

## Portable Electronic Devices Using A Low-Power VLSI Technique

Dr.G.R.Sinha<sup>1</sup>,S.Malles<sup>2</sup>,Y.PremKumar<sup>3</sup>

<sup>1</sup>Professor, Department of E&CE, CMR Technical Campus, Hyderabad, Telangana, India

<sup>2,3</sup>Assistant Professor, Department of E&CE, CMR Technical Campus, Hyderabad, Telangana, India

[drgrsinha@ieee.org](mailto:drgrsinha@ieee.org)

**Abstract:** In portable electronic devices that operate on battery power, it is essential to have power saving techniques to increase the operating time as they are energy constrained. This paper presents a novel power saving technique supported by two design models for multimedia purposes. The two designs are with two varying significance. The most significant part is turned off when it can't produce different results. This is done to save power consumption. The two design examples explored in this paper have varying hardware configurations thus reveal different realization. The models are namely multi-transform model and multimedia functional unit. The former computes three transforms for H.264 encoding while the latter supports six functions which are commonly used namely addition, multiplication, subtraction, interpolation, MAC and sum-of-absolute-difference. For these designs the proposed VLSI technique is capable of saving power by 27% and 24% respectively at the expense of 20% area overheads.

**Index Terms** - Low-power design, multimedia, digital signal processing, video coding, image coding

### I. Introduction

Designing Integrated Circuits for portable electronic devices are essential is challenging as they are energy constraint. The ICs for such devices should be made energy efficient in order to let the devices operate long time. As many wireless, small handheld devices with innovative technologies came into existence, they are capable of processing multimedia or digital signal processing applications. As a matter of fact, the multimedia applications such as H.264 CODECs is very complex in terms of mathematical complexity [2] causing more power consumption in hand held multimedia enabled devices. This warrants new VLSI technique implementations for making such devices energy efficient. Many techniques came into existence for reducing power consumption in VLSI designs. They include dynamic voltage frequency scaling, multiple supply voltages, threshold-voltage controlling, power-down techniques, clock gating, switched-capacitance reduction, and voltage scaling [3], [6]. All these techniques are efficient in reducing power consumption with some cost due to multimedia designs. They achieve it by reducing dynamic power that has significant share in power dissipation. To improve the power saving features in VLSI designs, this paper proposes a novel technique that ensures low power dissipation while supporting two kinds of designs that have various capabilities. The existing techniques explored in [7]-[10] that focus on reducing dynamic power minimizing switched capacitance. In case of [7] while making arithmetic operations, the un used parts are turned off in order to reduce power consumption. This technique is known as partially guarded computation. It could reduce power usage up to 44% with area overheads up to 36%. The drawback with this technique is that it can't reduce power consumption in case of adders due to the kind of circuitry. A new adder was introduced in [8] which is a 32 bit model with two inputs namely sign extension and dynamic range determination in order to reduce power consumption. A multiplier is presented in [9] for effective dynamic range which resulted in Booth codes. Delay and area overheads are the two drawbacks of [9]. Glitching power minimization is the technique used in [10] for replacing existing gates with new ones which are equal in terms of functionality. It is capable of saving only 6.3% power dissipations. A double switched circuit block is used in [11] could reduce power dissipation during downtime. Finally DCT is used in [12] which follows adaptive bandwidth approach. However, it has trade offs between arithmetic precision and power consumption.

This paper explores the two design models and also the proposed technique for reducing power consumption. The flexible and scalable design of processor that supports multimedia is as given in fig. 1. the proposed technique can be applied to two design models. In each design the realization is different with different hardware configurations. With much focus on the optimization, the proposed technique can reduce power dissipation with 1.8-V supply voltage.





# Distinctive Feature Extraction for Indian Sign Language (ISL) Gesture using Scale Invariant Feature Transform (SIFT)

Sandeep Baburao Patil<sup>1</sup> · G. R. Sinha<sup>1</sup>

Received: 12 August 2014 / Accepted: 4 July 2016 / Published online: 21 July 2016  
© The Institution of Engineers (India) 2016

**Abstract** India, having less awareness towards the deaf and dumb peoples leads to increase the communication gap between deaf and hard hearing community. Sign language is commonly developed for deaf and hard hearing peoples to convey their message by generating the different sign pattern. The scale invariant feature transform was introduced by David Lowe to perform reliable matching between different images of the same object. This paper implements the various phases of scale invariant feature transform to extract the distinctive features from Indian sign language gestures. The experimental result shows the time constraint for each phase and the number of features extracted for 26 ISL gestures.

**Keywords** Indian sign language · Gesture recognition · Scale invariant feature transform · Distinctive features · Key points · Difference of Gaussian (DOG)

## Introduction

In recent years, there have been numerous research contributions in the field of Indian sign language (ISL) biometrics which helps in identification of persons based on their traits or characteristics. This area is not very easy because no standard databases are available for the ISL biometrics. The significance of the problem can be easily illustrated by using natural gestures applied together with verbal and nonverbal communication. The use of hand

gestures in support of verbal communication is very useful for the people having no visual contact [1–6]. Different approaches for recognizing hand gestures are available in literatures; Few of them require wearing marked gloves or attaching extra hardware to the body of the subject [7–9]. These approaches are less likely to apply for real world applications whereas vision-based approaches are considered as non-intrusive and hence more likely to be used for real world applications.

ISL is an attempt in this direction that deals with recognition of various static and symbolic characters generated by hand gestures. The biometrics uses the ISL gestures as human traits and recognizes the characters accordingly, which is very useful for deaf and dumb people [10–15]. Many professional estimate that the deaf population in India is approximately 3 million and hard hearing people is 10 millions. Around 100 million people are associated and involved with these 13 million people caring them and helping them in communication. The involved peoples are family members, social workers, audiologist, professional, teachers etc. If any solution is developed for helping the deaf and dumb people to recognize the language then it would be a significant contribution towards society and mankind [11].

## Literature Review

A numerous research works on ISL biometrics is being carried out and some of the researchers have already contributed in this area. Study of sign language biometrics and also ISL biometrics was made and below is a report of literature survey.

Bhuyan, et al. [4] proposed a novel approach for hand pose recognition for analyzing the textures and key

✉ Sandeep Baburao Patil  
patilsandeepb1212@gmail.com

<sup>1</sup> Shri Shankaracharya Technical Campus, Shri  
Shankaracharya Group of Institutions, Bhilai, India

## The Influence of Geometrical Shapes of Stenosis on the Blood Flow in Stenosed Artery

(Pengaruh Bentuk Geometri Stenosis ke atas Aliran Darah dalam Arteri Stenos)

SARFARAZ KAMANGAR\*, IRFAN ANJUM BADRUDDIN, N. AMEER AHAMAD, KALIMUTHU GOVINDARAJU, N. NIK-GHAZALI, N.J. SALMAN AHMED, A. BADARUDIN & T.M. YUNUS KHAN

### ABSTRACT

*The present work was carried out to investigate the blood flow behavior and the severity of blockage caused in the arterial passage due to the different geometries such as elliptical, trapezium and triangular shapes of stenosis. The study was conducted with respect to various sizes of stenosis in terms of 70%, 80% and 90% area blockage of the arterial blood flow. The study was carried out numerically with the help of advance computational fluid dynamic software. It was found that the shape of the stenosis plays an important role in overall pressure drop across the blockage region of artery. The highest level of pressure drop was observed for trapezoidal shape of stenosis followed by elliptical and then by triangular shaped stenosis. The wall shear stress across the stenosis is great for trapezoidal shape followed by triangular and elliptical stenosis for same blockage area in the artery.*

**Keywords:** CFD; coronary artery; non-Newtonian flow; stenosis

### ABSTRAK

*Kajian ini dijalankan untuk mengkaji sifat aliran darah dan keterukan laluan arteri yang tersumbat disebabkan oleh geometri stenosis yang berbeza seperti elips, trapezium dan bentuk segi tiga. Kajian ini dijalankan dengan pelbagai saiz stenosis pada kadar saiz sumbatan laluan arteri 70%, 80% dan 90%. Kajian ini dijalankan dengan kaedah berangka menggunakan perisian dinamik bendalir. Hasil kajian mendapati bahawa bentuk stenosis memainkan peranan penting dalam penurunan tekanan keseluruhan pada kawasan arteri yang tersumbat. Tahap tertinggi kejatuhan tekanan diperhatikan berlaku pada stenosis yang berbentuk trapezoid diikuti oleh elips dan kemudian oleh stenosis berbentuk segi tiga. Tegapan ricih permukaan seluruh stenosis yang paling besar adalah untuk bentuk trapezoid, diikuti oleh stenosis segi tiga dan elips.*

**Kata kunci:** Aliran bukan Newtonian; arteri koronari; stenosis; CFD

### INTRODUCTION

The development of atherosclerotic plaque on the inner side of the wall of arteries causes the myocardial infarction which is one of the most widespread diseases in human causing millions of deaths around the globe each year. The atherosclerotic plaque brings the most effective changes in the pressure, velocity, wall shear stress and impedance (flow resistance). The flow patterns such as velocity, pressure, directions strongly influenced by the geometry of the stenosis formed. It is more complex to assess the physiological severity of an intermediate stenosis in a single vessel or branched vessel using usual coronary angiogram or multi slice computed tomography (Tobis et al. 2007). There are a number of investigators such as Fatemi and Rittgers (1994), Giddens et al. (1976), Khalifa and Giddens (1978), Lee (1994) and O'Brien and Ehrlich (1985) who have reported that the flow pattern disturbance is a sensitive indicator of mild to moderate stenosis. It is known that the shape and dimension of stenosis play an important role in deciding the flow behavior in the cylindrical rigid artery as demonstrated by Lorenzini

and Casalena (2008) that the trapezium plaques shape geometries are the most sever pathologies as they favor higher stain and further more chances of depositions on the walls of artery. The wall shear stress plays a vital role in the progression and development of arterial diseases was demonstrated by Fry (1973). The blood behavior inside the arteries have been subject of differing opinion as many researchers such as Deshpande et al. (1976) and Young (1968) have considered blood as Newtonian fluid for steady analysis through stenosed artery, whereas Shukla et al. (1980) and Misra and Shit (2006) considered the generalized model of Non-Newtonian fluid and analyzed the blood as a Casson and Herschel-Bulkley fluid. The pulsatile blood flow in the curved artery with varying degree of stenosis was analyzed by Ha and Lee (2014), Keshavarz et al. (2011), Liu (2007) as well as Paul and Larman (2009) who have investigated the effect of spiral blood flow in stenosed artery.

Although a significant amount of work has been carried out to investigate the blood flow in stenotic arteries in the past few decades, but not much work has been



## Image Processing Tools for Improved Visualization and Analysis of Remotely Sensed Images for Agriculture and Forest Classifications

G. R. SINHA

Department of Electronics and Communication Engineering  
CMR Technical Campus Hyderabad, India. Email: drgrsinha@ieee.org

### ARTICLE INFO

#### Article history:

Received 25 March 2017

Received in revised form 3 June 2017

Accepted 10 June 2017

#### Keywords:

Remotely Sensed Images,  
Image Enhancement,  
Classification,  
Image Processing.

### ABSTRACT

This paper suggests Image Processing tools for improved visualization and better analysis of remotely sensed images. There are methods already available in literature for the purpose but the most important challenge among the limitations is lack of robustness. We propose an optimal method for image enhancement of the images using fuzzy based approaches and few optimization tools. The segmentation images subsequently obtained after de-noising will be classified into distinct information and the appropriate conclusions would be drawn with regard to forest, agriculture, environmental effect, and crop assessment etc. The tools and techniques are useful for Scientists, Researchers and Academicians working in the area of remote sensing, weather forecasting, crop assessment etc.

### 1. Introduction

The idea of this Proposal originated from my previous publications. A paper entitled "Speckle reduction in Ultrasound Image processing" was published in Journal of Acoustical. Society of India, 35(01): 36-39 (2008). In same volume of the journal one more paper "Contrast enhancement of underwater images" was published (pp. 33-35). Study of "Assessment of Image Restoration Techniques to Remote Sensing Applications" was carried out that has been published in i-manager's Journal on Future Engineering & Technology, 05(03): 33-37 (2010). When CHANDRAYAAN sent the image of moon then researchers started their research works on the data. Now, number of satellites has been increased that have been moving around for different purposes. There are many examples where remotely sensed images play very important role such as: Impact study of soil moisture content and guiding the farmers; doing the detective work for fraudulent crop insurance claims; Detecting oil spills for marine life and environmental preservation, Identifying forest stands and tallying their area to estimate forest supplies etc.

This paper suggests addressing the challenges pertaining to poor image quality of the remotely sensed images and improving the quality and subjecting them for improved analysis and applications.

### 2. Related Research

Remotely sensed images carry huge amount of information. If the quality of the images are not good or the analysis of images does not use optimum set of features then the impact of study based the images would be adversely affected. So, the image processing tools especially image enhancement has been extensively studied and few important contributions at international level have been highlighted here with their findings and limitations.

Tang et al (2001) proposed a novel approach for color image denoising that is based on separating the color data into chromaticity and brightness, and then processing each one of these components with partial differential equations or diffusion flows. The concerns of the paper include uniqueness of solutions. Yun and Chao (2006) worked on image enhancement algorithms to improve the quality of fingerprints used in minutiae extraction from finger print images and to improve the performance of the system. An adaptive preprocessing method extracted five features from the fingerprint images, analyzed image quality with clustering method, and enhanced the images as per their characteristics. Although the method improves the performance of the fingerprint identification significantly but robustness remains challenging issue with this work also. Future work aims to develop image characteristic factors for the identification system in real worlds. Pollak et al. (2000) introduced a family of first-order multidimensional ordinary differential equations (ODE's) with discontinuous right-hand sides and demonstrate their applicability in image processing of SAR (synthetic aperture radar) images. It has used a new approach to edge enhancement and segmentation for its application to signals and





# LECTURE BASED MAPPING TOWARDS ACHIEVING EXCELLENCE IN OUTCOME BASED EDUCATION (OBE) FRAMEWORK

G. R. Sinha

Fellow (IETE) and Senior Member (IEEE) is Professor in Department of Electronics and Communication Engineering, CMR Technical Campus, Hyderabad, Telangana, India.

## ABSTRACT

OBE concept of education has become so much relevant in present context of industry requirement and other expectations of various stakeholders recruiting our graduates. Particularly, engineering graduates are more required to practise the concept and assess themselves in the framework if the learning goes into appropriate direction to meet achieve the expected outcome. Programme outcomes (POs) are based on extensive contributions due to several factors that are derived from course outcomes (COs); which are further derived from unit and chapter outcomes. This paper recommends few pragmatic approaches of mapping the POs with lecture based ordination that might differ again from topic based concept. The recommendation explicitly describes how each lecture could contribute towards meeting overall PO of a particular programme. The emphasis has been given to engineering and technology based education and its impact on society and development of nation. The way one could develop few skills of employability skills, has also been suggested.

**KEYWORDS:** OBE, Employability skill, Lecture, Course outcome, Mapping, Excellence, Competence.

## 1. INTRODUCTION

India has made significant progress in the field of education in last decade across the globe but in proportion to world's population share, she has long way to go to become at par with many countries in the world. Infrastructural expansion in the education sector particularly in higher and technical education is being attempted vibrantly. However, as truly envisaged in OBE concept of education, a lot of things yet to be done that require internal procedural changes; revision of curriculum meeting the current requirement; proactive approach etc [1]. At the same time, India has emerged as powerful player in the field of information technology (IT); in fact the IT growth and its huge applications in the globe is mainly due to the contributions of young and dynamic IT professionals and engineers. Now, OBE is being practiced in many institutes of the country so that it can meet the requirement at global level and its graduates could be accepted anywhere.

OBE talks about outcome of every activity in academic organization that may be research activity; teaching activity; problem and project based activity; each of the activities should contribute some outcome as a change in students. Outcome is culminating exhibition of actual learning in students. Students start their studies with certain objectives in their minds also with certain dreams of their parents and own. OBE framework of education suggests the ways, tools, means by which one can ascertain the outcomes that are mapped with objectives which were set in at the time of starting of the study. Simply producing the graduates or post graduates would serve the purpose, this may merely help them in getting employment but sustainable career growth could not be enjoyed by the candidates if not properly trained through OBE process [2-3]. This requires transitional change in conventional education system although selected number of reputed organizations has started practicing OBE [1].

The goal is to develop competence in students in the form of set of skills which is also called as employability skills so that they can excel in their respective profession and contribute in sustainable growth of the organization. So, the OBE also ensures that the feedback from employers matches with the vision and mission of the institute from where the student has passed out. Effectiveness of technical education lies in several factors such as industry institute interaction and its exposure to students; practicing problem based learning (PBL); realizing the students about importance of values, ethics, societal responsibility and also their role towards the nation [4]. OBE focuses on more student centric concept and less faculty centric approach, at the same time the concept of research centric plays an important role in the OBE framework [5].

There are three important agreements, namely Washington accord (for engineering), Dublin agreement (technologist) and Sidney accords for technician. In almost all, the expectations of the various industries were taken into consideration and also the desired employability skills such as communication skill, strong work ethic, technical aptitude, attitude etc. Then, graduate engineering attributes are compared in ABET criteria clearly identifying the design aspects of engineering and developing the attributes through solving complex engineering problems [6]. The outcomes also referred as program outcomes (Pos) include student learning outcomes as set of course learning outcomes (COs) that is further derived from chapter learning outcomes (LOs). The fact remains unaddressed widely in the technical institutes despite that fact that more than 70 percent engineering graduates are not employable as reported by many research and survey agencies such as NASSCOM. What we require today are innovative, critical and

creative thinkers who could apply their appropriate knowledge in solving real world problems of the society for larger cause and benefit of society and mankind [7-10].

This paper highlights about the simple ways by which an ordinary teacher or faculty can contribute all expected outcomes in our students as envisaged in OBE framework to make India in the list of developed nation when it comes to quality education that is more research based. Few tools are suggested as recommendations towards achieving excellence in the field of technical education by observing OBE religiously.

## 2. RESEARCH BACKGROUND

Sarkar [1] studied the assessment of education systems in terms of primary enrolment to teaching learning outcome. The assessment of any education system should be based on the true outcome of teaching learning process as an integrated process. The learners need to involve in active learning process and ought to get the opportunity to evaluate themselves if they are moving in right direction or not. "Sarva Shiksha Abhiyan" is the brilliant step towards making all educated that needs reformative steps involving the assessment tools and the environment for mapping between outcome and objective that again needs teacher's training at appropriate level so that they can propagate and impart the suitable amount of assessment oriented education to the children right from childhood and school education. The involvement of different government bodies such as NCTE, AICTE, NCERT, CBSE, ICSE etc. is equally important since they are responsible for policy making and their implementations.

Davis [2] discussed different possible ways in which the outcome in OBE could be achieved. The implementation of OBE was discussed along with advantages and disadvantages thereof. The paper particularly highlighted outcome achievement in context with medical science education, namely effective communication; basic clinical sciences and their knowledge; use of basic sciences in the practice of medicine; knowledge of diagnosis, management, and prevention; lifelong learning; self-awareness, self-care, and personal growth; social and community perspective of healthcare; moral reasoning and clinical ethics; problem solving-based approaches to real time situations and challenges etc. The concept of OBE discussed in this paper is equally applicable to all sectors of education.

Batra [3] highlighted about impact of teaching learning process to society through interdisciplinary studies. The values are equally important in any education system which helps in empowering the young minds to become future leaders of the nation. The aim of the new concept of learning should be developing citizenship and democratic values in students. Educational change in institutional patterns may require keeping regularly updated to keep pace with the ongoing and changing demands of the industry and the societal needs. The contemporary curriculum needs to be revisited on regular basis for the same. Classroom practice and subsequent learning is shaped by the sub-culture and social ethos of teacher education. The argument about more robust epistemological underpinnings in designing teacher education programmes has been also underlined in this paper. A new pedagogic imagination way of learning style could of great help in achieving involvement in social activity and teaching as social practice.

Wadhwa et al. [4] stressed on various types of skills required in 21st century workforce and students, such as technical skills, soft skills and life-long learning

Copyright© 2016, IERJ. This open-access article is published under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License which permits Share (copy and redistribute the material in any medium or format) and Adapt (remix, transform, and build upon the material) under the Attribution-NonCommercial terms.



## Modified Improved Kernel Fuzzy Adaptive Threshold Algorithm on Modified Level set method for Picture Segmentation

T.Saikumar<sup>1</sup>, G.SudhaRani<sup>2</sup>, K.Keerthi<sup>2</sup>, K.Sneha<sup>2</sup>, B.Srikar<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Electronics & Communication Engineering

<sup>2</sup>B.Tech Final Year Students, Department of Electronics & Communication Engineering  
CMR Technical Campus, Hyderabad, India

**Abstract**— Using thresholding method to segment an image, a fixed threshold is not suitable if the background is rough. Here, we propose a new adaptive thresholding method using level set theory. The method requires only one parameter to be selected and the adaptive threshold surface can be found automatically from the original image. An adaptive thresholding scheme using adaptive tracking and morphological filtering. The Improved Kernel fuzzy c-means (IKFCM) was used to generate an initial contour curve which overcomes leaking at the boundary during the curve propagation. MKFCM algorithm computes the fuzzy membership values for each pixel. On the basis of MKFCM the edge indicator function was redefined. Using the edge indicator function of a image was performed to extract the boundaries of objects on the basis of the presegmentation. Therefore, the proposed method is computationally efficient. Our method is good for detecting large and small images concurrently. It is also efficient to denoise and enhance the responses of images with low local contrast can be detected. The efficiency and accuracy of the algorithm is demonstrated by the experiments on the images. The above process of segmentation showed a considerable improvement in the evolution of the level set function.

**Keywords**- Adaptive thresholding, Image segmentation, MKFCM, Level set method.

### I. INTRODUCTION

Thresholding techniques are often used to segment images consisting of dark objects against bright backgrounds, or vice versa. It also offers data compression and fast data processing [1]. The simplest way is through a technique called global thresholding, where one threshold value is selected for the entire image, which is obtained from the global information. However, when the background has non-uniform illumination, a fixed (or global)

threshold value will poorly segment the image. Thus, a local threshold value that changes dynamically over the image is needed. This technique is called adaptive thresholding.

Basically these techniques can be divided into region-based and edge-based thresholding. Region-based technique uses the whole image to extract the information for the threshold value computation, while edge-based technique is based on the attributes along the contour between the object and the background.

For region-based technique, most of the early introduced techniques are based on the image histogram. In 1979, Otsu [2] presented a technique that considered the image histogram as having a two gaussian distribution representing the object and the background. A threshold is selected to maximize the inter-class separation on the basis of the class variances.

For the edge-based thresholding technique, the idea of applying the boundary based attributes is based on the fact that discriminate features exist at the boundary between the object and the background [3]. Thus, the edge-based thresholding technique has become more popular for exploration. Milgram [10] applied edge information to segment images by proposing “superslice” method. In this method, the edge information (gradient) is integrated with the recursive region splitting technique. The superslice method was also applied and improved in [3, 11].

The level set method is [4-7] based on geometric deformable model, which translate the problem of evolution 2-D (3-D) close curve(surface) into the



## Visibility Metric (VM) for Haze images based on Color Channel

T.Saikumar<sup>1</sup>, B.Dwijendra<sup>2</sup>, M.Arika<sup>2</sup>, K.Nandita<sup>2</sup>, A.Mukesh<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Electronics & Communication Engineering

<sup>2</sup>B.Tech Final Year Students, Department of Electronics & Communication Engineering  
CMR Technical Campus, Hyderabad, India

**Abstract**— The Visibility Metric parameter plays a key role in Image Enhancement for misty, foggy and Haze weather conditions lead to reduction in resolution and distortion in color and gray images which are observed in outdoor scenes. In this article haze and foggy images are considered for evaluation of VM using Contrast to Noise Ratio (CNR) which remove the haze from the original haze affected single gray or color images. We proposed a unique novel effective algorithm for VM based on image filtering approach using Gaussian low pass filter. The Evaluation of VM for haze and foggy image was evaluated using CNR which gives the CNR values of dehaze images.

**Keywords**—; Visibility Metric (VM), Haze or foggy images, CNR, image filtering.

### I. INTRODUCTION

Visibility is the ability to see through air, irrelevant to the sunlight or the moonlight. Clear clean air has a better visibility than air polluted with dust particles or water droplets. There are a number of factors affecting visibility, including precipitation, fog, mist, haze, smoke, and in coastal areas sea spray, and they are generally composed principally of water droplets or the particles whose size cannot be ignored for the wavelength. The difference between fog, mist, and haze can be quantified as the visibility distance. Visibility degradation is caused by the absorption and scattering of light by particles and gases in the atmosphere[1-3]. Scattering by particulate, impairs visibility more severe than absorption. Visibility is mainly reduced by scattering from particles between an observer and a distant object. Particles scatter light from the sun and the rest of the sky through the line of sight of

the observer, thereby decreasing the contrast between the object and the background sky. Images or videos acquired are often affected by visibility in surveillance, traffic, and remote sensing systems, due to light scattering and absorption by the atmospheric particles and water droplets. For the rest of the paper, the atmospheric particles and water droplets from the mist, haze, fog, smog, and cloud are not distinguished for convenience[2]. Visibility enhancement methods of degraded outdoor images fall into two main categories. The first category is non-model-based methods, such as histogram equalization Retinex theory and Wavelet transform. However, the shortcomings of these methods are that they have less effectiveness on maintaining the color fidelity, and also seriously affect the clear region. The second category is model-based methods, who can achieve better results by modeling from the scattering and absorption, but usually need additional assumptions of imaging environment or imaging system, such as scene depth or multiple images. Nonetheless, when their assumptions are not accurate, the effectiveness is greatly compromise.

### II. IMAGE DEGRADATION MODEL

Assuming the image degraded model caused by hazy weather conditions is often described in a mathematical equation such as

$$I(x) = J(x)t(x) + A(1-t(x)) \dots \dots \dots (1)$$

where  $x$  denotes position of an pixel,  $I \in C^{M \times N}$  is an observed digital image,  $J$  is scene radiance,  $A$  is global atmosphere light, and  $t$  is medium transmission function. The product of  $J(x)t(x)$  is direct attenuation term, representing the image



# Simulink based Implementation and Performance Analysis of CP-OFDM in Time Varying Environments

A.Suhasini<sup>1</sup>, A.Saritha<sup>2</sup>, M.Lavanya<sup>3</sup>, T.Uma<sup>4</sup>,  
Sudha arvind<sup>5</sup>

1,2,3,4 (B.Tech Students, ECE Department, CMRTC, Hyderabad)

5(Assoc. Professor, ECE Department, CMRTC, Hyderabad)

**Abstract:** In this paper, we develop simulink based software models to implement and test cyclic prefix OFDM (CP-OFDM) systems. This technique has been introduced in terrestrial digital broadcasting in the P.R.C., and it seems to be particularly suitable to highly mobile environments. Overall system performances are evaluated in terms of bit error ratio (BER) for different signal-to-noise ratio (SNR) levels in the AWGN, Rayleigh multipath, Rician channel environments for mobile systems. The transmission channel is modeled as a time varying AWGN channel. By varying the QAM levels we calculate the BER for entire system and inner coder of the system.

**Keywords:** Digital video broadcasting terrestrial(DVB-T), AWGN, Cyclic prefix, interleaving.

## I.INTRODUCTION:

High data rate communication systems are an integral part of life today, especially in defense applications. The necessity of transferring a high volume of data in real time is critical to the success of missions involving mobile units. One of the most successful digital modulation techniques is orthogonal frequency-division multiplexing (OFDM), which is capable of transferring large blocks of data at a time even in the presence of poorly known wireless channels. By contrast, standard single-carrier modulation requires complex and unreliable channel equalization, which is not the case for OFDM. The area of digital broadcasting has fueled quite a bit of research in high data rate communications, especially due to the commercialization of high-definition television for mobile devices. It turns out that in most of the world OFDM is at the basis of standards for digital TV and audio broadcasting.

## II. BACKGROUND:

It is well known that wireless communication channels are more unpredictable than their wired counterparts due to fading factors present in the wireless communication environment. The undesired fading loss in terrestrial applications is usually caused by multipath propagation and Doppler frequency shift. These two factors also further affect the system performance in terrestrial communication. The issues introduced by the presence of multipath and Doppler shift in wireless communication systems are first discussed in this chapter. Then, existing digital terrestrial television standards are introduced. Finally, the modulation techniques employed in this thesis are described briefly.

**A.Existing TV Standards [1] :** Four major DTTB standards for TV signals transmitted in the VHF and UHF frequency bands exist nowadays; their geographical usages.

**1.Advanced Television System Committee (ATSC)** is used mainly in North America. This standard is an evolution from conventional analog National Television Standards Committee (NTSC), with eight-level amplitude-shift keying (8-ASK) modulation; ATSC is more resistant to interference distortions than digital video broadcasting-terrestrial (DVB-T) but is less resistant to multipath distortion.

**2. Digital Video Broadcasting-Terrestrial (DVB-T)** is used mainly in Europe and also has been adopted in Russia, Australia, India, North African countries, the Middle East, Taiwan, and many other countries. This standard is based on standard OFDM with either 16- or 64-quadrature amplitude modulation (QAM). In theory, a channel with higher-level modulation is capable of transmitting with a higher bit-rate but needs more power to obtain the specific BER performance and is more susceptible to interference distortions.



## POLLUTION MEASUREMENT USING AURDINO AND SMART PHONE

BHUMANAPALLE ROHINI<sup>1</sup>, DR. SUMALATHA. S.<sup>2</sup>

<sup>1</sup>Bhumanapalle Rohini, M.Tech Student, Dept of ECE, CMR Technical Campus, Kandlakoya, Medchal, Medchal Dist., Telangana, India.

<sup>2</sup>Dr. Sumalatha. S, Ph.D., Professor, Dept of ECE, CMR Technical Campus, Kandlakoya, Medchal, Medchal Dist., Telangana, India.

**Abstract:** Pollution has a major role in depleting air system. The health risks of air pollution are extremely serious. The Internet of Things (IOT) is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure. The IOT concerns the connection of physical devices (cars, thermostats, smart phones, home lighting, tide sensors, smart meters, etc.) to the Internet. There are more devices connected to the Internet than people on the planet, and the prediction is that there will be 50 billion IOT devices by 2020. In previous papers, to integrate sensors with cloud computing and IOT, other authors have opted for ZigBee hybrid network connected to a GPRS MODULE. The main objective of this paper is to implement IOT to measure the pollution of public transports using MQ2 Arduino which is sensitive for Carbon Monoxide. The amount of Carbon Monoxide emitted is sensed once in (say 20km) and also the locality of vehicle is used for finding the area which is polluted the most.

### I. INTRODUCTION

Pollution is unwanted, harmful stuff contaminating an environment. The race to develop clean energy is motivated by high levels of pollution that people fear are permanently damaging the earth's environment. Poor air quality increases respiratory ailments like asthma and bronchitis, heightens the risk of life-threatening conditions like cancer, and burdens our

health care system with substantial medical costs. Particulate matter is singlehandedly responsible for up to 30,000 premature deaths each year. The immediate alterations that the world is witnessing is Global warming. With increased temperatures worldwide, increase in sea levels and melting of ice from colder regions and icebergs, displacement and loss of habitat have already signaled an impending disaster if actions for preservation and normalization aren't undertaken soon. Having an onsite carbon monoxide gas alarm in your RV, boat, plane or house is essential to mitigate risk. Being able to detect presence of carbon monoxide remotely, from wherever you are, alerts you to a problem as it occurs and wherever you may be. This makes you aware of a situation before you arrive, and enables you to remedy the issue quickly. This paper is mainly interested in reducing pollution mainly from the vehicles using IOT.

The advent of the Internet of Things and cloud computing brings a new approach, enabling to collect, transfer, store and share information on the logistics flow for better cooperation and interoperability among devices. IOT is an evolution in computer technology and communication that aims to connect objects together via the Internet. Objects mean everything that surrounds us and can communicate. IOT provides secure, bi-directional communication between Internet-connected things (such as sensors, actuators, embedded devices, or



# Provisioning of QoS Using Weighted Cross Layer Link Coding in Heterogeneous Wireless Networks

Sangeeth Reddy<sup>1</sup>, Jaya Laxmi<sup>2</sup>, Supriya<sup>3</sup>, Nagaraju<sup>4</sup>

Sudha Arvind<sup>5</sup>

<sup>1, 2, 3, 4</sup>(B.Tech Students, ECE Dept, CMRTC, Hyderabad)

<sup>5</sup>(Assoc. Professor, ECE Dept, CMRTC, Hyderabad)

**Abstract:** Heterogeneous wireless network (HWN) is the most preferable and demanding technology for military applications because of low cost and high performance in terms of high-quality data transmission with low end-to-end delay. But congestion is the most serious issue which may cause high packet loss; increase the number of retransmissions, Packet Delivery Ratio and MAC Overhead, lower the network life time by increasing the energy consumption, lower the throughput and increases End-to-End Delay. This paper proposes a new congestion control mechanism in wireless heterogeneous networks based on the evaluation of weight values as a link cost index. This Approach uses a multipath routing technique which discovers multiple disjoint routes from source to destination. Among the discovered routes, the route with minimum cost index is selected. At the end, performance of the new congestion control scheme has been studied through simulation.

