile of FC is low, a quadratic boost converter is interfaced with the FC and dc bus. A control technique is designed for quadratic boost converter to maintain or regulate dc bus voltage in proportion to load change. This paper introduces a sliding mode controller based a quadratic boost converter which maintain constant voltage at dc bus during transient condition or during load variation. The stability of the closed loop system analyzed with the help of Routh-Hurwitz criterion. The typical block diagram of hybrid electric vehicle is shown in fig. 1.

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Sliding Mode Controller Based Interleaved Boost Converter For Fuel Cell System

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Abstract—**Electric vehicle (EV) is replacing conventional internal combustion engine based vehicle, as EV never produces greenhouse gasses and air pollutant. Electric vehicle is also known as green vehicle. Electric vehicle uses fuel cell as primary source of energy, whose transient response is very slow. Fuel cell based EV needed a step-up high power dc-dc chopper or converter for adjustment of dc bus or load voltage, load current, and load power to meet vehicle requirements. Main problem for designing a step-up converter or chopper for high power rating application is to deal with high current ratings at the input side of converter and high voltage ratings at the output side of converter. Interleaved boost converter (IBC) can deal with high power ratings application such as HEV. This paper presents control technique for boosting output voltage of FC using an interleaved boost converter and for controlling DC bus voltage under load variation condition sliding mode controller is used.**

Keywords— fuel cell; interleaved boost converter; pi controller ; sliding mode controller;.

I. INTRODUCTION

Electric vehicle uses electrical energy for rotation of propulsion system, resulting in pollution free energy for automobile industry. Internal combustion engine uses petrol, diesel for its propulsion system which produces air pollution as well as high emission resulting in global warming.

Electric vehicle uses battery, ultra-capacitor, Fuel cell (FC) as energy source for propulsion system. Fuel cell attracts automobile industries to use FC as primary source of energy in EV, due to high energy storage and green source of electrical energy. FC is not able to respond alone in sudden change in load that is why an ultra-capacitor is used for propulsion system during dynamic condition. Ultra-capacitor also charge during regenerative braking [1]-[3].

Normally voltage profile of FC is very low and motor for which FC will supply energy operates at high voltage level, so that a step-up power chopper is required for boosting the voltage profile of FC. For this type of application it is challenging task to maintain high efficiency with the use of conventional step up converter [4]-[8].

When input voltage is low then input current will be high. Operation at less or small duty cycle increase the size of inductor and output capacitor [11], and also increase losses, resulting less efficient converter.

So for high power application such as EV a high power converter is required for boosting up voltage profile of FC, which can deal with high current and high voltage at the input and output respectively [5]. Most efficient way to tackle this problem is interleaving of conventional boost converter.

When two conventional boost converters are connected in parallel this arrangement of conventional boost converter is known as interleaved boost converter (IBC) [23]. Parallel connection of boost converter will share high input current, interleaving is most suitable process for high power application such as EV. And an interleaved boost converter is most suitable converter for boosting voltage profile of fuel cell in EV.

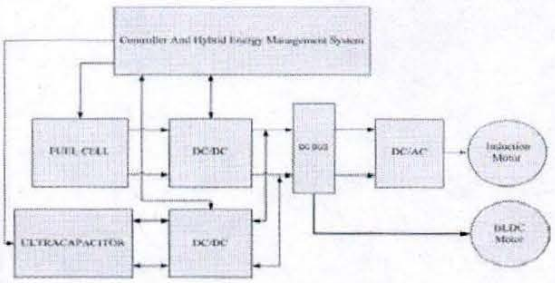

Figure 1. Block diagram of FC based hybrid electric vehicle.

For controlling output voltage of IBC a controller is required [6]. The nature of step-up chopper is non-linear time-varying; So that it is necessary to fulfill the above property of the system by designing controller [1, 2, 5-10].

As FC is primary energy source; so it provides regular power to propulsion system that is why it is required to regulate the output voltage of FC. As voltage profile of FC is less therefore for EV application a high power converter is required, an interleaved boost converter (IBC) is used to regulate dc bus voltage. A controller is also required for maintaining output voltage in proportion to load change. This paper presents an interleaved boost converter for boosting the voltage profile in load change condition and for controlling voltage profile of dc bus a sliding mode controller is used.

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Component Selection For An Electric Vehicle: A Review

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Abstract— **Electric vehicles are widely used for pollution free transportation but it has been observed that distance travelled by battery operated electric vehicle is very less as compared with the other fuel powered engine and poor regenerative energy recapturing from the vehicle's kinetic energy. There are so many types of losses in power converter which increase consumption of battery energy. For increment of distance travelled by electric vehicles and increment of recapturing of regenerative energy we have to improve performance of all component used in electric vehicle like electric motor, power converter and energy storage system like battery or ultra-capacitor. This paper presents comparative study of all components used in an electric vehicle. This paper also concluded that which drive or converter is suitable for electric vehicle is being proposed. Best coordination of all components can lead to optimize power consumption in electric vehicle. Energy dissipated in power train during the operation of conversion from electrical energy to mechanical energy and vice-versa should be minimize, it cans be achieved only by using a converter whose efficiency is high like interleaved boost converter. There are various methods of modifying power converter to get more efficiency and increased power rating is explained, like using multi model method of boost converter.**

Keywords—component used in electric vehicle, lithium-ion battery, buck-boost converter, interleaved boost converter.

I. INTRODUCTION

Conventionally we are using IC engine for rotating wheel of vehicle but it has a disadvantage of pollution over other type of vehicle and an another problem with IC engine is its fuel which is being finished in next few decades so that scientist are trying to make an efficient vehicle which can replace conventional vehicle. Everybody wants to move on a vehicle which can reduce pollution, availability of that source of energy in world for future use and cost of the vehicle should be low with best performance. Electric vehicle is most suitable for current scenario as efficiency of motor is about 90%, efficiency of battery is approximate 75%, and efficiency of power converter is also about 90%. So overall efficiency of electric vehicle is about 75%, which is very high in comparison of IC engine vehicle whose efficiency is about 5-10% [1]. Research work on electric vehicle which can be termed as green vehicle is under process as it is eco-friendly in nature. The electrical energy can easily generate and store with the help of different methods with less operating cost. Electric vehicle is well knows as future vehicle of world.

Power performance of electric vehicle can be improved in the way as mentioned below:

- Improvement in vehicle battery energy performance.
- Reduction in loss of the propulsion motors and power train.
- Recovering regenerative braking energy from vehicle.

It is necessary that reduction of energy loss method should not affect any other factor of system like acceleration, speed and cost of the vehicle. For example if we reduce the size of electrodes then power performance of battery will improve but it reduce energy density and life of battery.

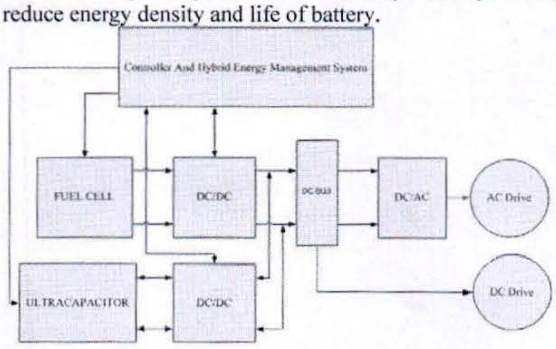

Fig.1. Block diagram of electric vehicle.

Figure (1) shows block diagram of electric vehicle which has three basic component included, electric motor, power converter and energy storage system. Energy storage system is again divided into two parts main and auxiliary energy storage system. Main energy source is connected of unidirectional boost converter and auxiliary energy source or energy storage system is connected by bidirectional dc-dc converter.

Comparison of all type of component is on the basis of their characteristic like modularization, size, losses of electric

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Renewable Energy Scenario of India (A Review): Present and Future

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Abstract—*This article present a review about present and future evaluation concerning renewable energy growt. As the global economy maintains its low level expansion, the Indian market continues on its high expansion or growth path. Previous year 2016-17 has seen a pattern shift in the way India's wealth will function by focusing on laying the infrastructure for extensive insertion of all monetary movement on the digital stage. Energy area plays a very important role in the development of Indian wealth and it is going up at fast pace. The whole installed power has reached to 315 GW with production mix of Thermal (69.5%), Hydro (14.1%), Renewable (15.1%) and Nuclear(2%). It is apparent that the renewable energy has secured 2nd position following Thermal and is increasing with fast speed or quickly in India. Last 27 years has been a period of high-spirited track of actions related to explore, growth, manufacture and demonstration at India. India has obtained appliances of a mixture of renewable energy technologies for the use in different areas too. This research article will explore present condition, most important achievements and potential aspects of renewable energy in India. This article will assessment of present power or energy policies for winning the obstruction and imposing renewable for the prospect is also been accessible. The administration and management of Indian Government have upscale the objective of renewable energy power to 175 GW which have 100 GW from Solar, 60 GW from wind, 10 GW from bio-power and 5 GW from small hydro power to be achieved by 2022.*

Keywords: *Renewable energy, Solar energy, Wind energy, Biomass*

1. INTRODUCTION

The administration and management of energy department of Government of India has up scaled the target of renewable energy capacity to 175 GW which Includes 100 GW from Solar, 60 GW from wind, 10 GW from bio-power and 5 GW from small Hydro power to be achieved by 2022. The department of new and renewable energy is focusing on a wide range of schemes with economic and monetary support and favorable policies to accomplish this objective. biggest ever wind energy capacity totaling of 3423 MW, more than target by 43% and solar energy capacity totaling of 3,019 MW, more than target by 116% was made in 2015-16.[7] For the first time the largest solar power project capacity of 20,904 MW was tendered and 31,472 Solar Pumps were Installed which is more than the total number of solar pumps installed in the last financial year Overall Generation. in this paper the potential of different energy in different states are explained with the help of different tables, graphical structure and figure.

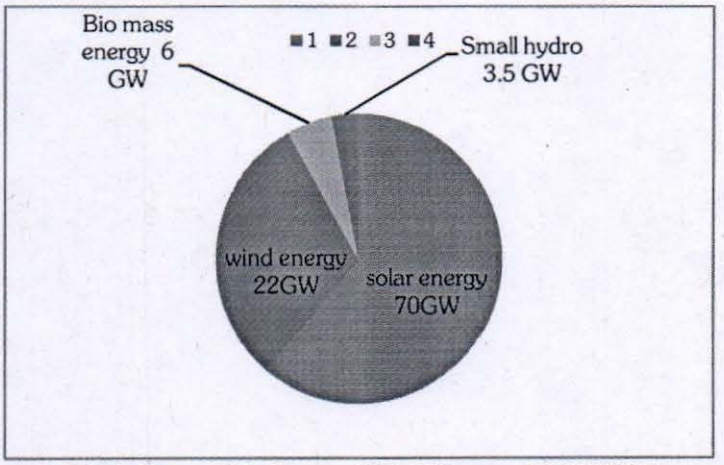

Fig. 1: Renewable Energy 110 GW as on 30.06.2017

Performance Analysis of a Shell and Tube Heat Exchanger: A CFD Analysis

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Abstract—*In this study, heat transfer performance of a shell & tube heat exchanger (STHX) using baffles have been studied for two different tube arrangements. STHX with 21 & 24 tubes arranged in inline and staggered grid structure is considered in the first case for the heat transfer performance analysis. Shell & tube dimensions were same for both types of tube arrangements. From the analysis it was found that shell & tube heat exchanger with staggered tube arrangement provides less thermal stratification conditions compared to inline tube arrangement. In the second case, STHX with staggered grid structure is considered for the study of mass flow rate variation in shell side keeping the tube side flow rate constant. Variation of Mass flow rate in shell side was observed ranging from 0.1 kg/s to 0.5 kg/s respectively and keeping the tube side mass flow rate constant at 0.25 kg/s. Effect of mass flow rate on heat transfer performance of shell & tube heat exchanger and pressure drop was analyzed. CFD results were compared with analytical solution and it shows a good agreement between them.*

Keywords: *CFD Simulation, Heat Transfer, Inline and Staggered Tube Arrangement, Shell and Tube Heat Exchanger, Mass Flow Rate Variation*

1. INTRODUCTION

Heat transfer analysis of a shell & tube heat exchangers is becoming important owing to their applications in many of the engineering fields such as power generation, chemical engineering applications, air conditioning, refrigeration and food industries etc. [1]. It is reported that around 35% of the total heat exchangers in use are STHX [2]. STHX of various sizes are used widely in many industrial applications. The design configurations of shell & tube heat exchangers may vary according to the need. TEMA (Tubular Exchanger Manufacturers Association) publishes the standards and design configurations regularly. The Bureau of Indian Standards also suggested a design configuration and standards for shell & tube heat exchanger.

In this study, two shell & tube heat exchangers were modeled, one with inline tube structure and second with staggered tube structure. CFD simulation was performed to analyze the heat transfer performance of both the heat exchangers. Shell & tube heat exchanger with staggered grid structure gives the better heat transfer performance so it was considered for further analysis.

The shell side flow inside the STHX is very complicated due to different leakages and bypass between different flow zones and for different shell design and shell sizes, the effect on performance of STHX of each one of the leakage and bypass may vary [4]. So, in the second phase of the study, mass flow rate variation in shell side fluid was analyzed, keeping tube side flow rate constant at 0.25 kg/s and result and conclusion were drawn based on the performance of heat exchanger under different mass flow rate varying from 0.1 kg/s to 0.5 kg/s.

With the advancement of computer programming and technology, numerical simulation has replaced the prototype testing. Now a day, numerical simulations are being conducted to optimize the efficiency of various devices, tools and equipment. To perform the study, numerical simulation has been done on 3D geometry of a STHX using ANSYS FLUENT 15 to know the effect of variation in mass flow rate of shell & tube side and arrangements of tube bundles in the heat exchanger. CFD results were also compared with analytical solutions and the differences between the analysis procedures were examined.

2. MODELING DETAILS

In this study the tubes of shell and tube heat exchanger was arranged in two different manners, first in inline structure and then in staggered structure having 21 & 24 numbers of tubes respectively. The dimensions of the geometric model having a shell with 94.7 mm diameter and 810.1 mm length, outer and inner diameters of the

Advanced Energy Storage Technique and its Conversion

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Abstract—*Energy storage is an important aspect of the conservation of energy such as the energy releases from the solar radiations using different energy storage in an efficacious way of renewable energy. Hydrogen is considered as a precious mode for energy storage and energy carrier for the future scope and it can acquire by low-temperature water electrolysis, high-temperature water electrolysis and carbon assisted hydrogen production. Electrochemical energy storage is a favourite zone of the modern era because of its adorable properties such as site versatility, static structure and modularity. Redox flow battery and lithium-ion batteries are most popular in energy storage because they have the most appreciable feature as the depth of discharge, which decides the lifespan of the batteries and signifies the maximum number of the cycle for which the capacity of batteries does not undergo the nominal capacity. Lithium-ion batteries enrolled all the aspects such as size range, capital cost, efficiency and found that the Redox flow battery and lithium-ion batteries have major potential to store energy for an off-grid renewable source.*

Keywords: *Redox Flow Batteries (RFB), Hydrogen Cell, Depth of Discharge (DOD)*

1. INTRODUCTION

Energy storage provides the vision for the renewable energy as an alternative to other fueling options. Energy storage has the primary focus to advance the clean energy which provides the cost-effective green energy source, which is eco-friendly also. For the sake of sustainable development and fulfill the requirement of energies, the scientists work on the alternative of non-renewable energy and their storage system. Because non-renewable energy has many bad marks such as they are limited and their uses lead to increasing the greenhouse gas emissions and many other afflictions for the environment. Therefore, time demand is to emerge out the efficacious alternative of the non-renewable energy that is solar, wind and other renewable energies. The main perplex with renewable energy especially solar and the wind is their storage and conversion. Worldwide, the work to develop the efficient and eco-friendly energy storage system has been going on [1]. Energy storage has many generalizations for instance thermal energy storage, electrochemical, mechanical, biological and magnetic energy storage. This stored energy can be converted into chemical, electrical, kinetic, potential and thermal forms as per the requirement and demand. Electrochemical energy storage system is in trend because electricity is a basic need of daily life and electrochemical energy storage is an efficacious way to fulfil this need up to certain scale. Redox flow batteries (RFB) represent one of the most recent technologies and most favourable choice for stationary energy storage [2, 3]. The most conspicuous part of redox flow battery is long durability, fast responsiveness, scalability and flexibility, high round-trip efficiency, independent sizing of power and energy, less environmental effect [4]. Such features make it practical for generating electricity from non-conventional energy resources because of its vast operational power and discharge time. Consequently, electrochemical energy storage is going to be a revolutionary change in the field of electricity generation using renewable energy which enhances the low-cost electricity. The renewable energy has tremendous availability; therefore, it will be going to be an important factor to maintain the growth of developing countries. Many countries encourage their research and development field for non-conventional energy to decrease the dependency on conventional energy resources. Therefore many wide types of research have been enrolled for improvisation of desired properties of all generalization of energy storage and its compatibility. For the sustainable development of this competing era, the energy is not only required to fulfill the basic or comfort needs but also in various other fields also for instance in defense sectors. This year the article has been published by U.S government for the waste of precious energy sources such as nuclear energy waste, many countries preferred to use this energy for their defense sector which is indirectly the waste of precious energy. With this rate of consuming these non-renewable energies we will not have a secure future in the field of non-renewable energy sources, we have to search for effective and long-term alternatives as renewable energy

Review Paper on Phase Change Material in Application of Thermal Energy Storage

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Abstract—*Traditionally, energy was stored as a sensible heat that has a problem of large volume for storing heat, to eliminate this issue latent heat energy storage system (LHTESS) was introduced. Latent heat thermal energy storage using phase changing materials (PCM) is a very popular source to fulfil the gap between demand and supply of energy. Thermal energy storage (TES) is an important aspect of conservation of energy such as the energy releases from the solar radiations using phase change material in an efficacious way. In organic PCMs, the latent heat thermal storage gives the higher energy density storage for a limited melting and freezing temperature difference than inorganic materials. This review gives an important aspect of the materials, development, generalization and applications of thermal energy storage using PCMs. This paper also provides the efficacious way of using different PCMs for instance and its effective outcomes.*

Keywords: *Pcm, Tes, Shss, Lhtess*

1. INTRODUCTION

In this developing world, the elementary need of developing era is energy sources. These energy resources are categorized into two parts conventional and nonconventional energy resources. The main perplex with conventional energy sources is demand and supply as well as its availability. Recently, we found that the demand and consumption of non-renewable energy are increasing day by day. The conventional energy sources have many bad marks and their uses lead to increasing greenhouse gas emissions and many other afflictions for the environment. The efficacious alternative is non-conventional energy like solar energy and worldwide the research field on solar energy is become the first choice for the new era by the reason of its availability, inexpensive, persuasive and clean energy. But the prime challenge is to store the solar energy and supply this energy with demands. To store this huge amount of energy, scientists are searching for storage devices that maintain the demands and supply balance of the solar thermal energy. The remedy of all perplex is thermal energy storage device with phase change materials and this also can be categorized as two parts sensible heat storage system (SHSS) and latent heat storage system. In SHSS, the storage of energy is stored by rising up the temperature of a solid/liquid while in LHSS store the energy by changing the phase of a material in a small temperature range. The process of accumulation of energy to be stored by means of heat transfer fluid (HTF) called charging process and the process of deploying the stored energy called discharging process.

Latent heat storage system has potential to store 3 to 4 times more heat per volume than a sensible heating system with the 200C increment [1]. TES unit for solar thermal energy should have some salient properties such as they can store huge amount of energy, they can maintain the balance between demand and supply and enhance the reliability and performance of the thermal energy storage system [2, 3]. Although, the energy storage can be categorized mainly into five parts which will discuss ahead. PCM are stored thermal energy by changing their phase transformation into solid to liquid, solid to solid and liquid to gas. But generally, we avoid energy storage with solid to solid and liquid to gas phase change because they acquire low phase change enthalpy and large volume expansion respectively. There are many review paper are published on phase change materials [4, 5], gives the simple information's on PCMs. Further, PCM can be splits into mainly three parts organic PCM, inorganic PCM and their mixture [6]. Firstly discuss the inorganic PCM, which is wrapping up the wide range of temperature, they also acquire the higher melting enthalpies per volume than organic materials and generally their density is higher than 1.1g/cm3 but they lag behind because of their demerits of corrosion. Now organic PCM, which is wrapping up the smaller range of temperature (150C to 1400C), but they acquire lower melting enthalpies per volume than inorganic PCM [7, 8]. Generally, inorganic PCM are expensive but they have the advantage that they do not undergo sub-cooling. In the last category of phase change material is the mixture of organic and inorganic PCM, which are investigated to overcome the flaw of organic and inorganic PCM in remedial ways. The solar energy has tremendous availability so it will be going to be an important factor to maintain the growth of

Design of Wearable Load Assisting Device for Porters-Phase One

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Abstract—*This project proposes a wearable load assisting device for porters at Indian railway stations utilizing ergonomic study and computerized human models. This is the phase one of this project in which digital modeling using CATIA-V5 is performed for ergonomic investigation to assess the potential damage danger, considering contrast among utilizing and not utilizing the assist device. The assignment performed by the porters is lifting and conveying the luggage of travelers by manual process. In order to lift the luggage the porter has to bend his neck and trunk which can be responsible for the development of various work related musculoskeletal disorders (WMSD). The purpose of this evaluation was the development of a load carrying structure for luggage carrying and to distinguish issues that could bring about musculoskeletal damage in a real workplace. The results suggest that using this device, may decrease injury risk potentially and increase the load carrying capacity.*

Keywords: *Digital Human Modeling, CATIA, Ergonomics*

1. INTRODUCTION

Digital human modeling technology has been utilized to break down and enhance the physical ergonomics of various designs with the idea of lessening all designing expenses [9]. The technique permits design engineers to make virtual human with particular population information on their PCs, which would then be able to be embedded into the 3D workplaces.

In this paper Study regarding porter's performance and comfort in load lifting and carrying has been done using DHM and a model of load carrying frame has been proposed for even distribution of load so as to increase the load carrying capacity.

Improper lifting of luggage can be responsible for the development of various work related musculoskeletal disorders (WMSD). The WMSD pose occupational risks to the human which reduces the efficiency and also affect the health which has been demonstrated by Nicolas [1]. The ergonomics analysis is performed in the virtual environment using CATIA software as discussed by karmakar, Sanjog and Thaneswer [2].

Due to heavy luggage porter usually face many health issues like shoulder pain, neck pain and back pain. The lumbar spine may experience significant forces during occupational tasks due to the force of gravity acting on the upper body so need to restrict the load on the spine within the National Institute for Occupational Safety and Health (NIOSH) recommended spine limit.

Granata, Marras and Davis [3] attempted to decide ergonomic satisfactory limits as indicated by the NIOSH method. NIOSH limit demonstrated valuable for distinguishing certain lifting occupations that represented a hazard to the musculoskeletal framework for creating lifting related low back pain.

The objective of this study is to Model the working posture of a porter holding a proposed load carrying frame for analyzing the design considering the various risk factors associated with WMSD. Relationship between the risk factors and the musculoskeletal objections has been very much classified by Nirathi and Kari [4].

2. METHODOLOGY

The human modeling was conducted on CATIA V5. The main focus is to find out cause of fatigue and reduce occupational risk among porters. For the modeling pictures are captured of different postures while lifting process. The porter body postures and the movements are captured to be analyzed by the further study in future using RULA posture examination technique and will be checked by biomechanical approach as indicated by the biomechanical rule for work related low back disorders to validate or modify the design [5]

Effect of Parabolic Velocity Profile over a Streamline Cylinder

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Abstract—*Complex turbulent flow (Re = 0.5 ×10⁶ to 3.6×10⁶) around a two dimensional (2D) streamlined cylinder, is investigated numerically by using a standard k- ε turbulence model with 2D URANS equations. The main purpose of the current study undertaken is to assess the influence of parabolic velocity input on the flow variables, such as pressure and mean drag coefficient, along the external surface of an elliptical cylinder. Drag force over a circular cylinder as compare to elliptical cylinder is higher. Reduction in drag may be increased by reducing the axis ratio with parabolic velocity profile. Back pressure recovery is observed for an elliptical cylinder as the axis ratio decrease from 1 to 0.4. This recovery in back pressure is responsible for the reduction in pressure drag as well as in coefficient of drag.*

Keywords: *Elliptical Cylinder, Parabolic Velocity, Axis Ratio, URANS, Turbulent Flow etc.*

1. INTRODUCTION

The study of turbulent flow practically is very tedious and uneconomical. So the majority of studies on unsteady flow over a circular cylinder have been conducted by numerical simulation by creating a virtual environment. But in actual applications, flow over complex bodies like helicopter rotor blades, propeller, wings of plane, submarines and missiles are involved, modeling of such type of flow cannot be possible as a flow over a round shaped cylinder. In such flow condition, axis ratio can influence the nature of separation, drag force and lift force. Further, the predictions of turbulent flow with parabolic velocity profile attract interest due to its importance in the real engineering problems. A non-uniform velocity flow may influence the separation angle, back pressure and the aerodynamic forces acting on it. The study of variation in coefficient of drag, separation angle and back pressure recovery for such type of complex flow is very important for the designing of real world engineering application.

There are few numerical simulations in the open literature on such type of complex flow over an elliptical cylinder. Yoshihiro mochimaru [4] numerically examines the effect of axis ratio and Reynolds number on the various coefficients and flow streamlines up to Re = 10^5. Zhihua Li *et al.* [5] studied the behavior of drag coefficient with axis ratio at Re up to 10^4 by using Kω-SST model. The present model was first validated by comparing the present result with the experimental results of Achenbach [1] and numerical results of Catalano et al. [3] and Muk chen ong *et al.* [2] for a circular shaped cylinder and the results agree with the experiment as well as numerical simulations.

The evaluation of the effect of variation in axis ratios and parabolic velocity profile for the same mass flow rate in the domain on the coefficient of drag, pressure coefficient and skin friction coefficient over an elliptical cylinder, using standard k-ε turbulence model, is the main objective of the present numerical simulation.

2. MATHEMATICAL FORMULATION

The Reynolds-averaged equation for conservation of mass is given by

$$\frac{\partial u_i}{\partial x_i} = 0 \tag{1}$$

The Reynolds-averaged NavierStokes equation for conservation of momentum is given by

$$\frac{\partial u_i}{\partial t} + u_j \frac{\partial u_i}{\partial x_j} = -\frac{1}{\rho}\left(\frac{\partial p}{\partial x_i}\right) + \nu \frac{\partial^2 u_j}{\partial x_j^2} - \frac{\partial \overline{u_i u_j}}{\partial x_j} \tag{2}$$

Where i, j =1, 2. Here u_1 and u_2 are the mean velocity components in the horizontal (x_1) and vertical (x_2) directions respectively; p is the dynamic pressure and ρ is the density of the fluid.

Mass Optimisation of a Connecting Rod using Computed Aided Engineering Tools

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Abstract—*The connecting rod in an automobile engine is a very critical component and a high-volume production mechanical element. In this paper, the Finite Element Analysis of existing H-type shank connecting rod is presented and then the connecting rod has been optimised with reference to its mass. The mass optimisation has been done upon observing von-Mises stress contours and the corresponding Factor of Safety. The model of connecting rod has been made using CATIA, the pre-processor used is hypermesh and radioss linear has been used as solver. The displacement and von-Mises stress colour contours are plotted and the resulting patterns are studied. Significant amount of mass of the connecting rod has been reduced in the final design.*

Keywords: *Connecting rod, CATIA, Hypermesh*

1. INTRODUCTION AND PROBLEM FORMULATION

The use of connecting rod is to modify the motion by converting transverse movement to rotating movement in a reciprocating engine. It has to be sufficiently durable to remain stiff when subjected to loading. It is subjected to axial tensile and compressive forces, bending loads which are produced due to pulling and thrust on the piston produces bending stresses. As connecting rod is subjected to accelerations which result in inertia forces, so it has to be designed to be light as inertia forces are directly proportional to mass of a moving component. So, if some way we can reduce the mass of connecting rod while maintaining it in the safe zone, it will be a great achievement.

FEA of the connecting rod has been widely and intensively studied. Mr. P.G. Charkha and Dr. S.B. Jaju [1] done a static load finite element analysis and then optimized connecting rod for weight reduction using ANSYS WORKBENCH 9.0. PS. Shenoy and Fatemi Ali [2] offered the analysis of Connecting Rod Weight and Cost Reduction Optimization. A. Mirehei *et al.* [3] done the fatigue failure analysis on connecting rod of universal tractor (U650) using ANSYS and estimated its lifespan. Webster *et al.* [4] carried out 3D FE analysis on connecting rod of a high-speed diesel engine. For their analysis they performed a compressive load analysis by applying maximum possible compression. The compressive and tensile load acting on crank end and piston pin end surface and their distribution were found experimentally.

Hero Honda Splendor connecting rod has been used for redesign in the present work, and it has been tried to minimize the stresses and strain of the connecting rod so that the better performance of the bike has been achieved. Typical design variables for optimization are the thickness (h) of the grove made in the shank part of the connecting rod. A number of iteration were carried out to find optimised design on varying design parameter within the specified limits.

A structural analysis of connecting rod has been carried out using Radioss linear. The stress, strain and deformation contours have been plotted. The present work of optimization of connecting rod achieves the reduction in the weight of the engine component, thus reducing inertia load, and improving the engine performance and fuel economy.

2. FE MODELING METHODOLOGY

2.1 CAD Model Preparation

The first step in FE analysis is to generate a CAD Model of connecting rod. CAD model of the connecting rod is prepared using CATIA V5 R20. CAD model of used in present work is made as a single component.

Effect of Vanadium-Nitrogen Ratio on the Structure and Properties of 0.2C-1.5Mn Steel

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Abstract—*Low carbon steels of varying vanadium nitrogen ratio are hot rolled at 8000C with varying percentage of deformation within 20% to 60% thickness reduction. A set of experimental steels are subjected to thermo mechanical simulation in gleeble 3800 instrument by austenitizing at 10000C and followed by 60% deformation at 8000C. The deformed alloys are cooled at 800C/Sec within the simulator. Micro structural characterization was done by optical, scanning and transmission electron microscope. Mechanical properties are studied in Instron testing machine. It is found that the increasing deformation percentage leads to the formation of higher amount of precipitates of vanadium carbides/carbonitrides. Also increasing vanadium to nitrogen ratio increases precipitation density. Higher amount of deformation in thermo mechanical simulation has led to higher hardness due to increase in precipitate density.*

Keywords: *Thermo Mechanical Simulation, Precipitation, Microalloying, Vanadium-Nitrogen Ratio, Deformation Induced Precipitation.*

1. INTRODUCTION

Microalloying of steel for improvement of various properties of steel viz. strength, toughness, weld ability, formability and others are in vogue since early seventies. Nevertheless efforts are continuing for effective micro structural engineering in steels, micro alloyed with vanadium, titanium and niobium either singly or in combination [1]. Since recent times, there is a growing interest in the understanding of the impact of ratio of nitrogen and vanadium content on the structure and property of low carbon steel [2]. Vanadium is known to form its nitride or carbonitrides along with the vanadium carbide and the formation of these precipitates depends upon the steel chemistry and thermo mechanical processing condition. Reports on the precipitation kinetics of vanadium steel are documented in the literature [3-5].It is also reported by many workers that precipitation of vanadium carbonitrides and carbide takes place in the dislocations created due to the controlled thermo mechanical processing. Dissolved nitrogen in the steel gives rise to the bake hardening in automobile steel [5-8]. The ratio of vanadium and nitrogen also influence the strain ageing behavior of the steel.