**Keywords:** Heterogeneous Networks, Congestion, Packet Delivery Ratio, MAC Overhead

## 1. INTRODUCTION:

Ever increasing user demands and development of modern communication technologies have led to the evolution of communication networks from Homogeneous network to Heterogeneous networks. Further, Heterogeneous network environment will provide features such as, "Always Best Connected", "Anytime Anywhere" and seamless communication. Heterogeneous network are dynamic multi-hop wireless networks that are established by a group of mobile nodes on shared wireless channels. It is characterized by no fixed infrastructure, dynamic topologies, variable capacity links, limited physical security, and bandwidth constrained and energy-constrained operation. Routing in Heterogeneous networks has been extensively studied over the past few years [1]–[4], and many Heterogeneous routing protocols have been proposed. Most existing routing protocols assume homogeneous mobile nodes, that is, all nodes in the network have the same characteristics, e.g., having the same transmission power (range), transmission data rate, processing capability, reliability, and security level. However,

a homogeneous Heterogeneous network suffers from poor scalability, i.e., the network performance is degraded quickly as the number of nodes increases.

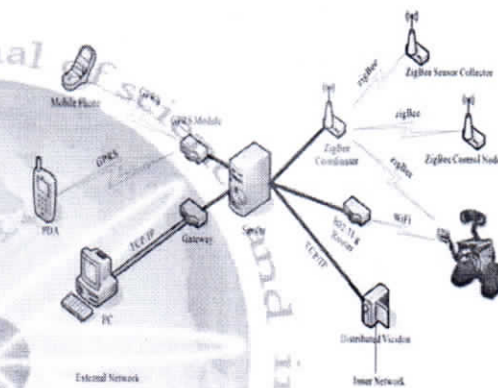


Fig:1 Heterogeneous network

Furthermore, in many realistic Heterogeneous networks, nodes are actually heterogeneous [5]. For example, in a battlefield network, portable wireless devices are carried by soldiers, and more powerful and reliable communication devices are carried by vehicles, tanks, aircraft, and satellites; these devices/nodes have different communication characteristics in terms of transmission power, data rate, processing capability, reliability, etc. So, it would be more realistic to model these network elements as different types of nodes. There are also many advantages that can be utilized to design more efficient routing protocols when nodes are modeled as different types. In Heterogeneous network congestion occurs with limited resources. Due to the shared wireless channel and dynamic topology, packet transmissions suffer from interference and fading, in such networks. The network load is burdened through the transmission errors. There is an increasing demand for support of multimedia communications in MANETs, recently. Large amount of real-time traffic involves high bandwidth and it is liable to congestion. Congestion leads to packet losses and bandwidth degradation and also wastes time and energy on



## Investigative Analysis of a Dual Chamber Combustor Design of a Turbofan Engine

S. V. RAMA TEJA<sup>1</sup>, DR. M. AHMED ALI BAIG<sup>2</sup>

<sup>1</sup>PG Scholar, Dept of Mechanical Engineering, CMR Technical Campus, JNTUH, TS, India, E-mail: ramteja.sv@gmail.com.

<sup>2</sup>Professor & Dean, Dept of Mechanical Engineering, CMR Technical Campus, JNTUH, TS, India, E-mail: mabaig13@gmail.com.

**Abstract:** This report explains about the investigative analysis of the Dual Chamber Combustor design based on annular combustion type as used in a turbofan engine. In aircraft, the engine plays the role of propelling which primarily depends on the efficiency of the combustor to achieve the desired thrust. Recent innovations have seen using the bi-annular or triple annular designs to achieve efficient combustion and higher efficiency. The present investigation is to see if this alternate design can achieve similar results as compared to single annular combustor design. The present design of combustor includes parameters taken from existing designs. The design incorporates positioning of two chambers linearly connected by a constant diameter throat section. The chamber II of the design is larger than the chamber I of the combustor to incorporate the additional mass flow due to combustion. The throat section is designed in order to sustain the mass flow rate for most efficient functioning of the combustor. Theoretical and analytical calculations are compared to find the advantages of the Dual Chamber Combustor design. The diameter of the throat is selected post comparison among 3 variations of present design models and observation of results. Flow and Energy analysis is done using the tabulations obtained during the analysis. Flow analysis reveals the stability of the combustor to sustain the operational environment as seen in existing engines. The Dual Chamber Combustor is analysed in sea level static environment conditions. Some assumptions have been taken for the design in order to replicate the conditions depicted by existing designs. Operational restrictions have been assumed due to non-availability of classified data.

**Keywords:** Fuel-To-Air Ratio (FAR), Lower Heating Value (LHV), LMS.

### I. INTRODUCTION

The aircraft industry turned the world of transportation drastically since its inception as the commercial aviation for everyday travel. As with every evolving industry the need for efficient means of travel was emphasized and developed. The primary means of energy for the aircraft to travel is through the aircraft engine thrust.

#### A. Motivation

The aircraft engines are broadly defined into two types in commercial aviation. One is reciprocating or piston engine and other is air breathing or jet engine. The Jet engine gained its popularity and acceptance since 1940s. The Jet engine

proved to be more powerful, fuel efficient and energy efficient as compared to the reciprocating engines.

#### 1. Turbojet:

- A turbojet engine can be constructed by adding an inlet and a nozzle to the gas generator. The turbojet was first used as means of propulsion in 1930s. As development proceeded, the turbojet engine became more efficient and replaced some of the piston engines.
- The jet engine can be designed with respect to its operational environment which is based on the altitude of flight, available air for compression and fuel used for combustion. This jet engine has evolved over time into various designs with different advantages and applications.
- The adaptations of the turbojet in the form of turbofan, turboprop and turboshaft engines came with the need for more thrust at relatively low speeds.
- The thrust of a turbojet is developed by compressing air in the inlet and compressor, mixing the air with fuel and burning in the combustor, and expanding the gas stream through the turbine and nozzle.
- The expansion of the gas through the turbine supplies the power to turn the compressor. The net thrust delivered by the engine is the result of converting internal energy to kinetic energy. A typical jet engine is displayed below Fig.1:

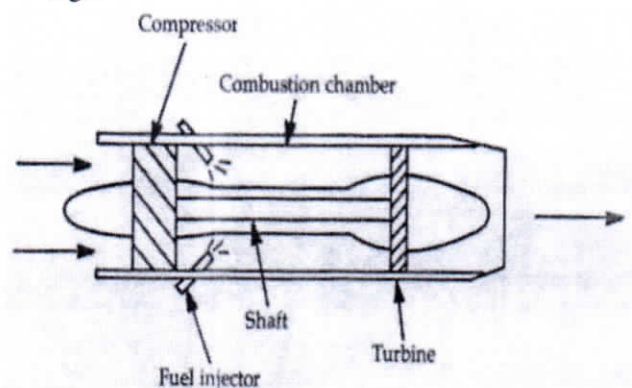


Fig.1. Turbo jet engine outline.

#### 2. Turbofan:

- The turbofan engine consists of an inlet, fan, gas generator, and nozzle. Generally the turbofan engine is



# Image Transmission Based Power Comparison Analysis of MC-CDMA Systems

Priyanka Yalavarthi, [yalavarthipriyanka@gmail.com](mailto:yalavarthipriyanka@gmail.com)

Prof.G.Srikanth M.Tech, Ph.D, [srikanth.cmrtc@gmail.com](mailto:srikanth.cmrtc@gmail.com)

Head of the ECE Department

CMR Technical Campus

Kandlakoya (V), Medchal (M), Hyderabad-501401.

## Abstract:

*In many applications retransmission of lost packets are not permitted. In an OFDM system, due to channel fading, only subsets of carriers are usable for successful data transmission. We present a power saving method to transmission of discrete wavelet transformation based compressed image frames over the OFDM channels. Based on one-bit channel state information at the transmitter, the descriptions in order of descending priority are assigned to the currently good channels. In order to reduce the system power consumption, the mapped descriptions onto the bad sub channels are dropped at the transmitter and we also calculate the important parameters such as image quality index, signal similarity. Via analysis, supported by MATLAB simulations, we demonstrate the usefulness of our proposed scheme in terms of system power saving without compromising the received quality in terms of peak signal-noise ratio.*

## Keywords

*DWT-OFDM system, fading broadcast channel, channel state feedback, power saving.*

## 1. Introduction

It is always desired to increase the data rate over wireless channels. But high rate data communication is significantly limited by Inter Symbol Interference (ISI) and frequency selective fading nature of the channel. Rayleigh fading channel is an example of frequency selective and time varying channel. Multi-carrier modulation is used for such channels to mitigate the effect of ISI. OFDM is a multi-carrier modulation scheme having excellent performance which allows overlapping in frequency domain. In OFDM, individual sub channels are affected by flat fading. So for a period of time, condition of the sub channels may be good, or they might be deeply

faded. The packets which are transmitted through these faded sub channels are highly prone to be lost at the receiver due to non-acceptable errors. OFDM system provides an opportunity to exploit the diversity in frequency domain by providing a number of subcarriers, which can work as multiple channels for applications having multiple bit streams.

There are three types of source coding techniques: on progressive coding, which is designed purely for compression efficiency but it requires retransmissions; progressive coding, which also requires retransmissions but it offers scalability; and multiple description coding (MDC), where no retransmission is required but it sacrifices some compression efficiency.

For still image transmission, most common way is progressive (or layered) encoding technique. State-of-the-art image or video compression techniques, such as JPEG2000 (which uses Discrete Wavelet Transform DWT), layered coding is performed. In this technique, layers should reach in a predefined order for processing the data and reconstructing the image at the receiver. Lost layers are retransmitted to complete the processing at the receiver. This process introduces unpredictable latency, thereby restricting the performance of the system. Layered coding produces data of unequal importance and hence one has to put a higher protection for more important data. Scalability property of the layered coding approach allows that a fewer layers can be transmitted to reconstruct the image frame of an acceptable quality. However those layers should be received perfectly, which leads to the need for retransmissions.

Thus, although progressive coding works well in loss-less transmission system, in the event of errors reconstruction of image can be stalled due to retransmission of lost coefficients, which is not acceptable in real time content delivery applications.



# Implementation of low power and high performance Half Adder using Transistor Super Cut off Technique

G Srikanth

*Department of Electronics and Communication Engineering  
CMR TECHNICAL CAMPUS, HYDERABAD, TELANGANA, INDIA*

Dr Bhanu Murthy Bhaskara

*Department of Electronics and Communication Engineering  
CMR TECHNICAL CAMPUS, HYDERABAD, TELANGANA, INDIA*

**Abstract:** All the electronics gadget are operated with battery, as technology improving scaling down the transistor area the leakage current is prominent then dynamic current. It is now important to reduce the leakage current to increase the battery life. This is the reason for need off leakage reduction techniques in deep submicron micron. There are several methods are proposed to reduce the leakage. In this paper comparison shown between proposed method and existing techniques. Comparing with the Conventional adder circuit, the circuit is achieved to reduce the power consumption by 19%.

**Key words-** SCCMOS, MTCMOS, VLSI.

## I. INTRODUCTION

MOSFET Scaling to deep into submicron region resulted in substantially greater leakage power consumption. Technology scaling leads to reduction in supply voltage VDD. To maintain switching activity in transistor at lower VDD, threshold voltage of the device need to reduce. However this leads to the sub threshold current to increase in exponential depend on  $V_{th}$ . Each new technology generation leads to 20 times increase in leakage current. Therefore, it has become extremely important to build up new techniques to static power reduction during the period of in active.

Multi threshold CMOS (MTCMOS), Power Gating is one of the important techniques to reduce the leakage current in standby mode. In simple Power Gating Technique a single high threshold voltage transistor is used as Sleep transistor. It will be added as footer or at header position of the circuit and it will in OFF condition whenever the circuit is idle condition and it will in ON condition when ever inputs are applied to the circuit. Instead of a single transistor, multiple transistor connected circuits are used form different sleep network [7, 8, 9].

The leakage power in adder circuit is significant factor in overall power dissipation. Analysis of power dissipation in half adder is carried out and with the technique for reducing power dissipation is compared. The paper is organized as follows. Section II, we present some of the general concepts of leakage currents. Section III describes the Conventional Half adder circuit. Section IV deal with Proposed method. V Proposed Half Adder circuit. Finally we draw Comparison and conclusion work in section VI

## II. SOURCES OF LEAKAGE

There are many sources of leakage currents in CMOS transistor [1,2,3]. These are the main sources of leakage as shown in figure 1.

### A. Sub-threshold (Weak Inversion) Leakage Current ( $I_{SUB}$ )

As the W/L ratio of the transistor is reducing the Sub -Threshold leakage is increasing drastically this because of weak inversion layer of CMOS. Therefore it is also called as Weak Inversion Leakage Current. It is referred as the Current which flow from the drain to the source Current of the transistor as shown in fig 1.



# Hand Written Telugu Character Recognition Using Bayesian Classifier

K.Mohana Lakshmi<sup>1</sup>, K.Venkatesh<sup>2</sup>, G.Sunaina<sup>3</sup>, D.Sravani<sup>4</sup>, P.Dayakar<sup>5</sup>

ECE Department, JNTUH, CMR Technical Campus, Hyderabad, India.

<sup>1</sup> mohana.kesana@gmail.com

<sup>2</sup> kondaboynavenkatesh1995@gmail.com

<sup>3</sup> sunaina.gundu@gmail.com

<sup>4</sup> sravanidabilpura009@gmail.com

<sup>5</sup> pdayakar135@gmail.com

**Abstract**— Identifying handwritten Telugu is difficult way in machine vision systems because of the complex shape of the individual characters and the size of Telugu character set. In this paper, an efficient algorithm is presented to identify individual handwritten Telugu characters based on HOG features and Bayesian classification. The proposed system utilizes features of Telugu scripts for identifying handwritten Telugu text efficiently. The recognition rate for Telugu script is 87.5%.

**Keyword** - Handwritten character recognition, Pre-processing, Feature Extraction, Bayesian Classifier.

## I. INTRODUCTION

Machine perception and recognition of handwritten character any language is a difficult task. It has many applications in banking, mail search, forms processing in administration and insurance. Telugu script presents additional challenges for handwriting recognition systems due to its highly connected components, curve nature forms of each letter and regional differences in writing style. Off-line Telugu Handwriting Recognition is a difficult task due to the high variability and uncertainty of human writing (infinite variations of shapes resulting from the writing style, scanning methods etc. The field of handwriting recognition can be divided into two approaches; on line recognition [1] and offline recognition (Miled H. 1998, Mantas J. 1991). Telugu is the primary language in Andhra Pradesh, Telangana, and Pondicherry. There are more than 10,000 old handwritten documents in Telugu. To identify old literature as new one, we have proposed an efficient mechanism to identify Telugu character set. Optical recognition is done off-line after the characters have been totally written or printed. Handwritten characters can be identified, but the characteristics of such systems can be largely dependent upon attribute of the input documents as well as the writing style of the writer. But, when it comes to completely unsupervised handwritten character recognition, machines are efficient as humans. However, the computer reads fast and technical advances are continually bringing the technology closer to its ideal.

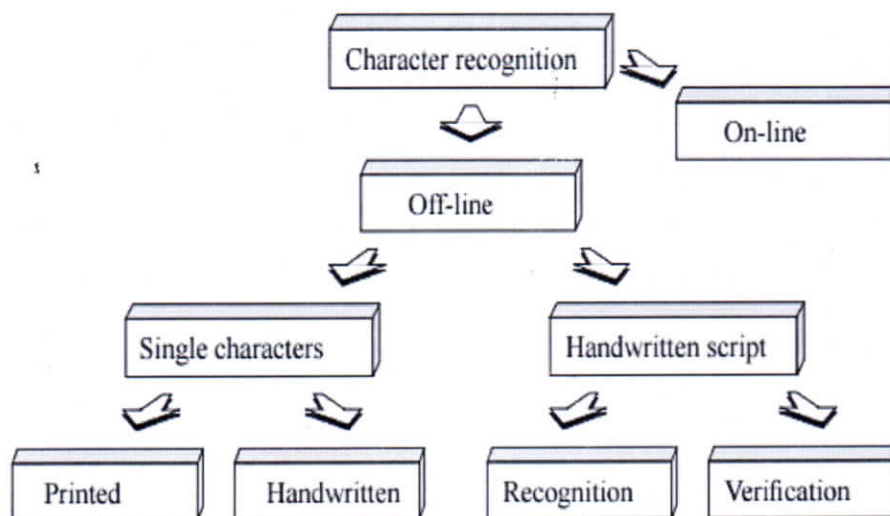


Figure 1. The different areas of character

U. Pal and B.B. Chaudhuri[2] suggested an enhanced quadratic classifier for identification of handwritten numerals in Devnagri, Bangla, Telugu, Oriya, Kannada and Tamil scripts. The primary idea behind automatic character recognition is to first train the machine classifier with instances of patterns that may occur and their appearance. In OCR these patterns are alphabets, numerals and some special symbols like commas, question marks etc., Using these samples the machine constructs a prototype or a description of each class of characters.



# Instinctive Gas Booking System by Using Intel Galileo Gen 2

T.Narendra kumar<sup>1</sup>, M.Sravanthi<sup>2</sup>, SK.Dilshad<sup>3</sup>

Assistant Professors, Department of ECE

CMR Technical Campus, Hyderabad, India

tanneru.narendra903@gmail.com<sup>1</sup>, matams62@gmail.com<sup>2</sup>, skdilshad.ece@gmail.com<sup>3</sup>

**Abstract:** Residual fuel detection in LPG cylinder is a major problem in domestic applications and gas driven vehicles. The best way to know about it is by using a continuous weight monitoring system of the cylinder. We here present a system which monitors the completion of the fuel in the cylinder and also booking the refill automatically with the LPG provider. This design has a load cell, which measures the weight of the gas cylinder and produces a current signal, proportional to the weight. This current signal is converted to an amplified form of voltage signal by the signal conditioning block, which is then compared with a threshold value. A sensor detects the error signal and sends the information to control unit, which triggers the control unit to send appropriate messages using GSM module. The design also alerts the consumer by sending a message through a GSM Module whenever the fuel level in the gas cylinder is lower than a threshold level.

**Index Terms:** Intel Galileo Gen 2, load cell, INA125P Amplifier, GSM module

## I. INTRODUCTION

Many a times it is difficult to monitor the fuel level in gas cylinder and estimate the remaining fuel to make an advance booking with LPG provider. In today's scenario of busy lives and preoccupied schedules people even forget to make the booking. Our system provides the solution in such cases. This is a prototyping example of a real time working module. The key objective is to develop a low cost system which can monitor the level (Weight) of the cylinder in the particular household and provide an alert in case of cylinder being empty. Being safe and secure is the need of the hour, so our effort behind this system is to design and fabricate a gadget which is so compact in itself that provides advantage of personal monitoring system. This device will be very useful for the household. This will prove as a multi-pronged strategy with the participation of multi stake holders of the society. The device is highly sensitive and easy to handle. Its response will provide information and monitoring of cylinder to individual user.

An Intel Galileo is the updated version of an Arduino Uno board, little bit larger compared to Arduino Uno, has a powerful processor, increased memory capacity for storage of code and data, has a facility to get connected to an Ethernet network and a USB port to connect computer accessories or the Mini PCI Express connector at the bottom of the board. Intel's Quark SoC X1000 is the processor at the heart of the Intel Galileo. The firmware that runs on the Galileo is much more advanced than what's on an Arduino Uno. On a Uno and most other Arduino devices, there is firmware on the board called the boot loader which is meant to help you upload and run your code on the board's processor. It only does that and not much else. The firmware on the Galileo, on the other hand, is much more advanced. Not only does it help you upload and run your code on the board, but it also keeps track of files, the date and time of day, and helps share the board's various resources between multiple programs running at the same time. In that way, it's more like a typical computer. In fact, the firmware on the Galileo is a version of Linux, the free operating system that powers many desktop computers and servers these days. Galileo

may not have a screen or desktop environment, but it still has much of the functionality that an operating system affords. And through your Arduino code, you'll be able to access this functionality, giving you much more facilities than you'd have with a typical Arduino. For instance, if you want your project to take a picture from a web cam and email it, it's something that would be difficult to do with only Arduino code. But with the power of Linux, this could be done more easily.

## II. PROPOSED WORK

A pressure sensor/weight scale sensor is placed under the gas cylinder. It measures the weight of the cylinder and pressure exerted by the gas cylinder on to the ground. Experimental values are recorded from pressure sensor/weight scale sensor at proper time intervals. These values are sent to the Intel Galileo board. By setting up a weight limit/pressure limit from the recorded experimental values, when the gas in the cylinder reduces than the limit value, intimation is given to the consumer mobile number.

These processes are done by interfacing Intel Galileo with GSM module used for sending messages. The GSM module sends a message to the Gas provider. The message consists of the data required for Gas booking. The refill is booked and intimation is send to the customer about details of booking.

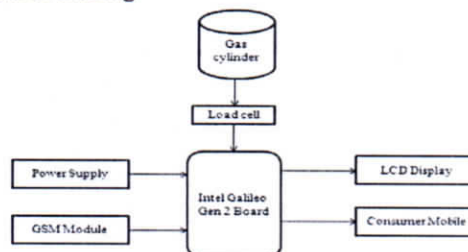


Fig. 1 System Overall Block Diagram

## A. INTEL GALILEO GEN 2

Galileo is an electronic circuit board, that helps you develop interactive objects by reading information from



---

**ABSTRACT**

Internet of things (IoT) is a network of devices with local intelligence (sensors, lights, gas pumps), which share access & control mechanisms to push and pull status and command information from the networked world. In this paper, a system is proposed for monitoring the weather changes in the environment. This project is about to collect the data from environment and is displayed on the webpage using wireless networks.

**KEYWORDS:** IoT, Weather, Wireless network, Environment.

---

**INTRODUCTION**

In most recent years, the usage of internet and its applications has grown rapidly. As everyone's work is dependent on it, without internet it would be difficult. In the past analog mechanisms are used to measure the physical environmental parameters and these are recorded on papers. Data loggers replaced these analog mechanisms. Data loggers are electronic devices which records the data over time with respect to location with inbuilt instruments i.e. sensors. Data loggers are merged with communication networks to retrieve the data. These loggers are cheap and are easy to operate and maintain.

Now a day's wireless sensor networks are widely used and these are low power devices with a processor, storage, power supply, and a transceiver and with one or more sensors. The wireless sensors are cheaper and small than the regular sensors. These are arranged themselves to form a multi hop network. Wireless sensor networks (WSNs) consist of more number of sensor nodes to complete a common task. These are self operating, fault tolerating and self optimizing. WSNs have their own design and resource constraints. Design constraints depend on the characteristics of environment. i.e. the size of network, network topology etc. Resource constraints consist of small amount of energy, communication network, low throughput and storage.

An instrument that records the parameters without the interference of humans using sensors is an automated weather station. The recorded parameters are stored in data loggers through communication link. These can be downloaded to the computer for further usage. So, an communication system is important in an automated weather station. Monitoring of environmental parameters is used in several applications and also in industrial processes.

The rest of the paper is presented as follows. Section-II presents literature survey on IoT and wireless sensor and networks. Section-III explains the system architecture with a detailed description of its components. Section-IV presents the implementation of design and its results followed by applications and advantages in section V. Section-VI cover the conclusion of paper with future scope in section VII.

**LITERATURE SURVEY****Internet of Things**

The Internet of Things (IoT) is becoming an increasing topic among technology giants and business communities.



# Hand Written Telugu Character Recognition Using Bayesian Classifier

K.Mohana Lakshmi<sup>1</sup>, K.Venkatesh<sup>2</sup>, G.Sunaina<sup>3</sup>, D.Sravani<sup>4</sup>, P.Dayakar<sup>5</sup>

ECE Department, JNTUH, CMR Technical Campus, Hyderabad, India.

<sup>1</sup> mohana.kesana@gmail.com

<sup>2</sup> kondaboynavenkatesh1995@gmail.com

<sup>3</sup> sunaina.gundu@gmail.com

<sup>4</sup> sravanidabilpura009@gmail.com

<sup>5</sup> pdayakar135@gmail.com

**Abstract**— Identifying handwritten Telugu is difficult way in machine vision systems because of the complex shape of the individual characters and the size of Telugu character set. In this paper, an efficient algorithm is presented to identify individual handwritten Telugu characters based on HOG features and Bayesian classification. The proposed system utilizes features of Telugu scripts for identifying handwritten Telugu text efficiently. The recognition rate for Telugu script is 87.5%.

**Keyword** - Handwritten character recognition, Pre-processing, FeatureExtraction, Bayesian Classifier.

## I. INTRODUCTION

Machine perception and recognition of handwritten character any language is a difficult task. It has many applications in banking, mail search, forms processing in administration and insurance. Telugu script presents additional challenges for handwriting recognition systems due to its highly connected components, curve nature forms of each letter and regional differences in writing style. Off-line Telugu Handwriting Recognition is a difficult task due to the high variability and uncertainty of human writing (infinite variations of shapes resulting from the writing style, scanning methods etc. The field of handwriting recognition can be divided into two approaches; on line recognition [1] and offline recognition (Miled H. 1998, Mantas J. 1991). Telugu is the primary language in Andhra Pradesh, Telangana, and Pondicherry. There are more than 10,000 old handwritten documents in Telugu. To identify old literature as new one, we have proposed an efficient mechanism to identify Telugu character set. Optical recognition is done off-line after the characters have been totally written or printed. Handwritten characters can be identified, but the characteristics of such systems can be largely dependent upon attribute of the input documents as well as the writing style of the writer. But, when it comes to completely unsupervised handwritten character recognition, machines are efficient as humans. However, the computer reads fast and technical advances are continually bringing the technology closer to its ideal.

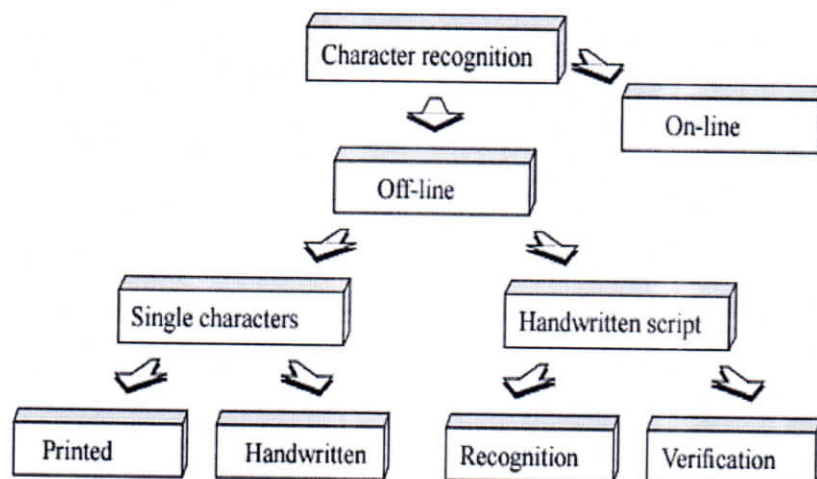


Figure 1. The different areas of character

U. Pal and B.B. Chaudhuri[2] suggested an enhanced quadratic classifier for identification of handwritten numerals in Devnagri, Bangla, Telugu, Oriya, Kannada and Tamil scripts. The primary idea behind automatic character recognition is to first train the machine classifier with instances of patterns that may occur and their appearance. In OCR these patterns are alphabets, numerals and some special symbols like commas, question marks etc., Using these samples the machine constructs a prototype or a description of each class of characters.



# AN EXTENSIVE REVIEW OF MEDICAL IMAGE DENOISING TECHNIQUES

Mohd. Ameen and Shah Aqueel Ahmed

Scholar, JIT University Chudela

## ABSTRACT

*Image denoising is an important pre-processing step in medical image analysis. The basic intent of image denoising is to reconstruct the original image from its noisy observation as accurately as possible, while preserving important detail features such as edges and textures in the denoised image. In medical imaging, for the precise analysis of diseases denoising of medical images like X-RAY, CT (Computed Tomography), MRI (Magnetic Resonance Imaging), PET (Positron Emission Tomography) and SPECT (Single Photon Emission Computed Tomography) is essential since a small loss of a particular area in case of medical images may result in immense disaster similar to death. To mitigate such threat over the last few decades, image denoising has been extensively studied in the image and signal processing community and suggested various denoising techniques. Each approach has its assumptions, advantages, and limitations. In this paper a detailed survey has been carried out on various image denoising approaches and their performances on medical images.*

**Key words:** Image Denoising, medical Images, X-ray, CT, MRI, PET, SPECT.

**Cite this Article:** Mohd. Ameen and Shah Aqueel Ahmed, An Extensive Review of Medical Image Denoising Techniques, *International Journal of Electronics and Communication Engineering and Technology*, 7(6), 2016, pp. 85–90.

<http://www.iaeme.com/IJCET/issues.asp?JType=IJCET&VType=7&IType=6>

---

## 1. INTRODUCTION

Digital images play an important role both in daily life applications such as satellite television, magnetic resonance imaging, and computed tomography as well as in areas of research and technology such as geographical information systems and astronomy. Noise removal is one of the very important aspect in the field of image processing. An image gets distorted with different types of noise during the process of transmission and reception. Noise may be classified as substitutive noise speckle noise and additive white Gaussian noise.

Therefore, denoising of medical images is further essential which leads physician for precise analysis of diseases. Medical images like X-RAY, CT (Computed Tomography), MRI (Magnetic Resonance Imaging), PET (Positron Emission Tomography) and SPECT (Single Photon Emission Computed Tomography) encompass diminutive information about heart, brain, nerves and more. For determining the internal structure of an object, X-ray Computed Tomography (CT) is a powerful method. As such it determines application, e.g. in the non-destructive testing of a variety of materials. From a huge number of systematic observations at diverse viewing angles, the CT image is derived, and with the support of a



# Android Based Smart Home Automation System Design Using Raspberry Pi3

T.Shreya, [thatishreya@gmail.com](mailto:thatishreya@gmail.com)

Ms.B.Karunasree, [bkarunasree@gmail.com](mailto:bkarunasree@gmail.com)

Associate Professor, ECE Department

CMR Technical Campus

Kandlakoya (V), Medchal (M), Hyderabad-501401.

## Abstract:

Automation plays an important role in today's human life and people's life is gradually changing with smart living due to modern technology development and Android Smartphone. This paper presents a low-cost Smart Living System, which uses Android based User Interface for control of home appliances. Connection to the smart living system can be made from the designed app via Bluetooth or internet connection. It also integrates home security and alert system. Also, the smart home concept in the system improves the standard living at home.

The main control system implements wireless Bluetooth technology to provide remote access from PC/laptop or smart phone. The design remains the existing electrical switches and provides more safety control on the switches with low voltage activating method. The switches status is synchronized in all the control system whereby every user interface indicates the real time existing switches status. The system intended to control electrical appliances and devices in house with relatively low cost design, user-friendly interface and ease of installation.

## Keywords

Smart Living; Automation; Android Smart Phone; Bluetooth.

## 1. Introduction

An embedded system is a combination of software and hardware to perform a dedicated task. Some of the main devices used in embedded products are Microprocessors, Microcontrollers.

Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output.

In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result. In this project we use RF

module as well as the DTMF decoder for communication. Now when we dial the numbers in the mobile phone from the controlling side then it automatically recognizes which number has been recorded and it follows with the corresponding next step to be taken i.e., movement of the robot in water.

An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specific function. A good example is the microwave oven. Almost every household has one, and tens of millions of them are used every day, but very few people realize that a processor and software are involved in the preparation of their lunch or dinner.

The continuous growth of mobile devices in its recognition and functionality has led to an increase in the demand for advanced ubiquitous mobile applications in people's daily lives. Smart phones are more than just phones in today's life having a broad range of applications, such as education, healthcare, and entertainment. Smart homes aim to provide enhanced convenience and comfort, energy efficiency, security and surveillance. It is claimed by market researchers that majority of homes will be outfitted with home automation systems in the very near future. Various smart home systems have been proposed where the control is via Bluetooth, internet based while some researchers have proposed voice controlled smart home system based on Microsoft speech recognition and microcontroller based voice activation (voice recognition module is used).

## 2. Proposed system Architecture

In this scenario, Raspberry PI is a server that handles all requests. It is used to receive information from the sensors, process that information and deliver processed data to mobile device. Also, Raspberry PI is used as a server in the other direction, when user uses mobile phone to send commands and change the environment in our smart home.