Taking all these things into consideration it appears to be worth that to study the effect on vanadium, nitrogen ratio on to the structure and property of the low carbon steel. This is why the attempts are made to study the precipitation behavior of low carbon steel of varying V-N ratio and subjected to the pre chosen thermo mechanical process schedule. Thermo mechanical simulation is carried out to impose the prechosen deformation on to steel and then the precipitation behaviour is monitored by elaborate microscopic studies. It is also evident that the Size of the ferrite grain and martens tic lathes is predominantly depend over the size of austenite grain size. Lath marten site of low carbon low alloy steels consists of multi-scale substructures such as packet, block and lath[6-8]. The packet and block sizes are the important factors with a wide adjustable scale for both strength and toughness of martensite steels. Since the sizes of packet and block in marten site strongly depend on the prior austenite grain size. prior austenite grain refinement was purchased in marten site steels. Controlled rolling is of much concern for austenite grain refinement. Average grain size of austenite as small as 20 μm was the refinement limitation of recrystallization rolling. The smallest thickness of pancaked austenite was therefore restricted larger than 5μm through non-recrystallization rolling. Heat treatment is the optional way for austenite grain refinement. Rapid cyclic heat treatment could achieve ultra-fine grained austenite with the average grain size smaller than 5 μm. However, it was hardly applied in mass production for the limitations of complex process and specimen dimension. Recently we obtained ultra-fine grained austenite smaller than 5 μm by combining controlled rolling and simple heat treatment. Vanadium instead of niobium was chosen as the micro alloying element to restrain austenite recrystallization and growth in controlled rolling and heat treatment. Furthermore, vanadium carbonitride has a large solubility product in austenite at relatively high temperature and could play a considerable strengthening role

Effect of Nature of Interphase Property Variation on the Properties of Polymer Nanocomposites

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Abstract—*In this paper, the effect of adding a nano inclusion (Alumina) to polypropylene polymer has been analyzed. As the inclusion is added, there is a formation of interphase in between the inclusion and the polymer matrix. The properties are varying in this interphase area. The interphase is considered in the form of layers. In this work, a solid model of the RVE of polymer nanocomposite was prepared and then calculations were done according to various types of variations, like parabolic and exponential and these properties were entered into the solid model and further mesh model was prepared. Now on the application of various boundary conditions, and displacement under small strain case, solutions were done and various results were obtained. Now on comparison of these obtained results with the reference values, it was found that there has become a huge improvement in the mechanical properties of polymer nanocomposites. The work was carried out with the help of ANSYS platform.*

Keywords: *Polymer Nano Composite, Interphase, RVE, Polymer Matrix, Inclusion*

1. INTRODUCTION

In the present scenario, the need of high strength materials is arising day by day. For fulfilling this need, initially polymers were introduced, then in the recent time the concept of polymer nanocomposites was introduced. Polymer nanocomposites are having two basic constituents, Polymer matrix and Nano level high strength inclusion (e.g. Alumina, Silica etc.).The Polymer Matrix is having certain Mechanical properties, which are strength wise quite less than the Mechanical properties of the nanofiller to be included to the Polymer Matrix But upon including a very little amount of the nanofiller to the Polymer Matrix, we get the Polymer Nanocomposite, which is having quite better and useful properties then the Polymer taken.

Now when the nano sized filler (order of 100 nm) is included into the bulk polymer via certain chemical and mechanical processes, there is a formation of an Interphase in between the Inclusion and the Polymer Matrix. This interphase connects the Polymer with the inclusion and the properties are not constant or certain in this interphase area. Now the motto of our work is to analyze about the nature of the properties of this interphase and effect of varying the interphase properties on the overall Mechanical properties of the Polymer Nanocomposites.

The interface of a composite material plays a large part in the effective properties of the material. The role of the interface in the strength of composite materials has been addressed in the early study of composites by Tsai and Hahn (1980) [1]. Drugan and Willis (1996) state that the minimum size of the RVE is the smallest volume element of the composite that is "statistically representative of the composite". They have shown that the minimum RVE size is at least twice the diameter of the reinforcement, citing a maximum error of five percent in elastic constants obtained with this RVE size [2]. Gusev (1997) studied disordered periodic elastic composite unit cells composed of various numbers of identical spheres in order to determine the scatter in elastic constants obtained with different numbers of spheres and found that the scatter is small with only a few dozen spheres in the cell [3]. When homogeneous boundary conditions are applied to a macroscopic composite, the deformation in each RVE is identical and the deformation along each RVE edge is compatible. Consequently, the mechanical response of a composite material can be obtained by applying periodic boundary conditions to a single RVE. The conventional method of applying periodic boundary conditions has been to pair nodes on opposite faces of the RVE. This method has been used by Segurado and Llorca (2002) [4] and Berger et al. (2005) [5]. In the conventional node-coupling scheme, opposite nodes on opposite boundaries of the RVE must be paired to ensure continuous deformation. For each pair of nodes with the same in-plane coordinates, the displacement components on the coupled boundaries are constrained with a constraint equation. This pairing of nodes ensures periodic deformation

Optimization of Cutting Force and Surface Roughness during Turning of EN-27 using Grey Relational Analysis (GRA)

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Abstract—*In this research work the effect of cutting parameters on cutting force (Fc) & Surface Roughness (R_a) in turning process is studied. The Grey Relational Analysis (GRA) is used as the optimization technique for finding the suitable cutting parameter for the machining of EN-27. Experiments were conducted using full factorial design. In this work three cutting parameters are selected named cutting speed (V), Feed (F), and Depth of Cut (DOC) and the significant effect on cutting force and surface roughness has been calculated. As in many manufacturing industries turning of EN-27 using carbide insert is one of the major machining operation, the result of this experimental work would significantly contribute to the optimization of cutting parameters.*

Keywords: *Grey Relational Analysis (GRA)*

1. INTRODUCTION

1.1 Cutting Force and Surface Finish

Surface roughness is a major factor for most of the machined parts especially when it is subjected to fatigue loads, fastener holes, precision fits and many other requirements. Quality of a product is measured by Surface finish and is an important parameter in cutting process. Many Factors like irregularities of chip formation, defect in the structure of work piece, tool wear, chatter or vibrations of the machine tool, etc. contribute to the surface damage during machining. Working of mechanical parts and cost production is directly related to the optimum value of surface finish [1-6]. The following model is popularly used for calculating the surface roughness [7-8]

$$R_a = \frac{0.0321 f^2}{r} \quad (1)$$

Where, f = feed (mm/rev), r = cutter nose radius (mm) and Ra = surface roughness (μm).

Cutting force is effected by the depth of cut (DOC), feed (F), and specific cutting energy coefficient (k)[9]. Various research works are in progress to investigate this influence and develop the models for different tool and work material to optimize the power consumption.

1.2 Material & Machine

Machine: The experiments were conducted on the centre lathe.

Work piece diameter: 40mm, work piece length: 300mm (approx.).

Tool: Carbide insert

The lathe tool dynamometer was used for measuring cutting force.

For the measurement of surface roughness, specimen is checked at four locations around the circumference and the average value is assigned for roughness. For measurement of roughness Mitutoyo Surftest SJ 301 model is used.

1.3 Grey Relational Analysis (GRA)

GRA invented by Deng in 1982. GRA include two extreme:

At one extreme no solution can be find/defined for any system with indication of no information.

On the other extreme a system with perfect information has a unique well defined solution.

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Mathematical models to predict the erosion wear rate of materials: A Study

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ABSTRACT

Erosion wear of brittle materials due to the repeated impact of hard and abrasive erodent particles is a complex phenomenon. The process of material removal in erosion wear depends on the nature of target material. We have different erosion wear mechanism for ductile material as explained by Finnie and Bitter [1-2]. Similarly, Brittle materials have different mechanism of fracture/failure [3]. The material is removed by brittle fracture from the target surface of erodent particle. It has been find out by through study of erosion wear mechanism that the size and type of cracks developed on the striking surface or target surface depends on the various factors such as particle shape, mass, velocity and properties of target surface material[4]. Erosion wear of material occurs only when the erodent particle strikes the surface above the threshold velocity; at extremely high velocities, erodent particles scratched the target surface and remove the material.

Generally, the erosion damage of material is a function of kinetic energy of erodent particle. Plastic deformation of target material is an important aspect in the study of brittle erosion wear, so a depth analysis of impact sites is required for better understanding this phenomenon. The objective of this paper is to give the crystal clear and brief review of different mathematical models developed to explain the erosion wear mechanism of brittle and ductile materials. It also consist the various parameters which influenced the erosion wear in predominantly.

Keyword: Brittle, Ductile, Erosion Wear, Mechanism, Models.

Acknowlegement: The author would like to acknowledge Dr. Siddhartha (Assistant professor, NIT Hamirpur) for guiding and supporting me for my research work.

Reference:

[1] Finnie, I., *Themechanism of erosion of ductilemetals*, Proceedings of the Third National Congress on Applied Mechanics, New York, 527–532, 1958.
[2] Bitter, J. G. A., *A study of erosionphenomena*, Wear, 6, 5-21, 1963.
[3] Evans, A. G., *TreatiseonMaterialsScience and Technology*, edited by C. M. Preece Academic Press, NewYork, 16, 11-67, 1979.
[4] Hockey, B. J., Wiederhorn, S.M., Johnson, H., Ibid., 379-402.

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ABSTRACT BOOK

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9 - 10 March 2018, National Institute of Technology Calicut, India.

Abstract Code: ICEE016/ORAL

Application of Hybrid Nanofluids in Heat pipe-An Experimental Study

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Abstract

A heat pipe is an excellent heat transmitting device, widely used in microelectronics thermal management system. Now-a-days application of nanofluid in the heat pipe is a newly emerging area of research. Researchers noticed some enhancement in thermal performance of heat pipe using nanofluid as working fluid. Mono nanofluid has very controversial and limited effect on the thermal performance of heat pipe. So researchers extend their work towards the application of hybrid nanofluid in heat pipes. In present experimental study TiO_2/H_2O mono nanofluid and $(TiO_2+MWCNT)/H_2O$ hybrid nanofluid have been used as working fluid in the heat pipe. The effects of TiO_2/H_2O mono nanofluid and $(TiO_2+MWCNT)/H_2O$ hybrid nanofluid application in heat pipe for a wide range of power input (50-100 W) have been investigated. Authors noticed the significant enhancement in thermal performance of heat pipe using hybrid nanofluids. The mechanisms/causes of enhancement in thermal performance of heat pipe have been identified.

Keywords: Heat Pipe, Thermal performance, Thermal conductivity, Thermal efficiency

Abstract Code: ICEE017/POSTER

Leeway for Recycling of Condensate in Sugar and Distillery Industries

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Abstract

India is the second largest producer of sugar in the world after Brazil and fourth largest producer of alcohol. Sugar industries require lot of fresh water for their different processes. In these industries different streams of liquid waste are produced; some of them are highly polluted whereas others are less contaminated. Condensate is considered as a liquid waste which produced in sugar industries. Sugar condensate is generated from evaporation and sugar boiling process. The quantity of excess condensate generated in sugar industry is about 20 to 25% of sugarcane crushed. This excess condensate can be reused after treatment. In developing countries though water is the most essential for pursuing developmental activities, it is a scarce resource. So, to overcome this scarcity of water resource recycling of wastewater is the only cost effective solution. Presently, sugar condensates are treated in condensate polishing unit in which different conventional treatments are used. These processes have high initial as well as operation and maintenance costs. So the industries are attempting only partial recycling of the condensate and therefore there is need of cost effective process for industry to treat condensate. The present study attempts to explore feasibility of electrocoagulation for treating condensate for recycling of it. The condensate samples are collected and characterized. The electrocoagulation experiments are carried by varying different current densities and hydraulic detention times to find removal efficiency for COD and TDS.

Keywords: Sugar condensate, recycling of condensate, electrocoagulation

which become a huge amount of waste per annum. Natural ingredients like Neriam flowers, tulsi, neem leaves, lemon grass oil and natural loban were used along with the elephant dung to enhance the efficiency of the mosquito repellent. Smoke toxicity effect of organic mosquito repellent was studied. Results showed that this elephant dung based herbal mosquito repellent can serve as cost effective and environmental friendly to eradicate mosquito borne diseases in natural way. Emission test for commercial and developed herbal repellent was also performed.

Keywords: Mosquito borne diseases, Insecticides, Toxicity, Elephant dung, Organic mosquito repellent.

Abstract Code: ICEE034/ORAL

Effect of Fuel Injector Nozzle Hole Configuration on the Performance and Emission of a Supercharged CI Engine in Diesel/Biodiesel Mode

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Abstract
Biodiesel derived from inedible vegetable oils is gaining acceptance as an alternative green fuel to replace the crude oil based diesel in internal combustion engines. This is a significant development in view of the fear of fast depletion of fossil fuel reserves and protecting the environment from severe degradation. Engine downsizing along with increasing the boost pressure is an effective way of enhancing the thermal efficiency of the internal combustion engines. In this work the experimental results of the effect of increasing the fuel injector nozzle hole number and nozzle orifice size in a compression ignition engine at increased boost pressure by means of supercharging are investigated. It has been found that at all load conditions the brake thermal efficiency has increased on supercharging for all the nozzle configurations considered in the study both in diesel as well as biodiesel mode. The best brake thermal efficiency of 34.11% is obtained for 3 hole injector under supercharging at 100 kPa gauge pressure at full load. For 4 hole and 5 hole injectors the best thermal efficiency is less than that for 3 hole injector, indicating the need for higher boost pressure.

Keywords: Supercharging, Diesel engine, Biodiesel, injector nozzle.

Abstract Code: ICEE036/ORAL

Effects of CeO_2/H_2O Nanofluid Application on Thermal Performance of Mesh Wick Heat Pipe

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Abstract
In the age of technological advancement, continuous improvement is required in every walk of life. In electronic equipment, due to miniaturization and densification of electronic circuits,

more heat flux is generated. High heat flux may affect the performance and operating life of the equipment. Heat pipes are the most effective solution to dissipate that high heat flux to the surroundings. Researchers noticed that nanofluids having superior thermophysical properties enhanced the thermal performance of heat pipe. There are different operating parameters, having effects on the thermal performance of heat pipes like power input, inclination angle type and volume of working fluid etc. In the present paper, CeO_2/H_2O nanofluid has been used as working fluid in the heat pipe. The effects of CeO_2/H_2O nanofluid application in heat pipe for a wide range of power input (50- 100watts) and nanofluid concentration (0-2.5 vol. %) has been analyzed. Authors noticed the significant enhancement in thermal performance of heat pipe.

Keywords: Heat Pipe, Thermal performance, thermal conductivity, thermal efficiency, nanofluids.

Abstract Code: ICEE038/ORAL

RSM Based Optimization of Defluoridation of Water Using Zirconia Nanoparticles

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Abstract
Fluorosis has become a major health hazard due to the presence of fluoride ion in water. Fluorides are naturally present in earth's crust as minerals in hard rock such as fluorite, appatite, cryolite etc. Anthropogenic sources contributing to fluoride are mainly mining activities, phosphate fertilizer, effluents and irrigation. Due to high toxicity of fluoride to mankind, there is an urgent need to treat fluoride-contaminated drinking water to make it safe for human consumption.
The versatility in size, shape and morphology of nanoparticles introduces unique properties to nanoparticles-based water treatment systems, providing high surface area for adsorption of fluoride. Zirconia nanoparticle is found to have high affinity towards
Fluoride and hence, nano-sized zirconia particles were investigated for adsorption of fluoride from water. Effects of the factor variables (effect of initial concentration, adsorbent dosage, pH, and contact time) and their interactions on adsorption of fluoride ion were investigated by response surface methodology (RSM) based on central composite design (CCD).
Characterization studies before and after adsorption studies was done employing X-ray diffraction, Fourier transform infrared spectroscopy, scanning electron microscopy and Zeta potential analyser. ZrO_2 particle size was found to be in the range of 80-90 nm. To understand adsorption of fluoride on to the nanoparticles, adsorption isotherms and adsorption kinetics were studied. The thermodynamic parameters for defluoridation were also determined. In this study, we observed that ZrO2 nanoparticles were able to bind fluoride due to electrostatic attraction.

Keywords: Defluoridation, Zirconia, Nanoparticles, RSM, CCD, Characterization.

Abstract Code: ICEE039/POSTER

Solar Paint in Cars for Green and Clean Energy

Aaditya Vignesh P. K. P

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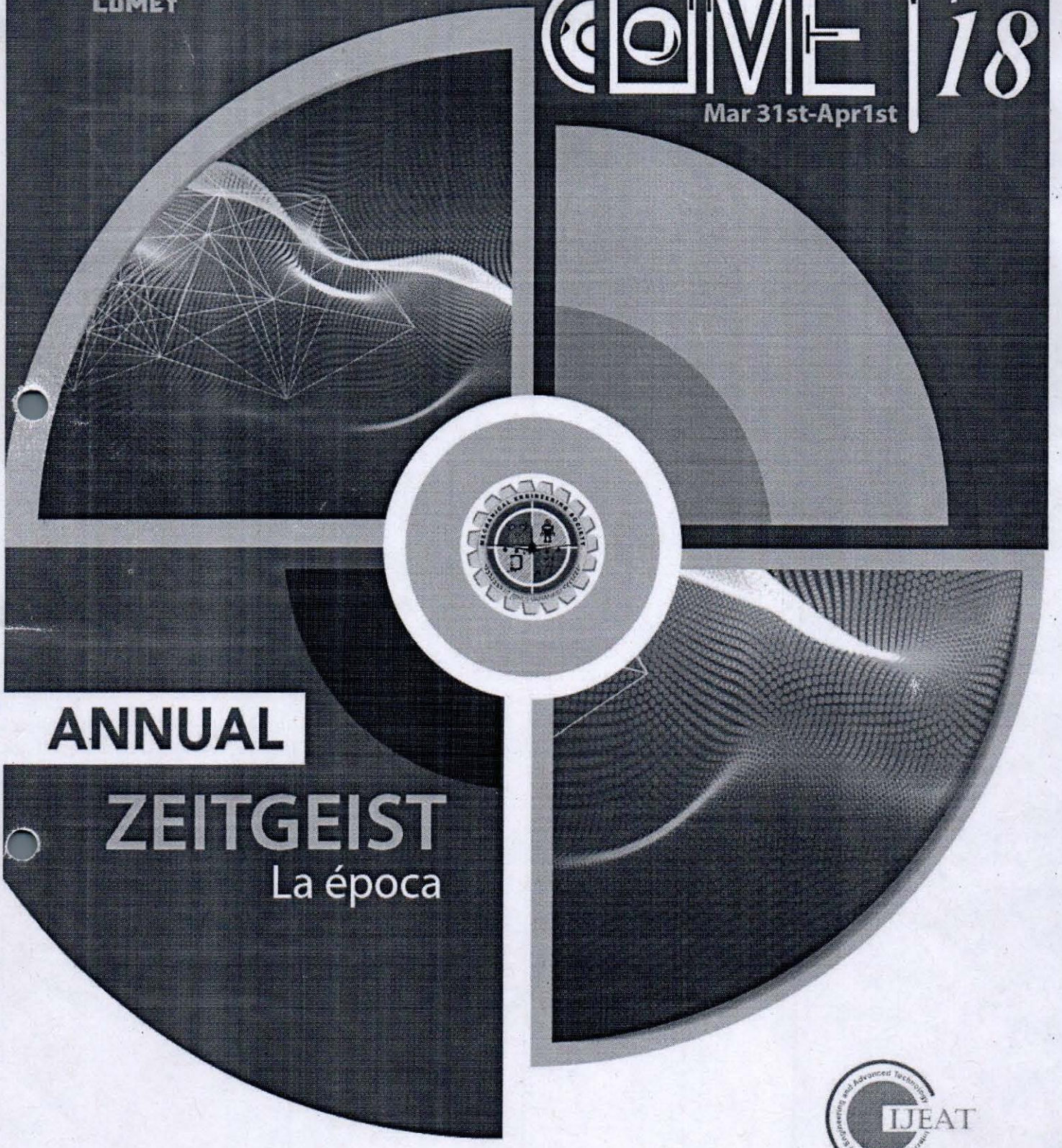

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Investigation of metal matrix composite obtained through powder metallurgy for its dependence of Surface and bulk property on particle size and their distribution

Aneesh Kumar

Abstract— The rule of mixture (ROM) can be the very initial approximation of the physical properties of composite materials, which accounts for the contribution of weights of constituent phases of composite. However, this approach may even sometime fail to depict the performance of composites with micro-structural description that cause a size effect in or create anisotropy of the regarded property. It is extensively acknowledged that the contribution of particles as well as their size with the volume fraction, the shape and the connectivity of the constituting phases has significant effects on the mechanical properties of composite. In this regard, the knowledge in variation of physical properties with the type and fraction of filler particles, the efficient and purpose of composite can be defined precisely.

Index Terms—Metal matrix composite; Particle size; Particle distribution; Density; Hardness.

I. Introduction

Due to outstanding electrical conductivity of copper and its alloys these are well known for electrical conductors. But mechanical properties of copper alloys such as hardness, wear resistance etc are of often substandard. Also, the mechanical strength of these alloys can be achieved through solid solution, precipitation strengthening, dispersion of insoluble oxides and ceramics as reinforcement in metal-matrix composites. The Hall–Petch relation states that, the strength and hardness of matrix phase may increase with decrease in grain size. Particle size, shape and distribution of reinforcement in matrix considerably affects the mechanical properties of composite material and increases with increasing the volume fraction of reinforcement but above the critical amount of reinforcement may create adverse effects on other properties such as ductility, electrical conductivity. It is also to be noted that the distribution of particle reinforcement obtained through powder metallurgy has significant consequence which depends on matrix to reinforcement particle size ratio and improves as it approaches to unity. The present investigation aims to investigate the surface and bulk property of copper metal matrix composite and its dependence on particle size and their distribution.

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II. Experiment

The matrix, copper has FCC (Face centered cubic) crystal structure with atomic number, atomic weight, density and melting point are 29, 63.546 amu, 8.933 g/cm^3, 1083°C respectively while the particle reinforcement, titanium oxide (TiO_2) also known as titania, is naturally occurring oxide of titanium has density, molar mass and melting point 4.23 g/cm^3, 79.866 g/mol, 1843 °C respectively. Copper and titanium oxide composite prepared by power metallurgy technique with ball milled powder, mixed with varying volume fractions further consolidated into hot compaction pressing. The sintering (sintering influential factors being temperature, time and atmosphere) were performed in the chamber furnace in inert atmosphere of argon gas. The particle size analyzed with the Instrument make and Model number Zeta Nano ZS Malvern UK for the different milling time of reinforcement. The particle size measured of ball milled ceramic reinforcement powder for 1.5 hrs, 8 hrs and 15 hrs were 32nm, 24nm, 20nm respectively and were mechanically alloyed to obtain homogeneous dispersion of nano-ceramic TiO_2 particle (Particulate reinforcement of TiO_2 is exceptionally hard ceramic and inert chemically with the fact that, it can be reduced in finer sizes by mechanical milling with much ease) by successive mechanical milling and then strengthen the product into bulk solid component through sintering at high pressure. Mechanical milling involves disintegration and plastic deformation of the particles which depends on a number of parameters like size, shape and distribution of matrix powder and size of reinforcement. To achieve a composite with a good combination of strength and ductility, small reinforcement and relatively large volume fractions are required. The reinforcement in the composites may be discontinuous or continuous. This is indeed very much needed to design the composition of the Cu based MMCs.

III. Result and Discussion

The Instrument make and Model number of the optical microscope used to capture the optical images is Leica DM 2500 M, using a system of magnifying lenses to produce contrast between different regions when viewed in reflected light for surface topography. The optical micrograph below for various combinations shows that the reinforcement is

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Modeling of Industrial supply networks to make them more effective by handling disruptions and uncertainties using MATLAB

Modeling of Industrial supply networks to make them more effective by handling disruptions and uncertainties using MATLAB

Rajkumar Sharma, Piyush Singhal

Abstract:

In ever changing world supply networks are found to be having the utmost aim to meet customer's demand at the earliest with the optimum network cost. This aim seems to be difficult to obtain because of unavoidable delays and uncertainties in supply chain such as delay in transportation/production, uncertainty in transportation/production, damaging of the product in storage/ transportation, cancelation of backorders, etc. Nowadays, the spans of the networks have been extended to each and every corner of the world. This requires an approach to deal with supply chain complexities and taking appropriate decisions to manage adverse effects of supply chain disruptions. It is evident that researchers address the supply chain disruption issues by using different methodologies such as fuzzy logic, neural networks, genetic algorithm, hybrid (neuro-fuzzy) etc but the risk propensity and its dynamic nature is not appropriately addressed. In this paper an attempt has been made to address uncertainties and delays relevant to food and beverages industries using model predictive control. It is noticed that supply chains architecture can be modeled using eight possible configurations. Step & Impulse response shows possibility to meet all the demands with fewer inventories at different echelons of the network under unseen and unavoidable circumstances. The paper provides an expert system for supply chain managers for taking appropriate decisions at right time at different instances which in turn results in efficient running of supply chains.

Index Terms - Echelon, Delays, Model Predictive Control Supply Chain

I. INTRODUCTION

In the era of globalization most of the firms have supply networks to support them. At one side supply networks make the system efficient and agile but on the flip side it causes the dependency risks in form of delays and disruptions. Due to number of supply chain uncertainties, inventory management becomes a critical problem for most of the organizations. It is not feasible and uneconomical to maintain high stock levels due to budgetary constraints, perishable nature of product and space limitations. Thus managing the appropriate inventories under uncertain business environment becomes a focal area of research now a day.

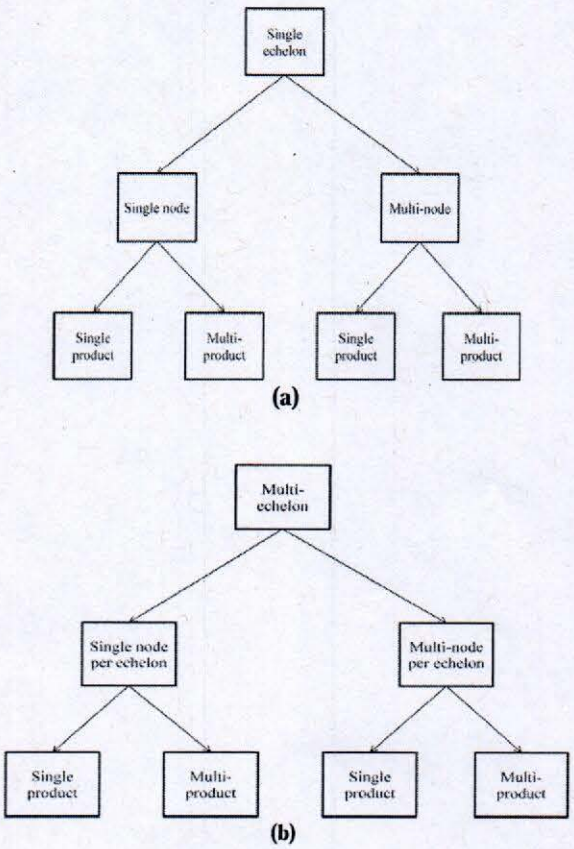

Fig1. Possible Networks (a) Single echelon type & (b) Multi-echelon type

Food and beverage industry have many common business challenges. Margins are less, expiry & perishable nature of the items; the demand for items unpredictable, and the demand for customer's satisfaction is significant. Thus dynamic environment factors & variables must be precisely overseen if an item is to keep on meeting customers necessities for quality and expense.

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Thermo-physical characterization of Jatropha-based Biodiesel

Rishabh Chhirolya*, Yash Gupta, Amit Kumar Paswan, Rishabh Agrawal, Rajkumar Sharma, Piyush Singhal

Abstract— The aim of this research paper is to characterize the thermo-physical properties of Jatropha-based bio-diesel. As we all aware that, the petroleum products are limited on earth so there is a requirement to replace petroleum products with a new type of fuel as biodiesel. The Jatropha-based biodiesel has many properties to replace the diesel. Researchers are now engaged in searching of such bio-diesels. Jatropha-based biodiesel has potential to fulfill the future energy demands because agricultural land of India is most suitable for the production of Jatropha trees. Jatropha crop can be easily cultivated in infertile soil and can be harvested in any season. Our farmer can also be trained for efficient production of this crop. Different experiments are performed for Transesterification of Jatropha (Ratanjyoti) during this process. The properties like viscosity, density are determined through Brookfield digital Viscometer. In these experiments a proper mixture of Potassium hydroxide(KOH) and Ethanol(C_2H_5OH) in a pre-decided contain ratios mixed with Jatropha oil and heated up to 70^{0}C for 4 hours. After this process, the solution is left for solidification for two days. Finally we get Jatropha-based bio-diesel and Glycerin as a by-product from the solution. The experiments are performed in the laboratory of Pharmacy Department at GLA University, Mathura. Results obtained after Transesterification of Jatropha oil are tabulated and compared with diesel. It was found that properties of bio-diesel are approximately similar to diesel and are also superior to diesel in some aspects.

Index Terms— Biodiesel, By-product, Transesterification, Viscosity.

I. INTRODUCTION

As we know petroleum sources are going to vanish from the Earth in few centuries so there is requirement of such an alternative which can fulfill the future requirement of petroleum. In this paper effort has been made to replace the diesel with an alternative fuels like biodiesel. Biodiesel is a alternative fuel produced from vegetable oil, animal fats, waste cooking oil, palm oil, Jatropha oil etc that have potential to replace with diesel. The biodiesel can be produced by the Transesterification of vegetable oil, animal fats, waste cooking oil, palm oil, Jatropha oil etc. Jatropha is the best tree as an oil seed plant and it have large shrub or small tree its maximum height 5m and color is smooth grey black and it is a American native plant but now available everywhere in the world due to its well adaptability. The requirements- Soil: Wastelands, poor soil, infertile soil, pH value=5.4 to 8.4. Water: low rainfall and draught area. Male female ratio in jatropha flower: 1:12. Seed: Good quality plumped seed (soaked in cow-dung solution for 10 to 12 hours and kept it wet in gunny bags for 10 to 12 hours). Sowing: In hot and humid climate, Jatropha plant are propagated by seed (in poly bag-soil: sand: decomposed FYM=1:1:1)/stem cutting and for commercial purpose seed propagation is beneficial. Spray 120kg phosphate per hectare and 4 to 5kg of FYM (Farm yard manure).Flower grows after 9 to 10 months after sowing. We get the final crop of Jatropha fruit after 4 to 5 year of sowing. We get 4 to 5kg Jatropha fruit per tree or 6000 to 7000kg per hectare. By milling, we get 30% crude Jatropha oil by weight from the fruit. For next crop spray phosphorus and decomposed FYM per year. We can get Jatropha fruit up to 30 to 40 year.

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A. EXTRACTION

Jatropha seeds are obtained from Jatropha plants. Seeds pressed into Screw Press Expeller Unit. 30% Jatropha oil and 70% De-oiled cake are extract.

B. LITRATURE REVIEW

[1]found that the use of vegetable oil biodiesel into diesel engine gives low quality performance and more smoke emissions due to high viscosity. The performance of vegetable oil improved by the transesterification process of vegetable oil. The methyl ester of Jatropha oil along with diesel may reduce the environmental impacts of transportation.

Synthesis and Dynamic Mechanical Analysis of Hybrid Reinforced Polymer Nano-Composites

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Abstract

The reinforcement of nano-particles is much better than macro range particles on the basis of mechanical property of polymer composite. Some researchers work with single category nano-particle and some used more than two or hybrid composition. Nano-particles are reinforced by weight percents and at random orientations to see the effect of reinforcement on hybrid polymer matrix. The present study of this research is to see combine result of two type Alumina profile nano-particles polymer with epoxy resin; which is prepared of hybrid polymer nano-composite matrix as per in-situ polymerization technique. In-situ techniques contain whole processes to fabricate the hybrid composite. Al_2O_3 particles have been used to reinforce in epoxy resin with different weight percentage of 0.25%, 0.5% and 1% and made hybrid polymer composite.

DMA (Dynamic Mechanical Analysis) for 3 point bending testing for microscopic structure analysis is done.

Keywords: DMA (Dynamic Mechanical Analysis)

Introduction

Over few last decades engineering materials as ceramic, polymer, composites have been rapidly grow. These composite materials having wide area of applications to developed fast & make branch in market. The composite material have many materials leads to use in refine application [1].

The mechanical vision growing in bringing resources, on which special types of experiment had made. The combine of two or more materials of dissimilar properties, whose combination produces, combined properties that are better in several ways, to its individual constituents. A new material with combination of two or more filler can provide enhanced properties that produce a synergetic effect [2].

In composite materials, there are two constituent one is matrix and other is reinforcement. The constituents which is continuous and present in greater quantity is called matrix. The function of the matrix is to hold or bind the nano-particles together, distribute the load evenly between the particles. Protect the nano-particles from mechanical and environmental damage and also bring interlaminar shear. While the further constituent is reinforcement; its major objective is to increase the mechanical properties e.g. stiffness, strength etc. The mechanical property mainly based on the shape, size and magnitude of reinforcement [2].

As per Berghezan [4] designed of the composite material in such a way that the individual component retain their characteristic are so built-in that the composite take advantage of their greater properties without compromise on the weakness of either. The matrix material can be metallic, polymeric or can even be ceramic. There are basically three major types of composite materials as per the matrix material available designated. When the mixture is a polymer, the composite is called polymer matrix composite.

The Al_2O_3 nanoparticles have phase steadiness, high rigidity, and good dimensional constancy in dispersion in water. It can be commonly used in plastics, rubber, ceramics, and refractory products. In particular, it can significantly improve ceramics, smoothness, thermal fatigue resistance, fracture toughness, density, creep resistance and polymer products wear resistance. Also Al_2O_3 nanoparticles water dispersion is a capable material of extreme infrared discharge, as the far infrared discharge and thermal insulation materials are use in chemical character products and high pressure sodium lamp.