# Instinctive Gas Booking System by Using Intel Galileo Gen 2

T.Narendra kumar<sup>1</sup>, M.Sravanthi<sup>2</sup>, SK.Dilshad<sup>3</sup>

Assistant Professors, Department of ECE

CMR Technical Campus, Hyderabad, India

tanneru.narendra903@gmail.com<sup>1</sup>, matams62@gmail.com<sup>2</sup>, skdilshad.ece@gmail.com<sup>3</sup>

**Abstract:** Residual fuel detection in LPG cylinder is a major problem in domestic applications and gas driven vehicles. The best way to know about it is by using a continuous weight monitoring system of the cylinder. we here present a system which monitors the completion of the fuel in the cylinder and also booking the refill automatically with the LPG provider. This design has a load cell, which measures the weight of the gas cylinder and produces a current signal, proportional to the weight. This current signal is converted to an amplified form of voltage signal by the signal conditioning block, which is then compared with a threshold value. A sensor detects the error signal and sends the information to control unit, which triggers the control unit to send appropriate messages using GSM module. The design also alerts the consumer by sending a message through a GSM Module whenever the fuel level in the gas cylinder is lower than a threshold level.

**Index Terms:** Intel Galileo Gen 2, load cell, INA125P Amplifier, GSM module

## I. INTRODUCTION

Many a times it is difficult to monitor the fuel level in gas cylinder and estimate the remaining fuel to make an advance booking with LPG provider. In today's scenario of busy lives and preoccupied schedules people even forget to make the booking. Our system provides the solution in such cases. This is a prototyping example of a real time working module. The key objective is to develop a low cost system which can monitor the level (Weight) of the cylinder in the particular household and provide an alert in case of cylinder being empty. Being safe and secure is the need of the hour, so our effort behind this system is to design and fabricate a gadget which is so compact in itself that provides advantage of personal monitoring system. This device will be very useful for the household. This will prove as a multi-pronged strategy with the participation of multi stake holders of the society. The device is highly sensitive and easy to handle. Its response will provide information and monitoring of cylinder to individual user.

An Intel Galileo is the updated version of an Arduino Uno board, little bit larger compared to Arduino Uno, has a powerful processor, increased memory capacity for storage of code and data, has a facility to get connected to an Ethernet network and a USB port to connect computer accessories or the Mini PCI Express connector at the bottom of the board. Intel's Quark SoC X1000 is the processor at the heart of the Intel Galileo. The firmware that runs on the Galileo is much more advanced than what's on an Arduino Uno. On a Uno and most other Arduino devices, there is firmware on the board called the boot loader which is meant to help you upload and run your code on the board's processor. It only does that and not much else. The firmware on the Galileo, on the other hand, is much more advanced. Not only does it help you upload and run your code on the board, but it also keeps track of files, the date and time of day, and helps share the board's various resources between multiple programs running at the same time. In that way, it's more like a typical computer. In fact, the firmware on the Galileo is a version of Linux, the free operating system that powers many desktop computers and servers these days. Galileo

may not have a screen or desktop environment, but it still has much of the functionality that an operating system affords. And through your Arduino code, you'll be able to access this functionality, giving you much more facilities than you'd have with a typical Arduino. For instance, if you want your project to take a picture from a web cam and email it, it's something that would be difficult to do with only Arduino code. But with the power of Linux, this could be done more easily.

## II. PROPOSED WORK

A pressure sensor/weight scale sensor is placed under the gas cylinder. It measures the weight of the cylinder and pressure exerted by the gas cylinder on to the ground. Experimental values are recorded from pressure sensor/weight scale sensor at proper time intervals. These values are sent to the Intel Galileo board. By setting up a weight limit/pressure limit from the recorded experimental values, when the gas in the cylinder reduces than the limit value, intimation is given to the consumer mobile number.

These processes are done by interfacing Intel Galileo with GSM module used for sending messages. The GSM module sends a message to the Gas provider. The message consists of the data required for Gas booking. The refill is booked and intimation is send to the customer about details of booking.

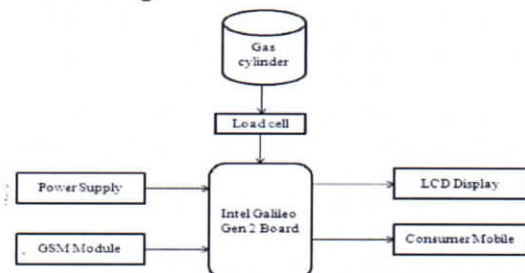


Fig. 1 System Overall Block Diagram

## A. INTEL GALILEO GEN 2

Galileo is an electronic circuit board, that helps you develop interactive objects by reading information from





# Role of cobalt doping on the electrical conductivity of ZnO nanoparticles



Umadevi Godavarti<sup>a,c</sup>, V.D. Mote<sup>b</sup>, Madhavaprasad Dasari<sup>c,\*</sup>

<sup>a</sup> Department of Physics, CMR Technical Campus, Medchel, Hyderabad, 501 401, Telangana, India

<sup>b</sup> Thin Films and Materials Research Laboratory, Department of Physics, Dayanand Science College, Latur, 413 512, Maharashtra, India

<sup>c</sup> Department of Physics, GITAM Institute of Technology, GITAM University, Visakhapatnam, 530045, Andhra Pradesh, India

## ARTICLE INFO

### Article history:

Received 4 May 2017

Received in revised form 19 July 2017

Accepted 11 August 2017

Available online 22 August 2017

### Keywords:

Chemical synthesis

ZnO nanoparticles

XRD

Spherical structure

Electrical conductivity

## ABSTRACT

Cobalt doped zinc oxide ( $\text{Zn}_{1-x}\text{Co}_x\text{O}$ ;  $x=0, 0.05, 0.10, 0.15$ ) samples were synthesized using co-precipitation method. The Co doped ZnO nanoparticles showed the maximum solubility limit. The XRD patterns confirm the hexagonal type wurtzite structure without secondary phase in Co substituted ZnO samples. The particle size was studied using transmission electron microscope (TEM) and grain size estimated using scanning electron microscope (SEM). We report the study of temperature dependence of conductivity on ZnO and Co doped ZnO nanoparticles. It is found that at a higher temperature range (above 470 K) thermally activated type of conduction is in dominance with the lower temperature range of conduction in which donor carrier hopping mechanism is dominated. DC conductivity result shows the reduction nature for cobalt doped ZnO. The obtained results are discussed on basis of potential barrier, donor concentration, point defects and adsorption–desorption of oxygen. Cobalt substitution increases resistivity, reduces grain growth, lower particle size and increase in activation energy. Detailed mapping of two regions of electrical conductivity is done to understand the activation energy mechanisms prevailing in cobalt doped ZnO.

© 2017 The Ceramic Society of Japan and the Korean Ceramic Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

Zinc oxide (ZnO) is a II–VI group semiconductor has a wurtzite crystal structure, with a direct and wide bandgap of 3.37 eV, a large exciton binding energy (60 meV) and high optical gain at room temperature [1–3]. Numerous applications of wurtzite ZnO comprises of field-effect transistor [4], optical device [5], dye-sensitized solar cell [6], solid-state gas sensor [7,8]. The strong n-type conductivity is exhibited by zinc oxide varistor (ZnO) with the electrons to move in the conduction band as charge carriers. Primary dependence of electrical properties of ZnO is based on the composition and on microstructure characteristics such as grain size, density and morphology. The study of effect of dopants on physical and electrical properties of ZnO are related to applications in electronic components such as piezoelectric transducers and varistor.

Most of the ZnO nanomaterials have been fabricated by conventional high temperature solid state mechanisms which is energy consuming and unfavorable to control the particle properties [9].

ZnO nanoparticles can be synthesized by simple solution based methods on a large scale such as chemical precipitation, sol–gel synthesis, and solvothermal/hydrothermal reaction [10]. We synthesized ZnO nano powders using precipitation method at a sintering temperature of 400 °C. This fabrication method has been successfully employed in our work to prepare nanoscale particles being cost-effective and controlled which desires low temperatures for processing and a high degree of solubility can be acquired.

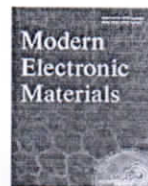
Among many research dopants in zinc oxide, cobalt doped zinc oxide shows potential in various applications [11,12]. According to reference studies [13], doping Cobalt in ZnO creates more zinc vacancies. Thus among diluted magnetic semiconductors (DMS), Cobalt doped ZnO is considered as a potential candidate among the TM because of its abundant electron states, large solubility in the ZnO matrix and also cobalt has a similar ionic radius (0.58 Å) to that of Zn (0.60 Å) [14]. Further different complex morphologies such as flowers, rods, sheets etc require too many control parameters which limit the application of the nanostructures.

The presence of secondary phases like  $\text{Co}^{3+}$  ions which may coexist with  $\text{Co}^{2+}$  ions in Co doped ZnO nanoparticles, are expected to have lattice defects [15]. Kumar and Khare, Roy et al. [16,17] and Yan et al. [18] reported increase in resistivity of  $\text{Co}^{2+}$  doped

\* Corresponding author.

E-mail address: [madhavaprasaddasari@gmail.com](mailto:madhavaprasaddasari@gmail.com) (M. Dasari).





## Precipitated nickel doped ZnO nanoparticles with enhanced low temperature ethanol sensing properties

Umadevi Godavarti<sup>a,c</sup>, V.D. Mote<sup>b</sup>, Madhavaprasad Dasari<sup>c,\*</sup>

<sup>a</sup> Department of Physics, CMR Technical Campus, Medchel, Hyderabad 501401, Telangana, India

<sup>b</sup> Thin Films and Materials Research Laboratory, Department of Physics, Dayanand Science College, Latur 413512, Maharashtra, India

<sup>c</sup> Department of Physics, GITAM Institute of Technology, GITAM University, Visakhapatnam 530045, Andhra Pradesh, India

### ARTICLE INFO

#### Keywords:

ZnO  
Nanoparticles  
XRD  
Selectivity  
Superior sensing

### ABSTRACT

The  $\text{Zn}_{1-x}\text{Ni}_x\text{O}$  nanoparticles have been synthesized by novel co-precipitation method and systematically characterized by XRD, SEM, TEM and photo luminescence. The XRD patterns confirm the hexagonal wurzite structure without secondary phases in Ni substituted ZnO samples. SEM and TEM are used for the estimation of particle shape and size. In PL study there is a peak in the range of 380–390 nm in all samples that is attributed to the oxygen vacancies. Gas sensing tests reveal that Ni doped ZnO sensor has remarkably enhanced performance compared to pure ZnO detected at an optimum temperature 100 °C. It could detect ethanol gas in a wide concentration range with very high response, fast response–recovery time, good selectivity and stable repeatability. The possible sensing mechanism is discussed. The high response of ZnO Nanoparticles was attributed to large contacting surface area for electrons, oxygen, target gas molecule, and abundant channels for gas diffusion. The superior sensing features indicate the present Ni doped ZnO as a promising nanomaterial for gas sensors. The response time and recovery time of undoped is 75 s and 60 s and 0.25 at% Ni are found to be 60 s and 45 s at 100 °C respectively.

### 1. Introduction

Zinc oxide (ZnO), with a wide band gap (3.4 eV) and a large exciton binding energy (60 meV), has fascinated eminent attention for its electronic and photonic applications such as ultraviolet (UV)/blue light-emitting devices, solar cells, piezoelectric devices, acousto-optical devices and chemical sensors [1,2]. Nowadays, the advancement of gas sensors to reveal volatile and toxic gases is crucial due to the consideration for environmental pollution, safety concerns in industry and for our daily life. ZnO has been considered as a favorable material for gas sensors because of its high electrochemical stability, non-toxicity, suitability to doping, and low cost.

Due to raised atmospheric pollution, efficient and inexpensive systems for detection and degree of environmentally hazardous gases have been progressively more important. Currently, general air pollution measurements are still based on time-consuming and expensive analytical techniques such as optical spectroscopy and gas chromatography/spectroscopy. Due to their low cost, outrageous sensitivity, quick response and direct electronic interface, the gas sensors have been regarded as an optimistic alternative for environmental measurements. However, to meet the specifications of standard air pollution

measurement their performances including accuracy, selectivity and reliability must be in addition improved. Over the past decades, several kinds of gas sensors have been progressed based on different sensing materials and several transduction platforms. The main classes of gas-sensing materials include metal-oxide semiconductors, conducting polymer composite, intrinsically conducting polymer metal-oxide/polymer composite and other novel materials [3].

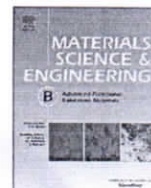
Many fabrication methods such as sol–gel, spray pyrolysis, vapor phase method and hydrothermal techniques have reported gas sensing properties which were operated at elevated temperatures and demonstrated poor selectivity [4,5]. However, still some limitations remain unsolved, such as expensive apparatus, rigorous condition, complex process, low yield and high temperature needed. In contrast to the above growth techniques, the precipitation method could be a simple and cost-effective technique. Herein we develop a low temperature ZnO nano powders using precipitation method at a sintering temperature of 400 °C. In the case of transition metal doping, sensing response of nickel doped ZnO, Wang et al. and Rambur et al. [6,7] reported that the response to ethanol has been greatly enhanced by Ni doping ZnO with an optimal doping concentration was 0.05 at%. X. Majority of semiconducting metal oxides are n-type because electrons are naturally

\* Corresponding author.

E-mail address: [madhavaprasaddasari@gmail.com](mailto:madhavaprasaddasari@gmail.com) (M. Dasari).

<https://doi.org/10.1016/j.moem.2017.10.006>





# Preparation and characterization of nanostructured Gd doped cerium oxide thin films by pulsed laser deposition for acetone sensor application

P. Nagaraju<sup>a,\*</sup>, Y. Vijayakumar<sup>a,b</sup>, R.J. Choudhary<sup>c</sup>, M.V. Ramana Reddy<sup>d</sup>

<sup>a</sup> Nanosensor Research Laboratory, Department of Physics, CMR Technical Campus, Hyderabad, Telangana State, India

<sup>b</sup> Department of Textile Engineering, Chemistry and Science, North Carolina State University, NC, USA

<sup>c</sup> IUC-Indore, Indore, Madhya Pradesh, India

<sup>d</sup> Department of Physics, Osmania University, Hyderabad, Telangana State, India

## ARTICLE INFO

### Keywords:

Gd doped cerium oxide  
Pulsed laser deposition  
Raman spectroscopy  
Energy band gap  
Sensor

## ABSTRACT

10 mol% Gd doped cerium oxide nanostructured films were deposited on quartz substrate by pulsed laser deposition technique at different substrate temperatures. X-ray diffraction studies indicated polycrystalline nature of the thin films with fluorite type structure. Atomic force microscopy results indicated the presence of nanocrystallites over the thin film surface. The root mean square (rms) roughness of the thin films increased with increasing substrate temperature. Morphological studies were carried out with scanning electron microscope. Raman Spectra was recorded using micro Raman spectrometer. Energy band gaps of Gd doped cerium oxide thin films at various substrate temperatures were determined by using Tauc's relationship. The sensing properties of the nanostructured thin films towards acetone vapor were investigated for various concentrations of acetone in air at different operating temperatures in the range 273–523 K.

## 1. Introduction

Large quantities of volatile organic compounds (VOCs) such as benzene, xylene, ethanol, toluene, methanol and acetone are emitted into the atmosphere by petroleum and other chemical industries [1]. There are different types VOC detection techniques are reported in the literature based on chemi-resistive [2], surface-acoustic-wave [3], capacitive [4] and optical sensors [5]. However, development of efficient sensors which can be operated at low power with high sensitivity and stability is still a challenge to the researchers. Acetone is the simplest organic compound widely used in the laboratories and in the medical fields. It is a colorless, flammable liquid and the simplest ketone. It has higher vapour pressure at ordinary temperature. Its high vapour pressure results from a low boiling point, which causes large number of molecules to evaporate or sublime from the liquid or solid form of the compound and enter the surrounding air. Acetone in the environment can irritate and cause permanent eye damage. Its long term exposure can damage kidney and liver and also cause depression of the central nervous system. Detection of acetone in the environment poses major challenge due to its complex nature. Hence, in the recent past, much attention has been given by researchers to design and develop sensors with desired figure of merit for the detection of acetone.

Rare-earth compounds are important materials due to their

applications as gas separation membranes [6], catalysts [7], electrolyte materials for solid oxide fuel cells [8], radiation emitters for thermophotovoltaic (TPV) system [9], nanophosphors [10], permanent magnets, data storage [11] and gas sensors [12]. The nanostructured dependent properties of cerium oxide based materials differ much from those of crystals of the chemically identical bulk materials. High density of defects in nano structured materials provides a large number of active sites for ionic conduction and high diffusivity through nanometer sized inter phase boundaries to promote fast kinetics and ion transportation. In the thin film, particles/grains are easy to form cross linking frame work, which promotes the fast ionic transport and dynamic process. This could be the reason why the nanostructured cerium oxide based thin films have demonstrated a number of great improvements compared with their bulk materials. Due to the doping of the Gd<sup>3+</sup> ions into the cerium oxide exhibits the highest conductivity due to small association enthalpy between dopant cation and oxygen vacancy in the fluorite lattice. It minimizes unit cell expansion or contraction which leads to increase the density of Gd doped cerium oxide. Due to these reasons Gd doped cerium oxide thin films are promising materials for gas sensor applications. In our previously reported work [12], we have deposited cerium oxide thin films for acetone gas sensing characterization. To the best of our knowledge, this is the first research paper reported on 10 mol% Gd doped nanocrystalline cerium oxide thin

\* Corresponding author.

E-mail address: [nagarajuphysics@gmail.com](mailto:nagarajuphysics@gmail.com) (P. Nagaraju).





## Full Length Article

# Effect of oxygen partial pressure on the microstructural, optical and gas sensing characterization of nanostructured Gd doped ceria thin films deposited by pulsed laser deposition

P. Nagaraju<sup>a,\*</sup>, Y. Vijayakumar<sup>a,b</sup>, M.V. Ramana Reddy<sup>c</sup>

<sup>a</sup> Nanosensor Research Laboratory, CMR Technical Campus, Hyderabad, Telangana, India

<sup>b</sup> Department of Textile Engineering, Chemistry and Science, North Carolina State University, NC, USA

<sup>c</sup> Department of Physics, Osmania University, Hyderabad, Telangana, India

## ARTICLE INFO

## Article history:

Received 21 July 2017

Received in revised form 25 August 2017

Accepted 1 September 2017

Available online 19 September 2017

## Keywords:

Pulsed laser deposition

Gd doped ceria

Thin film

Gas sensor and acetone

## ABSTRACT

Microstructural properties of 10 mol% gadolinium doped ceria (CeO<sub>2</sub>) thin films that were deposited on quartz substrate at substrate temperature of 1023 K by using pulsed laser deposition with different oxygen partial pressures in the range of 50–200 mTorr. The influence of oxygen partial pressure on microstructural, morphological, optical and gas sensing characterization of the thin films was systematically studied. The microstructure of the thin films was investigated using X-ray diffraction, atomic force microscopy and Raman spectroscopy. Morphological studies have been carried out using scanning electron microscope. The experimental results confirmed that the films were polycrystalline in nature with cubic fluorite structure. Optical properties of the thin films were examined using UV–vis spectrophotometer. The optical band gap calculated from Tauc's relation. Gas sensing characterization has been carried at different operating temperatures (room temperature to 523 K) for acetone gas. Response and recovery times of the sensor were calculated using transient response plot.

© 2017 The Ceramic Society of Japan and the Korean Ceramic Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

Acetone is the simplest organic compound widely used in laboratory and medical field. It is a colourless, flammable liquid and the simplest ketone. It has a chemical formula of CH<sub>3</sub>COCH<sub>3</sub>. Acetone is a volatile organic compound which has higher vapour pressure at ordinary temperatures. Its high vapour pressure that results from a low boiling point, which causes large number of molecules to evaporate or sublime from the liquid or solid form of the compound and enter the surrounding air. The large quantities of acetone, is emitted into the atmosphere by human body, plants, trees, volcanic gases, forest fires, as a product of the breakdown of body fat and industries. Acetone in environment can irritate, cause permanent eye damage and its long-time exposure can cause kidney, liver and paralyze central nervous system [1]. Detection of acetone in environment poses a major challenge due to its complex nature.

Hence, in the recent past, much attention has been given by the researchers to design and develop sensors with desired figure of merits for the detection of acetone [2–5]. There are different types of gas sensors reported in the literature viz. (1) the potentiometric gas sensor monitors distinct activities of two regions, which are separated by a solid electrolyte that allows ions to pass through, but not electrons. It is most widely used in automobile exhaust systems as an oxygen sensor. (2) The calorimetric gas sensor is also known as the pellistor, which monitors resistance changes resulting from combustion. This sensor is used in a mixed atmosphere with an inflammable gas. (3) The chemiresistive gas sensor, which is a small, simple, sensitive, rugged microsensor with low power requirements capable of detecting chemical vapours in air, soil or water. A sensing material which has a high surface-to-volume ratio and is connected to two metal electrodes is placed on an insulating substrate. It measures resistance changes at elevated temperature. Among these three, the first two types of gas sensors, the potentiometric and the calorimetric sensors, are more specific in detecting oxygen and inflammable gases, respectively.

Pure and Gd doped ceria have a variety of technological applications. ceria has a high refractive index and absorption of ultra violet radiation which makes it an ideal UV blocker and a poten-

\* Corresponding author.

E-mail address: [nagarajuphysics@gmail.com](mailto:nagarajuphysics@gmail.com) (N. P.).

Peer review under responsibility of The Ceramic Society of Japan and the Korean Ceramic Society.



## A REVIEW ON GROWTH AND STRUCTURAL PROPERTIES OF ZNO NANOSTRUCTURES

P.Radhika<sup>1</sup>, P.Nagaraju<sup>a</sup>, KMR Achary<sup>b</sup>

<sup>a</sup>*Department of Physics, CMR Technical Campus, Hyderabad, India*

<sup>b</sup>*Department of Physics, Malla Reddy College of Engineering & Technology, Hyderabad, India*

### ABSTRACT

Zinc oxide nano structures are versatile nano material with a wide range of applications in optoelectronic, sensor technology, transducers and biomedical services. A controlled growth mechanism is required for commercial usages of ZnO nanostructures. This work reviews different growth mechanism and structural properties of ZnO nanostructures for novel applications. This work is focused on getting better understanding about the role of various growth parameters for tuning the structural and morphological properties of zinc oxide nanostructures.

**Keywords:** *Growth Mechanism, Lattice Parameters, Ph, SEM, XRD.*

### I. INTRODUCTION

The keystone of modern electronic industry is metal oxide nano structure. They have been used widely in fabrication of photovoltaic, optoelectronic and photonic devices. In last few decades, zinc oxide nano materials have received broad attention due to their numerous structural and optical properties suited for various technological applications. Among all metal oxide nano structures, zinc oxide nano material has become of particular interest to scientist for their surprising optoelectronic and magnetic properties. The strong piezoelectronic and pyroelectronic properties are observed in ZnO nanostructures because of the lack of a centre of symmetry in wurtzite structure combined with large electro-mechanical coupling. It is a versatile functional material and it has diverse group of growth morphologies. ZnOnano structures are obtained in the form of nano rods, nano combs, nano wires, nano belts, nano springs, nano flowers etc. The different synthesis procedures, structural optical properties and the potential applications of ZnOnano structures will be reviewed in this work (1-3).

Zinc oxide is a wide band gap (3.37 eV) material with high exciton binding energy of 60 meV. This high exciton binding energy of ZnO material would allow for excitonic transitions even at room temperature. It could results for high radiative recombination efficiency for spontaneous emission as well as Zinc oxide can be made highly conductive by the method of doping and it is transparent to visible light. Zinc oxide nano materials fulfill the





# Role of cobalt doping on the electrical conductivity of ZnO nanoparticles



Umadevi Godavarti<sup>a,c</sup>, V.D. Mote<sup>b</sup>, Madhavaprasad Dasari<sup>c,\*</sup>

<sup>a</sup> Department of Physics, CMR Technical Campus, Medchel, Hyderabad, 501 401, Telangana, India

<sup>b</sup> Thin Films and Materials Research Laboratory, Department of Physics, Dayanand Science College, Latur, 413 512, Maharashtra, India

<sup>c</sup> Department of Physics, GITAM Institute of Technology, GITAM University, Visakhapatnam, 530045, Andhra Pradesh, India

## ARTICLE INFO

### Article history:

Received 4 May 2017

Received in revised form 19 July 2017

Accepted 11 August 2017

Available online 22 August 2017

### Keywords:

Chemical synthesis

ZnO nanoparticles

XRD

Spherical structure

Electrical conductivity

## ABSTRACT

Cobalt doped zinc oxide ( $\text{Zn}_{1-x}\text{Co}_x\text{O}$ ;  $x=0, 0.05, 0.10, 0.15$ ) samples were synthesized using co-precipitation method. The Co doped ZnO nanoparticles showed the maximum solubility limit. The XRD patterns confirm the hexagonal type wurtzite structure without secondary phase in Co substituted ZnO samples. The particle size was studied using transmission electron microscope (TEM) and grain size estimated using scanning electron microscope (SEM). We report the study of temperature dependence of conductivity on ZnO and Co doped ZnO nanoparticles. It is found that at a higher temperature range (above 470 K) thermally activated type of conduction is in dominance with the lower temperature range of conduction in which donor carrier hopping mechanism is dominated. DC conductivity result shows the reduction nature for cobalt doped ZnO. The obtained results are discussed on basis of potential barrier, donor concentration, point defects and adsorption–desorption of oxygen. Cobalt substitution increases resistivity, reduces grain growth, lower particle size and increase in activation energy. Detailed mapping of two regions of electrical conductivity is done to understand the activation energy mechanisms prevailing in cobalt doped ZnO.

© 2017 The Ceramic Society of Japan and the Korean Ceramic Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

Zinc oxide (ZnO) is a II–VI group semiconductor has a wurtzite crystal structure, with a direct and wide bandgap of 3.37 eV, a large exciton binding energy (60 meV) and high optical gain at room temperature [1–3]. Numerous applications of wurtzite ZnO comprises of field-effect transistor [4], optical device [5], dye-sensitized solar cell [6], solid-state gas sensor [7,8]. The strong n-type conductivity is exhibited by zinc oxide varistor (ZnO) with the electrons to move in the conduction band as charge carriers. Primary dependence of electrical properties of ZnO is based on the composition and on microstructure characteristics such as grain size, density and morphology. The study of effect of dopants on physical and electrical properties of ZnO are related to applications in electronic components such as piezoelectric transducers and varistor.

Most of the ZnO nanomaterials have been fabricated by conventional high temperature solid state mechanisms which is energy consuming and unfavorable to control the particle properties [9].

ZnO nanoparticles can be synthesized by simple solution based methods on a large scale such as chemical precipitation, sol–gel synthesis, and solvothermal/hydrothermal reaction [10]. We synthesized ZnO nano powders using precipitation method at a sintering temperature of 400 °C. This fabrication method has been successfully employed in our work to prepare nanoscale particles being cost-effective and controlled which desires low temperatures for processing and a high degree of solubility can be acquired.

Among many research dopants in zinc oxide, cobalt doped zinc oxide shows potential in various applications [11,12]. According to reference studies [13], doping Cobalt in ZnO creates more zinc vacancies. Thus among diluted magnetic semiconductors (DMS), Cobalt doped ZnO is considered as a potential candidate among the TM because of its abundant electron states, large solubility in the ZnO matrix and also cobalt has a similar ionic radius (0.58 Å) to that of Zn (0.60 Å) [14]. Further different complex morphologies such as flowers, rods, sheets etc require too many control parameters which limit the application of the nanostructures.

The presence of secondary phases like  $\text{Co}^{3+}$  ions which may coexist with  $\text{Co}^{2+}$  ions in Co doped ZnO nanoparticles, are expected to have lattice defects [15]. Kumar and Khare, Roy et al. [16,17] and Yan et al. [18] reported increase in resistivity of  $\text{Co}^{2+}$  doped

\* Corresponding author.

E-mail address: [madhavaprasaddasari@gmail.com](mailto:madhavaprasaddasari@gmail.com) (M. Dasari).





# Precipitated nickel doped ZnO nanoparticles with enhanced low temperature ethanol sensing properties

Umadevi Godavarti<sup>a,c</sup>, V.D. Mote<sup>b</sup>, Madhavaprasad Dasari<sup>c,\*</sup>

<sup>a</sup> Department of Physics, CMR Technical Campus, Medchel, Hyderabad 501401, Telangana, India

<sup>b</sup> Thin Films and Materials Research Laboratory, Department of Physics, Dayanand Science College, Latur 413512, Maharashtra, India

<sup>c</sup> Department of Physics, GITAM Institute of Technology, GITAM University, Visakhapatnam 530045, Andhra Pradesh, India

## ARTICLE INFO

### Keywords:

ZnO  
Nanoparticles  
XRD  
Selectivity  
Superior sensing

## ABSTRACT

The  $\text{Zn}_{1-x}\text{Ni}_x\text{O}$  nanoparticles have been synthesized by novel co-precipitation method and systematically characterized by XRD, SEM, TEM and photo luminescence. The XRD patterns confirm the hexagonal wurzite structure without secondary phases in Ni substituted ZnO samples. SEM and TEM are used for the estimation of particle shape and size. In PL study there is a peak in the range of 380–390 nm in all samples that is attributed to the oxygen vacancies. Gas sensing tests reveal that Ni doped ZnO sensor has remarkably enhanced performance compared to pure ZnO detected at an optimum temperature 100 °C. It could detect ethanol gas in a wide concentration range with very high response, fast response–recovery time, good selectivity and stable repeatability. The possible sensing mechanism is discussed. The high response of ZnO Nanoparticles was attributed to large contacting surface area for electrons, oxygen, target gas molecule, and abundant channels for gas diffusion. The superior sensing features indicate the present Ni doped ZnO as a promising nanomaterial for gas sensors. The response time and recovery time of undoped is 75 s and 60 s and 0.25 at% Ni are found to be 60 s and 45 s at 100 °C respectively.

## 1. Introduction

Zinc oxide (ZnO), with a wide band gap (3.4 eV) and a large exciton binding energy (60 meV), has fascinated eminent attention for its electronic and photonic applications such as ultraviolet (UV)/blue light-emitting devices, solar cells, piezoelectric devices, acousto-optical devices and chemical sensors [1,2]. Nowadays, the advancement of gas sensors to reveal volatile and toxic gases is crucial due to the consideration for environmental pollution, safety concerns in industry and for our daily life. ZnO has been considered as a favorable material for gas sensors because of its high electrochemical stability, non-toxicity, suitability to doping, and low cost.

Due to raised atmospheric pollution, efficient and inexpensive systems for detection and degree of environmentally hazardous gases have been progressively more important. Currently, general air pollution measurements are still based on time-consuming and expensive analytical techniques such as optical spectroscopy and gas chromatography/spectroscopy. Due to their low cost, outrageous sensitivity, quick response and direct electronic interface, the gas sensors have been regarded as an optimistic alternative for environmental measurements. However, to meet the specifications of standard air pollution

measurement their performances including accuracy, selectivity and reliability must be in addition improved. Over the past decades, several kinds of gas sensors have been progressed based on different sensing materials and several transduction platforms. The main classes of gas-sensing materials include metal-oxide semiconductors, conducting polymer composite, intrinsically conducting polymer metal-oxide/polymer composite and other novel materials [3].

Many fabrication methods such as sol–gel, spray pyrolysis, vapor phase method and hydrothermal techniques have reported gas sensing properties which were operated at elevated temperatures and demonstrated poor selectivity [4,5]. However, still some limitations remain unsolved, such as expensive apparatus, rigorous condition, complex process, low yield and high temperature needed. In contrast to the above growth techniques, the precipitation method could be a simple and cost-effective technique. Herein we develop a low temperature ZnO nano powders using precipitation method at a sintering temperature of 400 °C. In the case of transition metal doping, sensing response of nickel doped ZnO, Wang et al. and Rambu et al. [6,7] reported that the response to ethanol has been greatly enhanced by Ni doping ZnO with an optimal doping concentration was 0.05 at%. X. Majority of semi-conducting metal oxides are n-type because electrons are naturally

\* Corresponding author.

E-mail address: [madhavaprasaddasari@gmail.com](mailto:madhavaprasaddasari@gmail.com) (M. Dasari).

<https://doi.org/10.1016/j.moem.2017.10.006>



## Extraction of geometric and prosodic features from human-gait-speech data for behavioral pattern detection: Part I

Raj Kumar PATRA<sup>1,\*</sup>, Tilendra Shishir SINHA<sup>2,3</sup>, Ravi Prakash DUBEY<sup>1</sup>

<sup>1</sup>Department of Computer Science & Engineering, Dr. C. V. Raman University, Kota, Bilaspur, India

<sup>2</sup>Dr. Sudhir Chandra Sur Degree Engineering College, Surermath, Kolkata, India

<sup>3</sup>Maulana Abul Kalam Azad University of Technology, Salt Lake City, Kolkata, India

Received: 30.04.2016

Accepted/Published Online: 01.11.2016

Final Version: 30.07.2017

**Abstract:** In this work, we extract prosodic features from subjects while they are talking while walking using human-gait-speech data. These human-gait-speech data are separated into 1D data (human-speech) and 2D data (human-gait) using the adaptive-lifting scheme of wavelet transform. We carry out extraction of prosodic features from human-speech data, such as speech duration, pitch, speaking rate, and speech momentum, using five different natural languages (Hindi, Bengali, Oriya, Chhattisgarhi, and English) for the detection of behavioral patterns. These behavioral patterns form real-valued measured parameters, stored in a knowledge-based model called the human-gait-speech model. Extraction of geometrical features from human-gait data, such as step length, energy or effort, walking speed, and gait momentum, is carried out for the authentication of behavioral patterns. In this paper, the data of 25 subjects of different ages, talking in five different natural languages while walking, are analyzed for the detection of behavioral patterns.