1. Raw Materials used:

1.1 Alumina nano-particles:

Aluminum oxide is a chemical compound of aluminum and oxygen with the chemical formula Al_2O_3 commonly called Alumina and It Is in Powder Form. There are hybridization matrix of two Al_2O_3 nano-particles i.e. 1)rod shape 2) spherical shape , the Rod shape particle have diameter 5-10 nm and length 50 nm, on the other hand spherical shape having diameter 14-27 nm. Both shape alumina particles provided by Sigma Aldrich India. Particles authentication TEM image received from Sigma Aldrich. Individually spherical and rod particles shape authentication show in figure 1.1 & 1.2 respectively [20].

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Multi- Optimization of Surface Roughness & Material Removal Rate of D3 Tool Steel While Wet Turning Using Multi-Criterion Decision Making Methods

Vikas Sharma[1,2 *], Joy Prakash Misra[3]

Abstract— The objective of the paper is to obtain an optimal setting of turning process parameters (cutting speed, feed rate and depth of cut) resulting in an optimal value of the surface roughness and material removal rate while turning D3 tool steel TiC-coated tungsten carbide tool under wet condition. Taguchi L9 array has been used to design the experiments, the results are further analyzed using MCDM techniques named Technique for order preference by similarity to ideal solution TOPSIS and Preference Ranking Organization Method for Enrichment of Evaluations (PROMETHEE) to investigate the multi-optimization of response characteristics of D3 tool steel bars.

Index Terms—

I. INTRODUCTION

Mostly the machining parameters are selected based on the knowledge, labour expertise and also referring to standard handbooks. The chosen machining parameters may not be the optimal solution which leads to higher cost of the product[1] .High machining performance is obtained by the selection of optimum machining parameters. Optimization techniques help as to select the optimum combination of machining parameters [2] Production hubs around the world looking for lower cost solutions with reduced lead time and better surface quality in order to maintain their competitiveness. Traditionally, most ferrous metal parts are rough turned, heat-treated and finished by abrasion [3]. In recent years, hard turning which uses a single point cutting tool has replaced grinding to some extent for such applications D3 tool steel is one of the widely used materials due to its high and unique strength that is maintained at elevated temperature and its exceptional wear resistance. It is suitable for manufacturing of cold work dies and rolls.D3 steel possessing high strength and toughness in range of HRC 60 and above is usually known to create major challenges during machining. Turning is traditional machining method that could be cost effective method of machining of D3 tool steel[4]. However there is not much evidence regarding turning of material like tool steel in literature.

Ravinder et al; worked on AISI O3 steel in order to optimize the parameter for surface roughness and material removal rate and compared the different method for multi optimize the output parameter, they found the WSN method best for multi optimize the input parameters[5]. Chaudhari et al; worked on mild steel using L9 orthogonal array with output parameter surface roughness and tool wear under the environment of MQL(minimum quantity lubrication). The experimental result showed that the cutting speed, feed rate and depth of cut are the main parameters that can effect the tool wear. They also showed that MQL provides solution for many problem during turning. Thamizhmanii et al; applied Taguchi method for finding out the optimum cutting conditions for surface roughness in turning SCM 440 alloy steel using speed, depth of cut and feed rate. The experiments were with the accordance of L18 orthogonal array and results were analyzed with the help of ANOVA (Analysis of Variance) method. The work revealed that depth of cut was significant factor which contributed to the surface roughness[6]. Sahoo and Sahoo Paper presents the experimental study, formation of mathematical model and input factors optimization for surface roughness in turning D2 steel using TiN coated carbide insert using Taguchi parameter design and response surface methodology. The experiments were conducted with the help of L27 OA taking work-piece speed , feed and depth of cut cutting parameters. The influence of the machining parameters on the surface finish has also been investigated and the optimum cutting condition for minimizing the surface roughness is evaluated. Result shows that feed the most significant process parameter on surface roughness followed by depth of cut. The cutting speed is found to be insignificant from the study[7]. Selvaraj et al; worked on AISI 304 austenitic stainless steel to show influence of cutting parameters like speed, feed & depth of cut on surface roughness of material during dry turning. A plan of experiment based upon Taguchi's technique was used to acquire the data. An orthogonal array L9, S/N ratio and ANOVA was employed to investigate the cutting characteristics of material using coated TiC coated carbide tool. They found feed rate and cutting speed affects the surface roughness most and almost equally[8].

II. EXPERIMENTAL SETUP

In this study cylindrical work piece AISI-D3 tool steel was used, Chemical ingredients of the work-piece material as shown in Table 1. D3 tool steel is one of the widely used materials due to its high and unique strength that is maintained at elevated temperature and its exceptional wear resistance. It is suitable for manufacturing of cold work dies and rolls.D3 steel possessing high strength and toughness in range of HRC 60.

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Correlations development for Nusselt number and friction factor of roughened double pass solar air heater duct

Gaurav Bharadwaj, Vikas Sharma and Avdhesh Sharma

Abstract*—An experiential study has been executed to see the otcome of using inclined and transverse ribs as roughness elements on the Nusselt number and friction features on absorber plate in the rectangular duct used in DPSH. Width to duct height proportion (w/h) is 10, relative roughness pitch (p/e) varies from 5-20, relative roughness height (e/D_h) varies from 0.043, attack angle (α) varies from 30°-90° and Reynolds number lies between 4000-18000. The comparision of heat transfer and friction factor of roughened duct and smooth duct has been shown. A appreciable rise in the Nusselt number and friction factor has been noticed as that of smooth duct. Nusselt number and friction factor correlations have been developed using the experimental data

Index Terms*— Nusselt number; friction factor; Solar air heater duct; Ribs.

I. INTRODUCTION

Low heat transfer rate between the collector plate and the air streaming inside solar air heater channel lower down its efficiency. Also they have low specific heat. These shortcomings are being minimized by providing artificial roughness over the absorber plate to a greater extent. It enhances both the Nusselt number and friction factor to a considerable extent. This method of enhancing heat transfer and friction factor characteristics as artificial roughness on the absorber plate have not been used in double pass solar air heater till now. Artificial roughness can be provided by machining, sand blasting, by providing dimples and fixing ribs etc. as given by Dippery and Sabersky [1], Saini and Saini [2], Leung et al. [3], Burgess et al. [4], Bhushan and Singh [5].

The design of double pass reverse ebb air heater is firstly given by Satunanathan and Deonarine [6]. They flows air firstly between the gap between absorber plate and glass cover and then sent it to the duct. They found that the thermic fall from one or more cover glasses can overcome by using such structures. These types of DPSH are 10-15% more efficient than the single pass solar air heater.

N.E.Wijeysundera et al. [7] executed the thermic performance of two-pass solar heaters. He found that DPSH are 10 to 15% efficient than traditional solar collector .

Momin et al. [8] worked over rugged solar air heater channel. They found that increment in the Reynolds number increase the Nusselt number and visa versa for friction factor. They noticed that the Nusselt number rises 2.30 times and Friction factor rises 2.83 times as compared to smooth collector plate for an angle of attack of 60°.

A.P.Omojaro and L.B.Y.Aldabbagh [9] have investigated the experimental performance of single and DPSH with fins and steel wire mesh as absorber. They found that by using wire mesh as an absorber plate the thermal performance of single and DPSH increases when the mass flow rate increases from 0.012 kg/s to 0.038 kg/s. They also found that the maximum thermic performance is 59.62% and 63.74% for both single pass and DPSH respectively.

Prashant et al. [10] carried out the analytical study of performance of a novel parallel ebb filled bed solar air heater. They design analytical model describing various temperature and heat transfer characteristics. They found that filled bed solar air heater always gives more efficiency as compare to the conventional non porous DPSH.

M.F.El-khawajah et al. [11] investigated the outcome of cross fins on a DPSH (Double pass solar air heater) using wire net as a collector plate. He investigated thermal performance with 2, 4 and 6 fins attached. They found that performance rises with increasing mass flow rate for the range of 0.0121-0.042 kg/s. The maximum performance found to be 75%, 82.1% and85.9% respectively for 2, 4, 6 fins attached for the same mass flow rate of 0.042 kg/s.

Maithani and Saini [12] investigated the effect of V-ribs with symmetrical gaps on the collector plate of DPSH. They investigate the augmentation in the Nusselt number and friction factor are 3.6 times and 3.67 times respectively. They also develop the correlation for the same.

Sharma et al. [13], [14] investigated the enhancement in the friction factor and the Nusselt number by placing V ribs on absorber plate of DPSH. The correlation for the Nusselt number and friction factor have also developed by them.

The present experiential investigation executed to see the outcome of inclined and transverse ribs on the Nusselt number and friction factor used in rectangular duct of a double pass solar air heater as artificial roughness on the absorber plate, as none of the studies is being carried out over double pass solar air heater. The experimental data has been collected and used for the development of heat transfer and friction factor correlations.

II. EXPERIMENTAL SETUP

A schematic view of the experimental set-up has been shown in Figure 1.To study the effect of artificial

EXPERIMENTAL INVESTIGATION FOR OPTIMIZATION OF PROCESS PARAMETERS OF EDM FOR TITANIUM GRADE 5 ALLOY [TI6AL4V] USING TAGUCHI METHOD AND PROMETHEE METHOD

Avdhesh Kumar Sharma, Gaurav Bhardwaj, Bharat Singh

Abstract. The Electrical Discharge Machining (EDM) is one of the most common and most accepted non-traditional machining process used. The work-piece material selected in this experiment is Titanium Grade 5 Alloy [Ti6Al4V] taking in to account its wide usage in industrial application. The high strength and stiffness of Titanium Grade 5 Alloy leads to improve tensile shear and flexural properties. The variable parameters are peak current, pulse on time, and pulse off time and gap voltage. On the basis of PROMETHEE matrix and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) methodologies for four factors with three levels of each factor, we have selected L_9. ARRAY for DOE (Design of Experiments) to be carried out for knowing the TWR and MRR the effect of the variable parameters mentioned above upon machining characteristics such as MRR and TWR is studied and investigated. The tool material is COPPER CADMIUM.

Keywords: Electric Discharge Machining, Tool Wear Rate, Material Removal Rate, Peak Current, Flushing Pressure.

I. INTRODUCTION

Electrical Discharge Machine (EDM) has now turned into the most critical acknowledged innovation in assembling businesses since numerous mind boggling 3D shapes can be machined utilizing a straightforward molded instrument terminal.

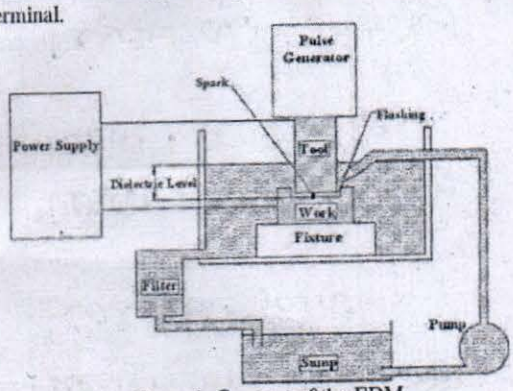

Figure1: Concept of the EDM

EDM is a vital "non-customary assembling technique", created in late 1940s and has been acknowledged worldwide as a standard handling production of forming tools to deliver plastic moldings, die casting, forging dies and so forth. Customary machining methods regularly in view of the material removal, utilizing tool material harder than the work material and can't machine them financially. An EDM depends on the dissolving impact of an electric spark on both the terminal utilized. EDM really is a procedure of using the evacuation phenomenon of electrical-discharge in the electric. Consequently, the cathode and anode assumes an essential part, which influences the material removal rate (MRR) and the tool wear rate (TWR) which are the fundamental yield parameter of EDM. Figure 1 demonstrates the mechanical setup and electrical setup and electrical circuit for electro discharge machining. A thin slit around 0.025mm is keep up between the device and work-piece by a servo framework appeared in figure. Both tool and work-piece are submerged in a dielectric liquid. Kerosene oil/EDM oil is extremely basic kind of fluid dielectric albeit gaseous dielectrics can likewise be utilized in certain cases. The tool acts as cathode and work-piece acts as anode. Voltage in form of a spark discharge through the gap, when sufficient enough in a time interval of 10 micro seconds. Because of heat the positive ions and electrons produce a conductive discharge channel. It is exactly now when the spark hops causing crashes amongst particles and electrons and making a channel of plasma. A sudden drop of the electric protection of the past channel enables current thickness to achieve high esteems creating an expansion of ionization and the sure of an effective magnetic field. The minute spark happens adequately pressure is produced amongst work and tool because of which a high temperature is come to and at such high pressure and temperature some piece of metal is liquefy and disintegrated. Such restricted outrageous ascent in temperature prompts material evacuation. Material expulsion happens because of case vaporization of the material and additionally because of

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CFD analysis of free surface flow over Broad-Crested Weir using Volume of Fluid Method

Mr. Prashant Dixit, Dr. T. S. Deshmukh

ABSTRACT **The prediction of water surface elevation in open channels is quite important in order to evaluate and determine the side wall heights of structures in open channel systems. At present empirical equations are being widely used for this purpose. In earlier half of 19[th] century experimental approach was used but it has some drawbacks such as laborious data collection and instrument operation limitation. Moreover the 3D flow behavior or some complex turbulent structure which is the nature of any open channel flow cannot effectively captured through experiments, so in these circumstances, computational approach can be adopted to overcome some of these issues. In comparison to experimental studies computational approach is repeatable, can simulate at full scale, can generate the flow taking all the data points into consideration.**

The intention behind the present work is to use the simple geometry of the rectangular broad crested weir to test the commercial CFD software ANSYS-CFX with a view to test its feasibility for implementation in more complex open channel flows. In this first the experimental results of Hager & Schwalt's are validated and then analysis is done for weirs with different

INDEX TERMS— **CFD, VOF, Volume Fraction, Weir**

INTRODUCTION

In order to evaluate and determine the side wall heights of structures in an open channel systems the prediction of water surface elevation in open channels is quite important but still empirical equations are more relied upon for the said purpose. The physical model tests (investigating different flow conditions and geometrical setups) and numerical modeling (for free surface in open channel) may be the prominent methods for assessment of the effect of flows on water levels. In comparison to experimental studies computational approach is repeatable, can simulate at full scale, can generate the flow taking all the data points into consideration.

The study of free surface flow in channels play an important role in river modeling, hydropower engineering, irrigation engineering, flood mitigation etc... The prediction of free surface profile is very important in the design of various hydraulic structures such as measuring flumes, spillways, hydropower canals etc. flow in open channel are affected by following parameters such as shape and slope of channel and depth and velocity of fluid. Interface capturing (makes use of advection of a function that represents the interface for simulating interface behavior) and tracking method (simulates the behavior of interface by deforming the elements) are well known methods to carry out the analysis of free surface flow modeling in CFD. Although later method simulates the interface behavior more accurately as compared to earlier one but it requires regeneration of elements depending upon the fluctuations on interface which makes the method unstable. This instability can be avoided by increasing the number of elements however this increases the computational load. As compared to this the interface capturing method gives fairly accurate results without deforming the interface elements.

The Volume of Fluid (VOF) method for capturing the free surface variation is quite popular due to simplicity in coding (since interface elements need not to be regenerated) and stable calculations (even when there are fluctuations in interface).

In 1981, Hirt C. W. And Nichols B. D. **[9]** presented volume of fluid (VOF) technique for the Dynamics of Free Boundaries as a simple and efficient means for numerically treating free boundaries embedded in a calculation mesh of Eulerian or Arbitrary Lagrangian-Eulerian cells. It is particularly useful because it uses a minimum of stored information, treats intersecting free boundaries automatically, and can be readily extended to 3D calculations. In 1999 Gueyffier Denis [7] introduced three-dimensional methods for interface calculations that can deal with topology changes, describe a numerical scheme, built from a volume-of-fluid interface tracking technique that uses a piecewise-linear interface calculation in each cell. In 2007 Hargreaves D. M. **[8]** describes the validation of Computational Fluid Dynamics (CFD) for modeling free surface flows over common hydraulic structures. Different CFD simulations were compared against an existing set of experimental results for the free surface flow over a broad-crested weir which was given by the Hager and Schwalt (1991). He fixed the upstream and downstream water heights in the CFD simulation and reproduces the analytical free surface profiles, velocity profiles and pressure profiles and discharges over the weir for different discharge rates. The use of turbulence model is very important for good results, he used different turbulence model for different cases. In 2010 Gandhi B. K. [5] investigated the different real flow conditions to determine the velocity profiles in both the directions in which field ideal flow condition rarely exists. A commercial CFD code 'Fluent' was used for numerically models of various situations. He investigated and discussed the effects of bed slope, convergence/divergence of channel width and

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Multiobjective Optimization of Submerged Arc Welding Parameters on AISI 5130 Alloy Steel using Taguchi Method

Bharat Singh, Piyush Singhal, Avdhesh Sharma

Abstract—Submerged Arc Welding (SAW) is considered as a multi-input process. In order to achieve high productivity and quality of weld, it is very difficult to select optimum combination of input process parameters. In this work Taguchi Method is being used for the optimization of input process parameter, which is very simple, fast, robust and convenient. Submerged arc welding (SAW) is a process of overlaying metals by coalescence. The heat required for coalescence is provided by an arc generated between consumable electrode and work-piece. Analysis of SAW process parameter is key point for researcher due to its wide application in heavy welding industry, ship construction, pipeline etc. To set the optimum process parameter is a common problem with SAW for desired response due to its multi input parameter. These parameter are welding current, arc voltage, welding speed, wire feed rate etc. Later response found by the process significantly influence by these parameter. In this work, Submerged Arc Welding is performed on AISI 5130 alloy steel. Responses in terms of depth of penetration and Hardness of welded joint are analyzed. Based on optimization a regression model has been developed for each response. Optimum levels of factors have been identified. The predicted value of levels has been validated by experimental run.

Index Terms— SAW, Taguchi, Response Surface Method, Depth of Penetration, Peak temperature.

I. INTRODUCTION

Welding is a process of overlaying the metal over the other. Welding is much faster, advantageous and economical compared to other fabrication process. In order to provide high quality and high deposition weld, submerged arc welding was introduced in 1930s. Variation in Procedure of SAW Input parameters will affect the weld quality, shape and as well as the amount of weld deposition. There has been a continuous interest of researchers and practitioners since 1930 in the augmentation of weld quality. In Submerged Arc Welding, the qualities of weld deposits are mainly influenced by welding current, welding voltage, welding speed, wire feed rate ,electrode sickout etc [1].

Several attempts have been made by Researchers [1-5] for prediction and optimization of input process parameters in SAW process. Datta et. al[6] elaborates the study of welding input parameters effects on bead geometry i.e. depth of penetration, weld bead width, weld reinforcement. ANOVA and grey based Taguchi technique, has been utilized for optimized results. Chandel et al.[7] has investigated the effect of deposition rate on bead geometry Submerged arc welding can also utilize for welding of dissimilar material [8]. A comparative study has been developed by Gunaraj[9] for for predicting weld bead quality of bead-on-plate. The area of the heat affected zone is more for bead-on-plate as compare to heat affected zone for bead-on-joint[9].

There has been changing trend in increasing use of Taguchi Method in design of experiments since past decades due to efficient and systematic approach to optimize designs for experiments, characteristics and cost[1-26]. This method is very common in all engineering problems. Taguchi method eases the optimization procedure for investigating the process parameters in submerged arc welding. Tareng et al. applied Taguchi Method for optimizing the hard facing by using submerged arc welding. In this investigation, a grey relational grade achieved from by establishing the grey relation Then, optimal process parameters are predicted by developing the design of experiment proposed by Taguchi method[27].

In the present study, attempt has been made to determine the optimal process parameter in submerged arc welding to yield desired weld quality in terms of bead geometry and bead mechanical properties and to analyse the effect of various process parameters on Weld bead. In present study Taguchi L27 orthogonal array design has been used for conducting the experiment. The influence of SAW welding parameters i.e. welding current, welding voltage, welding speed, and wire feed rate on depth of penetration (DOP) and weld bead hardness has been investigated.

II. TAGUCHI METHOD

Taguchi Methodology is an emergent tool for the systematic and scientific design of experiment for high quality production process and system. Dr. Genichi Taguchi, developed a orthogonal array experiments, which reduce variance in the process and system. Orthogonal array (OA) developed in Taguchi method provides best set of design of experiment (DOE) which results in

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Influence of Steel Crystal Powder on Performance of Recycled Aggregate Concrete

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Abstract. This research paper presents the scientific attempt of a comparative study of recycled aggregate concrete (RAC) and conventional concrete with the incorporation of waste steel crystal powder. In this study, recycled aggregate concrete has been prepared using recycled coarse aggregate as a partial substitute (0-30%) of natural coarse aggregate which provides an efficient solution to the dilemma of valuable fertile landfilling and also saves natural aggregate resources. The objective of this study is to investigate the strength and abrasion resistance of concrete made with recycled coarse aggregate. The addition of waste steel crystal powder varying from 0% to 5% by weight (with 2.5% increment) of total mix and assess its suitability for use in a series of designated applications. The compressive and flexural strength results on the recycled coarse aggregate demonstrated higher percentage loss than natural aggregate but remained within the acceptable limits. An adverse effect observed when waste steel crystal powder added into the RAC as well as conventional concrete. The results arrived from abrasion tests reveals that wear depth with the replacement of coarse concrete aggregates is enhancing with the increase in the replacement ratio but decreases with increase in waste steel crystal powder in the mix. In general, addition of waste steel crystal powder can produce stronger recycle coarse aggregate concrete as compare to conventional coarse aggregate concrete.

1. Introduction

Concrete is one of the most versatile materials employed in the construction industry. Progressively, the exigency for concrete is increasing which in turn boost the demand for their raw materials [1, 2] The consumption of concrete is second next to the water on our planet [3, 4]. The cement industry faces several challenges such that depleting fossil fuel reserves, scarcity of raw materials, perpetually increasing demand for cement and concretes, growing environmental concerns linked to climate change and an ailing world economy [5-7]. Presently, escalating industrialization results into immoderate work of construction and demolition (C&DW) activities. During last decade, the C&DW activities have increased tremendously around the world [8]. This waste is generated by the demolition of concrete elements and structures. In India, around 10-12 million tons of wastes, i.e. bricks, tiles, wood, metals, concrete etc. are annually generated by construction industry only. Concrete and bricks waste generation occupy 50% of total wastes which is not efficiently recycled [9]. Recycling of this wastes has various advantages such as reduce waste disposal problems and decreasing the consumption of natural resources. Many countries inaugurate regulations on reuse of waste materials in construction activity and have to generate recycled aggregate from the construction waste and

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Effect of Temperature on Volume, Thermal Expansivity and Bulk Modulus in Nanomaterials

Monika Goyal

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In the present work, the author has used the potential independent theoretical models for the determination of variation of thermo elastic parameters such as coefficient of volume expansion, volume expansion and bulk modulus for nanocrystals of silver (Ag) and aluminium (Al). The temperature dependent forms of Tait's equation of state and Murnaghan equation of state are employed. The values obtained from the equation of states (EOS's) for volume expansion are compared with the available experimental results. The results obtained are used to choose the best model from the two models considered to study the thermoelastic properties of nanomaterials. A good agreement has been obtained between the theoretically calculated results and available experimental data.

Keywords: Equation of State, Nanocrystals, Thermal Expansion, Thermal Expansion Coefficient.

1. INTRODUCTION

The thermo elastic properties of metallic solids, minerals and alloys etc. have been studied by many scientists under pressure and temperature. This study helps to understand the earth's interior as it provides important information about the evolution of the earth. The change in temperature and pressure affects the atomic stability of the solid material and as a result alter the physical properties of the material like compression, heat conduction, elastic properties, thermal expansion etc.[1,2] It is found that very less quantity of nanocrystalline forms of minerals are present inside the earth's crust; however their importance cannot be neglected.[3–5] In past few years, there has been intensive study, both experimental and theoretical, to explore the fascinating physical properties of nanomaterials. The study of nanomaterials having dimension upto 100 nm is current area of interest to understand its intrinsic characteristics. Large surface to volume ratio in nanomaterials enhance the surface effects and make them different from their bulk form. Because of the significant difference in behavior of nanomaterials from the bulk form, their study under high pressure and temperature is necessary. Various experimental and theoretical studies are performed on nanomaterials under high pressure and temperature.[6–12] However, the theoretical studies are less. So, a theoretical method is presented here for the study of nanocrystals under high temperature.

2. METHOD OF ANALYSIS

The Tait's equation of state is expressed as follows:[13–15]

$$V(P,T_o)/V(o,T_o) = 1-\frac{1}{(B'_o+1)}\ln\left\{1+\left(\frac{B'_o+1}{B_o}\right)(P)\right\} \quad (1)$$

where B_o, V_0 are bulk modulus and initial volume at zero pressure. B'_o is the pressure derivative of bulk modulus. For including the temperature effect in Eq. (1), the thermal pressure (P_{Th}) term is introduced in Eq. (1) given by:

$$P_{\mathrm{Th}} = \alpha_0 B_0 (T-T_0) \quad (2)$$

So, the net pressure acting on the solid is given as:

$$P_T = P - \alpha_0 B_0 (T-T_0) \quad (3)$$

The temperature and pressure dependent Tait's equation of state is expressed as:

$$V(P,T_o)/V(o,T_o) = 1-\frac{1}{(B'_o+1)}\ln\left\{1+\left(\frac{B'_o+1}{B_o}\right)\times(P-\alpha_0 B_0(T-T_0))\right\} \quad (4)$$

Putting $P=0$, the temperature dependent form of equation is expressed as:

$$V(P,T_o)/V(o,T_o) = 1-\frac{1}{(B'_o+1)}\ln\{1-\alpha_0(B'_o+1)(T-T_0)\} \quad (5)$$

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DISASTER MANAGEMENT

• Dr. Vinod Kr. Vashistha • Dr. Dipak Kr. Das

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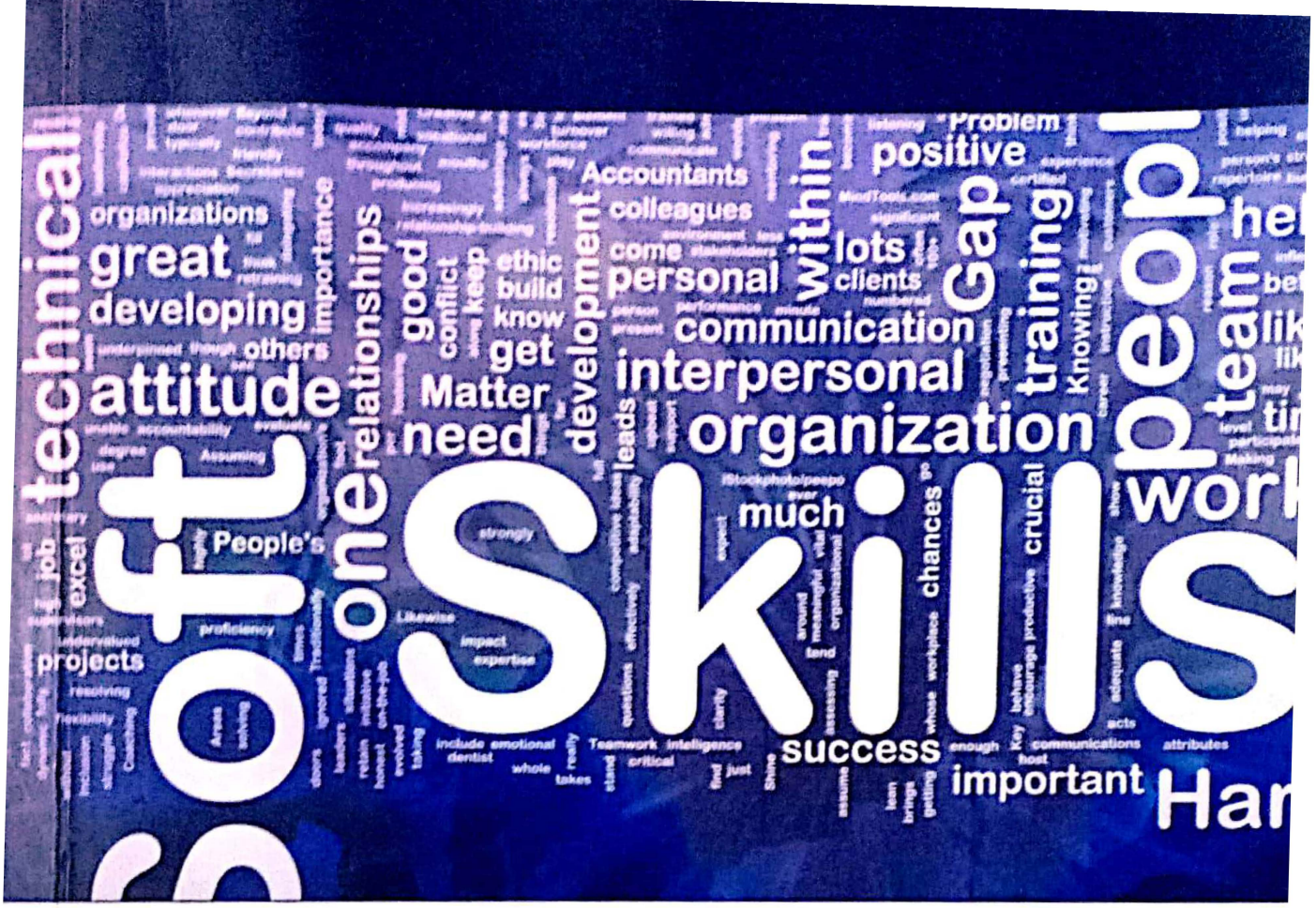

Manish Kumar

Learning and Teaching of Communicative Skills

in Government and English Medium Public Schools in the District of Bhagalpur: A Study in Applied Linguistics

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One of the initial targets of Applied Linguistics is language teaching. Applied Linguistics embraces social aspects which are core to any understanding of language attitude whereas policy and planning represent practical application. Teaching English as a Second Language without knowing both the linguistic and cultural norms of the students' population is never proper because a Linguistic study excluding social aspects is really missing something critical. The English language has emerged as a stepping-stone for educational, economical and national development of any developing country. Its utilitarian value to the larger Indian society is vested in the role of English as the official language of administration and commerce; and it emphasizes the importance of and need for improving the quality of spoken and written English language among school children.

Dr. Manish Kumar - Degree of Doctor of Philisophy in English, Faculty of Humanities, Tilka Manjhi Bhagalpur University, Bhagalpur.

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Inheritance of resistance to *Fusarium* Wilt in Pigeonpea

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Wilt caused by *Fusarium udum* is the most common and destructive disease of pigeonpea. In order to incorporate *Fusarium* wilt resistance into adapted, popular high yielding but susceptible genotype MAL -18, the inheritance of resistance to *Fusarium* wilt was investigated in pigeonpea using two *Fusarium* wilt resistant genotypes, namely BWR-133 and BSMR-846 and MAL-18 as susceptible genotype. In the cross of MAL-18 × BSMR-846, analysis of F_2 progenies showed a digenic epistatic interaction mechanism of resistance with a 13 (resistant): 3 (susceptible) segregation ratio. Similarly, evaluation of F_2s of the cross MAL-18 × BWR-133 also showed digenic epistatic interaction with segregation ratio of 9 (resistant): 7 (susceptible), indicating a complementary gene action. Study of progenies back crossed to resistant parents indicated the segregation of resistant and susceptible progeny in the ratio of 3R:1S in both the crosses. The allelic test between BWR-133 and BSMR-846 confirmed the independence of genes governing resistance. The information on genetics of *Fusarium* wilt resistance generated from this study could be used, to introgress *Fusarium* wilt resistance into susceptible but highly adopted cultivars using marker-assisted backcross breeding and in conventional breeding programs. Further studies using diverse pigeonpea lines with resistance to specific virulent isolates will be undertaken in order to confirm or reveal additional resistance genes.