**Key words:** Adaptive-lifting scheme of wavelet transform, out-of-corpus, blind speech signal separation, modified adaptive vector quantization

### 1. Introduction

Prosodic features are the real values measured from speech patterns [1] such as pitch, energy, or duration between utterances. In the present work, both human gait (2D data) and human speech (1D) are considered simultaneously for analysis in two different domains. Both these data have been mapped properly using statistical and soft-computing techniques [2–8]. In the central and eastern parts of India, the most commonly spoken languages are Hindi, Bengali, Oriya, and Chhattisgarhi, which contain some phrases with resemblances. The English language has also been adopted. All of these languages have been used as a case-based study for the successful extraction of prosodic features. The entire speech pattern of the five languages is partitioned [7] into considerable isolated subwords with optimal boundaries [9]. A wavelet, which is considered here as any real-valued function of time, has a certain structure and has been detected using the discrete wavelet transform (DWT) method [10]. Hence, lossless compression is performed so that no information is lost. Another focus of this paper is human-gait data for the extraction of geometrical features, including step length, walking speed, and energy or effort. Human-gait images have been studied in the literature, and a proposal has been made for the detection of a set of semantic traits discernible by humans at a distance, outlining their psychological validity [11]. Translation of human-gait biometrics has also been performed for forensic use [12], where features such

\*Correspondence: [patra.rajkumar@gmail.com](mailto:patra.rajkumar@gmail.com)



# Challenges arise of Privacy Preserving Big Data Mining Techniques

M.Chalpathi Rao<sup>1</sup>, A.Kiran Kumar<sup>2</sup>

<sup>1</sup> Assistant Professor, Dept of CSE, CMR Technical Campus, Telangana, India.

<sup>2</sup> Assistant Professor, Dept of CSE, CMR Technical Campus, Telangana, India.

\*\*\*

**Abstract** - Big data is being generated from various sources-transactions, social media, sensors, digital images, videos, audios and for domains including healthcare etc this data is known as big data. The characteristics of Big Data include 3 Vs they are Volume, Velocity and Variety. Useful data can be extracted from this big data with the help of data mining techniques. The massive volume of big data sets are too complicated to be managed and processed by conventional relational databases the term "Big Data" was coined to address this massive volume of data storage and processing. The quality of captured data can vary greatly, affecting accurate analysis. Protecting privacy is mechanism for data processing and producing right information to favor corporate sectors, business managers, stake holders and other users make highly informed business decisions. In this paper we are proposing a big data on privacy preserving Big Data.

**Key Words:** BI, Velocity, Volume, Variety.

## 1. INTRODUCTION

A combination of policy decisions, technical and legal mechanisms are used to address privacy concerns. A brief description of some of the major principles for protecting the privacy of data in its lifecycle is given below. Data collection and limitations: This principle limits the unnecessary excessive collection of personal data. Once the purpose for which data is collected is known, collected data should be just sufficient enough for that purpose. This principle is clearly a policy decision on the part of collector. Usage limitations: While collecting sensitive or personal data, collector needs to specify what for and how the data is used and limit the usage of collected data for other purposes than the original one. Security of data: It is an obligation of data collector to keep the data safe once collected. Adequate security mechanism should be in place to protect it from breaches. Transfer Policy: Often the usage of data is governed by laws which are prevalent at the place of collection and usage. If the data is moved outside the jurisdiction where the law enforcement is not prevalent in the new place it carries the danger of misuse. Accountability: When dealing with third party data, the party may ask to designate a person who is the point of contact and take processing and usage of data. Collection limitation: is the policy decision on part of data collector usage limitation, securing data and transfer policy can be addressed by technical means and the last one, accountability is addressed by having a legal team sign a declaration.

## 2. BIG DATA

There are various Challenges that companies are facing in identifying and processing value from the "Big Data". It is a big data challenge to preserve the privacy of end users at various stages of data life cycle. Today we live in the computerized world with drastic digitization the volume of structured and unstructured data being generated and stored is exploding. The data which is proposed is being taken from various origins. In addition to business and companies, individuals spend to the data volume. For particular 40 billion content are being distributed on Facebook every month. Big data is massive volume of both structured and unstructured data from various origins such as social data, machine generated data, traditional enterprise which is so large that it is complex to process with traditional database and software techniques. Big Data is data whose metric, diversity, and complexity require new framework, techniques, algorithms, and analytics to manage it and fetch value and hidden knowledge from it. Characteristics of Big Data include 3 Vs. They are Volume, Velocity, Variety and Veracity.

## 3. BIG DATA CHALLENGES

Here we have several challenges that companies are facing in identifying, processing and fetching value from the "Big Data". As in the following some of the key challenges include

1. Preserving Privacy
2. Integrating the Big Data Technologies
3. Proposing real time needs with higher data volumes and varieties
4. Data maintenance and management
5. Data distribution and Analytical systems.

## 4. PRIVACY PRESERVING POLICIES

### 4.1 Anonymization Techniques

Substitute delicate attribute values with some other values. This decreases disclosure of private data. In some situations, this clear substitution alone will not sophisticated anonymization techniques need to be worked.



# Cloud Support Big Data Analytics of Present Investigation and Forecasting

M.Chalapathi Rao<sup>1</sup>, A.Kiran Kumar<sup>2</sup>, B.P.Deepak Kumare<sup>3</sup>

Department of CSE, CMR Technical Campus, Hyderabad

*Abstract—literally, this is expected that more than half of the complete data will be on the cloud so far. This data is complicated and right to be stored, refined and analyzed for data that can be used by companies. Cloud computing serves an Advanced persistent threats platform for big data analytics in concerning of the data storage and computing prerequisites of the closing. It generates cloud-oriented analytics a possible investigation era. However, certain issues need to be elaborated and uncertainty needs to be reduced before constructive applications of this interdependent model can be regularly used. In This paper we examine the past investigation process, threats, straight issues and forecasting for this area of study.*

*Index Terms-* Cloud computing, Big Data Analytics, Big Data.

## I. INTRODUCTION

Today we are living in emerging cloud computing technology the big data complication is increasing exceedingly. This technique via looking simpler to users but comparatively it is more difficult to handle. In this area, there preexist different challenges for speed processing of data and privacy preserving of user data. This paper directing several concepts relating to big data in cloud computing area .Here we considered the elaborated field of research study in the challenging area of cloud computing and highlighting on data measures, availability, data integrity, volume(large amount of data) and velocity(data speed). The consequent chapters include the difference among the various technologies and discuss some of the things relating to the cloud and big data, storage, processing of big data in clouds and security scalabilities. There are various types of big data dimensions like tool big structured and unstructured, real time and virtual scale out.

## II. BIG DATA ANALYTICS

Big data specifies to large amount of data sets that are orders

of significance larger (volume); more distinct, which specifying structured, semi structured, and unstructured data; and moving faster (velocity) than persons or your companies has had to deal with previous. This stream of data is created by various communication devices—from Personal Computers and smart phones to sensors such as RF ID s and traffic cams. In addition, it's composite and traverse in different formats, including text data, document information, image files, video files, and many more. The literal value of big data is in the observation it generates when data analyzed—discovered arrangements, indicators for decisions, and basically the strength to respond to the world with greater knowledge. Big data analytics is a set of innovative technologies propagated to work with large amount of data. It uses practical significant methods such as machine learning, Neural Networks (NN), robotics, formal computational mathematics, and artificial intelligence (AI) to analyze the data and to discover interrelationships and arrangements. Organizations and companies are drastically increasing to identify vision into their respective data. Numerous big data projects initiated from the need to solve specific business doubts. With the possible big data analytics domains in place, an organization can strengthen sales, improve adequate access, and customer oriented service. Big data investment to study which business domains companies plan to utilize Big Data analytics to increase operations. About more than half of all users said they were applying big data analytics to increase the often customer retention, support with product advancement and gain some advantage. Big data analytics explore huge volume of data to disclose invisible patterns, correlations and other insights. By today's analysis it's possible to examine your data and get solutions from it almost immediately – an effort that's slower and less efficient with more traditional business intelligence solutions.



# RSOS: Reliable and Secure Operating System

► Ashutosh Saxena

Adjunct Professor CS, Email: saxenaa@gmail.com

Did you recollect when your landline phone got hanged, probably you do not remember either it really did not happened or you are using smart mobile phone for a long time. Then, did you remember when your elegant smart phone got hanged while you were running few applications? Probably last month!! Let me extend the query: when was your TV stuck while you were watching favourite show or movie, in contrast, how many times your laptop got hanged while you were playing the DVD? All are electronics devices with processors, several interfaces, I/O ports and an operating system (OS) running for you to provide the desired functionality. It is the OS on computers/smart phones that provides flexibility, where you can load, install and execute external software, whereas on the TV you may not enjoy that level of freedom, reason being a very small with focussed functionality OS is being embedded in TV sets which does not fall in prey hands.

The popular operating systems have two characteristics which makes them unreliable and insecure 1) they are very large in size and 2) they have very poor fault isolation. The Linux kernel has over 2.5 million lines of code and Windows XP is twice more than Linux. A study [1] of software reliability conveys it contains 6-16 bugs per 1000 lines of executable code while a different one [2] states that the fault density at 2-75 bugs per 1000 lines of executable code. To be on a conservative end one can estimate of 6 bugs per 1000 lines of code the Linux kernel probably has something like 15,000 bugs, Windows has as at least double, not sure mobile OS for smart phones!! Further, to make matters worse, typically about 70% of the operating system consists of device drivers, and they have error rates 3 to 7 times higher than ordinary code [3]. It is also true that finding and correcting all these bugs is simply not always feasible, and bug fixes frequently

introduce new bugs. Any modern operating system contains hundreds or thousands of procedures linked together as a single binary program running in kernel mode. Any one line from the millions of lines of kernel code can overwrite key data structures used by an unrelated component and crash the system which is difficult to detect. In addition, if a virus or worm manages to infect one kernel procedure, there is no way to keep it away from rapidly spreading to others and taking control of the whole machine. The challenge in developing operating systems security is to design security mechanisms that protect process execution and their generated data in an environment with such complex interactions. However, these mechanisms do not account or only partially account for the complexity of practical systems. The current state of operating systems security takes two forms: (1) constrained systems that can enforce security goals with a high degree of assurance and (2) general-purpose systems that can enforce limited security goals with a low to medium degree of assurance. An ideal secure operating system provides security mechanisms that ensure that the system's security goals are enforced despite the threats faced by the system. Thus the basic security mechanism improves the reliability of system software by protecting it from the most obvious source of unreliability; namely, user programming errors.

## Reliability

Reliable software provides services that are adequate for the intended application with respect to being: usable, correct, and trustworthy.

Usable means that the user receives services that are effective for his application. Correct means that the software meets its functional specifications. If the specifications are incomplete, then correct software may not be usable. Trustworthy means that there is a minimum level of services

that is provided correctly, and there is an effective way to evaluate or measure the performance of the software with respect to the minimum level of service. Software may be correct even if there is no effective way to demonstrate its correctness; however, trustworthy software must be structured so that testing, auditing, and/or proofs of correctness can be used to achieve a reasonable level of confidence in the software.

## Security

Security goals describe how the system implements accesses to system resources that satisfy the following: secrecy, integrity, and availability. A system access is traditionally stated in terms of which subjects (e.g., processes and users) can perform which operations (e.g., read and write) on which objects (e.g., files and sockets). Secrecy requirements limit the objects that individual subjects can read because objects may contain secrets that not all subjects are permitted to know. Integrity requirements limit the objects that subjects can write because objects may contain information that other subjects depend on for their correct operation. Some subjects may not be trusted to modify those objects. Availability requirements limit the system resources (e.g., storage and CPU) that subjects may consume because they may exhaust these resources. Much of the focus in secure operating systems is on secrecy and integrity requirements, although availability may indirectly impact these goals as well.

In general, security provisions must be as simple and rigid as possible in order to minimize the danger of oversights and of human error. Nevertheless, for security in a computer operating system, the flexibility is desirable for the following reasons:

- (1) System security will be attacked at its weakest point. It makes little sense to build extremely rigorous



## Comparative study for selection of an item based on multi-criteria DSS

Viharika Padma  
([padmaviharika178@gmail.com](mailto:padmaviharika178@gmail.com))  
IV B. Tech (CSE) II Sem,  
Anurag Group of Institutions,  
Hyd, India

Sanjana B L  
([sanjanabl19@gmail.com](mailto:sanjanabl19@gmail.com))  
IV B. Tech (CSE) II Sem,  
Anurag Group of  
Institutions  
Hyd, India

M Varaprasad Rao  
([varam78@gmail.com](mailto:varam78@gmail.com))  
Professor, CSE  
Anurag Group of  
Institutions  
Hyd, India

### Abstract

Recommender systems lay a pathway to users in delivering the best solution in their area of interest. Recommender systems have gained prominence in the field of Information Technology, e-commerce, etc., inferring personalized recommendations by effectively pruning from a universal set of choices for end users to identify their content of interest. A number of multi criteria decision support system algorithms are available for generating priority based recommendations, which include Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS), Analytical Hierarchy Processes (AHP). This paper focuses mainly on user-to-item based filtering technique. Here, a comparative study is conducted between TOPSIS and AHP for selecting a mobile based on filtering.

### Keywords

Recommender Systems, TOPSIS, AHP, User-to-Item Filtering, Efficiency, Decision Support Systems.

### Introduction

Decision Support Systems are computer-based systems that bring together information from a variety of sources, assist in the organization and analysis of information and facilitate the evaluation of assumptions underlying the use of specific models. In other words, these systems allow decision makers to access relevant data across the organization as they need it to make choices among alternatives. Most decision-making processes supported by DSS are based on decision analysis, most commonly multi-criteria decision making (MCDM). MCDM involves evaluating and combining alternatives' characteristics on two or more criteria or attributes in order to rank, sort or choose from among the alternatives. Now-a-days a smart phone has become a necessity in everybody's life. Since, every day a new model comes into market users get confused during selection of mobile phone while buying. To select the most suitable mobile phone among various alternatives, the decision maker must consider meaningful criteria & possess special knowledge of the phone specifications. In this study, the evaluation criteria for decision making are selected from the studies in the discussions with the target audience. A number of alternatives and conflicting criteria are increasing very rapidly. So, robust evaluation models are crucial in order to incorporate several conflicting criteria meritoriously. With its need to trade-off multiple criteria, the selection problem like mobile phone selection is a multi-criteria decision-making (MCDM) problem. A number of recommender system algorithms / methods are present for selecting an item using item-based,



# IMPROVE THE QUALITY OF STATISTICAL METHOD OF OBTAINING REPRESENTATIVE DATA SCHEME FOR DE-DUPLICATION USING FUZZY CLUSTERING AND GENETIC ALGORITHM

<sup>1</sup>RAVIKANTH.M, <sup>2</sup>DR.D.VASUMATHI

<sup>1</sup>Associate Professor, Department of CSE, CMRTC, Medchal, Telangana, India

<sup>2</sup>Professor, Department of CSE, JNTUCE, Hyderabad, Telangana, India

E-mail: ravikanthm.cse@gmail.com, vasukumar\_devara@yahoo.co.in

## ABSTRACT

Record De-duplication is the important task under merging different database records. We can provide tuning results to the users after implementation of de-duplication operation. Existing approaches are failing under tuning of web databases and removal of duplicate records. All existing approaches are not providing efficient and effective results [1] [2] [3] [4]. In this paper we are designing one new prototype discussion related to effective and enhanced de-duplication. Prototype design starts with fuzzy clustering and genetic algorithm. Its can control more number of duplicate records compare to other approaches. Its saves more storage and time compare to other approaches [12] [13]. In distributed databases the complexity of finding similarity factor is very high. The existing techniques are not accurate to minimize the duplication in the same data base. In the present work a new technique is proposed to improve the accuracy level [24]. In the proposed work a multi-level technical process implemented like tuning. The tuning technique finds all types of duplicated documents in the database. Here all duplicate files are searched with all attributes in sequential order in tree fashion. The results are further improved and reached to an optimized and acceptable range with new data duplication detection method with Genetic Algorithm (GA) and Particle Swarm Optimization (PSO). It further removes unwanted residual files from the database. Bases on the view of previous ranking system problems a new manifold ranking is proposed in the current research work. In the proposed system the ranking is evaluated with new multimodality manifold ranking with sink points.

**Keywords:** *Web Databases, De-Duplication Operation, Un-Supervised Duplicate Recognition, Edit Distance Algorithm, Fuzzy Clustering Algorithm, Genetic Algorithm, Margin Relevance.*

## 1. INTRODUCTION

Data Sciences explores its branches in many directions. It has many wings which waves its benefits to many of real time applications. It has extended its topographies to many areas like Intelligent Data Analysis, Big Data Analytics, Data Mining, Information Securities, Data Base management Systems, Internet, Web Database, Internet of Things, and many more. They are facing many challenges in corporate fields, economic field, and in daily life. Researchers have much interest in the field of data analysis. The data analysis era starts long back when organizations start data sharing between computers in large networks. During data analysis

people start realising about data duplication problem. As the network area increasing the process of data uploading and downloading also increased, but this increase the multiple data copies in the network systems. This creates large problems for the company databases. Data duplication in data base increased data storage needs also diminished data accuracy. The duplication in such personal organization data bases can be cleared at regular intervals by doing simple identification and deletion process to improve the database searching process. In this process the professions identify the files where they are the copies of the original files which are located somewhere in the database. The identification done by certain parameters like size of the file on the disk, number of



## INTERNET OF THINGS AND CLOUD COMPUTING IN MEDICAL MONITORING SYSTEMS

<sup>1</sup>MD RAFAEEQ, <sup>2</sup>C.SUNIL KUMAR

<sup>1</sup>Associate Professor in CSE, CMR Technical Campus, Hyderabad, India, rafeeq.mail@gmail.com

<sup>2</sup>Professor in IT, SNIST, Ghatkesar, Hyderabad, Telangana, India,  
E-mail: ccharupalli@gmail.com

**Abstract-** With the fast development of cloud computing and computer science technology, the combination of the IOT and cloud computing in the medical-assisted environment is urgently needed. The prior research focus more on individual development of the single technique, quite a less research on the field of medical monitoring and managing service application have been conducted. Therefore, in this paper, we study and analyze the application of cloud computing and the Internet of Things on the field of medical environment. We are trying to make the combination of the two kinds of technology monitoring and management information system in hospital. Remote monitoring cloud platform architecture model (RMCPA) set up medical information in the first place. Then the RMCPA architecture was analyzed. Eventually, the last effective PSOSAA algorithm proposed the hospital medical information service cloud system monitoring and management application. Experimental simulation illustrates that the proposed algorithm outperforms the other state-of-the-art algorithms. Further potential research areas are discussed.

**Keywords-** Cloud Computing, Internet of Things (IOT), Medical Monitoring; Big Data; Theoretical Analysis

### I. INTRODUCTION

The Internet of Things (IoT) paradigm is based on intelligent and self-configuring nodes (things) interconnected in a dynamic and global network infrastructure. It represents one of the most disruptive technologies which make the ubiquitous and pervasive computing scene. Internet of things is usually refers to the real world and little things limited storage and processing ability, and the important problems about reliability, performance, security and privacy. On the other hand, cloud computing has the almost unlimited capacity of storage and processing power which is a more mature technology at least to a certain extent to solve the problem of most of the Internet of things [1-3]. Thus, a novel IT paradigm in which Cloud and IoT are two complementary technologies merged together is expected to disrupt both current and future world. We call it Cloud-IoT new paradigm. This paper reviews the literature integration of cloud computing and Internet of things promising subject research and industry. We have conducted a review work to propose an integrated usage of Cloud and IoT. In the Figure 1, we illustrate the both topics gained popularity in the last few years and the total amount of papers handling with these two topics, respectively. The Internet of things is the generation of information technology. This is a major development in the field of information and conversion opportunity [4]. The commission believes that development of the Internet of things application will solve the problems of modern society in the future, [5] make a big contribution. Modern logistics use modern information technology in modern logistics management instruction. The three basic requirements are: good service, low cost, speed

faster. Health information technology has a wide range of function in modern applications [6].

Medical information technology and healthcare service are closely related to the national welfare and the people's livelihood. Cloud computing and Internet of integration in the application of modern medicine would be a great breakthrough. Because in large-scale cloud computing has its advantages such as high reliability, virtualization, high efficiency and scalability, the construction of public cloud in hospital and the patients can promote resource sharing, cost savings, build medical monitoring and management system with high efficiency. Internet as an important support to realize the safe, efficient and high quality of the medical monitoring and management, the main technology of RFID and photos and other acoustic electromagnetic sensors which can achieve breakthroughs in medical information transmission, intelligent health monitoring and precise location [7-10]. IoT also brings great convenience to hospital, especially in the patient monitoring and tracking management. With the rapid development of Internet, cloud computing and Internet integration of medical monitoring and management platform is to provide new opportunities for the hospital, even in social fields [11-14]. This research paper summarizes the health information technology in the field of cloud computing and Internet of things, especially in health monitoring and management application fields of the current study situation. In this article, we put forward and analysis model of medical information architecture of remote monitoring and management platform (RMCPA) clouds. Then an efficient POSAA algorithm of medical monitoring and management of cloud



# An Optimal Cloud Based Road Traffic Management System with Novel VM Machine Migration Technique

Md. Rafeeq<sup>1</sup>, C. Sunil Kumar<sup>2</sup>, and N. Subhash Chandra<sup>3</sup>

<sup>1</sup>CMR Technical Campus, Kandlakoya, medchal, hyd-501401, TS, India

<sup>2</sup>SNIST, Yamnampet, Ghatkesar, Hyd 501301, TS-India

<sup>3</sup>HITS, Keesara, Bogaram, Rangareddy - 501301, TS-India

Email: {rafeeqmail, ccharupalli, subhashchandra.n.cse}@gmail.com

**Abstract**—With the tremendous growth of population and the increasing road traffic, the demand for optimized traffic data collection and management framework is also increasing. The collection of traffic data using multiple sensors and other capture devices are been addressed in multiple researches deploying the mechanism using geodetically static sensor agents. Nevertheless to avoid the congestion, the parallel research works has proposed frameworks based on cloud based data centers. Thought, those approaches does not propose any technique to reduce the cost and improve the service level agreements to match with the current industry and research demands. Thus, this work proposes a cloud based automatized framework for virtual machine migration to increase the SLA without compromising the cost for storage and energy. The major achievement of this work is to minimize the SLA violation compared to existing virtual machine migration techniques for load balancing. The extensive practical demonstrations of virtualization and migration benefits are also carried out in this work. With the extensive experimental setup the work furnishes the comparative analysis of simulations for popular existing techniques and the proposed framework.

**Index Terms**—Three phase optimal migration, SLA improvement, VM image formats, cost comparison, performance evaluation matrix

## I. INTRODUCTION

Load Balancing Techniques on cloud computing is the generic framework based process where the generated workloads are distributed over multiple data center resources. The load balancing techniques brings the advantage of lower response time [1]. However the cost of replication of resources is also to be taken care as an additional cost. The cloud data center based load balancing is distinguished from the domain name service based load balancing.

The domain name service load balancers deploys the hardware and software components to balance load for the hardware resources, whereas the cloud based load balancing techniques deploys the software algorithms or protocols to distribute the load over multiple data center nodes. Also it is to be understood that, the cloud based load balancing techniques allows the customers to use the global or geodetically distributed services based on

geodetically distributed servers [2], [3]. Multiple parallel researches are been carried out to demonstrate the benefits of load balancing on cloud based data centers as handling the high unexpected traffic generally referred to Cyber Spikes. Making the application scalable based on demand without degrading the performance, increases the reliability at the cost of VM migration.

However the recent researches constraint to achieve the optimal SLA violation during VM Migration. Thus this work demonstrates A Service Level Agreement Effective Optimal Virtual Machine Migration Technique for Load Balancing on Cloud Data Centers using proposed three phase optimal virtual machine migration technique.

## II. VIRTUALIZATION BENEFITS FOR CLOUD DATA CENTERS

This work also highlights the benefits of virtual machine migrations and also evaluates the parameters influencing the performance and productivity [3].

### A. Open Access Control

TABLE I: PARAMETERS FOR OPEN ACCESS CONTROL [3]

Parameter Type	Parameter Name	Access Permissions	
		Traditional	Virtual Machine Migration
Processing	CPU Type	Not Allowed	Allowed
	Allocation	Allowed	Allowed
	Priority	Allowed	Allowed
Memory	Size	Allowed	Allowed
	Buffer	Not Allowed	Allowed
Storage	Access IDE Bus	Not Allowed, Physical	Allowed, Logical
	Capture Mode	Not Allowed	Allowed
	Library Group	Allowed, Physical	Allowed, Logical
Network	IP Address	Allowed	Allowed
	/MAC Address	Not Allowed	Allowed
	Internal Network	Partially Allowed	Allowed

The Virtual Machines come with a reduced abstraction in the system level and allows the provider, customer and researchers to access more properties of



# Optical, Structural and Morphological Properties of Photocatalytic ZnO Thin Films Deposited by Pray Pyrolysis Technique

Durgam Komaraiah, Eppa Radha, Y. Vijayakumar, J. Sivakumar, M. V. Ramana Reddy, R. Sayanna

Department of Physics, University College of Science, Osmania University, Hyderabad, India

Email: dkumarou@gmail.com

How to cite this paper: Komaraiah, D., Radha, E., Vijayakumar, Y., Sivakumar, J., Reddy, M.V.R. and Sayanna, R. (2016) Optical, Structural and Morphological Properties of Photocatalytic ZnO Thin Films Deposited by Pray Pyrolysis Technique. *Modern Research in Catalysis*, 5, 130-146. <http://dx.doi.org/10.4236/mrc.2016.54011>

Received: September 10, 2016

Accepted: October 18, 2016

Published: October 21, 2016

Copyright © 2016 by authors and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

Photocatalytic ZnO thin films have been deposited onto glass substrate by spray pyrolysis technique. The sprayed solution consists of 0.1 M of zinc acetate dihydrate dissolved in double distilled water and sprays onto ultrasonically cleaned glass substrates maintained at 350°C, through an air-atomizing nozzle. The X-ray diffraction (XRD), scanning electron microscopy (SEM), EDX and UV-VIS spectrophotometer were applied to describe the structural, morphological, compositional and optical properties of ZnO catalyst. XRD analysis confirms that the films were found to be single phase hexagonal wurtzite structure. The SEM micrograph of the films is shown highly uniform, crack free and found to be fiber like structures. The optical transmittance spectra of the ZnO thin films were found to be transparent to visible light and the average optical transmittance was greater than 85%. The direct optical band gap energy values of the films shift towards the lower energy as a consequence of the thermal annealing. The Urbach energy of the films was found to increase with annealing temperature. The refractive index of the films was calculated and the refractive index dispersion curve of the films obeys the single oscillator model. The values of oscillatory energy  $E_o$ , dispersion energy  $E_d$ , and static dielectric constant  $\epsilon_s$  for the ZnO thin films were determined. The films were evaluated for their ability to degrade methylene blue. The Langmuir-Hinshelwood kinetic model was used to interpret quantitatively the observed kinetic experimental result. The photocatalytic activity of ZnO thin films was enhanced by annealing temperature.

## Keywords

ZnO Thin Film, Spray Pyrolysis, Optical Band Gap, Refractive Index, Photo Catalysis

## 1. Introduction

Zinc oxide (ZnO) is an n-type semiconductor, has a hexagonal wurtzite structure, and



# Cloud Support Big Data Analytics of Present Investigation and Forecasting

M.Chalapathi Rao<sup>1</sup>, A.Kiran Kumar<sup>2</sup>, B.P.Deepak Kumare<sup>3</sup>

Department of CSE, CMR Technical Campus, Hyderabad

*Abstract—literally, this is expected that more than half of the complete data will be on the cloud so far. This data is complicated and right to be stored, refined and analyzed for data that can be used by companies. Cloud computing serves an Advanced persistent threats platform for big data analytics in concerning of the data storage and computing prerequisites of the closing. It generates cloud-oriented analytics a possible investigation era. However, certain issues need to be elaborated and uncertainty needs to be reduced before constructive applications of this interdependent model can be regularly used. In This paper we examine the past investigation process, threats, straight issues and forecasting for this area of study.*

*Index Terms- Cloud computing, Big Data Analytics, Big Data.*

## I. INTRODUCTION

Today we are living in emerging cloud computing technology the big data complication is increasing exceedingly. This technique via looking simpler to users but comparatively it is more difficult to handle. In this area, there preexist different challenges for speed processing of data and privacy preserving of user data. This paper directing several concepts relating to big data in cloud computing area .Here we considered the elaborated field of research study in the challenging area of cloud computing and highlighting on data measures, availability, data integrity, volume(large amount of data) and velocity(data speed). The consequent chapters include the difference among the various technologies and discuss some of the things relating to the cloud and big data, storage, processing of big data in clouds and security scalabilities. There are various types of big data dimensions like tool big structured and unstructured, real time and virtual scale out.

## II. BIG DATA ANALYTICS

Big data specifies to large amount of data sets that are orders

of significance larger (volume); more distinct, which specifying structured, semi structured, and unstructured data; and moving faster (velocity) than persons or your companies has had to deal with previous. This stream of data is created by various communication devices—from Personal Computers and smart phones to sensors such as RF ID s and traffic cams. In addition, it's composite and traverse in different formats, including text data, document information, image files, video files, and many more. The literal value of big data is in the observation it generates when data analyzed—discovered arrangements, indicators for decisions, and basically the strength to respond to the world with greater knowledge. Big data analytics is a set of innovative technologies propagated to work with large amount of data. It uses practical significant methods such as machine learning, Neural Networks (NN), robotics, formal computational mathematics, and artificial intelligence (AI) to analyze the data and to discover interrelationships and arrangements. Organizations and companies are drastically increasing to identify vision into their respective data. Numerous big data projects initiated from the need to solve specific business doubts. With the possible big data analytics domains in place, an organization can strengthen sales, improve adequate access, and customer oriented service. Big data investment to study which business domains companies plan to utilize Big Data analytics to increase operations. About more than half of all users said they were applying big data analytics to increase the often customer retention, support with product advancement and gain some advantage. Big data analytics explore huge volume of data to disclose invisible patterns, correlations and other insights. By today's analysis it's possible to examine your data and get solutions from it almost immediately – an effort that's slower and less efficient with more traditional business intelligence solutions.



# Challenges arise of Privacy Preserving Big Data Mining Techniques

M.Chalapathi Rao<sup>1</sup>, A.Kiran Kumar<sup>2</sup>

<sup>1</sup> Assistant Professor, Dept of CSE, CMR Technical Campus, Telangana, India.

<sup>2</sup> Assistant Professor, Dept of CSE, CMR Technical Campus, Telangana, India.

\*\*\*

**Abstract** - Big data is being generated from various sources-transactions, social media, sensors, digital images, videos, audios and for domains including healthcare etc this data is known as big data. The characteristics of Big Data include 3 Vs they are Volume, Velocity and Variety. Useful data can be extracted from this big data with the help of data mining techniques. The massive volume of big data sets are too complicated to be managed and processed by conventional relational databases the term "Big Data" was coined to address this massive volume of data storage and processing. The quality of captured data can vary greatly, affecting accurate analysis. Protecting privacy is mechanism for data processing and producing right information to favor corporate sectors, business managers, stake holders and other users make highly informed business decisions. In this paper we are proposing a big data on privacy preserving Big Data.

**Key Words:** BI, Velocity, Volume, Variety.

## 1. INTRODUCTION

A combination of policy decisions, technical and legal mechanisms are used to address privacy concerns. A brief description of some of the major principles for protecting the privacy of data in its lifecycle is given below. Data collection and limitations: This principle limits the unnecessary excessive collection of personal data. Once the purpose for which data is collected is known, collected data should be just sufficient enough for that purpose. This principle is clearly a policy decision on the part of collector. Usage limitations: While collecting sensitive or personal data, collector needs to specify what for and how the data is used and limit the usage of collected data for other purposes than the original one. Security of data: It is an obligation of data collector to keep the data safe once collected. Adequate security mechanism should be in place to protect it from breaches. Transfer Policy: Often the usage of data is governed by laws which are prevalent at the place of collection and usage. If the data is moved outside the jurisdiction where the law enforcement is not prevalent in the new place it carries the danger of misuse. Accountability: When dealing with third party data, the party may ask to designate a person who is the point of contact and take processing and usage of data. Collection limitation: is the policy decision on part of data collector usage limitation, securing data and transfer policy can be addressed by technical means and the last one, accountability is addressed by having a legal team sign a declaration.

## 2. BIG DATA

There are various Challenges that companies are facing in identifying and processing value from the "Big Data". It is a big data challenge to preserve the privacy of end users at various stages of data life cycle. Today we live in the computerized world with drastic digitization the volume of structured and unstructured data being generated and stored is exploding. The data which is proposed is being taken from various origins. In addition to business and companies, individuals spend to the data volume. For particular 40 billion content are being distributed on Facebook every month. Big data is massive volume of both structured and unstructured data from various origins such as social data, machine generated data, traditional enterprise which is so large that it is complex to process with traditional database and software techniques. Big Data is data whose metric, diversity, and complexity require new framework, techniques, algorithms, and analytics to manage it and fetch value and hidden knowledge from it. Characteristics of Big Data include 3 Vs. They are Volume, Velocity, Variety and Veracity.

## 3. BIG DATA CHALLENGES

Here we have several challenges that companies are facing in identifying, processing and fetching value from the "Big Data". As in the following some of the key challenges include

1. Preserving Privacy
2. Integrating the Big Data Technologies
3. Proposing real time needs with higher data volumes and varieties
4. Data maintenance and management
5. Data distribution and Analytical systems.

## 4. PRIVACY PRESERVING POLICIES

### 4.1 Anonymization Techniques

Substitute delicate attribute values with some other values. This decreases disclosure of private data. In some situations, this clear substitution alone will not sophisticated anonymization techniques need to be worked.



## **An Outlook of Brt (Bus Rapid Transit) System in Telangana**

<sup>a</sup> D. Bhaskar, <sup>b</sup> M. Srujan Kumar, <sup>c</sup> R. Srinivasa Kumar

<sup>a</sup>, Assistant Professor, Department Of Civil Engineering, CMR Technical Campus, Hyd, India, 501401

<sup>b</sup> Assistant Professor, Department Of Civil Engineering, CMR Technical Campus, Hyd, India, 501401

<sup>c</sup> Assistant Professor, Department Of Civil Engineering, Osmania University, Hyd, India

### **Abstract**

Urban transport is a nightmare in India through most urban residents takes it as a fait accompli. Despite investments in road infrastructure and plans for land use and transport development, all cities face the ever increasing problems of congestion, traffic accidents, air, and noise pollution. Bus rapid transit system (BRTS) is safe, economical, rapid, convenient & new concept of public transport in Indian scenario, BRTS was running successfully worldwide the few examples are Bogota, Beijing, etc.; Ahmedabad (India) is also a successful example of BRTS.

In past decades there are no considerable development in the fields of urban transportation so due to this reason & also tremendous growth of vehicular population on urban roads causes the congestion & traffic jam condition in the most of Indian cities. Bus rapid transit system is an innovation and it is up gradation to the present transportation system. BRT is affordable, adaptable and cost effective. The term of rapid transit system means a form of high speed urban passenger's transportation. Here, mode of transportation is bus hence it is called as bus rapid transit system (BRTS). Especially for developing countries, transportation is a problem and BRT is the best way to overcome it. If a country gets richer the development will be seen in different aspects like education, industry, science and technology etc., except transport which will get worse. In the urban transportation, growth of the population & their needs has increased mobility in order to fulfil them. The private vehicle owners need to share space with public transport. This can channelize by introducing BRTS.

Telangana, the newest state of India is land of ample projects for civil engineers. Apart from Hyderabad, Warangal and Karimnagar are identified as the prominent growth areas in the state. The growth of the mixed traffic especially in Karimnagar can be taken care by introducing BRTS. It needs "network thinking involved planning and not corridor thinking".

**KEYWORDS** – BRTS, Urban transport, city, passenger, mobility, utility, urban transportation

### **I. Introduction**

Bus rapid transit system (BRTS) takes part of its name from "rapid transit", which describes a high-capacity transport system with its own right-of-way, implemented using buses through infrastructural and scheduling improvements, to provide a high level of service. Normally BRT includes the following features like dedicated lanes, off board fare



# DiDrip: A Secure and Distributed Protocol for Updation and Dissemination of Data in WSN

Shobhna Vedprakash Pandey<sup>1</sup>, Dr. K. Srujan Raju<sup>2</sup>

<sup>1</sup> M.Tech Student, CMR Technical Campus, Kandlakoya(V), Medchal(M), Ranga Reddy District, Telangana, India

<sup>2</sup> HOD, CSE Department, CMR Technical Campus, Kandlakoya(V), Medchal(M), Ranga Reddy District, Telangana, India

**Abstract**— A data discovery and dissemination protocol for wireless sensor networks (WSNs) is responsible for updation of configuration parameters and distribution of management commands to the sensor nodes. The existing data discovery and dissemination protocols faces several drawbacks. The idea behind the project is to use the first secure and distributed data discovery and dissemination protocol named DiDrip for WSN. DiDrip allows the network owners to authorize multiple network users with different privileges to directly and simultaneously disseminate data items to the nodes. Extensive security analysis shows that DiDrip is probably secure.

**Keywords**— Data Dissemination, DiDrip, Wireless Sensor Networks, Zero Protocol.

## I. INTRODUCTION

Wireless Sensor Network (WSN) which is deployed, usually need to update buggy/old small programs or parameters stored in the sensor nodes. This can be achieved by the so-called data discovery and dissemination protocol, which facilitates a source to inject small programs, commands, queries, and configuration parameters to sensor nodes [1]. The sensor nodes could be distributed in any harsh environment, remotely disseminating such small data to the sensor nodes through the wireless channel is a more preferred and practical approach than manual intervention. Considering the upper sub-figure in fig.1, all existing data discovery and dissemination protocols follows centralized approach, where data items can only be disseminated by the base station [2]. But the centralized approach is inefficient, non-scalable, and vulnerable to security attacks that can be launched anywhere along the communication path. Different number of security attacks may occur in Wireless sensor network that is clone attack, man in the middle attack and replay attack. Zero knowledge protocol is an improvement on these attacks.

**1.1 Zero knowledge Protocol:** The objective of this protocol is to have such system in which prover has to convince a verifier that he has knowledge of a certain secret without disclosing any information. In Zero Knowledge Protocols, the first party domain has the

knowledge of some "secret" or private key information where he has to be verified by a second party without imparting the actual secret information or private key to that second party or to any eavesdropping third party. The first party owning the secret information or private key ("s") and trying to prove that it has possession of the information will be referred to as the "prover" ("P"); the second party wishing to verify without actually receiving knowledge of the secret will be referred to as the "verifier" ("V"). The secret information may be any numeric value, hereafter referred to as the secret number of the prover [3]. Zero knowledge protocols require less computational power, less bandwidth, and less memory compared to other authentication methods. With attachment of unique fingerprint to each node the clone attack can be addressed. Zero knowledge Protocol is helpful for preventing man-in-the middle attack and replay attack.

## 1.2 Algorithm for Zero knowledge Protocol [4]

1. Using Specific code find the fingerprint (S) which is used as a private key for each node.
2. Base station will maintain product of two large primes which value of N as public key.
3. The base station generates a secret code by using i.e.  $v = s \bmod N$ . Prover ("P") node will try to verify with Verifier ("V"). The value of v (secret code) is given to the Verifier on its request.
4. This secret code will be changing for every authentication process. The change of bits will be done diagonally. This will save memory and computation power which is important in sensor nodes.
5. Now zero knowledge protocol is applied. Some challenges are asked by Verifier ("V") to Prover ("P") based upon its secret.
6. Prover ("P") will answer the challenges but will not open secret.
7. In this case, the value of secret s is not revealed anywhere during communication and thus it will not be used by any attacker in node.

For such networks, data dissemination is better to be carried out by using technique of distribution by





## LOCALIZATION BASED PACKET FORECASTING PROTOCOL FOR REDUCING COLLISIONS IN WIRELESS NETWORKS

Narayanadas Madhavi<sup>1</sup>, N Bhaskhar<sup>2</sup>

<sup>1</sup>M.Tech Student, Dept of CSE, CMR Technical Campus, Hyderabad, T.S, India

<sup>2</sup>Associate Professor, Dept of CSE, CMR Technical Campus, Hyderabad, T.S, India

### ABSTRACT:

Our work comprises a concept on joint trouble of packet scheduling additionally to self-localization in underwater acoustic sensor network with distributed nodes at random. While a lot of the scientific studies are made round the techniques of underwater localization no work ended to uncover how a anchors have to transmit their packets towards sensor nodes. Concerning packet scheduling, our purpose is always to reduce localization time, and to get this done we produce a deliberation over two packet transmission approaches for example collision-free plan, additionally to collision-tolerant plan. The collision-tolerant require a shorter time for localization when compared to collision-free one for similar possibility of localization. Without average energy consumed by anchors, the method of collision-tolerant includes a lot of advantages.

**Keywords:** *Underwater localization, Collision-tolerant, Packet transmission, Collision-free, Self-localization.*

### 1. INTRODUCTION:

Allowing programs sensor nodes determine different ecological parameters, and connect them into data packets, and replace packets

by way of other sensor nodes. Within our work we create a thought on packet scheduling calculations that don't require fusion center. While synchronization of anchors that are outfitted by GPS navigation



## Shared Authority Based Privacy-Preserving Authentication Protocol in Cloud Computing

M. SRAVANTHI<sup>1</sup>, N. BHASKAR<sup>2</sup>

<sup>1</sup>PG Scholar, Dept of CSE, CMR Technical Campus, Hyderabad, TS, India.

<sup>2</sup>Associate Professor, Dept of CSE, CMR Technical Campus, Hyderabad, TS, India.

**Abstract:** Cloud computing is ascending as an overall data intelligent worldview to understand clients' data remotely hang on in a web cloud server. Cloud administrations offer decent comforts for the clients to savor the on-interest cloud applications while not considering the local foundation constraints. All through the data getting to, totally diverse clients could likewise be in an exceptionally strong affiliation, and after that data sharing turns out to be vital to acknowledge unique pay. the present well being measures arrangements fundamentally focus on the validation to fathom that a client's private data can't be illicit access, however relinquish a modern protection issue all through a client troublesome the cloud server to demand elective clients for indirect sharing. The stand up to right of passage request itself could uncover the client's protection despite regardless of whether or not it will get the data right of access authorizations. Amid this paper, we tend to propose a mutual power principally based protection safeguarding validation convention (SAPA) to handle higher than security issue for distributed storage space inside the SAPA.

- Shared access power is achieved by anonymous access request matching mechanism with security and privacy concerns and forward security);
- Attribute primarily based access management is adopted to comprehend that the user will solely access its own information fields;
- Proxy re-encryption is applied by the cloud server to produce information sharing among the multiple users. Meanwhile, universal composability (UC) model is established to prove that the SAPA in theory has the look correctness. It indicates that the planned protocol realizing privacy-preserving information access authority sharing, is engaging for multi-user cooperative cloud applications.

**Keywords:** Cloud Computing, Authorization Authentication Protocol, Security, Privacy Preservation, Shared Authority.

### I. INTRODUCTION

Distributed computing could be a promising information innovation outline for every ventures and individuals. It dispatches a beautiful data stockpiling and intelligent worldview with evident endowments, together with on-interest self administrations, present system get to, and site independent asset pooling. Towards the distributed computing, a common administration configuration is anything as an administration (XaaS), inside which foundations, stage, programming, et al ar connected for present interconnections. Late studies are attempted to push the distributed computing advance towards the net of administrations. Later on, security and protection issues are getting key contemplations with the expanding nature of cloud administrations. Run of the mill security approaches predominantly focus on the powerful confirmation to understand that a client will remotely get to its own particular data in on-interest mode. Next to the assortment of the machine necessities, clients might need to get to and share each other's endorsed data fields to achieve beneficial

advantages, which brings new security and protection challenges for the distributed storage.

A case is acquainted with recognize the premier inspiration. Inside the distributed storage based gives succession administration, that square measure a unit shifted vested parties (e.g., supplier, bearer, and retailer) among the framework. Everyone return proportionally claims their clients that unit admissible to get to the certify awareness fields, and totally unique clients own decently independent access foundation. It suggests that any a couple of clients from totally distinctive gatherings got the opportunity to get to totally disparate data fields of a comparative record. There into, a supplier purposefully would conceivably wish to get to a bearer's information fields, despite the fact that it's uncertain regardless of whether or not the transporter will change its privilege of section solicitation. In the event that the bearer rejects its request, the supplier's entrance might want square quantify going to be uncovered close to nothing got towards the real learning fields. Really, the supplier won't mail the entrance ask for or pull back the inadmissible





## Protected and dynamic keyword search rank scheme for cloud database

Almashpur Pruthvi *M.Tech*

N.Bhaskar *M.Tech* *Associat Professor*

*CSE Department, CMR Technical Campus, Hyderabad*

### Abstract-

The major aim of this paper is to solve the problem of multi-keyword ranked search over encrypted cloud data (MRSE) at the time of protecting exact method wise privacy in the cloud computing concept. Data holders are encouraged to outsource their difficult data management systems from local sites to the business public cloud for large flexibility and financial savings. However for protecting data privacy, sensitive data have to be encrypted before outsourcing, which performs traditional data utilization based on plaintext keyword search. As a result, allowing an encrypted cloud data search service is of supreme significance. In view of the large number of data users and documents in the cloud, it is essential to permit several keywords in the search demand and return documents in the order of their appropriate to these keywords. Similar mechanism on searchable encryption makes centre on single keyword search or Boolean keyword search, and rarely sort the search results. In the middle of various multi-keyword semantics, deciding the well-organized similarity measure of "coordinate matching," it means that as many matches as possible, to capture the appropriate data documents to the search query. Particularly, we

### INTRODUCTION

Cloud Computing is a new but increasingly mature model of enterprise IT infrastructure that provides on-

consider "inner product similarity" i.e., the amount of query keywords shows in a document, to quantitatively estimate such match measure that document to the search query. Through the index construction, every document is connected with a binary vector as a sub index where each bit characterize whether matching keyword is contained in the document. The search query is also illustrates as a binary vector where each bit means whether corresponding keyword appears in this search request, so the matched one could be exactly measured by the inner product of the query vector with the data vector. On the other hand, directly outsourcing the data vector or the query vector will break the index privacy or the search privacy. The vector space model facilitate to offer enough search accuracy, and the DES encryption allow users to occupy in the ranking while the popularity of computing work is done on the server side by process only on cipher text. As a consequence, data leakage can be eradicated and data security is guaranteed.

**Keywords—** Multi-keyword ranked search over encrypted cloud data, OTP, Product resemblance, Cloud, Data owners

demand high quality applications and services from a shared pool of configuration computing resources .The cloud customers, individuals or enterprises, can outsource their local complex data system into the cloud



# Inference Rules of User Uploaded Images on Social Network Sites

P. Sahithi<sup>1</sup>, N. Bhaskar<sup>2</sup>

<sup>1</sup>M-Tech in CSE, CMRTC, Hyderabad, India,

<sup>2</sup>Associate Professor CSE, CMRTC, Hyderabad, India,

## Abstract:

*Client Image sharing social site keeping up security has turned into a noteworthy issue, as exhibited by a late influx of promoted episodes where clients coincidentally shared individual data. In light of these occurrences, the need of apparatuses to help clients control access to their common substance is obvious. Toward tending to this need an Adaptive Privacy Policy Prediction (A3P) framework to help clients create protection settings for their pictures. The arrangement depends on a picture characterization system for picture classifications which might be connected with comparative approaches and on a strategy forecast calculation to naturally produce an arrangement for each recently transferred picture, additionally as per client's social components. Picture Sharing happens both among already settled gatherings of known individuals or groups of friends furthermore progressively with individuals outside the clients groups of friends, for reasons*

*for social revelation to help them recognize new companions and find out about associates interests and social surroundings, Sharing pictures inside online substance sharing destinations, thusly, may rapidly prompt undesirable divulgence. The accumulated data can bring about startling presentation of one's social surroundings and lead to manhandle of one's close to home data.*

## INTRODUCTION

An A3P system that helps clients computerizes the protection approach settings for their transferred pictures. The A3P system gives a far reaching structure to induce security inclinations in view of the data accessible for a given client. We additionally viably handled the issue of chilly begin, utilizing social connection data. A3P-center: (i) Image

arrangement and (ii) Adaptive strategy expectation. Client pictures are initially ordered, in view of substance and metadata. Security strategies of every class of pictures are broke down for the



## HEAT AND MASS TRANSFER EFFECTS ON MHD NATURAL CONVECTION FLOW PAST AN INFINITE INCLINED PLATE WITH RAMPED TEMPERATURE

SIVA REDDY SHERI<sup>†</sup>, ANJAN KUMAR SURAM<sup>1</sup>, AND PRASANTHI MODULGUA<sup>2</sup>

<sup>1</sup>DEPARTMENT OF MATHEMATICS, GITAM UNIVERSITY, HYDERABAD CAMPUS, TELANGANA, INDIA  
E-mail address: sreddy7@yahoo.co.in

<sup>2</sup>DEPARTMENT OF MATHEMATICS, CMRTC, KANDLAKOYA, MEDCHAL, TELANGANA, INDIA

**ABSTRACT.** This work is devoted to investigate heat and mass transfer effects on MHD natural convection flow past an inclined plate with ramped temperature numerically. The dimensionless governing equations for this investigation are solved by using finite element method. The effects of angle inclination, buoyancy ratio parameter, permeability parameter, magnetic parameter, Prandtl number, heat generation, thermal radiation, Eckert number, Schmidt number, chemical reaction parameter and time on velocity, temperature and concentration fields are studied and presented with the aid of figures. The effects of the pertinent parameters on skin friction, rate of heat transfer and mass transfer coefficients are presented in tabular form. The numerical results are compared graphically with previously published result as special case of the present investigation and results found to be in good agreement.

### 1. INTRODUCTION

Heat transfer is a study of the exchange of thermal energy through a body or between bodies which occurs when there is a temperature difference. Heat always transfers from hot to cold. Whereas mass transfer is the transport of constituent from a region of higher concentration to that of lower concentration. Heat and mass transfer is important in many engineering application such as food processing, nuclear reactors and polymer. A comprehensive discussion on heat and mass transfer was made by Abdallah and Zeghamati [1] have investigated natural convection heat and mass transfer in the boundary layer along a vertical cylinder with opposing buoyancies. Olajuwon [2] has presented convection heat and mass transfer in a hydromagnetic flow of a second grade fluid in the presence of thermal radiation and thermal diffusion. Bisht et al. [3] have analyzed the effects of variable thermal conductivity and chemical reaction on steady mixed convection boundary layer flow with heat and mass transfer inside a cone due to a point sink.

---

Received by the editors October 4 2016; Revised December 9 2016; Accepted in revised form December 9 2016;  
Published online December 20 2016.

2000 *Mathematics Subject Classification.* 76R10, 76W10, 76D50, 76S05, 76D10.

*Key words and phrases.* Heat and Mass transfer, MHD, Inclined Plate, Ramped temperature, FEM.

<sup>†</sup> Corresponding author.



## Aurdino Based wireless load Control Using Interactive Voice Recording System

G.Srikanth

Professor of ECE Department CMR Technical Campus, Medchal, Hyderabad, Telangana, India

E-mail: [srikanthgimmadi@gmail.com](mailto:srikanthgimmadi@gmail.com)

### ABSTRACT

Electronically control of household activities has long been explored in various ways. From electronic remote control using infra-red sensors, to voice-controlled application, we are continuously trying to find a better way to control electrical and electronic devices to ease our daily life. This paper presents the development of a low cost remote home control system using speech recognition. The system focused on controlling fan and lamp wirelessly by applying speech recognition into the system, with Arduino Uno as the controller. Two different units were developed: the main control unit which also act as the transmitter and the receiver unit which controls the fan and lamp. The main control unit accept voice command from the user and convert it into text by using Easy VR shield. The signal is then transmitted to the receiver using RF signal. With the use of RF technology, the system is able to work wirelessly. This system is hoped to be able to help people to use the electronics devices effectively besides provide improved convenience and comfort to user especially for elderly and disabled who live alone and help them to be more independent.

**Keywords:** arduino uno, easyVR, home control.

### INTRODUCTION

Smart home technology has long been explored, since the early 1980s when the "intelligent building" concept was used. The concept proposed an intelligent implementation of consumer electronic devices, electrical equipment, and security devices. It aimed for the automation of domestic tasks, easy communication, and human-friendly control, as well as safety [1]. Some smart house systems allow home control via LAN (Local Area Network), and WAN (Wide Area Network). This type of home control system allows devices to be controlled through computers and Android smart phones at the same time [2]. There are many methods available to control electric appliances at home. The most common way is by using an electronic remote control. Home appliances can also be controlled via voice control, or it can also implement home automation based on predefined user profiles or independent sensors. In this paper, voice control method is used to control home electric devices.

Voice control method offers a more user interactive approach in delivering control commands [3]. By applying speech recognition system, a system can be developed to help user control devices remotely. Voice control system for ZigBee based home automation has been introduced in journal of "ZigBee based voice Controlled Wireless Smart Home System". Speaker independent automatic speech recognition technique has been used. In this system Zig Bee network receives voice command as input to an ARM9 controller, which converts the data into a required format to be used in the microcontroller. Finally, the system generates some control characters to switch ON/OFF the home appliances [4].

There are two types of speech recognition system. They are speaker-dependent and speaker-independent system. Speaker-dependent system is designed for a

specific speaker that works by learning the unique characteristics of a single person's voice [5]. It is also known as voice recognition. New users must first "train" the software by speaking to it, so the computer will analysed how the person talks. This system is useful as the security system. Speaker-independent systems on the other hand, require no training phase with data of users, and are desirable to many applications where training is difficult to conduct [6].

Arduino UNO is a multi-purpose microcontroller board based on the ATmega328P. It has 14 digital input/output pins and 6 analog inputs. Each of the 14 digital pins on the Uno can be used as an input or output. An Arduino Uno board can either be powered via USB connection or with an external power supply (AC-to-DC adapter or battery). Leads from a battery can also be inserted in the Gnd and Vin pin headers of the power connector. The board can operate on an external supply of 6 to 20 volts [7] [8]. Arduino Uno can communicate with other devices such as a computer, another Arduino board, or any other types of microcontrollers. Its software serial library allows serial communication on any of the Uno's digital pins [9].

In the journal of title "Improved Authentication Using Arduino Based Voice & Iris Recognition Technology", a voice recognition system is proposed to build as security function. The Arduino board as important role integrate with EasyVR Shield [10]. The proposed system is using speaker-dependent system to train the password command. In this project also using the password command rolled as the security of the system. Therefore, the usage of both boards can be used to develop a speech recognition system. The model of the system in EasyVR Module is HMM Model.



## Design and Analysis on Compact Fin Heat Exchangers with Perforations

**Gandi Saichandar**  
M.Tech Student,  
Department of Mechanical,  
CMR Technical Campus, Hyderabad, India.

**K.Ratna Kumari**  
Assistant Professor,  
Department of Mechanical,  
CMR Technical Campus, Hyderabad, India.

### ABSTRACT:

This paper aims at optimizing the performance of plate fin heat exchangers with the help of perforations using FLUENT software. The widespread use of the heat exchangers design has ensured that there are numerous dimensional variations and shown that changes in dimensional parameters affect the performance. It is then important to understand how the geometry of compact heat exchanger can affect its performance. Therefore an investigation into the parametric effect on the global performance on types of plate fin heat exchangers (plain fin, circular and elliptical perforated fin, strip offset fin with and without perforations) are modeled and simulated at same boundary conditions (low Reynolds number). From the results, the heat transfer behaviour, Nusselt number,  $j$  and  $f$  factors are analyzed and compare all the parameters for different types of plate fin heat exchangers.

### Keywords:

Strip offset fin, perforated fin, plate fin heat exchanger, Fluent, modeling, heat transfer

### INTRODUCTION:

Plate fin heat exchangers are widely used in automobile, aerospace, cryogenic and chemical industries. They are characterized by high effectiveness, compactness (high surface area density), low weight and moderate cost. Although these exchangers have been extensively used around the world for several decades, the technologies related to their design and manufacture remain confined to a few companies in developed countries. Recently efforts are being made in India towards the development of small plate fin heat exchangers for cryogenic and aerospace applications.

This thesis constitutes a part of this overall effort. Its focus, however, is on the basic heat transfer and flow friction phenomena applicable to all plate fin heat exchangers, and not confined to the Indian development programme.

### 1.1 Plate Fin Heat Exchangers:

A plate fin heat exchanger is a form of compact heat exchanger consisting of a block of alternating layers of corrugated fins and flat separators known as parting sheets. A schematic view of such an exchanger is given in Fig. 1.1. The corrugations serve both as secondary heat transfer surface and as mechanical support against the internal pressure between layers.

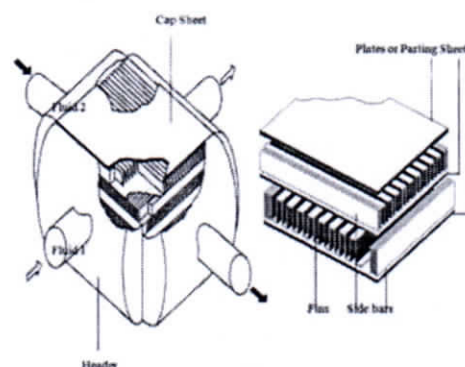


Fig 1.1: Plate fin heat exchanger

### Materials

Plate fin heat exchangers can be made in a variety of materials. Aluminium is preferred in cryogenic and aerospace applications because of its low density, high thermal conductivity and high strength at low temperature. The maximum design pressure for braze aluminium plate fin heat exchangers is around 90 bar.



## Triple Blending of Cement Concrete with Micro Silica and Ground Granulated Blast Furnace Slag

Balakrishna.Y<sup>1</sup>, V.Lavanya<sup>2</sup>, Naresh. A<sup>3</sup>, S.vijaya Bhaskar Reddy<sup>3</sup>

<sup>1</sup>PG Student, Department of Civil Engineering, CMR Technical Campus-501401, Hyderabad, Telangana, India.  
E-mail Id: balakrishnayadavalli@gmail.com

<sup>2</sup>PG Student, Department of Civil Engineering, CMR Technical Campus-501401, Hyderabad, Telangana, India.  
E-mail Id: lavanyavelpula06@gmail.com

<sup>3</sup>ANaresh, Department of Civil Engineering, VAGDEVI ENGINEERING College Hyderabad, Telangana, India  
E-mail Id:azmeerang123@gmail.com

<sup>4</sup>S.Vijaya Bhaskar Reddy, Prof & Head Department of Civil Engineering CMR Technical Campus-501401, Hyderabad, Telangana India.  
E-mail Id: Vbsgen.phd@gmail.com

\*\*\*

**Abstract** - Cement industry may be one amongst the key sources of environmental pollution so the reduction of cement demand should be improved. Micro Silica (MS) and Ground granulated blast furnace slag (GGBS) are the by-products of industries and it ought to be reused to scale back the waste pollution. Therefore the present study is directed towards developing a better understanding on the combined performance of MS and GGBS on the strength properties of Ternary concrete over an Ordinary concrete. This work primarily deals with the strength characteristics such as Compressive, Split Tensile and Flexural Strength. Total 12 Different concrete mixtures were cast and tested with different cement replacement levels (5%, 10% and 15%) of Micro Silica with GGBS as addition (20%, 30%, 40% and 50%). Compressive, Split Tensile and Flexural Strength of Ternary Blended Concrete At the ages of 7, 28, 60 and 90 days for various combinations of Micro Silica and GGBS. All Mixes were studied at water cement ratio of 0.55.

The experimental results shows that, the strength properties of ternary blended concrete increase with increase in cement replacement levels of Micro Silica and GGBS (40%), the addition of Micro Silica and GGBS does not improve the strength properties of compressive, Split Tensile and Flexural.

**Keywords**—Compressive Strength, Split Tensile and Flexural Strength, Ordinary Portland cement and Ternary Concrete, Micro Silica and GGBS.

### 1. Introduction

Concrete is a mixture of naturally, cheaply and easily available ingredients as cement, sand, aggregate and water. Cement is occupied second place as most used material in

the world after water. The rapid production of cement creates big problems to environment. First environment problem is emission of CO<sub>2</sub> during the production process of the cement. The CO<sub>2</sub> emission is very harmful which creates big changes in environment. According to the estimation, 1 tonne of carbon dioxide is released to the atmosphere when 1 tonne of ordinary Portland is manufactured. As there is no alternative building material which totally replace the cement. The search for any such material, which can be used as an alternative or as a supplementary for cement should lead to global sustainable development and lowest possible environmental impact. Substantial energy and cost savings can result when industrial by products are used as a partial replacement of cement. Fly ash, Ground Granulated Blast furnace Slag, Rice husk ash, High Reactive Meta kaolin, silica fume are some of the pozzolanic materials which can be used in concrete as partial replacement of cement [1] Micro Silica is extremely fine with particle size less than 1 micron and with an average diameter of about 0.1 micron, about 100 times smaller than average cement particles. Silica fume has specific surface area of about 20,000 m<sup>2</sup>/kg against 230 to 300 m<sup>2</sup>/kg. Micro Silica has become one of the necessary ingredients for making high strength and high performance concrete. In India, silica fume has been used very rarely. Nuclear Power Corporation was one of the first to use silica fume concrete in their Kaiga and Kota nuclear power projects. Micro Silica was also used for one of the flyovers at Mumbai where, for the first time in India 75 MPa concrete was used (1999). Silica fume is also now specified for the construction of proposed Bandra-Worli sea link project at Mumbai. Silica fume, also referred to as micro silica or condensed silica fume, is another material that is used as an artificial pozzolanic admixture. It is a product resulting from reduction of high purity quartz with coal in an electric arc furnace in the manufacture of silicon or ferrosilicon alloy.

Ground granulated blast-furnace slag is a nonmetallic product consisting essentially of silicates and aluminates of calcium and other bases. The molten slag is rapidly chilled by quenching in water to form a glassy sand



## Identification of Unutilized Spectrum: an aid to Digital India Initiative

Sudhamani Chilakala<sup>a\*</sup>, Satya Sai Ram M<sup>b</sup>, Ashutosh Saxena<sup>a</sup>

<sup>a</sup> CMR Technical Campus, Medchal, Hyderabad-501401, India.

<sup>b</sup> Chalapathi Institute of Engineering and Technology, Guntur-522034, India.

\*Corresponding author Email: sudhamanich@gmail.com

**Purpose:** One of the key initiatives of the present Government of India is Digital India Initiative. The Digital India initiative aims at availing digitizing of various individual projects of all central government and ministries which can deliver their services using ICT by joining all areas of India including the Gram Panchayats via Internet, in order to focus on the e-governance by 2019. The possibility of Digital India lies on the communication backbone. There are several techniques which provide the communication channel across country are both wired and wireless. India being vast country, there are several limitations to cover through wired channels and thereby the rural areas get ignored which constitute more than 50% of India economy. Therefore wireless communication channels are important pillar for communication as their reach is relatively more feasible in various geography including rural areas. However, there are scenarios where channels are underutilized.

**Methods:** In a survey conducted by United States government on spectrum utilization by an independent agency Federal Communication Commission conveys that the licensed spectrum is underutilized by the primary users (PU) [1]. Cognitive radio is a technology that enables secondary users (SU) to sense and detect the pre/absence of PU [2]. When PU is absent then the free spectrum can be utilized by the SUs. The PU detection using one SU is not reliable due to multipath fading and shadowing [3]. To overcome this issue cooperative spectrum sensing (CSS) has been proposed, which enhances the detection accuracy by allowing the cooperation among the SUs [4]. The drawback in CSS is energy efficiency. Therefore we consider an optimization technique that gives the significant improvement in the energy efficiency.

**Results:** The performance of energy efficiency in CSS with energy detector has been studied using hard and soft fusion rules for improving the energy efficiency. While using AND, OR, and Majority rules our results suggest that the performance of OR rule is better than AND rule. Our analysis shows as the number of cooperative secondary users increases the probability of detection increases for OR rule and decreases for AND rule.

**Conclusion:** The identification of unutilized channels (which is more than 50%) can be effectively used to reach the Gram Panchayat level and may aid for communication bandwidth required for various Government applications. This is also demonstrated via SATCOM, under Digital Gujarat, as a key tool to impart distant interactive education and skill development. Also, 10000+ e-Gram centres were provided net through VSAT network which is used to provide a basket of services to the rural citizen, this number can further be enhanced if we can able to identify the unused bandwidth/channel.

**Keywords:** Cognitive radio, Cooperative spectrum sensing, Energy efficiency, Optimization.

### References:

- [1] Federal Communications Commission, "Spectrum Policy Task Force", ET Docket No.02-35, 2002.
- [2] J. Mitola and G. Q. Maguire, "Cognitive radio: Making software radios more personal", *IEEE Personal Communications*, Volume. 6, pp. 13-18, 1999.
- [3] D. Cabric, S. M. Mishra, and R. W. Brodersen, "Implementation issues for Cognitive radios", in *Proc. Asilomar Conf. Signals, Systems, Computers*, Volume.1, pp. 772-776, 2004.
- [4] Hang Hu, Hang Zhang and Hong Yu, "Energy-efficient design of channel sensing in cognitive radio networks", *Computers and Electrical Engineering*, Volume.42, pp. 207-220, 2015.