Keywords: Pigeopea, *Fusarium,* Wilt, Inheritance, Digenic, Complementary, Epistasis

Pharmacognostic evaluation of WithaniacoagulansDunal (Solanaceae) - an important ethnomedicinal plant

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Department of Botany
UdaiPratap (Autonomous) College, Varanasi

The genus *Withania* (Family: Solanaceae) holds an important position in Ayurveda, the Indian traditional system of medicine. *Withaniasomnifera* Dunal and *Withaniacoagulans* Dunal have been documented in folklore as panaceas for various ailments since time immemorial. *W. coagulans* (WC), commonly called as Indian cheese maker is used for fermenting milk for cheese production in various parts of India. Medicines derived from natural products have generated widespread interest and attention globally on account of their safety, efficacy and relatively fewer side effects. This has caused a paradigm shift towards opting for safer plant-based remedies. The plant, *Withaniacoagulans* Dunal is well-documented in Ayurveda as a cure for a plethora of diseases and conditions. Fruits and leaves of *W. coagulans* Dunal contain an enzyme called Withanin and are commonly used to coagulate milk.Various parts of this plant are known to possess and exhibit a wide spectrum of biological activities. The fruit is a berry having a sweet taste with reported sedative, emetic and diuretic properties. The dry fruits are commonly used for treatment and management of diabetes in northern parts of India. No wonder, the fruit is also commonly referred to as 'tukhm-e-hayat' (fruit of life). The plant has also been found to possess a range of activities *viz.*hypoglycemic, hypolipidemic, freeradical scavenging cardiovascular, hepatoprotective, anti-inflammatory, wound healing, antitumor, immuno-suppressive, cytotoxic, antifungal and antibacterial properties .

Effects of 2-4 D concentration and sodium salt stress in Banana callus

Pradeep Choudhary*[1], Vishal Khandelwal and Ashok kumar Bhatia
Department of Biotechnology, GLA University, Mathura, U.P.

This study aims to employ plant tissue culture techniques in the initiation of callus for three variety of Banana at different Auxin concentration and to evaluate their salt tolerance. The response on three different banana variety to callus formation and salinity stress was investigated. A callus was initiated from shoot tips, cultured on MS medium supplemented with 2, 4, 6 or 8 mg/l 2,4-D in addition to the control. Callus cultures were then exposed to different salinity levels (0, 0.5, 1, 1.5 and 2%) NaCl to regenerate salt tolerant plants. The results revealed that the best callus initiation was observed on explants cultured on 4 mg/l 2,4-D containing medium, while 2 mg/l 2,4-D was more suitable for callus growth and multiplication. Shoot tips and young leaves were superior in callus production as compared to young stem segments, and significant differences were observed among the different variety in their response to produce callus and subsequent plant regeneration. The results also showed that callus fresh weights were significantly reduced with increased NaCl concentration in the medium. Furthermore, different variety of banana showed significant differences in their response to salt stress, and the variety present in Mathura region was superior to the other two variety of eastern U.P. in this respect. Estimation of the amino acid proline in callus cultures showed an increase with increased salt concentrations. Finally, plant regeneration percent in callus cultures were reduced with increased NaCl concentration, and no generation was attained at 1.5and 2% NaCl levels.

Key words: 2-4D, Salt stress, Callus, Proline

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This is to certify that Prof./Dr./Mr./Ms. Pradeep kumar choudhary *of* GLA University, Mathura (U.P) *has Participated in the International Symposium on Environmental, Educatio and Biological Research for Human Welfare. He/She has delivered/lecture/paper/poster entitled* Effects of 2-4D concentration and sodium salt stress in Banana callus *in "EEBRHW - 2018" held at K. N. Udupa Auditorium, IMS, Banaras Hindu University, Varanasi.*

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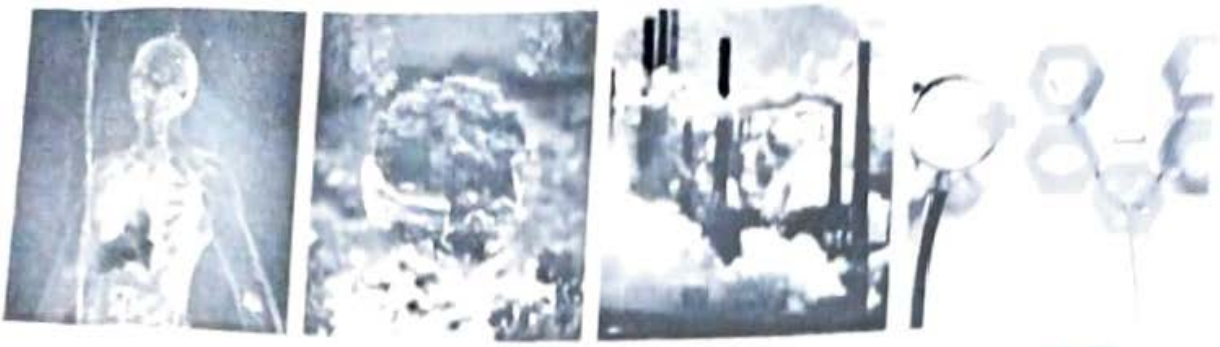

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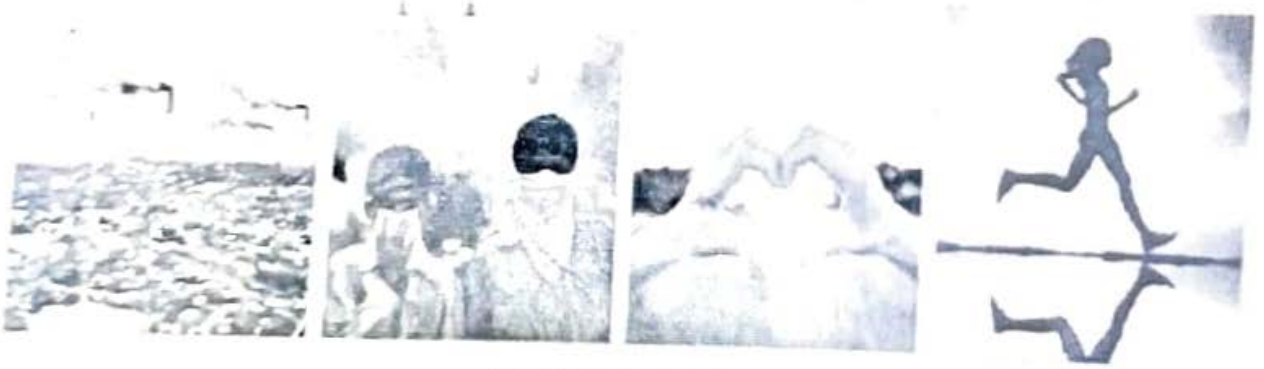

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EDITORS

EFFECT OF METAL IONS ON ANTIBACTERIAL ACTIVITIES OF PIPER NIGR...

Rama Sharma[*1], Shivangi Agrawal[1], J. A. Khan[1], A. K. Bhatia[2]

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ABSTRACT

Chemistry of natural product is an ancient science. Plant materials show beneficial medicinal ... due to the presence of secondary products in plants. This results from the combinations of ... metabolites. Piper nigrum (black pepper) has been selected because of medicinal applications ... since ancient times and no harmful effects. Piperine is the main constituent present in Piper ... is widely used in different system of medicines like Unani and Ayurvedic. Piperine shows ... pharmacological activities like antimicrobial, antihypertensive, antitumor, antioxidant, ... antiasthmatics, analgesic, anti-inflammatory, anti-diarrheal, immuno-modulatory, anti-thyroid... Based on medicinal importance, an effort has been made to review the antibacterial properties ... effect of metal ions on this activity. P. aeruginosa, S. aureus and E. coli bacterial strains were ... antibacterial activity. The antibacterial activity was determined by well diffusion method. The ... aqueous extract of Piper nigrum was more active against S. aureus than cold aqueous and ethan... extract. Against E. coli ethanolic extract showed better zone of inhibition.

Keywords: *Piper nigrum(Black pepper); antibacterial study;metal ion effect*

INTRODUCTION

Piper nigrum (black pepper) fruit (dried) is used as a spice and seasoning. It is a flowering vine ... fruit of the black pepper is called a drupe and when dried it is a peppercorn. Peppercorn is around ... millimeters in diameter, dark red in colour and contains a single seed. Peppercorns may be described ... simply as pepper, or more precisely as black pepper. Extracts prepared from plants are used ... medicines to cure diseases as these are as effective as allopathic preparations [1].

The antibacterial activity of ethanolic extracts of black pepper has been investigated by ... scientists [2-4]. Investigation has been made to find out the immunomodulatory effects of ... pepper and it was observed that aqueous extracts appreciably increase splenocyte proliferation ... dose-dependent, synergistic fashion [5]. In order to deal with side effects of synthetic antibiotics ... the present studyinvestigation has been made for the antimicrobial activity of black pepper. ... nigrum (black pepper) has been selected because of medicinal application of plants since ancient ... times and no harmful effects. Piperine is the main constituent present in Piper nigrum. It is widely ... used in different system of medicines like Unani and Ayurvedic [6,7]. Piperine shows various ... pharmacological activities like antihypertensive and antiplatelets [8], antimicrobial [10,11] antitumor ... [6,9,13,14], antioxidant [12-16], antiasthmatics [17], antipyretic, analgesic, anti-inflammatory, anti- ... diarrheal, antispasmodic, anxiolytic, antidepressant [18-22], hepato-protective[23], immuno- ... modulatory [24,25], antibacterial, antifungal, anti-thyroids, insecticidal and larvicidal activities ... Piperine has been found to improve the therapeutic efficacy of many drugs, vaccines and nutrients ... [26]. It is also known to enhance cognitive action and fertility [27].

MATERIALS AND METHOD

SPICE SAMPLE

Black pepper collected from local shops Vibhuti Khand, Lucknow. Black pepper was then ground ... powder using a mixer and grinder.

OMICS FOR PERSONALIZED MEDICINE

Aditya Saxena

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High throughput omics technologies have revolutionized the life science research and have set the stage for translational aspect of medical informatics in the form of personalized medicine. Indian-subcontinent with its rich genetic diversity and IT-skilled manpower offers a niche for conducting genomic-medicine-based clinical studies.

Omics data however comprises just a stratum of the big data that must be collected, organized and analyzed in order to construct an information system that can support personalized medicine-based decisions.

This study primary focuses on the fundamental concepts of individualized medicines, delineates the various information sources: epidemiological, clinical, geographical, and environmental with special reference to omics resources that are used in the decision support framework and identify key challenges particularly in the context of India.

Evaluation of antioxidant and immunomodulatory potential of *Neolamarckia cadamba* leaves extract in Wistar albino rat

Vishal Khandelwal[1]*, Pradeep Choudhary[1], Anjana Goel[1] and A.K.Bhatia[1]
[1]Departmnt of Biotechnology, GLA University, Mathura (UP)

Hot aqueous extract (HAE) of *Neolamarckia cadamba* leaves has been used for determination of antioxidant and immunomodulatory activity. 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay method and splenocyte proliferation by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay was used for determination of antioxidant activity and immunomodulatory activity respectively. Significant ($p < .01$) antioxidant potential was also noticed in term of percentage inhibition of free radicals using DPPH free radical scavenging method at different concentrations of HAE when compared with ascorbic acid and butylated hydroxytoluene (BHT). HAE exhibited about 73.10% DPPH radical scavenging activity in comparison to 12.56% and 19.72% scavenging activity of ascorbic acid and BHT respectively at same concentration (0.025 mg/ml). When 0.05mg/0.10mg/0.20mg per ml concentrations were used the percentage inhibition with HAE in comparison to ascorbic acid and BHT was relatively more pronounced. Dose dependent percentage inhibition was also found. The study was designed and conducted to assess the effect of different doses of HAE of *N. cadamba* leaves on rat splenocyte proliferation. For *in vitro* effect of HAE of *N. cadamba* leaves 200 µl of $2x10^5$ spleen cells/well were used and cultured in triplicate in RPMI-1640 medium supplemented with 10% fetal bovine serum (FBS) in presence of (5 µg/ml) optimum conc. of concanavalin-A (a conventional stimulating substance for splenocyte proliferation). *In vitro* study revealed that HAE showed dose dependent induction of Con-A treated splenocyte proliferation. 500, 250, 100, 50 and 20 µg/ml of HAE caused 258%, 195%, 137%, 81.4% and 26.95% proliferation in spleen cell culture respectively. Study concludes antioxidant and immunostimulatory potential of HAE of *N. cadamba* leaves and responsible phytochemicals present in HAE of *N. cadamba* needs to be further investigated.

Key words: antioxidant, immunostimulatory, MTT assay

Molecular Breeding in Ornamental Plants

Vishwa Mohan Dev Chauhan*, Anil K. Singh, Anjana Sisodia, Meenakshi Padhi, Sumit Pal
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Banaras Hindu University, Varanasi 221005

Novelty in color and form of the plant are two of the important traits that persuade the consumer for selection of a particular type of ornamental plant cultivar. Molecular breeding using recombinant DNA techniques offers ample opportunities to produce ornamental cultivars displaying novel flower colours and form which are far beyond the range of traditional breeding methods. The *rolC* gene has been used in molecular research to modify plant architecture of chrysanthemum, leading to its bushy habit and induction of small flowers with compact stems. While in case of petunia and pelargonium induction of the *rolC* gene with *Agrobacterium rhizogenes* resulted in the reduction in plant height, leaves, and flower size. The time for flowering is also reduced in *rolC* transgenic plants. Application of molecular breeding strategies to modify flavonoid biosynthesis in chrysanthemum, cyclamen, cymbidium, lisianthus, pelargonium, and petunia is also under study. Despite the significant potential of genetic modification (GM) technology for ornamentals, the high costs of research, development and regulatory approval, the costs and difficulties of access to intellectual property rights (IPR), and some market resistance present significant challenges for profitable applications of molecular breeding. Although consumer resistance may be less for genetically modified ornamentals than that for food products, but at the same time narrowing the genetic base can put us in a bad situation in future. However, understanding that there is a need for novel traits that can be provided only by molecular breeding, the technology is still likely to have a major impact on the industry in the future.

sKeywords: Molecular Breeding, rolC gene, ornamentals, flavonoids

EVALUATION OF SOME HIGHER PLANTS FOR THEIR ANTIFUNGAL ACTIVITY AGAINST RED ROT OF SUGARCANE

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Two hundred forty eight samples, comprising various parts of 170 plant species of 149 genera belonging to 66 families, were screened against the test fungus *collectotrichum falcatum*. Only the fruit extract of *Xanthium strumarium* Linn exhibited 100% fungitoxicity. Other plant extracts showed either poor fungitoxicity or some accelerated the mycelial growth of test fungal. The hydroethanolic extract of fruit was fractionated by different solubility method and only the petroleum ether extract was found to have fungitoxicity. MIC of the active fraction was worked out (1200 PPM) and at this concentration it was fungicidal in Nature. The active fraction at MIC was able to withstand heavy inaculum density; killed the test pathogen in 1.30 hrs of exposure, could be more effectively used at any pH between 4 and 9; had a broad antifungal spectrum and proved to be superior than other commercial fungicides. The active fraction proved to be nonphytotoxic and it stimulated the rate of sprouting of setts and seedling growth of *Saccharum officinarum*.

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WHITEFLIES: A POTENTIAL THEREAT TO AGRICULTURE

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Whiteflies are small Hemipterans that typically feed on the undersides of plant leaves. They comprise the family **Aleyrodidae**, the only family in the superfamily **Aleyrodoidea.** Aleyrodidae are small insects, most species with a wingspan of less than 3 mm and a body length of 1 mm to 2mm. Many are so small that their size create a problem of their control in greenhouses because they can only be excluded by screening with very fine mesh; in fact they can enter mesh so fine that many of their natural enemies cannot come in after them, so that unchecked whitefly populations in greenhouses rapidly become overwhelming and cause a considerable loss to agricultural as well as forestry plantation with the increasing temperature. The ability of whiteflies to carry and spread disease is the widest impact they have had on global food production. In the tropics and subtropics, whiteflies have become one of the most serious crop protection problems. While several species of whitefly cause crop losses through direct feeding, a species complex, or group of whiteflies in the genus *Bemisia* are important in the transmission of plant diseases. A major problem is the fact that whiteflies, viruses they carry can infect many host plants, including agricultural crops, palms, and weeds.
Keywords: Whiteflies, Agriculture, Threat, Aleyrodids

ORGANIC FARMING: A SCENARIO FOR SUSTAINABLE AGRICULTURE IN INDIA

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To meet the requirements of growing population, green revolution was accepted in 1960's in India that pose a negative impact on soil health as well as on consumer health because farmers used excessive amounts of chemical fertilizers and pesticides to increase the crop yield. These chemical fertilizers and pesticides have deteriorated the soil fertility and overexploitation of pesticides has led to the development of various life threatening diseases such as cancer etc. in humans. To overcome the adverse effects of chemical fertilizers, both developed and developing countries now adopted organic farming. In India, organic farming was the traditional means of farming but after the deleterious effects of green revolution, now the farming practices again shifted towards organic crops. The main aim of organic farming is to maintain the soil health by cultivating crops using organic wastes (plant, animal waste) along with the beneficial microbes (biofertilizers) that helps in keeping the soil alive with sustainable production in pollution free ecofriendly environment. As per the records available, India stood first in terms of organic products among 170 countries till 2015. India has also secured 11th rank till 2015 in exporting the organic products to other countries. The above data is sufficient to conclude that future of organic farming is very bright and secured in India and has a sustainable approach also.
Keyword: Organic Farming, Chemical Fertilizers and Sustainable Agriculture

The current scenario of renewable biofuel production is inadequate to overcome the high urge for fossil fuels and to fulfil the need of existing fuel demand. In several studies it has been found that microalgae can deliver a sustainable and harmonizing biofuel platform with some important advantages and in contrast to other biomass feedstocks, microalgae show a number of significantly superior benefits as a raw material for biofuel production. This study revealed on algal biomass conversion methods into various biofuel products such as biodiesel, syngas, biogas and bioethanol etc. However, microalgal cultivation for biofuel production is a costly process and from an economic outlook, the large-scale production of biofuels from microalgae achieves a somewhat less appealing status, due to the requirement of large quantities of water, inorganic nutrients like N and P and the CO_2. The applicability of algae can be determined through the classification of algae for its applications, the technical approaches and their strengths and drawbacks and the future perspectives of algae-based technologies. Here, the authors emphasis on whether the nutrient-rich ash and flue gas generated in biomass power plants could be used as a nutrient source for culturing *Chlorella spp.* to make the cultivation process of biolipids, a trendy and cost-efficient manner. It is estimated that the algae-based biofuel will be acceptable in the upcoming decades and potentially dominate over 75% of the world's economy.