## Survey on Data Mining Algorithms

**Md Ajmat**

Student of M.Tech, Department of CSE,  
Anurag Group of Engineering, Hyderabad,  
Telangana, India

**Dr. M. Vara Prasad Rao**

Professor, Department of CSE,  
Anurag Group of Institutions, Hyderabad,  
Telangana, India

**Abstract—** The basic aim of this paper is to comparing the classification and clustering algorithms and to find out its complexity in terms of time and memory. As we know that clustering is the most commonly used technique in data mining. Clustering maximize the intra-cluster similarity and minimize the inter clusters similarity. Clustering algorithms are attractive for the task of class identification in spatial databases. However, the application to large spatial databases rises the following requirements for clustering algorithms: minimal requirements of domain knowledge to determine the input parameters, discovery of clusters with arbitrary shape and good efficiency on large databases. The well-known clustering algorithms offer no solution to the combination of these requirements.

**Keywords—** DATA MINING, CLASSIFICATION, CLUSTERING, COMPLEXITY, DENSITY, SPATIAL DATABASES

### I. INTRODUCTION

We live in a world that is turning out to be increasingly associated. A large number of little gadgets are conveyed all through the globe gathering data on climate conditions, the signs created by various machines and on human action when all is said in done. The data gathered by these frameworks can be utilized as a part of a wide range of courses, from foreseeing conceivable disappointments to prescribing the best answers for various issues in light of past encounters. A famous way to deal with conquer this trouble is machine learning, in particular, grouping calculations.

Classification on large spatial databases is a difficult and computational heavy task. Using clustering algorithms is one way of doing it, and we have seen that there are several methods out there that get the job done. However we have also seen the problem included when using these methods, find the right input parameters, localizing clusters of arbitrary shapes and last but not least doing the whole process in reasonable time.

As part of our project we have studied several classifications and clustering algorithms. We have made a comparison study of this algorithm and their respective time and space complexity.

### II. DATA MINING ALGORITHMS

#### A. Classification

Two common data mining techniques for finding hidden patterns in data are clustering and classification analyses. Although classification and clustering are often mentioned in the same breath, they are different analytical approaches. In this survey, I will describe similarities and differences between these related, but distinct approaches.

Classification is a data mining task of predicting the value of a categorical variable (target or class) by building a model based on one or more numerical and/or categorical variables (predictors or attributes). Classification is basically termed as a Supervised Learning.

#### Supervised learning:

Suppose we have a basket and it is filled with some fresh fruits our task is to arrange the same type fruits at one place. Suppose the fruits are apple, banana, and cherry, grape. So we already know from our previous work that, the shape of each and every fruit so it is easy to arrange the same type of fruits at one place. Here our previous work is called as train data in data mining. so we already learn the things from our train data, This is because of we have a response variable which says that if some fruit have so and so features it is grape, like that for each and every fruit. This type of data we will get from the train data. This type of learning is called as supervised learning. This type solving problem come under Classification.

#### 1) Decision Tree Algorithm:

##### Aim of Algorithm:

To create a model that predicts the value of a target variable by learning simple decision rules inferred from the data features.

##### Procedure:

A Decision Tree Classifier consists of a decision tree generated on the basis of instances. A decision tree is a classifier expressed as a recursive partition of the instance space. The decision tree consists of nodes that form a



## A Novel Scheme For Dynamically Tracking Solar Panel

Sali Naveen<sup>1</sup>, M. Ahmed Ali Baig<sup>2</sup> And Ashutosh Saxena<sup>3</sup>

<sup>1</sup>P.G Scholar, Department Of Mechanical, Cmr Technical Campus / Jntuh, India

<sup>2</sup>Professor, Department Of Mechanical, Cmr Technical Campus / Jntuh, India

<sup>3</sup>Professor, Department Of Cse, Cmr Technical Campus / Jntuh, India

**Abstract:** Usage of electricity is increasing day-by-day, with limited fossil fuel. Researchers always like to explore other sources. Solar energy is one such source. Where in the sunlight is captured via solar cells which then transform heat energy to electrical energy to be store for consumption. With the rotation of earth, the direction of sun light changes throughout the day. Attempts are being made to rotate the solar panel by various means to capture maximum sunlight. In this paper we attempt to review the major work carried out in solar tracking system and also propose a novel method for tracking using GPS based infrastructure

**Keywords :** Solar tracker, solar panel, solar power, photovoltaic cell.

### I. Introduction

Today the usage of electricity in the universe is gradually increasing day-by- day. To overcome the lag of electricity, there are different types of techniques available. One of them is to utilize the solar energy to generate electricity directly from the sunlight by photovoltaic conversion. Solar energy has long been regarded as an ideal energy source but for the fact that we knew little to tap or use it to our advantage. The advancement in science and technology brought out by mankind had lead to developments like the photovoltaic cell (PV cells). Solar panels comprise of a number of such PV Cells. The output of the Solar Panel is proportional to the intensity of incident radiation from the sun.

A field of young sunflowers will slowly rotate from east to west over the course of a sunny day, each leaf seeking out as much sunlight as possible as the sun moves across the sky through an adaptation called heliotropism. It's a clever bit of natural engineering. On similar line a solar tracking system is designed for power generation from sunlight. This method of power generation is simple and is taken from natural resource for maximum sunlight to generate power. This project helps for power generation by setting the equipment to get maximum sunlight automatically. Efforts are there to automate the tracking system for maximum intensity of light. When there is decrease in intensity of light, this system automatically changes its direction to get maximum intensity of light.

In this paper we attempt to review the works carried out in this area and propose a novel method for Automatic solar tracking using GPS. The organization of the paper is follows: Section 2: presents several Methods to Drive Solar Trackers, in Section 3: Types of Tracking Systems and Factors Affecting Tracing Efficiency are discussed, in Section 4: we cover Solar Tracking Applications along with few advantages and disadvantages, in Section 5: Review of Solar Tracking System is presented along with the brief of our scheme this is followed by Conclusion and later the references.

### II. Methods To Drive Solar Trackers

#### 2.1 Active tracker

Active trackers make use of motors and gear trains for direction of the tracker as commanded by the controller responding to the solar direction. The position of the sun is monitored throughout the day. When the tracker is subjected to darkness, it either sleeps or stops depending on the design. This is done using sensors that are sensitive to light such as Lower Density Radiations (LDR). Their voltage output is put into a microcontroller that then drives actuators to adjust the position of the solar panel.

#### 2.2 Passive solar tracking

Passive trackers use a low boiling point compressed gas fluid driven to one side or the other to cause the tracker to move in response to an imbalance. Because it is a non precision orientation it is not suitable for some types of concentrating photovoltaic collectors but works just fine for common PV panel types. These have viscous dampers that prevent excessive motion in response to gusts of wind.



## Utilization of f-Chart Method for Designing Solar Thermal Heating System

Dasari Deepika<sup>1</sup>, M. Ahmed Ali Baig<sup>2</sup>, A. Raji Reddy<sup>3</sup>, D. Maneaih<sup>4</sup>

<sup>1</sup> PG Scholar, Mechanical Department, CMRTC, JNTU, Hyderabad, Telangana, India

<sup>2,3</sup> Professor, Mechanical Department, CMRTC, JNTU, Hyderabad, Telangana, India

<sup>4</sup> Associate professor, Mechanical Department, CMRTC, JNTU, Hyderabad, Telangana, India

**Abstract:** Solar energy systems convert solar energy into useful energy. Design of solar systems is complicated because of the presence of both predictable and unpredictable parameters. Predictable parameters include performance characteristics of collectors and other components whereas unpredictable parameters include weather data such as solar radiation, ambient temperature which exhibits nonlinear behavior. This nonlinear dependence makes it difficult to analyze the performance by simply observing their response to short-term or average weather conditions. Thus this work analyzes the use of f-chart method in designing liquid solar heating systems due to its simplicity and ability to estimate the fraction of total heating load supplied by solar heating system. This method is widely used in designing both active and passive solar heating systems, especially in selecting the sizes and type of solar collectors that provide the hot water and heating loads. This paper includes estimation of percentage of load contributed with a fixed collector area of 1 m<sup>2</sup> for a solar water heating system in Hyderabad.

**Keywords:** F-chart method, Solar Energy, Total heating load, Water Heater, percentage of load contributed.

### I. Introduction

Solar energy is simply a radiant energy direct from the sun to earth surface. But only a fraction of this energy gets to the Earth surface. Some of them are reflected back into the space, while others are scattered by water droplets in the clouds and dust particles.

Solar energy is used for a variety of heating purposes such as heating of home and spaces, industrial processes, thermal treatment of water supply, production of hot water and steam for industries etc. It is also used in the generation of electricity using solar-powered thermal electric generating systems. Solar energy systems convert solar energy into either thermal or electrical energy and such systems can either be passive or active systems. The passive systems do not require input of any form of energy apart from the solar radiation, while the active systems require additional mechanisms such as circulation pumps, air blowers or automatic systems.

Proper design of solar water heating system is important to assure maximum benefit to the user, especially for a large system. Designing a solar hot water system involves appropriate sizing of different components based on predicted solar isolation and hot water demand. A number of design methods are available for solar water heating systems.

#### Design methods for solar thermal processes can be put in three general categories:

The first category applies to system in which collector operating temperature is known or can be estimated and for which critical radiation levels can be find out.

**Eg:** Utilizability method, are based on analysis of hourly weather data to obtain the fraction of the total month's radiation that is above critical level.

The second category includes those that are correlations of the result of a large number of detailed simulations.

**Eg:** f-chart method.

The third category involves Short cut simulation in which simulations are done using meteorological data for representative days.

**Eg:** SOLCOST method

### II. F-Chart Method

The F-chart method is developed by Klien et al. (1976, 1977) and Beckman et al. (1977). The results of many numerical experiments are correlated in terms of easily calculated dimensionless variables.

F-chart method is used for estimating the annual thermal performance of active heating systems for buildings (using either liquid or air as working fluid) where the minimum temperature of energy delivery is near 20 C.



## Design & Development Analysis of Aircraft Composite Window Frame

G.Veranna<sup>1</sup>, B. Shiva prasad<sup>2</sup>, ch.Neeraja<sup>3</sup>,

<sup>1,2,3</sup> (Assistant professor, Mechanical Department, CMRTC/ JNTUH, India)

**Abstract :** In most manufactured and operated aircraft used frames of Windows, made of aluminum, for production of which uses the processes of stamping, extrusion and further processing under size. The frame of the window consists of the following main parts: outer flange, an inner flange and a vertical flange placed between these flanges perpendicular thereto. Upon aluminum we use composites as a material in making window frame, the weight of the frame made in the above way, is near approximately 50 percent of the weight of conventional aluminum frame windows. Moreover, the cost of production in both cases about the same. It is assumed that the tolerances of such frame in industrial production will be significantly less than the tolerances of the respective aluminum products. At the same time. It is assumed that proposed in the invention, the frame of the window will provide enhanced security and improved thermal insulation compared to conventional aluminum frames. The testing of these frames is done under researchers who worked under defense. This main project report addresses the Design, Development and testing of window frame.

**Keywords:** Composite material of E-glass fabric, Aircraft window Frame, cad design mould for FRP, fabrication of aircraft window frame, Vibration test and tensile test.

---

### I. Introduction

The present invention relates generally to aircraft, and, more specifically, to windows therein. In the typical commercial aircraft, numerous windows are distributed along both sides of the fuselage from the cockpit aft to just before the tail. Typical aircraft skins are made of high strength metal, such as aluminum, and the typical window frame is also made of high strength metal. In most of the passenger aircraft manufactured and in operation today, window frames made of aluminum are used, which comprise a part which is made by forging and truing. Aircraft weight directly affects aircraft efficiency during flight, and aircraft are therefore being continually developed for reducing weight while providing sufficient strength of the various aircraft components for enjoying long service life during commercial operation. Furthermore, the cost of commercial aircraft operation is a paramount design objective especially with the ever increasing price of engine fuel. The initial manufacturing cost of the aircraft itself is also an important design objective, with both the cost of the initial aircraft purchase and subsequent cost of operation being significant criteria in the competitive evaluation of aircraft and their expected low cost operation during the service life. Accordingly, it is desired to provide an improved aircraft window frame, and method of its manufacture.

### II. Composite Material

In its most basic form a composite material is one, which is composed of at least two elements working together to produce material properties that are different to the properties of those elements on their own. In practice, most composites consist of a bulk material (the "matrix"), and a reinforcement of some kind, added primarily to increase the strength and stiffness of the matrix.

#### 2.1. Role of matrix in a composite

Many materials when they are in a fibrous form exhibit very good strength property but to achieve these properties the fibers should be bonded by a suitable matrix.

#### 2.2. Materials used as matrices in composites

In its most basic form a composite material is one, which is composed of at least two elements working together to produce material properties that are different to the properties of those elements on their own. In practice, most composites consist of a bulk material (the matrix) and a reinforcement of some kind, added primarily to increase the strength and stiffness of the matrix. Composites are versatile, used for both structural applications and components, in all aircraft and spacecraft, from hot air balloon gondolas and gliders, to passenger airliners, fighter planes and the Space Shuttle.



## Thermal Radiation and Heat Transfer Effects on MHD Micropolar Fluid Flow Past a Vertical Plate with Chemical Reaction

K.BhagyaLakshmi<sup>1</sup>, P.V.Satya Narayana<sup>2</sup> and N.V.R.V.Prasad<sup>3</sup>

<sup>1</sup> (Department of Mathematics, CMR Technical Campus, Medchel, Hyderabad, Telangana, India)

<sup>2</sup> (Department of Mathematics, SAS, VIT University, Vellore 632 014, T.N, India)

<sup>3</sup> (Department of Mathematics, S.V.G.S. Junior College, Nellore, A.P, India)

**Abstract:** We examine the instantaneous effects of chemical reaction and radiation absorption on unsteady MHD free convective heat and mass transfer flow for a micropolar fluid bounded by a semi infinite vertical plate in the presence of heat generation and thermal radiation. The plate is assumed to move with a constant velocity in the direction of fluid flow. A uniform magnetic field acts perpendicular to the porous surface in which absorbs micropolar fluid with a suction velocity varying with time. The dimensionless governing equations of the flow, heat and mass transfer are solved analytically using regular perturbation method. The effects of various pertinent parameters on flow, heat and mass transfer properties are discussed analytically and explained graphically. Also the velocity profiles of micropolar fluid is compared with the corresponding flow problem for a Newtonian fluid and found that the polar fluid velocity is decreasing.

**Keywords:** Chemical reaction, heat transfer, micropolar fluid, MHD, thermal radiation

### I. Introduction

The theory of micropolar fluids was first introduced and formulated by Eringen [1]. This theory displays the effects of local rotary inertia and couple stress. The theory is expected to a mathematical model for the non-Newtonian fluid behavior observed in certain fluid such as exotic lubricants, colloidal fluids, liquid crystals etc., which is more realistic and important from a technological point of view. The theory of thermo micropolar fluids was developed by Eringen [2] by extending his theory of micropolar fluid. Sharma and Gupta [3] studied the effects of medium permeability on thermal convection in micropolar fluids. Prathap Kumar *et al.* [4] have studied the problem of fully developed free convective flow of micropolar and viscous fluids in a vertical channel. Muthu *et al.* [5] studied peristaltic motion of micropolar fluid in circular cylindrical tubes. Srinivasacharya *et al.* [6] analyzed the unsteady stokes flow of micropolar fluid between two parallel porous plates. Muthuraj and Srinivas [7] investigated, fully developed MHD flow of a micropolar and viscous fluids in a vertical porous space using HAM. Kim [8] investigated the effects of heat and mass transfer in the MHD micropolar fluid flow past a vertical moving plate.

The role of thermal radiation on the flow and heat transfer process is major importance in the design of many advanced energy conversion systems operating at higher temperatures. Thermal radiation within the system is the result of emission by hot walls and the working fluid. Effects of chemical reaction and thermal radiation on heat and mass transfer flow of MHD micropolar fluid in rotation frame of reference is investigated by Das [9]. A complete analytic solution to heat transfer of a micropolar fluid through a porous medium was analyzed by Rashidi *et al.* [10]. MHD flow of a micropolar fluid towards a vertical permeable plate with prescribed surface heat flux is investigated by Nor Azizah *et al.* [11]. Ezzat *et al.* [12] studied the combined heat and mass transfer for unsteady MHD flow of perfect conducting micropolar fluid with thermal relaxation. Peristaltic motion of a magneto hydrodynamic micropolar fluid in tube is analyzed by Yongqi Wang *et al.* [13]. Patil, Kulkarni [14] studied the effects of chemical reaction on free convective flow of a polar fluid through a porous medium in the presence of internal heat generation. Kesavaiah *et al.* [15] investigated, effects of the chemical reaction and radiation absorption on an unsteady MHD convective heat and mass transfer flow past a semi-infinite vertical permeable moving plate. Effects of chemical reaction on unsteady MHD heat and mass transfer flow past a semi infinite vertical porous moving plate in the presence of viscous dissipation is analyzed by Bhagya Lakshmi [16]. Many researchers [17–20] have studied the problem of non-Newtonian fluid flows analytically and numerically over various flow geometries.

In this paper we examine the instantaneous effects of chemical reaction and radiation absorption on unsteady MHD free convective heat and mass transfer flow for a micropolar fluid bounded by a semi infinite vertical plate in the presence of heat generation and thermal radiation. The plate is assumed to move with a constant velocity in the direction of fluid flow. A uniform magnetic field acts perpendicular to the porous surface in which absorbs micropolar fluid with a suction velocity varying with time. The dimensionless



## **Diesel Particulate Filter Modeling For Compression Ignition Engine**

Khasim Sharif. SK<sup>1</sup>, D.Jagadish<sup>2</sup>, K. Phaneendra Kumar<sup>3</sup>, K. Rakesh<sup>4</sup>

<sup>1</sup>(Assistant professor, Mechanical Department, CMRTC/ JNTUH, India)

<sup>2</sup>(professor, Mechanical Department, VFSTR, India)

<sup>3</sup>(professor & principal, Mechanical Department, VLIT, India)

<sup>4</sup>(B.Tech Student, Mechanical Department, CMRTC/ JNTUH, India)

---

**Abstract :** Diesel particulate filters capture particle emissions through a combination of filtration mechanisms, such as diffusion deposition, inertial deposition, or flow-line interception. Collected particulates are removed from the filter, continuously or periodically, through thermal regeneration. Diesel filters are highly effective in controlling solid particulate emissions—including solid particle numbers—but may be ineffective in controlling liquid fractions of PM emission. Filters were first commercialized as retrofit devices, followed by a wide scale adoption on new light-duty and heavy-duty diesel engines in both highway and non road applications.

**Keywords:** CPSI, DPF, HSU, MECA, PM

---

### **I. Introduction**

Diesel particulate filters were introduced in 1985 on Mercedes cars sold in California. Particulate filters have been in use on non-road machines since 1980 and in automobiles since 1985. Historically medium and heavy duty diesel engine emissions were not regulated until 1987 when the first California heavy truck rule was introduced capping particulate emissions at 0.60 g/bhp hour [1]. The resulting exhaust is clean – no odor or diesel smell. This cleaner exhaust won't blacken your trailer, and won't even blacken inside of exhaust stack [2]. Since then, progressively tighter standards have been introduced for light- and heavy-duty road going diesel-powered vehicles and for off-road diesel engines. Similar regulations have also been adopted by the European Union and some individual European countries, most Asian countries, and the rest of north and South America [3].

This chapter explores the undesirable emissions generated in the combustion process of automobile and other IC engines. These emissions pollute the environment and contribute to global warming, acid rain, smog, odors, and respiratory and other health problems. The major causes of these emissions are non-stoichiometric combustion, dissociation of nitrogen, and impurities in the fuel and air. The emissions of concern are hydrocarbons (He), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), sulfur, and solid carbon particulates. Ideally, engines and fuels could be developed such that very few harmful emissions are generated, and these could be exhausted to the surroundings without a major impact on the environment. With present technology this is not possible, and after treatment of the exhaust gases to reduce emissions is very important. This consists mainly of the use of thermal or catalytic converters and particulate traps [4].

### **II. Air Pollution**

Until the middle of the 20th century the number of IC engines in the world was small enough that the pollution they emitted was tolerable, and the environment, with the help of sunlight, stayed relatively clean. As world population grew, power plants, factories, and an ever-increasing number of automobiles began to pollute the air to the extent that it was no longer acceptable. During the 1940s, air pollution as a problem was first recognized in the Los Angeles basin in California. Two causes of this were the large population density and the natural weather conditions of the area. The large population created many factories and power plants, as well as one of the largest automobile densities in the world. Smoke and other pollutants from the many factories and automobiles combined with fog that was common in this ocean area, and smog resulted. During the 1950s, the smog problem increased along with the increase in population density and automobile density.



## Multiple Response Optimization of TIG Welding Process for Optimum Weld Bead Width and Reinforcement Height of Ti-Alloy (Ti-6Al-4V)

Debashis Mishra<sup>1</sup>, Maneiah. Dakkilli<sup>2</sup>, L. Mangesh<sup>3</sup>, Dr. K. Prahlada Rao<sup>4</sup>

<sup>1</sup>Assistant Professor, Dept. of Mechanical Engineering, CMR Technical Campus/ (JNTUH), India

<sup>2,3</sup>Associate Professor, Dept. of Mechanical Engineering, CMR Technical Campus/ (JNTUH), India

<sup>4</sup>Professor, Dept. of Mechanical Engineering, JNTU Ananthpur, India

**Abstract:** The Titanium alloy (Ti-6Al-4V) is recognized for its distinctive characteristics such as high strength to weight ratio, low density, and excellent elevated temperature properties up to 600 °C. These structurally efficient metals are mostly accepted and frequently used for the manufacturing of critical high performance aircrafts, such as jet engines and other airframe, automobile components. Tungsten inert gas welding (TIG) is one of the mostly used arc welding process in various manufacturing industries. In this experiment response surface methodology has been adopted to evaluate the effects of the input variables (current and welding speed), on output responses (weld bead width and reinforcement height). The Relationship between these two responses is analyzed using the multiple response optimization technique named as desirability function. The outcome shall be beneficial in selecting suitable parameters of TIG welding of Titanium alloy (Ti-6Al-4V) to obtain the required shape of the weld bead from which quality of the weld can be accessed.

**Keywords:** Desirability function, Response Surface Methodology, TIG Welding, Titanium alloys (Ti-6Al-4V), Weld bead geometry

### I. Introduction

The welding arc is defined as continuous and controlled electrical discharge through an ionized gas. Tungsten inert gas welding process (TIG) also called as gas tungsten arc welding (GTAW) is one of the widely used arc welding process that uses non consumable tungsten electrode to produce the weld. The shielding gas (argon) is used to avoid the atmospheric contaminations of the molten weld pool. A filler metal may be added only if required. The advantage of using this technique is the intense heat source which produces high quality welded joints in lesser defects. The other benefits of this welding technique lies with its economy, easy in handling in manual as well in automated condition and its potential capability towards the joining of various metals and their alloys of thinner sections of stainless steel, aluminum, copper, magnesium and sensitive material like Titanium and its alloys. A constant current AC and DC (straight or reverse polarity) welding power supply is generally used to produce the energy [1, 2]. The (Ti-6Al-4V) is known as an alpha-beta titanium alloy. The elevated Strength-to-Density Ratio called high structural efficiency, low density (roughly half of the weight of steel, nickel and copper alloys) and excellent elevated temperature properties (up to 600°C) made the Ti-6Al-4V titanium alloy most desirable material for the successful use in the manufacturing of the blades, gas turbine engines and airframe, automobile structures and other different components which demands high levels of accuracy and reliable performance. Statistical design of experiment is refers to the process of planning and conducting the experiment so that appropriate data can be collected and analyzed by statistical means to draw a meaningful conclusions from the experimental data by minimizing number of experiments. Response surface methodology is a collection of mathematical and statistical technique useful for the modeling and analysis of the problem in which a response of interest is influenced by several variables and the objective is to optimize the response and is to locate the optimum and desirable condition for the higher performance [3, 4]. The performance and quality of welded parts are deeply dependent upon the welding process parameters. The prime aim of many researchers is to identify the effects of the input variable on the output responses and also to identify the relation between the multiple responses. The relationships between the responses are quite common and a researcher has to identify which response is important to study. Thus optimization of welding process parameters to get desirable mechanical properties is a major motto of many researchers. Desirability function is one of the advanced techniques used for the simultaneous optimizations of several responses. Daniel J. Obermiller "Multiple Response Optimization using JMP" in which different techniques of simultaneous optimization of several responses are evaluated and presented [5]. Kumar Kundan et al. used response surface methodology for predicting the output responses of TIG welding process in which two welding process



## Thermo Structural Analysis of Two Stroke Si Engine Cylinder

Dayadi Nageswararao <sup>1</sup>, Gobbur Mukesh <sup>2</sup>

<sup>1,2</sup> Department Of Mechanical Engineering ,Cmr Technical Campus ,Jntu ,India

**Abstract:** Cylinder is the heart of internal combustion engine as combustion takes place inside the cylinder large amount of heat is produced inside the cylinder due to that heat distortion of cylinder wall may take place. Due to inadequate heat transfer through the engine cylinder block the engine cylinder gets overheated, leading to knocking and some time result into structural failure. This also causes an increase in the thermal stresses in the liner wall which ultimately affects the strength of liner wall. The main objective of this paper is to carry out thermo structural analysis of combustion chamber (Liner) in Ansys workbench 15.0 to predict temperature distribution across the combustion chamber of scavenged engine. The design of 2 stroke engine cylinder is modeled in ANSYS workbench 15.0. Around 27 cases are considered of different fin thicknesses, gaps and materials. Then geometry for each case is modeled. The boundary conditions are applied to each case. For thermal the boundary conditions are convection at liner, fins and exhaust section of the cylinder. For structural, cylindrical support and pressure are applied. Each case is analyzed in the ANSYS workbench 15.0. The results of total heat transfer and stresses induced in the cylinder for each case are obtained.

**Keywords:** Engine cylinder, Fin thicknesses, gaps and materials, Thermo structural analysis, ANSYS workbench 15.0.

### I. Introduction

Heat transfer is a very wide field used in analysis of internal combustion engine heat transfer effect parameter such as performance, emission and also efficiency. It is said that for a given mass of fuel higher the heat transfer to the combustion wall will reduce the average combustion pressure and temperature, this indirectly reduces the work done by the piston per cycle and these effects the specific power. Temperature rise of the engine parts may cause a serious durability of the engine. The shape of isothermal lines and high temperature regions become more important in these studies. The experimental way will find these regions are costly and time consuming; Analytical methods are almost equally good for fast conformation of this region by using finite elements. Measuring the actual dimension of various components of two-stroke S.I engine (BAJAJ, 100cc). modeling of piston, liner along with combustion chamber are done using Ansys 15 we analyzed the temperature distribution and thermal stresses on above component, compare that thermal stresses with theoretically calculated thermal stresses.

### II. Specification Of The Problem

Objective of the paper is to design cylinder with fins for BAJAJ 100cc engine, by changing the fin thickness and distance between the fins to analyze the thermal properties of the fins. Analyzation is also done by varying the materials of fins. Present used material for cylinder fin body is cast iron. Our aim is to change the material for fin body by analyzing the fin body with other materials and also by changing the geometry distance between the fins and thickness of the fins. Thickness of fins are— 2, 2.5 and 3mm Distance between the fins —5.6, 6.6mm. Materials are considered for analysis —Grey cast Iron, Mild steel, Magnesium alloy and Aluminum alloy.

#### 2.1. Survey on air cooled engine cylinder fins, commercially:




Bajaj pulsar-150		Honda Shine-125		Hero Passion-110	
					
No Of Fins	12	No Of Fins	12	No Of fins	8
Pitch (mm)	10	Pitch (mm)	10	Pitch (mm)	9
Thickness (mm)	2	Thickness (mm)	2	Thickness (mm)	2
Height (max/min) in (mm)	35/10	Height (max/min) in (mm)	22/7	Height (max/min) in (mm)	38/7
Fin Material	Al.alloy	Fin Material	Al.alloy	Fin Material	Al.alloy
Position of Fins W.R.T. Cylinder Axis	Perpendicular	Position of Fins W.R.T. Cylinder Axis	Perpendicular	Position of Fins W.R.T. Cylinder Axis	Parallel

Fig 1: engine cylinder fins



## Effect of Alkali Treatment on Mechanical Properties of Agave Fibre Reinforced Polymer Composites

Pradeep Kumar J<sup>1</sup>, A.Sugunakar<sup>2</sup>, Chetty.Nagaraj<sup>3</sup>

<sup>1</sup>Assistant Professor, Department, of mechanical Engineering, St .Peter's Engineering College, Maisammaguda (V), Medchal (M).Hyderabad.500014, Telangana, India.

<sup>2</sup>Assistant Professor, Department, of mechanical Engineering, Vivekananda institute of technology& science, Karimnagar,505001, Telangana, India.

<sup>3</sup>Assistant Professor, Department, of mechanical Engineering, CMR Technical Campus Kandlakoya(V), Medchal (M), Hyderabad- 501401, Telangana, India.

**Abstract:** The present work study flexural and tensile behavior of short AGAVE fiber reinforced composites. The fibers are chemically treated in 10% NaOH solution at room temperature. Short fibers of 7mm, 10mm and 12 mm are used in the present work. The composite lamina is prepared by hand molding using isophthalic polyester resin. Flexural test and tension tests are carried out as per ASTM standards. The flexural strength and tensile strength of composite lamina are evaluated. The Effect of Fiber surface Treatment on flexural and tensile properties are observed. Surface modification of the fibre by alkali treatment improves the chemical bonding and tensile strength. An interact between fiber and matrix was observed from the SEM (scanning electron microscope) micrographs.

**Keywords:** Natural fibres, Agave, reinforced polymer, tensile test, hand layup technique.

### I. Introduction

For making advanced composites the natural fibre are being used instead of glass fibre and carbon fibres. The interest of industry is growing in natural fibre reinforced composites for industrial and research applications. Natural fibers are found superior to the artificial fibers with the properties like less weight, low density, eco-friendly, high specific strength etc..A combination of properties of some natural fibers including low cost, low density, non-toxicity, no abrasion during processing and recyclability has arisen more interest for the manufacturing industry of low cost and low weight composites [1-2]. physical and mechanical properties of natural fibers are mainly depends on their physical composition such as structure of fibers, cellulose content, angle of fibrils and cross section. Their biodegradability can contribute to a healthy ecosystem while their low cost and high performance fulfills the economic interest of industry [3-4]. The tensile and flexural properties of the green composites with different pineapple fiber content and compared with the virgin resin[5]. Composite are those material made up from two or more distinct materials having different chemical and physical properties provide a well defined structure [6]. The effect of alkali treatment on the mechanical and thermal properties of hemp fiber-reinforced polyester composites are investigated[7]. The chemical modification of flax fiber by alkali treatment. The study concentrated on optimizing parameters, such as time and concentration of NaOH, to develop a continuous process for the treatment and fabrication of unidirectional flax fiber epoxy composites[8]. The Effects of different chemical modifications on the properties of flax fiber-reinforced rotationally molded composites. The chemical modifications carried out were mercerization, peroxide treatment, benzylation, and peroxide treatment[9]. the effect of chemical modification on the tensile strength of flax fibers. The authors tried acetylation and steartion and found that the tensile strength of flax fibers did not exhibit any drastic improvement[10]. Different methods for chemical modification of natural fibers so as to incorporate water repellency, resistance towards chemicals and better mechanical properties, have been discussed[11]. The tensile, flexural, and impact behavior of PALF-reinforced polyester composites as a function of fiber loading, fiber length, and fiber surface modification are investigated. The tensile strength and Young's modulus of the composites were found to increase with fiber content in accordance with the rule of mixtures[12].



## An investigation of Mechanical characterization of Orange Peel Reinforced Epoxy Composite

Katla.Praveen Kumar<sup>1</sup>, Chetty.Nagaraj<sup>2</sup>

<sup>1</sup>Assistant Professor, Department, of mechanical Engineering, St .Peter's Engineering College, Maisammaguda (V), Medchal (M),Hyderabad.500014, Telengana, India.

<sup>2</sup>Assistant Professor, Department, of mechanical Engineering, CMR Technical Campus Kandlakoya(V), Medchal (M), Hyderabad- 501401, Telengana, India.

**Abstract:** Polymeric materials reinforced with synthetic fibers such as glass, carbon, and aramid provide advantages of high stiffness and strength to weight ratio as compared to conventional construction materials, i.e. Wood, concrete and steel. Despite these advantages, the widespread use of synthetic fiber-reinforced polymer composite has a tendency to decline because of their high-initial costs, their use in non-efficient structural forms and most importantly their adverse environmental impact. However, natural filler and fiber materials are emerging as suitable alternatives to synthetic materials for reinforcing polymers such as epoxy due to their environment friendliness, high abundance, renewability, and cost effectiveness. Several research efforts have been put to study the effectiveness of natural fiber based materials on the mechanical behaviour of epoxy composites, focusing mainly on fibers and their weight percent's within the composites. The present experimental study aims at learning Mechanical behaviour of orange peel reinforced epoxy composites and effect of the weight percentage of the orange peel reinforcement was investigated experimentally on the mechanical properties of the developed composites. The mechanical properties were tested using computerized UTM machine as per the ASTM standards. Its biodegradability, low cost, and moderate mechanical properties make it a preferable reinforcement material in the development of polymer matrix composites. Composites having 5, 10, 20 and 30% weight fraction of orange peel specimens were made by using hand layup method. The fabricated composite samples were cut according to the ASTM standards for different experiments. density test, Hardness test were carried out at the samples. The maximum hardness, density, tensile, flexural and ILSS are getting for the material prepared with the 20 % reinforced orange peel epoxy composite.

**Keywords:** Composites, density, Hardness, Mechanical Strength, orange peel.

### I. Introduction

When two or more material with different properties is combined together they form a composite material [1]. The composite materials have a higher strength than many other materials. Normally the good quality fibers having highest cost, Synthetic fibers are non renewable fiber and the availability of the fiber was also difficult. The constituents are combined in such a way that they keep their individual physical phases and are non soluble in each other or do not form a new chemical compound. There are basically two category of constituent material, one constituent is called reinforcing phase and one in which the reinforcing phase is embedded is called matrix. The primary function of matrix is to hold the fiber to form a certain shape. Besides, the functions of the matrix are also to transfer stress between the reinforcing fibers and to protect them from mechanical and environmental damage. The function of reinforcing phase in matrix is to improve the mechanical properties such as strength, stiffness etc. As per Berghezan [2] the composite material is to be designed in such a way that the individual component retain their characteristic are so incorporated that the composite take advantage of their superior properties without compromising on the weakness of either.

Among all reinforcing fibres, natural fibres have gained great significance as reinforcements in polymer matrix composites. Depending upon the source of origin, natural fibres are classified as plant, animal and mineral fibres. Recently, due to the growing global energy crisis and ecological risks, natural fibres reinforced polymer composites have attracted more research interests. The main advantages of natural fibres are their availability, biodegradable, renewable, environmental friendly, low cost, low density, high specific properties, good thermal properties and enhanced the energy recovery, low energy consumption, non-abrasive nature and low cost. Plant fibres are justifies their use as reinforcement for polymer composites due to their renewability with good mechanical properties. It is also observed that natural fibres are non-uniform with irregular cross sections, which make their structures quite unique and much different from man-made fibres such as glass fibres, carbon fibres etc. As far as reinforcement is concerned fibers occupy the largest weight fraction in a FRP composite and it share its major portion of the load that act on the composite structure. The



## Analysis of Single Vendor – Multi Buyer Consignment Inventory

Chidurala Srinivas<sup>1</sup>, A. Raji Reddy<sup>2</sup>

<sup>1</sup>(Professor, Mechanical Engineering Dept., Vaageswari College of Engineering, Karimnagar, India

<sup>2</sup>(Professor, Mechanical Engineering Dept., CMR Technical Campus, Hyderabad, India

**Abstract:** Some significant strategies or practices for streamlining inventory along the supply chain include Consignment models. This paper describes the benefits of Consignment Policy inventory models of single vendor – multi buyer model which is view as a classification of divergent supply chain with end to multi end case which is a distinctive flavor of Vendor Managed Inventory. The change of ownership commences during pull system at which the payment is made to vendor. It evaluates minimum joint total expected cost of vendor and buyer, simultaneously optimise quantitative decision variables. Numerical examples are presented to illustrate the benefit of the proposed strategies and the effects of changes on the cost and parameters are studied.

**Keywords:** Consignment Policy, Delay delivery, Information sharing.

### I. Introduction

The field of production and inventory planning and control has moved from elementary rules of thumb used within four walls of factory to sophisticated computer algorithms shared among the trading partners in supply network. With reference to Figure.1, it can predict Vendor Managed Inventory (VMI) is transforming into Consignment Inventory (CI) approach and then elimination of intermediary channels is possible and hence direct selling which gives more profits. Different models have formulated to minimize joint total expected cost of single vendor – multi buyer (upto two buyers) and simultaneously optimize other decision variables such as quantity transported, number of transport operations, delay deliveries and buyer maximum and minimum stocks under stochastic environment.

The basic fundamental of consignment policy is explained in Braglia and Zavanella [1], Valentini and Zavanella [2], Simone and Grubbstrom [3]. Goyal [4] proposed a joint economic lot size model to minimize total costs and is compared with total costs incurred if vendor and buyer act independently. Banerjee [5] generalized Goyal's [4] model by assuming vendor with finite rate produces for a buyer on a lot-for-lot basis under deterministic conditions. Goyal [6] generalized the Banerjee [2] model by relaxing the assumption of the lot-for-lot policy of the vendor.

In CI model vendor use buyer warehouse for keeping the goods produced by the vendor without changing the ownership. To fulfill this concept, the vendor should be close to the buyer production line. This creates a condition of shared benefit, neither the vendor nor the buyer will benefit until the product is sold to an end user. This shared risk benefit condition will often be enough to convince the buyer to stock the products. The key benefit to the buyer should be obvious, that the buyer doesn't have to tie up capital hb, finance. This doesn't mean that there is no inventory carrying costs for the buyer they do still incur costs hb, stock related to storing and managing the inventory i.e., both parties incur holding cost, depending on different rates and the length of time for which materials has been stocked in supply chain (SC). Finally, the buyer sees a lower inventory cost per unit i.e., only hb, stock instead of the entire hb, stock + hb, finance. The vendor will have setup cost and holding cost whereas the buyer will have order emission cost and holding cost. Typically, it is suitable for automobile components, fashion products, pharmaceutical, electronic, fast moving consumer goods, retail items of super and hypermarkets. In some sectors, consignment inventory would be around 15-20% of total inventory.



Figure 1: Conceptual evaluation of consignment policy



## Control of Suddenly Expanded Flows from Correctly Expanded and under Expanded Nozzles at Supersonic Mach number for Area Ratio 2.56

Musavir Bashir<sup>1</sup>, M. Ahmed Ali Baig<sup>2</sup>, Ahmad Faris Ismail<sup>3</sup>, and S. A. Khan<sup>4</sup>

<sup>1</sup> Research Scholar, School of Aerospace Engineering, USM, Penang, Malaysia

<sup>2</sup> Professor, Department of Mechanical Engineering, CMR Technical Campus, Hyderabad, India

<sup>3,4</sup> Professor, Department of Mechanical Engineering, Faculty of Engineering, IIUM, Malaysia

**Abstract:** Airflow from convergent-divergent axisymmetric nozzles expanded into circular duct of higher area were studied experimentally, with the main focus on the flow development in the duct. The flow parameters considered in this investigation are the Mach number at the nozzle exit and the level of expansion. The geometrical parameters considered are the area ratio and the L/D ratio of the duct. To control on the flow field developed in the duct, four tiny jets of 0.5 mm radius located at 90° intervals at 6.5 mm radius from the centre of the nozzle exit were employed as the flow regulators. The Mach number in this case was 1.48. The area ratio of the study was 2.56. The nozzle pressure ratio (NPR) used was from 3.27 and 5.35 respectively which corresponds to ideally expanded and under expanded cases. The L/D ratio of the enlarged duct was varied from 10 to 1. From the results it is found that there is a jump in the wall pressure when flow passes through first oblique shock and this trend is repeated for all the cases. From the results it is found that the entire flow field is full of waves and flow remains identical with and without control when the jets were operated under favourable and adverse pressure gradient, it is also observed that when flow regulators in the form of tiny jets are employed they do not disturb the flow of duct.

### I. Introduction

Flow field of abrupt axis-symmetric expansion is a complex phenomenon which results in the flow separation, flow recirculation and re-attachment. A shear layer into two main regions may divide such a flow field, one is the flow recirculation region and the other the main flow region. The point at which the dividing streamline strikes the wall is called the re-attachment point. Nusselt is the one who conducted tests with gas flow through ducts with sudden enlargement. The effect of boundary layer on sonic flow through an abrupt cross-sectional area was studied experimentally by Wick [1]. He found that the pressure in the corner of was related to the boundary layer type and thickness before the expansion. The base corner was assumed to be a sump with two supplies of mass. The first was the boundary layer flow around the corner and the second source was the back flow in the boundary layer along the wall. This back flow occurred because of the pressure difference across the shock wave originating where the jet meets the wall.

Badrinarayanan[3] investigated experimentally the base flows at supersonic speeds for flow at 2-D and 3-D bodies with blunt base were made at  $M = 2$ . Ackeret[4] studied special features of internal flow. He concluded that there is a pre-dominant role played by the equation of continuity, especially if compressibility is involved and in aeronautics big deflection of the air streams are avoided as far as possible but in ducted flow, they may be quite common. If the width of the duct is not growing too fast along its length, separation is followed by re-attachment. He observed that, in case of internal flow also, three-dimensional boundary layers can appear as in external flow. He presented the article on the aspects of internal flow covering different types of internal flows describing some of the aspects of separation, re-attachment and pressure fluctuations that are associated with sudden enlargement flows.

Rathakrishnan and Sreekanth[5] conducted tests for flows from convergent nozzles up to sonic Mach numbers. In their experiments, the flow of air from a plenum chamber to a circular cross-section constant area tube was made to expand suddenly by having an abrupt change in cross-sectional area. The pressure ratios covered ranged from 1.1 to 3.0 and the area ratio used were 2.78 to 8.38. For an optimum performance of flow through pipes with sudden enlargement, it is not sufficient if the base pressure minimization alone is considered. The total pressure loss must also be taken into account.

Selby [6] studied the 3-D separated flow associated with swept rearward facing steps. Results have indicated that geometric modifications in the region downstream of the step where the span-wise vortex is formed has little effect on the extent of the separated flow, while "conical-lip" and "vortex-trough" base



## Investigation on Buckling of Laminated Composite Plate

Mr. N. Uday Ranjan Goud<sup>1</sup>, Dr. N. V. Swamy Naidu<sup>2</sup>

<sup>1</sup> (Aeronautical Engineering, CMR Technical Campus, Hyderabad, India)

<sup>2</sup> (Aerospace Engineering, GITAM University, Hyderabad, India)

**Abstract:** Composite laminated plates are widely used in aerospace industries, ship industries and civil applications because of their high strength to weight ratio, high strength to stiffness ratio. It is essential to find the buckling strength of these plates as these are subjected to axial forces in practice. In the present study nonlinear analysis is carried out to find the buckling strength of laminated composite plates under axial compressive load using ANSYS. Standard tests were performed as per ASTM/BIS/BSI/ISO to find the buckling strength of the composite plate using nonlinear analysis. A stiffened composite plate was considered and nonlinear analysis to be performed on it and the weight and the load carrying capacity of the stiffened composite plate has to be compared with the results of the stiffened steel plate.

**Keywords:** Composites, buckling, nonlinear analysis, Ansys etc.

### I. Introduction

The advent of technology has lead manufacture to fabricate aircraft components using composite materials. There many advantages provided by composite materials. In this paper, due to the advantage of composite materials, is selected for the use to fabrication of aircraft components like wing, fuselage, empennage and their respective internal components.

### II. Description of The Problem

Buckling is characterized by a sudden sideways failure of a structural member subjected to high compressive stress, where the compressive stress at the point of failure is less than the ultimate compressive stress that the material is capable of withstanding.

In the present analysis, buckling strength of composite laminated plate is carried out by using nonlinear analysis by considering a stiffened steel plate and a composite plate (carbon fiber).

### III. Bending And Buckling of A Composite Plate

#### INTRODUCTION:

The section begins by introducing the idea of orthotropic properties.

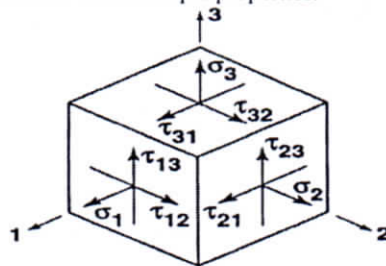


Figure 1: Stresses on an element

The strains are therefore defined by:

$$\begin{aligned}\epsilon_1 &= \frac{\sigma_1}{E_{11}} \\ \epsilon_2 &= \frac{\sigma_2}{E_{22}} \\ \gamma_{12} &= \frac{\tau_{12}}{G_{12}} \\ \epsilon_2 &= -\nu_{12} \cdot \epsilon_1 \\ \epsilon_1 &= -\nu_{21} \cdot \epsilon_2\end{aligned}$$



## Structural Analysis of Vee-Cap Sheet Metal Component

Asif Afzal<sup>1</sup>, M. Ahmed Ali Baig<sup>2</sup>, S. A. Khan<sup>3</sup> Shebeer A Rahim<sup>4</sup>

<sup>1</sup>(Assistant Professor, Mechanical Engineering Department, P. A. College of Engineering, Mangalore, India)

<sup>2</sup>(Professor, Mechanical Engineering Department, CMR Technical Campus, Hyderabad, India)

<sup>3</sup>(Professor, Mechanical Engineering Department, IIUM, Kuala Lumpur, Malaysia)

<sup>4</sup>(Assistant professor, Mechanical Engineering Department, YCET, Kollam, India)

---

**Abstract:** In this work, analysis of draw component i.e Vee-Cap used in AC motor and other machines is carried out. 3D modeling of the draw component is carried out in Solid Works software. ANSYS 16 is employed for the structural analysis of the sheet metal component considered for present study. Angles  $0^\circ$  and  $3^\circ$  at the corner of the draw angle are considered for analysis of the component in order to check the stress distribution at the bottom fillet, which is the most critical part of the component. The displacement of the component is also analyzed to check the plastic strain behavior of the component. From the structural analysis it is clear that the von-mises stress distribution is maximum at  $0^\circ$  and reduced for  $3^\circ$ . Whereas, for displacement and plastic strain of the component reduces by increasing the clearance angle from  $0^\circ$  to  $3^\circ$ .

**Keywords:** Vee-Cap, Plastic Strain, von-mises, Displacement, Sheet Metal

---

### I. Introduction

Design and development of Progressive tools for the sheet metal component is one important phase in sheet metal manufacturing. Sheet metal press working process by progressive tools is a highly complex process that is vulnerable to various uncertainties such as variation in progressive tools geometry, strip layout, die shear, material properties, component and press working equipment position error and process parameters related to its manufacturer. These uncertainties in combinations can induce heavy manufacturing losses through premature die failure, final part geometric distortion and production risk [10-12]. All station work simultaneously at different points along the work strip, which advances on station at each stroke of ram. Thus a complete part is produced with each stroke. Progressive dies generally include blanking and piercing operations but a complicated progressive die can do the operation of bending, forming, curling and heading also. Each workstation performs one or more distinct die operation, but the scrip must move from the first through each succeeding station to produce a complete part. One or more idle station may be incorporated in the die, not to perform work on the metal but to locate the strip, to facilitate inter station strip travel, to provide maximum size die sections or to simplify their construction [13-14].

### II. Literature Review

Murat Tahir Altinbalik et al., used progressive dies that have amount of advantage especially for mass production for comparing conventional deep drawing processes. Progressive dies, which needs have experience to be designed can be easily machined with new developed CAD-CAM technologies, and a progressive die designed for a certain part, which is used in building sector and then manufactured. A commercial steel sheet was chosen as a test material which is widespread used in automotive and kitchenware industry [1-3]. Progressive draw dies provides 4 times more production compared to conventional deep drawing dies. Thus, they are better in terms of energy consumption and workmanship cost. A design of compound die by combining the blanking, piercing, drawing operation [4-6]. Compound die design is applied to dies in which two or more cutting operations, typically piercing, blanking and drawing are performed. In the same single station and completed during the single press cycle.

As we have seen from the literature review, it becomes clear for us that a lot of work is carried out in sheet metal stamping of bending and forming shapes [7]. Even, though these tools are employed for draw operation, but no work is reported on draw operations of Vee-Cap component due its complexity. Hence we are motivated from this fact and we are using Vee-Cap component for analysis using commercial code ANSYS 16 software package which takes huge time to obtain the results as reported in earlier work [8,9].



## Control of Ideally Expanded and under Expanded Nozzle Flows with Micro Jets

Fharukh Ahmed G M<sup>1</sup>, M. Ahmed Ali Baig<sup>2</sup>, Musavir Bashir<sup>3</sup>, S. A. Khan<sup>4</sup>

<sup>1</sup>Assistant Professor, Department of Mechanical Engineering, Government Engineering College, Huvinahadagali, Karnataka

<sup>2</sup>Professor, Department of Mechanical Engineering, CMR Technical Campus, Hyderabad

<sup>3</sup>Research Scholar, School of Aerospace Engineering, USM, Penang, Malaysia

<sup>4</sup>Professor, Department of Mechanical Engineering, Faculty of Engineering, IIUM, Kuala Lumpur, Malaysia

**Abstract:** This paper presents an experimental investigation of an airflow from convergent-divergent axisymmetric nozzles expanded suddenly into circular duct of larger cross-sectional area than that of nozzle exit area, focusing attention on the base pressure and the flow development in the duct. To investigate the influence of active control on wall pressure as well as on the flow field developed in the duct, the micro jets of 1 mm orifice diameter located at 90° interval along a pitch circle diameter 1.3 times the nozzle exit diameter were employed as the controller of the base pressure. The Mach number investigated in the present study was 1.30. The area ratio of the present study was 2.56. The nozzle pressure ratio (NPR) used were from 2.77 and 4.16 respectively which corresponds to correct and under expanded conditions. The length-to-diameter ratio of the enlarged duct was varied from 10 to 1. The level of expansion at the nozzle exit (i.e. before sudden expansion) influences the wall pressure very strongly. When the micro jets were activated they found to influence the flow in the enlarged duct. Wall pressure results for correctly expanded and under expanded jets indicate that the flow in the enlarged duct remains attached for  $L/D$ s including at  $L/D = 1$ . Also, it is found that the wall pressure flow field in the duct for with and without control are identical and the control in the form of the micro jets does disturb the flow field. Results for  $L/D = 8$  and 10 for correctly expanded jets indicate peculiar phenomenon and are totally different from all the results for lower  $L/D$ s. Wall pressure results for under expanded jets indicate that control results in marginal decrease in the wall pressure otherwise the wall pressure flow field with and without control remains same.

### I. Introduction

THE flow field generated by the infringement of high-speed flows usually results in a very unsteady flow field. When such flows are generated at the rear end of aerospace vehicles, this flow can lead to a host of adverse effects that can diminish aircraft performance. One of the important related issues is the occurrence of base flow aerodynamic side loads due to vortex shedding and asymmetric flow separation inside a rocket nozzle. This problem has been well studied through experiments as well as computations. The unsteady separation phenomenon inside the nozzle can lead to steady/unsteady forcing of the thrusting nozzle, as well as associated mechanisms due to fluid-structure interactions [1-5]. The presence of such unsteady side loads can also result in adverse control systems of the vehicle in pitch, roll, and yaw [6]. Since the nozzle is located in the wake of the main body, response of the nozzle and the associated mechanical systems to the oscillating outer flow in the presence of asymmetric loading due to internal flow has been studied [4, 7, 8]. The investigations have demonstrated the origin of these unsteady phenomena at the base of the nozzle are 1) asymmetric separation line, 2) pressure pulsations at the separation and reattachment locations, 3) aeroelastic coupling, 4) transition of separation pattern between restricted shock separation (RSS) and full shock separation (FSS), and 5) external flow instabilities such as buffeting[9]. A computational approach to model the fluid-structure interactions of the one such nozzle using detached-eddy simulations coupled with second-order structural computations for different nozzle configurations has been studied [10].

In fluid dynamics research community, the efficient and effective control of turbulent flow has turned an upcoming goal. Innumerable applications of turbulence flow control include viscous drag reduction in numerous aerodynamic and hydrodynamic applications, regulation of heat transfer, reduction of wall pressure fluctuations and flow-generated noise, reduced oscillation and unsteadiness in resonance-dominated flows, and so on. These control techniques are also used to delay the transition to turbulence, and prevention/delay of boundary-layer separation in various internal and external flows leading to performance loss. The interaction of pressure distribution in the expansion corner with the boundary layer and thickness of upstream flow was studied by Wick[11]. Boundary layer is a cause of fluid for the corner flow and it was found that air expands



## Design of Bio Digester for CMR Technical Campus Hostel Using Kitchen Waste

M. Ahmed Ali Baig<sup>1</sup>, Khasim Sharif Sk<sup>2</sup>, G.S.N.Murthy<sup>3</sup>, K. Ramu<sup>4</sup>

<sup>1</sup>Professor, Mechanical Engineering Department, CMR Technical Campus, Hyderabad, JNTUH, India

<sup>2</sup>Assistant professor Mechanical Engineering Department, CMR Technical Campus, Hyderabad, JNTUH, India

<sup>3</sup>Professor, H&S Department, CMR Technical Campus, Hyderabad, JNTUH, India CMRTC/JNTUH, India

<sup>4</sup>Student, Mechanical Engineering Department, CMR Technical Campus, Hyderabad, JNTUH, India

**Abstract:** Biomass is a versatile energy source that can be used for production of heat, power, transport fuels and biomaterials, apart from making a significant contribution to climate change mitigation. The terms biomass energy, bioenergy and biofuels cover any energy products derived from plant or animal or organic material. The work presented in this paper is an attempt towards utilization of abundantly available biomass in different forms around us. The source of biomass considered for this study is the kitchen waste available from CMR Technical Campus hostel, Hyderabad. The paper presents the volume of biomass available at the said location and the effective ways of utilizing it. The most reliable source of biomass conversion, i.e. Bio digester is chosen as an energy convertor. After conducting a survey about the type and quantity of the waste, an attempt is made to design a biogas digester which suits to nature and quantity of waste. Thus it is planned to produce biogas from the bio digester and the same be used for cooking purpose in hostel, in effect contributing to saving of energy.

**Keywords:** Anaerobic digestion, Biogas, Kitchen waste, Bio Digester

### I. Introduction

Biomass energy systems have the potential to address many environmental issues, especially global warming and greenhouse gases emissions, and foster sustainable development among poor communities. Biomass fuel sources are readily available in rural and urban areas of all countries. Biomass-based industries can provide appreciable employment opportunities and promote biomass re-growth through sustainable land management practices. The increasing interest in biomass energy and biofuels has been the result of the associated benefits like Potential to reduce GHG emissions, Energy security benefits, Substitution for diminishing global oil supplies, Potential impacts on waste management strategy, Capacity to convert a wide variety of wastes into clean energy, Technological advancement in thermal and biochemical processes for waste-to-energy transformation. Biochemical processes, like anaerobic digestion and sanitary landfills, can also produce clean energy in the form of biogas and producer gas which can be converted to power and heat using a gas engine.

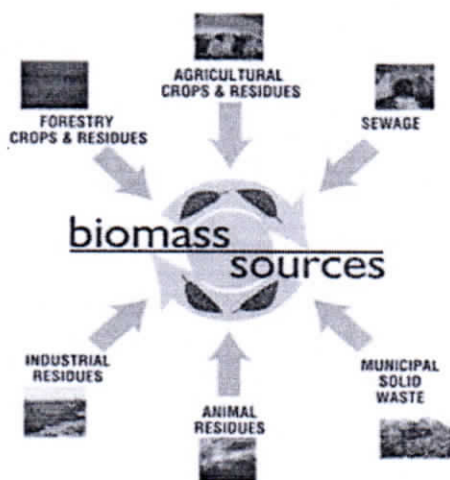


Fig 1

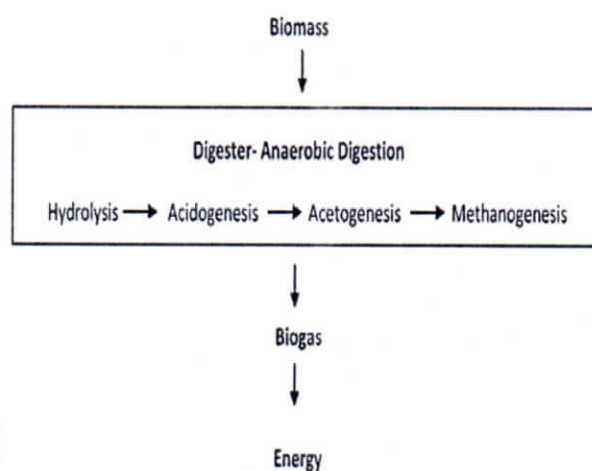


Fig 2



## Control of Wall Pressure Flow Field with Micro Jets and Control Effectiveness

Musavir Bahir<sup>1</sup>, Qummare Azam<sup>2</sup>, S. A. Khan<sup>3</sup>, M. Ahmed Ali Baig<sup>4</sup>

<sup>1</sup>Research Scholar, School of Aerospace Engineering, University Sains Malaysia (USM), Penang, Malaysia

<sup>2</sup>School of Mechanical Engineering, University Sains Malaysia (USM), Penang, Malaysia

<sup>3</sup>Professor, Department of Mechanical Engineering, International Islamic University Malaysia (IIUM), Malaysia

<sup>4</sup>Professor, Department of Mechanical Engineering, CMR Technical Campus, Hyderabad, India

**Abstract:** This paper presents an experimental study of airflow from convergent-divergent nozzles discharged into enlarged duct, focusing attention on the flow development in the duct. To investigate the influence of active control on the flow field developed in the duct, the tiny jets of 0.05 mm radius located at 90° interval along the base at 6.5 mm from the main jet were employed. The Mach number tested in the present study was 1.48. The area ratio tested was 2.56. The NPR tested are from 3, 5, 7, and 9 respectively. The L/D ratio of the duct was varied from 10 to 1. The level of expansion at the nozzle exit influences the wall pressure very strongly. When the micro jets were activated they found to influence the base region, taking the wall pressure to considerably higher values, for most of the cases. Flow field in the duct with and without control remains the same.

### I. Introduction

With the demand to acquire the advanced launchers, rockets and scramjets to meet the future economic requirements, the design aspects have to be researched further. In the development of advanced future nozzle designs for propulsion systems, the performance increases along with the reduction of cost, which is of course the most encouraging issue. Therefore, in base flow aerodynamics, a lot of concentration is being given to the base flow of the aerodynamic vehicles. The scope ranges from the nozzle design, flow field interactions, shock wave-boundary layer interactions, base drag and advanced concepts for these investigations. For example, in Europe, high area ratio concept is gaining strength for future engines, therefore is investigated to par with the requirements[1]. The performance is highly dependent on the aerodynamic design of the expansion nozzle, the main parameters being the area ratio and length to diameter ratio[2]. The literature supports the dependence of the parameters to control the base drag of the flow. As the separation phenomenon is dominant at higher Mach numbers, different kinds of dynamic loads and phenomenon occur when the flow is separation. One such phenomenon is wall pressure effect on the flow analysis, which in turn affects the performance of the flow. There are two types of control techniques employed to control the flow viz. active and passive categories[3, 4]. Passive methods do not require external energy input but involve fixed geometrical modifications and hence are advantageous from an integration and robustness standpoint[5]. However, passive techniques generally do not work well at off-design conditions and may introduce other penalties, such as increased drag. In active flow control schemes, an external energy input is used to introduce certain disturbances, ideally at critical points, in the flow field and tailor the natural behavior of the flow according to the control objectives. Active control allows more flexibility than passive control[5]. However, for the active control strategy to be deemed practical, the energy expenditure needed for control should have some acceptable relation to the benefits achieved through control. In other words, the control should be efficient in addition to being effective. Therefore, the unstable nature of this flow can be controlled using both active and passive methods. The result from the previous research has proved that active control is not only a workable technology for minimizing the unstable behavior, but also the approach is easily imitated for large scale applications [6-8]. It was investigated that the pressure in the augmented area is related to the boundary layer type and thickness upward of the expansion [9]. The effectiveness of bleed in the wake region and the flow field at higher Mach number showed that the pressure remains uniform across the plane [10, 11]. Initially, the average base pressure showed a gradual increment with the bleed flow rate, and the optimal results were characterized by a weak corner expansion, minimum shear value and absence of recirculation phenomenon. The experimental investigation to study the effectiveness of tiny jets at various level of expansion to control the base pressure in the abruptly expanded ducts is carried out [12-15]. From their investigation they observed that the base enhancement is more than 100 % for some set of parameters and control does not alter



## Optimization of Process Parameters of Plasma Arc Cutting Using Taguchi's Robust Design Methodology

Dr.S.V.S.S.Srinivasa Raju<sup>1</sup>, K.Kodanda Ram<sup>2</sup> D.V.S.S. Satyanarayana<sup>3</sup>,  
M.Sai Nishood Goud<sup>4</sup>

<sup>1</sup>(Professor, Dept. of Mechanical Engineering, VNRVJIE, India)

<sup>2</sup>(Associate Professor, Dept. of Automobile Engineering, VNRVJIE, India)

<sup>3</sup>(Associate Professor, Dept. of Mechanical Engineering, CMR TECHNICAL CAMPUS, India)

<sup>4</sup>(Dept. of Mechanical Engineering, VNRVJIE, India)

**Abstract:** One of the most important nonconventional machining methods is Plasma Arc Machining. Its high accuracy, high finishing, ability of machining any hard materials and to produce intricate shapes increased its demand in the market. It is cheaper than Laser cutting and about ten times faster than Oxy-fuel Cutting and hence is a better option for cutting many jobs. In this work the process parameters that influence the quality of cut in terms of the bevel angle have been analyzed statistically for cutting Mild Steel E350 grade sheets. The Current, Cutting Speed and Arc Gap have been considered as the important parameters. Taguchi Design of Experiments was used and analysis was done by Minitab 17 software. After performing Analysis of Means (ANOM), the optimum parameters have been found, percentage contributions of the parameters on the Bevel Angle have been obtained using Analysis of Variance (ANOVA), Regression equation being computed for the bevel angle and surface plot has been generated to understand the interactions of two factors on the Bevel Angle. From ANOVA it has been observed that the cutting speed influences the Bevel Angle the most with contribution of 62.18 % followed by arc gap with 15.16 % and the current 12.08 %.

**Keywords:** Mild Steel E350 material, Orthogonal Array, Plasma Cutting, Surface Plot and Taguchi Method.

### I. Introduction

Plasma arc cutting (PAC) is a non-conventional manufacturing process capable of processing a variety of electrically conducting materials. It is characterized by an electric arc established between an electrode and the work piece. The electrode acts as the cathode, and the work piece material acts as the anode. PAC process is to increase the energy density generated by the system. In order to achieve higher cutting thickness without losing the quality of the cut, many parameters must be taken into consideration. PAC process shown in Fig.1.

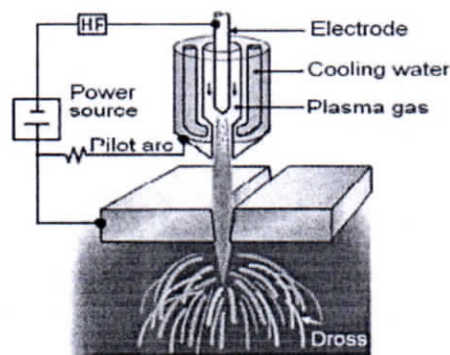


Fig.1 Plasma arc cutting principle

The purpose of this study is to understand the influence of Plasma Arc Cutting on E350 Mild Steel material of bevel angle as quality characteristic and to select Orthogonal Array using design of experiments. This work also involves selection of parameters minimizing the quality characteristic using Taguchi design of experiments. It also calculates percentage contribution of the independent variables on bevel angle using regression equation. A study has been conducted by analyzing the interaction of parameters affecting the bevel angle using surface plots. This work contributes to the development of Plasma Arc Cutting process to achieve desired quality at an optimum cost.



## Control of Wall Pressure Flow Field with Micro Jets and Control Effectiveness

Musavir Bahir<sup>1</sup>, Qummare Azam<sup>2</sup>, S. A. Khan<sup>3</sup>, M. Ahmed Ali Baig<sup>4</sup>

<sup>1</sup> Research Scholar, School of Aerospace Engineering, University Sains Malaysia (USM), Penang, Malaysia

<sup>2</sup> School of Mechanical Engineering, University Sains Malaysia (USM), Penang, Malaysia

<sup>3</sup> Professor, Department of Mechanical Engineering, International Islamic University Malaysia (IIUM), Malaysia

<sup>4</sup> Professor, Department of Mechanical Engineering, CMR Technical Campus, Hyderabad, India

**Abstract:** This paper presents an experimental study of airflow from convergent-divergent nozzles discharged into enlarged duct, focusing attention on the flow development in the duct. To investigate the influence of active control on the flow field developed in the duct, the tiny jets of 0.05 mm radius located at 90° interval along the base at 6.5 mm from the main jet were employed. The Mach number tested in the present study was 1.48. The area ratio tested was 2.56. The NPR tested are from 3, 5, 7, and 9 respectively. The L/D ratio of the duct was varied from 10 to 1. The level of expansion at the nozzle exit influences the wall pressure very strongly. When the micro jets were activated they found to influence the base region, taking the wall pressure to considerably higher values, for most of the cases. Flow field in the duct with and without control remains the same.