9. **Genetic variation in physiological response at population level of Jamunapari goats**

Rakesh Kaushik[a,b], Anjana Goel[a] and P.K. Rout[b]

[a]*Department of Biotechnology, G.L.A. University, Chaumuhan, Mathura-281406, U.P.;* [b]*ICAR-Central Institute for Research on Goats, Makhdoom, Farah, Mathura-281122, U.P.*

Heat stress is a major problem in livestock which is influenced by different climatic condition so it is necessary to develop different strategies to make better for maintaining production performance. The aim of this work was to analyze the genetic variation in physiological response at population level in Jamunapari goats. The physiological parameters were recorded at different period with THI (Temperature Humidity Index). The THI range varied from 82.00 to 92.08 during hot period, 49.96 to 59.68 during cold period and 65.32 to 74.00 during thermo-neutral period. The two contrasting (HST and HSS) phenotype were identified on the basis of RR and HR. RR and HR was significantly different ($P<0.01$) between heat stress-susceptible and tolerant phenotype. The RR and HR of kids and adult was significantly different ($P<0.01$) between in heat stress-susceptible and tolerant phenotype. Age by period and age by phenotypes interaction had significant ($P<0.05$) on RR and HR. The heritability of RT, RR and HR were 0.18 ± 0.058, 0.077 ± 0.044 and 0.307 ± 0.076 respectively in combined data set. The h^2 estimate was significant for both hot and cold period. Similarly heritability was analysed separately for age group. The genetic correlation between RT and HR was high and positive during hot and cold period as well as in combined data set. Our finding indicates that phenotypic difference can be heritable.

10. **Identification of tolerant tree species to establish green belts around the urban rural gradient**

Arideep Mukherjee and Madhoolika Agrawal

Laboratory of Air Pollution and Global Climate Change, Department of Botany, Institute of Science, Banaras Hindu University, Varanasi-221005, U.P.

Recent urbanization has significantly altered the air quality in both urban and rural environments. Recent studies have identified significantincreases in the Particulate matter (PM) and Ozone (O_3) in both urban and rural environments in Indo-Gangetic Plains of India. Considering this information, a comprehensive study was performed to identify tolerant tree species to establish green belts around

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Stem Cell Laboratory, Longboat Explorers AB, SMiLE Incubator, Scheelevägen 2, 22381 Lund, Sweden

Urinary tract infections (UTIs) are among one of the most common bacterial infections, causing considerable morbidity in UTI, although treatable, is now becoming increasingly tough to control because of rampant antimicrobial resistan Enterobacteriaceae family, particularly in Escherichia coli. As a result, these microorganisms are responsible for significant economic burdens for the communities and public health departments.In many Bacteria and most Archaea, CRISPR provide immunity against viruses and plasmids by targeting nucleic acid in a sequence-specific manner. The study reveals information regarding the role of CRISPR repeats and Cas9 protein in regulation of antibiotic resistance pattern with pathog UPEC bacteria.

Methodology and Theoretical Orientation: Urine and faecal samples from the suspected UTI patientsand controls respect screened for E.coli. using biochemical and morphological characterizationtests. Isolates were screened for susceptibility t lines of antibiotics. Profiling of CRISPR repeats in the genomic DNA was performed using Polymerase Chain Reaction.

...gs: The findings support a negative correlation between CRISPR repeats and antibiotic resistance of E.coli. Also, c strains have higher CRISPR content than UPEC isolates suggesting higher the resistance pattern, lower the CRISPR co study indicates the possible role of loss of CRISPR system in the development of antibiotic resistance.

Insights into the Non-Tuberculous Mycobacterial World along with M. leprae in the Environment of Leprosy Regions in India.

...ram Singh1, Ravindra P Turankar1, Mallika Lavania1, Itu Singh1, Joydeepa Darlong1, ...ena Goel2 and Utpal Sengupta1.
...Stanley Browne Laboratory, The leprosy Mission Trust India, Delhi
...GLA University, Mathura

...on-tuberculous mycobacteria (NTM) are environmental mycobacteria found ubiquitously in nature. The present ...oducted to find out the presence of various species of NTM in leprosy endemic region along with Mycobacterium (M) l ...d wet soil samples from the periphery of ponds used by the community were collected from districts of Purulia of Wes ...ampa of Chhattisgarh, India. Samples were processed and decontaminated followed by culturing on Lowenstein Jense ...erase chain reaction (PCR) was performed using 16S rRNA gene target of mycobacteria and species was c ...its ...ing method. Indirect immune-fluorescent staining of M. leprae from soil was performed using M. leprae-I ...clonal antibody. The phylogenetic tree was constructed by using MAFFT software.From 380 soil samples 86NTM ... of which 34(40%) isolates were rapid growing mycobacteria (RGM) and 52(60%) isolates were sl ...obacteria(SGM). Seventy-seven NTM isolates were obtained from 250 water samples, out of which 35(45%) w ...5%) were SGM. Amongst all the RGM, we isolated M. porcinum, M. psychrotolerans, M. alsenase, M. arabineseand ... Indian environmental samples. M. fortuitum was the most commonly isolated species of all RGM. Out of ...ticum, M. yongonense, M. seouense, M. szulgai, M. europaeum, M.simiae and M. chimaera were isolated for the ...n environment. M. intracellulare was the commonest isolated of all SGM.

...nce of M. leprae was confirmed by indirect immunofluorescent microcopy and PCR method from the same ...es. Phylogenetic tree was showing a close association between these NTMs and M. leprae in these samples. Sev ... NTM species along with M. leprae were isolated from soil and pond water sample

Evaluation of antioxidant and immunomodulatory potential of *Neolamarckia cadamba* leaves extract in Wistar albino rat

Vishal Khandelwal[1]*, Pradeep Choudhary[1], Anjana Goel[1] and A.K.Bhatia[1]
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EVALUATION OF SOME HIGHER PLANTS FOR THEIR ANTIFUNGAL ACTIVITY AGAINST RED ROT OF SUGARCANE

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Two hundred forty eight samples, comprising various parts of 170 plant species of 149 genera belonging to 66 families, were screened against the test fungus *collectotrichum falcatum*. Only the fruit extract of *Xanthium strumarium* Linn exhibited 100% fungitoxicity. Other plant extracts showed either poor fungitoxicity or some accelerated the mycelial growth of test fungal. The hydroethanolic extract of fruit was fractionated by different solubility method and only the petroleum ether extract was found to have fungitoxicity. MIC of the active fraction was worked out (1200 PPM) and at this concentration it was fungicidal in Nature. The active fraction at MIC was able to withstand heavy inaculum density; killed the test pathogen in 1.30 hrs of exposure, could be more effectively used at any pH between 4 and 9; had a broad antifungal spectrum and proved to be superior than other commercial fungicides. The active fraction proved to be nonphytotoxic and it stimulated the rate of sprouting of setts and seedling growth of *Saccharum officinarum*.

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Bioremediation of Xenobiotics: An Eco-friendly Cleanup Approach

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Abstract

Xenobiotics are the chemicals, which are not found in nature and are said to be foreign substances in the atmosphere. These compounds are synthesized by human beings e.g. pesticides, that may be added in the soil to kill the harmful pests but in addition this, these pesticides also kill the beneficial microorganisms that are

Nelumbo nucifera an Indian Lotus

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ABSTRACT

Nelumbo nucifera Gaertn (Family-Nymphaeaceae) is a well known plant in ancient medicine sciences, many research have been done on the leaves, flowers, seeds and rhizomes of the plant. Traditionally, the whole plant of lotus was used as astringent, emollient, and diuretic. It was used in the treatment of diarrhea, tissue inflammation, and homeostasis. The rhizome extract was used as antidiabetic and anti-inflammatory properties due to the presence of asteroidal triterpenoid. Leaves were used as an effective drug for hematemesis, epistaxis, hemoptysis, hematuria, and metrorrhagia. Flowers were used to treat diarrhea, cholera, fever, and hyperdipsia. In traditional medicine practice, seeds are used in the treatment of tissue inflammation, cancer and skin diseases, leprosy, and poison antidote. In this review, we summarize the pharmacologic characteristics and discuss the mechanisms of action and potential therapeutic applications of the plant and its active constituents.

Key words: *Nelumbo nucifera*, Anti-diabetic, Anticancer, Phytochemical, Alkaloids, Hypolipidemic

INTRODUCTION

Nelumbo nucifera is also known as Indian lotus, sacred lotus and simply lotus. The lotus has two species *Nelumbo nucifera* Gaertn and *Nelumbo lutea* (Wild). The *Nelumbo nucifera* belongs to Nymphaeaceae family. All

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Chapter 38
B-School Selection by Fuzzy TOPSIS and AHP

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ABSTRACT

Rapid liberalization of education sector in India has resulted in increased competition. As a result, we have witnessed rapid rise in number of management institutes. The student's evaluation about an institute/college is based on multiple criteria. Realizing the need a focused review on the literature was made to understand the subject. The review highlighted that conventional methods for B-school evaluation are inadequate for dealing with the imprecise, uncertain or vague nature of linguistic assessment. To overcome this difficulty, due to MCDM problem, Fuzzy multi-criteria decision-making methods are proposed. The aim of this study is to use fuzzy technique for order preference by similarity to ideal solution (TOPSIS) and Analytical Hierarchal process (AHP) methods for the selection of better B-school. The proposed methods have been applied to a B-School selection problem of the students of NCR and results are presented. This chapter contributes to previous researches by adding a new avenue, where the MCDM technique can be useful. The selection of an institution for getting a professional degree is a very tough task for the students and as well as for their guardians. This method can help them to find a better solution by providing a quantitative framework.

INTRODUCTION

In this competitive environment parents are very much concerned about B school selection after the completion of graduation of their wards. This study is intense on the best business school selection in NCR region in India. Liberalization and development of NCR region become the primary factors for the

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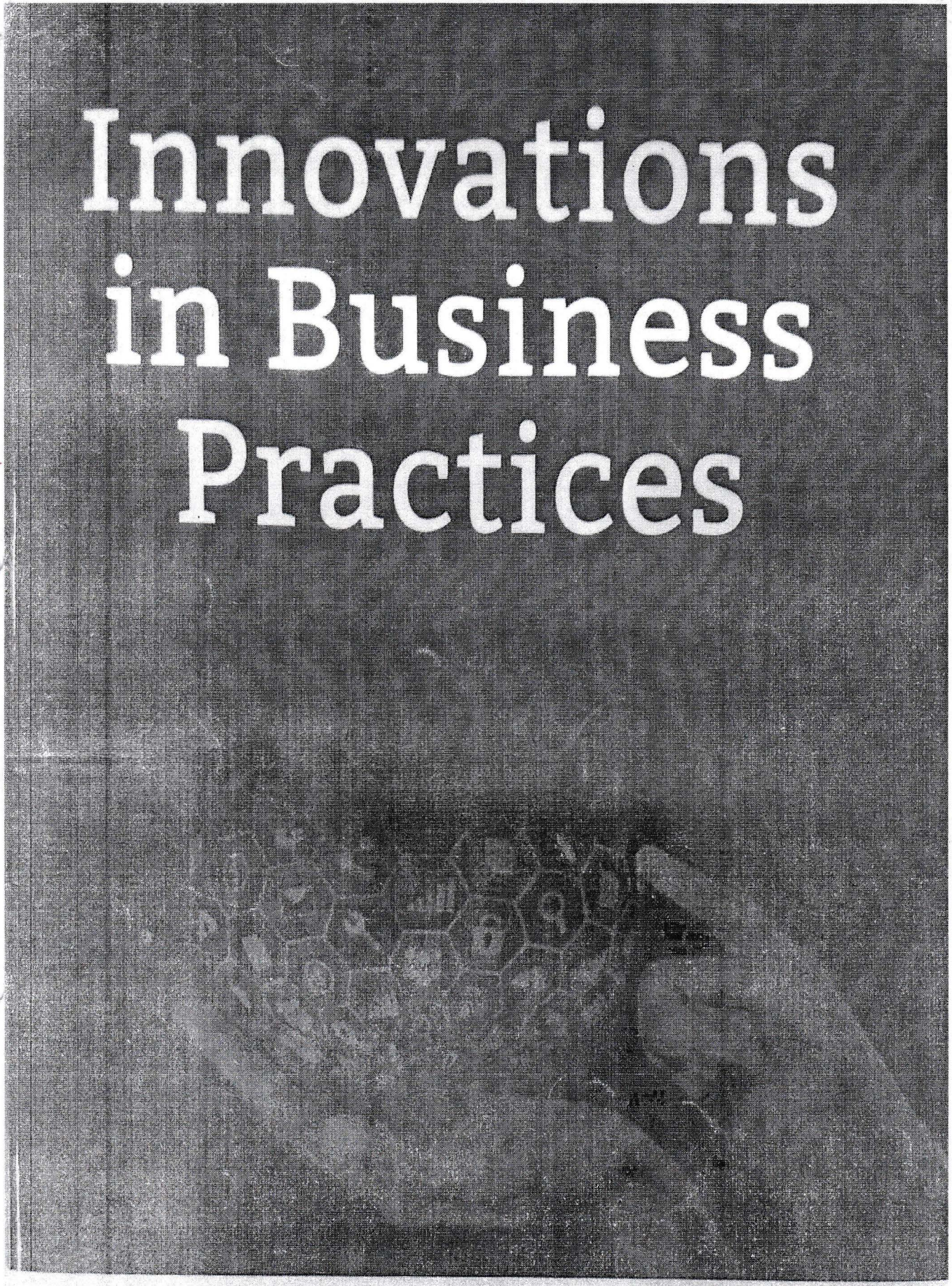

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Shashi Srivastava | Rajkiran Prabhakar

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A Comparative Analysis to Reveal Online Vs Offline Shopping Pattern Among Customers

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Abstract

All organization faces change in the related environment as a result of changes in the market and the ability for market satisfaction. Every organization faces problem while entering into newmarket and finds an opportunity for existing and potential market segment. One of the significant aspects is consumers' perception of online shopping. The purpose of this paper is to examine the online and offline shopping patterns among consumers who shop from traditional stores as well as via smart phone and internet. A survey was conducted in Agra and Mathura region of Uttar-Pradesh.Cronbach Alpha (a) reliability test was applied to check the reliability of the questionnaire and mean and standard deviation tools have applied for data analysis.The result shows a "positive perception of consumers toward online shopping, the key factors like offers and discounts, variety of product available, free home delivery, website user responsiveness and cash of delivery option. It can be judged that most of the respondents would agree to buy product or services online rather than shopping" traditionally. While on the other hand, some people also used to buy mostly offline shopping and they believe that they have enough time to purchase as well as some products which can break in the way of delivery they prefer to offline shopping.

Key Words: - *Online Shopping, Off line shopping, E-Commerce.*

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