### I. Introduction

With the demand to acquire the advanced launchers, rockets and scramjets to meet the future economic requirements, the design aspects have to be researched further. In the development of advanced future nozzle designs for propulsion systems, the performance increases along with the reduction of cost, which is of course the most encouraging issue. Therefore, in base flow aerodynamics, a lot of concentration is being given to the base flow of the aerodynamic vehicles. The scope ranges from the nozzle design, flow field interactions, shock wave-boundary layer interactions, base drag and advanced concepts for these investigations. For example, in Europe, high area ratio concept is gaining strength for future engines, therefore is investigated to par with the requirements[1]. The performance is highly dependent on the aerodynamic design of the expansion nozzle, the main parameters being the area ratio and length to diameter ratio[2]. The literature supports the dependence of the parameters to control the base drag of the flow. As the separation phenomenon is dominant at higher Mach numbers, different kinds of dynamic loads and phenomenon occur when the flow is separation. One such phenomenon is wall pressure effect on the flow analysis, which in turn affects the performance of the flow. There are two types of control techniques employed to control the flow viz. active and passive categories[3, 4]. Passive methods do not require external energy input but involve fixed geometrical modifications and hence are advantageous from an integration and robustness standpoint[5]. However, passive techniques generally do not work well at off-design conditions and may introduce other penalties, such as increased drag. In active flow control schemes, an external energy input is used to introduce certain disturbances, ideally at critical points, in the flow field and tailor the natural behavior of the flow according to the control objectives. Active control allows more flexibility than passive control[5]. However, for the active control strategy to be deemed practical, the energy expenditure needed for control should have some acceptable relation to the benefits achieved through control. In other words, the control should be efficient in addition to being effective. Therefore, the unstable nature of this flow can be controlled using both active and passive methods. The result from the previous research has proved that active control is not only a workable technology for minimizing the unstable behavior, but also the approach is easily imitated for large scale applications [6-8]. It was investigated that the pressure in the augmented area is related to the boundary layer type and thickness upward of the expansion [9]. The effectiveness of bleed in the wake region and the flow field at higher Mach number showed that the pressure remains uniform across the plane [10, 11]. Initially, the average base pressure showed a gradual increment with the bleed flow rate, and the optimal results were characterized by a weak corner expansion, minimum shear value and absence of recirculation phenomenon. The experimental investigation to study the effectiveness of tiny jets at various level of expansion to control the base pressure in the abruptly expanded ducts is carried out [12-15]. From their investigation they observed that the base enhancement is more than 100 % for some set of parameters and control does not alter



## High Speed Trains: A Review

M. Ahmed Ali Baig<sup>1</sup>, S. A. Khan<sup>2</sup>, M. Ansar Ali Baig<sup>3</sup>

<sup>1</sup>Department of Mechanical Engineering, CMR Technical Campus, JNTUH, India

<sup>2</sup>Department of Mechanical Engineering, Faculty of Engineering, IIUM, Malaysia

<sup>3</sup>Department of Electronics & Communication Engineering, CMR Technical Campus, JNTUH, India

---

**Abstract:** This review introduces the concept of high-speed trains in simplistic engineering terms. This review aims to discuss how the high speed trains function and what implications they have on public transportation. The objective of this review is to introduce to the reader the functions of a high-speed train. The scope of this review only extends to reviewing the relevant material provided. This review does not involve an experimental or simulation study. The paper is organized into four sections. Types of tracks, Power, Flow field around the train and economic efficiency of the train. In the depth of this article, the detailed explanation of the track system, power generation, aerodynamics, and the economic efficiency of the high speed train are provided, which will give a perfect visualization of the mechanism [how it works] of the whole system.

**Keywords:** Aerodynamic drag, Derailment, Maglev, Speed, traction.

---

### I. Introduction

“High speed train”, by hearing this phase most of the people obtain a visualization of a train which is moving at a tremendous speed (e.g. Japanese Bullet Train, fastest train alive in the world). But is the concept of high speed train really simple? Is it just moving at a great speed because it is obvious? The answer is “no”.

As intellects say, “don’t judge a book by its cover”, the straight path looking concept of high speed train is a complex maze in reality. To grasp the concept of it [high speed rail], individuals need to be fully aware and properly understand every particular detail [working process, parts to be mainly focused on] of it. But before obtaining a vivid explanation of the concept, gaining a proper definition of high speed train will be more understandable.

High speed train is a kind of train which uses a sophisticated rolling stock system [a system whereby vehicles move on a railway, special designed train sets] and a specialized track to sustain a very high speed. High speed train doesn’t have a worldwide standard over its speed. But in existing system and lines a high speed train can obtain speeds up to 200 or 220 km/h (newly proposed line can elevate it up to 250 km/h). [10]

Keywords such as induction, derailment aerodynamic drag etc. are very simplistic engineering terms and do not require detailed explanation. A person with non-engineering background and knowledge can still find the article useful as the keywords used in this report cater to all. It is believed that high speed train is an important transport in this modern world and will play a very important role [in terms of speed and traveling] in near future. Ergo, to introduce it to the people and propose some valuable ideas toward its development is the main goal/objective of this article.

### II. Types Of Tracks

High speed trains require different types of tracks to run, as the wear on the track from high velocity trains affect it greatly. Hence there are many different forms of railway meant to be able to handle the stress from the passing trains as well as to avoid accidents from occurring and making sure that the passengers are safe.

#### 2.1 Maglev

Maglev system were first made and used in Japan Maglev tracks work on a system of magnetic levitation to move the trains without having contact with the actual train. The magnets allow for the train to move by propulsion allowing for the train to be able to travel at exceedingly fast speeds. Guang Yang & Zhenmin Tang explain this concept as “The maglev train is levitated by the attraction between the controllable suspension electromagnet and the stator pack, and the suspension interstice is hold steadily by controlling suspending exciting current” [1]. This theory can be seen in magnets whereas opposite poles attract, but when similar poles are brought close together, there is a magnetic pull. The repulsion allows the train to levitate. As previously mentioned, by exciting the current, the constant shift in polarity allows for the magnetic field to pull the train and this causes thrust for the train to move forward. With the lack of friction due to not having any



## Effect of Laser Intensities on Additive Manufacturing Process - A Review

MR. D. DEV SINGH<sup>1</sup>, DR. A. RAJI REDDY<sup>2</sup>

<sup>1</sup>Research scholar, Department of Mechanical Engineering, JNTUH Hyderabad, India

<sup>1</sup>Associate Professor, Department of Mechanical Engineering, CMR Institute of Technology /JNTUH Hyderabad, India

<sup>2</sup>Professor & Director, Department of Mechanical Engineering, CMR Technical Campus /JNTUH Hyderabad, India

---

**Abstract:** Design and manufacture of critical components has become an important process and still posing problems towards the desired quality. The critical components can be used in applications of naval, aerospace, biomedical and other applications. Additive manufacturing is an economical and simple process for manufacturing of such complex and intrinsic components. Rapid Prototyping or Additive Manufacturing is defined as conversion of 3D CAD models into physical objects. Rapid Prototyping can be defined as used to generate non-structural and non-functional demo pieces or batch of one component for proof of concept. Whereas Additive Manufacturing is used as a real, scalable manufacturing process, to generate fully functional final components with high-tech materials for low batch, high-value manufacturing.

The present research work is focused on manufacturing such of components using additive manufacturing (by selecting one of the proper manufacturing methods) with combination of alloys of Ti and Al for any applications. The CAD model of the components can be generated using any CAD package, Meshing by Hypermesh package and analyzed by ANSYS package. Performance and material characterization with variation of laser intensities will be conducted on additive manufacturing products. Finally the best composition of materials for additive manufacturing product and laser intensity will be studied, along with their defects and remedies.

**Keywords:** Additive manufacturing, Design and characterization, Rapid prototyping, Ti and Al alloy.

---

### I. Introduction

#### 1.1 Introduction:

Development in every field started, when a wheel manufactured in Iraq, which was happened Before Christ. After that the invention in late the 1903 by the Wright brothers', aircrafts have seen colossal improvements in their design, right from their engine to their outer structure and also from being manned airplane to an unmanned one. An Unmanned Air Vehicle (UAV), in simple terms is an aircraft without a human pilot on board. Its flight is controlled either automatically by computers in the vehicle or under the remote control of a pilot on the ground or in another vehicle. The typical launch and recovery method of an unmanned aircraft is the function of an automatic system or an external operator on the ground. Unmanned Air Vehicle are usually deployed for the military and special operation applications, such as policing and firefighting and non-military security work such as surveillance of pipelines, aerial photography for mapping, surveying and disaster control etc., Unmanned Air Vehicle are usually preferred for missions that are too dull, or dangerous for manned aircrafts. The CAD model of those components can be generated using any CAD package, Meshing by Hypermesh package and analyzed by ANSYS package.

In this research work such components can be developed used for naval, aerospace, biomedical and other applications using the technology of Additive Manufacturing or Rapid Prototyping adopted for the fabrication.

#### 1.2 Rapid Prototyping:

A Prototype is the first original model that has been developed. It is a model or preliminary version. The word Prototype is defined as a non in the Oxford Advanced Learner's Dictionary of Current English. In general covering all aspects of the word Prototype used in design can be defined as, "An approximation of a product / system or its components in some form for a definite purpose in its implementation." Soft or virtual prototyping takes on a new meaning as more computer tools available- computer models can now be stressed, tested, analyzed and modified as if they were physical prototypes.



## Analysis of Single Vendor – Multi Buyer Consignment Inventory

Chidurala Srinivas<sup>1</sup>, A. Raji Reddy<sup>2</sup>

<sup>1</sup>(Professor, Mechanical Engineering Dept., Vaageswari College of Engineering, Karimnagar, India

<sup>2</sup>(Professor, Mechanical Engineering Dept., CMR Technical Campus, Hyderabad, India

**Abstract:** Some significant strategies or practices for streamlining inventory along the supply chain include Consignment models. This paper describes the benefits of Consignment Policy inventory models of single vendor – multi buyer model which is view as a classification of divergent supply chain with end to multi end case which is a distinctive flavor of Vendor Managed Inventory. The change of ownership commences during pull system at which the payment is made to vendor. It evaluates minimum joint total expected cost of vendor and buyer, simultaneously optimise quantitative decision variables. Numerical examples are presented to illustrate the benefit of the proposed strategies and the effects of changes on the cost and parameters are studied.

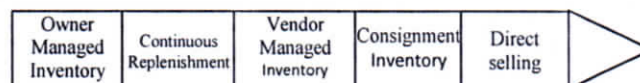
**Keywords:** Consignment Policy, Delay delivery, Information sharing.

### I. Introduction

The field of production and inventory planning and control has moved from elementary rules of thumb used within four walls of factory to sophisticated computer algorithms shared among the trading partners in supply network. With reference to Figure.1, it can predict Vendor Managed Inventory (VMI) is transforming into Consignment Inventory (CI) approach and then elimination of intermediary channels is possible and hence direct selling which gives more profits. Different models have formulated to minimize joint total expected cost of single vendor – multi buyer (upto two buyers) and simultaneously optimize other decision variables such as quantity transported, number of transport operations, delay deliveries and buyer maximum and minimum stocks under stochastic environment.

The basic fundamental of consignment policy is explained in Braglia and Zavanella [1], Valentini and Zavanella [2], Simone and Grubbstrom [3]. Goyal [4] proposed a joint economic lot size model to minimize total costs and is compared with total costs incurred if vendor and buyer act independently. Banerjee [5] generalized Goyal's [4] model by assuming vendor with finite rate produces for a buyer on a lot-for-lot basis under deterministic conditions. Goyal [6] generalized the Banerjee [2] model by relaxing the assumption of the lot-for-lot policy of the vendor.

In CI model vendor use buyer warehouse for keeping the goods produced by the vendor without changing the ownership. To fulfill this concept, the vendor should be close to the buyer production line. This creates a condition of shared benefit, neither the vendor nor the buyer will benefit until the product is sold to an end user. This shared risk benefit condition will often be enough to convince the buyer to stock the products. The key benefit to the buyer should be obvious, that the buyer doesn't have to tie up capital hb, finance. This doesn't mean that there is no inventory carrying costs for the buyer they do still incur costs hb, stock related to storing and managing the inventory i.e., both parties incur holding cost, depending on different rates and the length of time for which materials has been stocked in supply chain (SC). Finally, the buyer sees a lower inventory cost per unit i.e., only hb, stock instead of the entire hb, stock + hb, finance. The vendor will have setup cost and holding cost whereas the buyer will have order emission cost and holding cost. Typically, it is suitable for automobile components, fashion products, pharmaceutical, electronic, fast moving consumer goods, retail items of super and hypermarkets. In some sectors, consignment inventory would be around 15-20% of total inventory.



**Figure 1:** Conceptual evaluation of consignment policy



## Thermal Radiation and Heat Transfer Effects on MHD Micropolar Fluid Flow Past a Vertical Plate with Chemical Reaction

K.BhagyaLakshmi<sup>1</sup>, P.V.Satya Narayana<sup>2</sup> and N.V.R.V.Prasad<sup>3</sup>

<sup>1</sup> (Department of Mathematics, CMR Technical Campus, Medchel, Hyderabad, Telangana, India)

<sup>2</sup> (Department of Mathematics, SAS, VIT University, Vellore 632 014, T.N, India)

<sup>3</sup> (Department of Mathematics, S.V.G.S. Junior College, Nellore, A.P, India)

**Abstract:** We examine the instantaneous effects of chemical reaction and radiation absorption on unsteady MHD free convective heat and mass transfer flow for a micropolar fluid bounded by a semi infinite vertical plate in the presence of heat generation and thermal radiation. The plate is assumed to move with a constant velocity in the direction of fluid flow. A uniform magnetic field acts perpendicular to the porous surface in which absorbs micropolar fluid with a suction velocity varying with time. The dimensionless governing equations of the flow, heat and mass transfer are solved analytically using regular perturbation method. The effects of various pertinent parameters on flow, heat and mass transfer properties are discussed analytically and explained graphically. Also the velocity profiles of micropolar fluid is compared with the corresponding flow problem for a Newtonian fluid and found that the polar fluid velocity is decreasing.

**Keywords:** Chemical reaction, heat transfer, micropolar fluid, MHD, thermal radiation

### I. Introduction

The theory of micropolar fluids was first introduced and formulated by Eringen [1]. This theory displays the effects of local rotary inertia and couple stress. The theory is expected to a mathematical model for the non-Newtonian fluid behavior observed in certain fluid such as exotic lubricants, colloidal fluids, liquid crystals etc., which is more realistic and important from a technological point of view. The theory of thermo micropolar fluids was developed by Eringen [2] by extending his theory of micropolar fluid. Sharma and Gupta [3] studied the effects of medium permeability on thermal convection in micropolar fluids. Prathap Kumar *et al.* [4] have studied the problem of fully developed free convective flow of micropolar and viscous fluids in a vertical channel. Muthu *et al.* [5] studied peristaltic motion of micropolar fluid in circular cylindrical tubes. Srinivasacharya *et al.* [6] analyzed the unsteady stokes flow of micropolar fluid between two parallel porous plates. Muthuraj and Srinivas [7] investigated, fully developed MHD flow of a micropolar and viscous fluids in a vertical porous space using HAM. Kim [8] investigated the effects of heat and mass transfer in the MHD micropolar fluid flow past a vertical moving plate.

The role of thermal radiation on the flow and heat transfer process is major importance in the design of many advanced energy conversion systems operating at higher temperatures. Thermal radiation within the system is the result of emission by hot walls and the working fluid. Effects of chemical reaction and thermal radiation on heat and mass transfer flow of MHD micropolar fluid in rotation frame of reference is investigated by Das [9]. A complete analytic solution to heat transfer of a micropolar fluid through a porous medium was analyzed by Rashidi *et al.* [10]. MHD flow of a micropolar fluid towards a vertical permeable plate with prescribed surface heat flux is investigated by Nor Azizah *et al.* [11]. Ezzat *et al.* [12] studied the combined heat and mass transfer for unsteady MHD flow of perfect conducting micropolar fluid with thermal relaxation. Peristaltic motion of a magneto hydrodynamic micropolar fluid in tube is analyzed by Yongqi Wang *et al.* [13]. Patil, Kulkarni [14] studied the effects of chemical reaction on free convective flow of a polar fluid through a porous medium in the presence of internal heat generation. Kesavaiah *et al.* [15] investigated, effects of the chemical reaction and radiation absorption on an unsteady MHD convective heat and mass transfer flow past a semi-infinite vertical permeable moving plate. Effects of chemical reaction on unsteady MHD heat and mass transfer flow past a semi infinite vertical porous moving plate in the presence of viscous dissipation is analyzed by Bhagya Lakshmi [16]. Many researchers [17–20] have studied the problem of non-Newtonian fluid flows analytically and numerically over various flow geometries.

In this paper we examine the instantaneous effects of chemical reaction and radiation absorption on unsteady MHD free convective heat and mass transfer flow for a micropolar fluid bounded by a semi infinite vertical plate in the presence of heat generation and thermal radiation. The plate is assumed to move with a constant velocity in the direction of fluid flow. A uniform magnetic field acts perpendicular to the porous surface in which absorbs micropolar fluid with a suction velocity varying with time. The dimensionless



## Effect of Viscous Dissipation on MHD Free Convection Flow over an Inclined Plate Embedded In a Porous Medium with Heat Absorption

Siva Reddy Sheri<sup>1</sup>, Prasanthi Modugula<sup>2</sup>

<sup>1</sup>Department of Mathematics, GITAM University, Hyderabad Campus, Telangana, India)

<sup>2</sup>Department of Mathematics, CMRTC, Telangana, India)

**Abstract:** This work is devoted to investigate the influence of viscous dissipation on the magneto hydro dynamic (MHD) free convection flow of an electrically conducting incompressible viscous fluid over an inclined plate embedded in a porous medium with heat absorption. The dimensionless governing equations for this investigation are solved numerically by using Finite element method. With the help of graphs, the effects of the various important parameters entering into the problem on the velocity, temperature and concentration are discussed. The effects of the pertinent parameters on the skin friction, Nusselt number and Sherwood number at the wall are presented numerically in tabular form. In addition, the results obtained show that these parameters have significant influence on the flow. Finally present numerical results are compared with the existing literature and there is an excellent agreement between the results.

**Keywords:** FEM, Heat absorption, Inclined plate, MHD, Viscous dissipation.

### 1. Introduction

The convective heat and mass transfer flows in an inclined plate embedded in a porous medium has many engineering and geophysical applications such as chemical industry, geothermal reservoirs, drying of porous solids, thermal insulation, enhanced oil recovery, MHD power generators, packed-bed catalytic reactors, cooling of nuclear reactors and underground energy transport. Chamkha [1] discussed unsteady MHD convective heat and mass transfer past a semi-infinite vertical permeable moving plate with heat absorption. Nonlinear macrokinetics of heat and mass transfer and chemical or electrochemical reactions has explored by Sieniutycz [2]. Conjugate effects of heat and mass transfer on MHD free convection flow over an inclined plate embedded in a porous medium have investigated by Farhad Ali et al. [3].

There has been a renewed interest in studying magneto hydro dynamic (MHD) flow and heat transfer in porous and non-porous media due to the effect of magnetic fields on the boundary layer flow control and on the performance of many systems using electrically conducting fluids. In addition, this type of flow has attracted the interest of many investigators in view of its applications in many engineering problems such as MHD generators, plasma studies, nuclear reactors, geothermal energy extractions. The effect of an electromagnetic field on natural convection in an inclined porous medium was reported by Bian et al. [4]. Chamkha et al. [5] studied unsteady MHD free convective heat and mass transfer from a vertical porous plate with hall current, thermal radiation and chemical reaction effects.

Natural convection heat transfer induced by internal heat generation has recently received considerable attention because of numerous applications in geophysics and energy-related engineering problems. Acharya and Goldstein [6] studied numerically two-dimensional natural convection of air in an externally heated vertical or inclined square box containing uniformly distributed internal energy sources. Their numerical results showed two distinct flow pattern systems depending on the ratio of the internal to the external Rayleigh numbers. Also, it was found that the average heat flux ratio along the cold wall increased with increasing external Rayleigh numbers and decreasing internal Rayleigh numbers. Rapits [7] examined mathematically the case of time varying two-dimensional free convective flow of an incompressible, electrically conducting fluid along an infinite vertical porous plate embedded in a porous medium. Recently, Radiation Effects on MHD free convection flow along vertical flat plate in presence of joule heating and heat generation was reported by Mohammad mokaddes ali et al. [8].

The chemical reaction effect depends on the heterogeneous or homogeneous of the reaction. And this effect depends on the occurrence at an interface a single- phase volume reaction. A reaction is said to be of the order  $n$ , if the reaction rate is proportional the  $n$ -th power of the concentration. When, the rate of the reaction is directly proportional to the concentration itself, such reactions are of the first order. If we consider air or water, these don't occur naturally but mixed with foreign mass. This foreign mass is responsible for chemical





## DNA Binding/Cleavage Activity, Cytotoxic, and Density Functional Theory Studies of Pyridyl-Tetrazole Cu(II) Complexes

C. Amaravathi, Shaik Mustafa, M. S. Surendra Babu\*

Department of Chemistry, GITAM University Hyderabad Campus, Hyderabad - 502 329, Telangana, India.

Received 12<sup>st</sup> September 2016; Revised 09<sup>th</sup> October 2016; Accepted 11<sup>th</sup> October 2016

### ABSTRACT

A new series of Cu(II) complexes were synthesized from isomeric pyridyl-tetrazole ligands such as 2-(1-vinyl-1H-tetrazol-5-yl)pyridine (L1), 2-(2-vinyl-2H-tetrazol-5-yl)pyridine (L2), N,N-dimethyl-3-(5-(pyridin-2-yl)-1H-tetrazol-1-yl)propan-1-amine(L3), and N,N-dimethyl-3-(5-(pyridin-2-yl)-2H-tetrazol-2-yl)propan-1-amine (L4). All these complexes were characterized by the elemental analysis, molar conductance, Fourier transform infrared, ultraviolet-visible (UV-VIS), magnetic moment, and electron spin resonance studies. The conductance and spectroscopic data suggested that the ligands act as monobasic bidentate ligands and form square planar complexes with general formula  $[Cu(L)Cl_2]$ . Highest occupied molecular orbital and lowest unoccupied molecular orbital studies of complexes were carried by density functional theory calculation using B3LYP method. Binding studies were carried by UV-VIS absorption revealed that each of these complexes is avid binders of calf thymus DNA. The nucleolytic cleavage activities of complexes were carried on double-stranded pBR322 circular plasmid DNA using a gel electrophoresis experiment under various conditions, where cleavage of DNA takes place by oxidative free radical mechanism ( $\bullet OH$ ). Further modification of complex structure can further improve the cleavage activity in nano concentration to decrease the side effects.

**Key words:** Pyridyl-tetrazole, Pendant arm, Copper complexes, DNA binding.

### 1. INTRODUCTION

A vital polyazole heterocyclic compound is tetrazole, which can act as isostere to carboxylic group [1-4]. The major metal coordination studies are limited to metal-organic frameworks (MOF), where a tetrazole ligand is able to show nine different types of coordination, with a vast array of structural diversities having various topologies. These are used in various applications such as fluorescent sensor [5,6], organometallic, coordination chemistry [7], and organocatalysis and medicinal chemistry [8]. Copper-tetrazolate complexes have come to dominate the area of generation MOF in past few years [9-13]. Most of these synthesized frameworks or mononuclear compounds have shown interesting magnetic [8,14] catalytic [10], photoluminescence [13], or gas absorption [15] properties.

Transition metal complexes of tetrazolate have shown selective groove binding and inhibit selective cancer cells [16]. The interactions between DNA and copper tetrazolate complexes are relatively rare in the literature [17]. The DNA binding studies with tetrazolate complexes have drawn its attention

because of their site-specific binding properties. In light of the above and in continuation of our ongoing research work [18,19] on metal-DNA interactions and cytotoxic activity here, we describe the synthesis characterization, DNA binding, cleavage, and cytotoxic activity of Cu(II) complexes with regioisomeric ligands of 2-(1-vinyl-1H-tetrazol-5-yl)pyridine[L1:L2] and 2-[5-(pyridin-2-yl)-tetrazol-1-yl]propyl-N,N-dimethylamine[L3:L4].

### 2. EXPERIMENTAL

#### 2.1. Materials and Reagents

Chemicals were purchased from Sigma-Aldrich and copper chloride used in the preparation of the complexes is of reagent grade. The solvents used in the synthesis of the ligands and metal complexes were distilled before use. All other chemicals were of AR grade and were used without further purification. Agarose, used in gel electrophoresis, was purchased from Sigma-Aldrich; Calf thymus (CT) DNA and plasmid pBR322 were purchased from Genie Biolabs, Bengaluru, India. The elemental analysis of carbon, hydrogen, and nitrogen contents was performed using PerkinElmer CHNS analyzer. Molar conductance

\*Corresponding Author:  
E-mail: manabolu@gmail.com



## Design of Bio Digester for CMR Technical Campus Hostel Using Kitchen Waste

M. Ahmed Ali Baig<sup>1</sup>, Khasim Sharif Sk<sup>2</sup>, G.S.N.Murthy<sup>3</sup>, K. Ramu<sup>4</sup>

<sup>1</sup>Professor, Mechanical Engineering Department, CMR Technical Campus, Hyderabad, JNTUH, India

<sup>2</sup>Assistant professor Mechanical Engineering Department, CMR Technical Campus, Hyderabad, JNTUH, India

<sup>3</sup>Professor, H&S Department, CMR Technical Campus, Hyderabad, JNTUH, India CMRTC/JNTUH, India

<sup>4</sup>Student, Mechanical Engineering Department, CMR Technical Campus, Hyderabad, JNTUH, India

**Abstract:** Biomass is a versatile energy source that can be used for production of heat, power, transport fuels and biomaterials, apart from making a significant contribution to climate change mitigation. The terms biomass energy, bioenergy and biofuels cover any energy products derived from plant or animal or organic material. The work presented in this paper is an attempt towards utilization of abundantly available biomass in different forms around us. The source of biomass considered for this study is the kitchen waste available from CMR Technical Campus hostel, Hyderabad. The paper presents the volume of biomass available at the said location and the effective ways of utilizing it. The most reliable source of biomass conversion, i.e. Bio digester is chosen as an energy convertor. After conducting a survey about the type and quantity of the waste, an attempt is made to design a biogas digester which suits to nature and quantity of waste. Thus it is planned to produce biogas from the bio digester and the same be used for cooking purpose in hostel, in effect contributing to saving of energy.

**Keywords:** Anaerobic digestion, Biogas, Kitchen waste, Bio Digester

### I. Introduction

Biomass energy systems have the potential to address many environmental issues, especially global warming and greenhouse gases emissions, and foster sustainable development among poor communities. Biomass fuel sources are readily available in rural and urban areas of all countries. Biomass-based industries can provide appreciable employment opportunities and promote biomass re-growth through sustainable land management practices. The increasing interest in biomass energy and biofuels has been the result of the associated benefits like Potential to reduce GHG emissions, Energy security benefits, Substitution for diminishing global oil supplies, Potential impacts on waste management strategy, Capacity to convert a wide variety of wastes into clean energy, Technological advancement in thermal and biochemical processes for waste-to-energy transformation. Biochemical processes, like anaerobic digestion and sanitary landfills, can also produce clean energy in the form of biogas and producer gas which can be converted to power and heat using a gas engine.

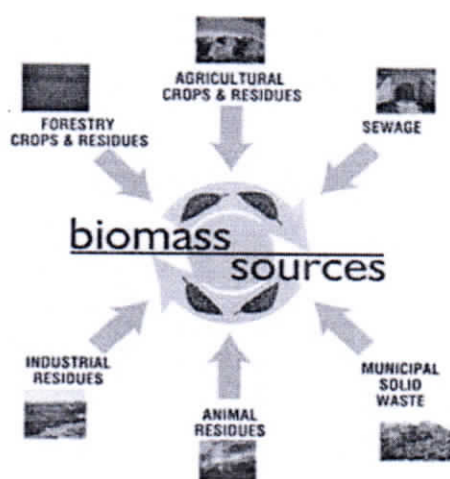


Fig 1

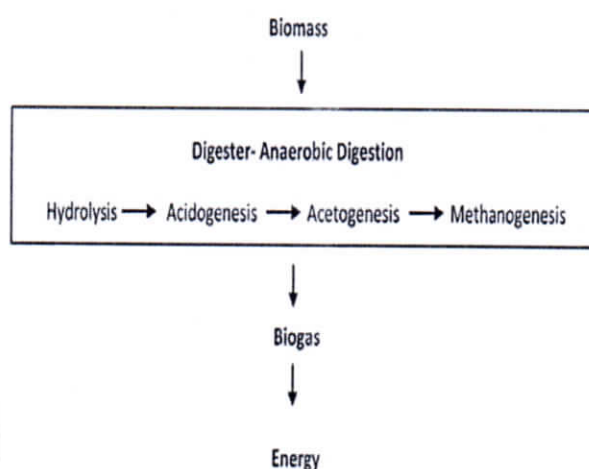


Fig 2



## Experimental studies on Impact resistance of Ternary concrete and Steel Fiber Reinforced Ternary concrete using MS and GGBS

Vijaya Bhaskar Reddy Suda<sup>1</sup>, P.Srinivasa Rao<sup>2</sup>

Professor and Head, Dept of Civil Engineering, CMR Technical Campus, Hyderabad, T.S. India<sup>1</sup>

Professor and Principal, Dept of Civil Engineering, J.N.T.U. College of Engineering, Hyderabad, T.S. India<sup>2</sup>

**Abstract:** Concrete is an intrinsically brittle material prone to damage through the impact of heavy objects and loads. There are several situations in which concrete structural elements are subjected to impact loading particularly industrial floors, Runways, exposed edges and rises. In this investigation, an attempt is made to study the impact resistance of Ternary blended concrete (TBC) subjected to drop weight test in accordance with the procedure suggested by ACI committee 544.2R-89. Ternary concretes were obtained by adding MS (5%, 10% and 15%) and GGBS (20% 30% 40% and 50%) to the Ordinary Portland cement. And also the study was extended to assess the impact resistance of Steel Fiber Reinforced Ternary Blended Concrete (SFRTBC). The concrete composites comprises of crimped steel fibers of aspect ratio (l/d) as 60 in various proportions viz., 0%, 0.5%, 1.0%, 1.5%, 2.0% by volume of concrete, with water to cement ratio 0.55. Impact strength characteristic of ternary concrete (TC) and fibrous ternary concrete for all the combinations were determined at 7, 28, and 90 day curing. The addition of steel fibers to concrete has improved the impact resistance considerably. The test results showed the variation of impact energy strength with different volume fraction of fibers. Investigation program included the determination of the optimum fiber content which can be provided in the concrete composites for different mix ratios.

**Keywords:** Crimped steel fiber, GGBS, Impact strength, Micro silica, Steel fiber reinforced ternary Concrete, Ternary concrete.

---

### I. Introduction

Today, the structural Engineers are facing the problem of ensuring the safe structures which will withstand for the impact loads in addition to static loads. Many concrete structures are often subjected to short duration dynamic loads. These loads originate from sources such as impact from missiles and projectiles, wind gusts, earthquakes and machine vibrations. The need to accurately predict the structural response and reserve capacity under such loading had led researches to investigate the mechanical properties of the component materials at such high rates of strain. Impact is a complex dynamic phenomenon involving crushing shear failure and tensile fracturing. It is also associated with penetration, Perforation, Fragmentation and scaling of the target being hit. The use of fibers was found to be advantageous in both static and impact conditions. One method to improve the resistance of concrete when subjected to impact or impulsive loading is by the incorporation of randomly distributed short fibers. Concrete so reinforced is called Fiber Reinforced Concrete (FRC). Many investigators have shown that addition of fibers greatly increase the energy absorption and cracking resistance characteristics of concrete. [1] In the recent times, impact resistance of concrete is recognized as an important property in infrastructure construction. Several methods have been suggested by different guidelines that evaluate the impact resistance of FRC (ACI committee 544) such as Charpy test, Projectile test, Explosive test and Drop weight test. Among them drop weight is simplest, popular and attractive method suggested by the ACI committee 544.

Impact resistance is one of the important attributes of FRC. Conventionally, impact resistance has been characterized by measure of the number of blows in a "repeated impact" test to achieve a prescribed level of distress in the test specimen. Steel Fiber Reinforced Concrete [SFRC] promises good ductility and improved mechanical responses. The addition of Steel fibers to concrete improves the impact and fracture that are governed by toughness characteristics of concrete. In fact, Steel fibers bridge these cracks and restrain their widening and thus improve the post peak ductility and energy absorption capacity. Toughness can determine from the experimental and analytical evaluation. A repeated drop weight impact test (equipment and procedures) has been published by ACI committee 544. This reports yields number of blows required to cause a certain level of distress in fiber Reinforced concrete [FRC] specimen [2].



## Partial Replacement of Cement in Concrete with Sugarcane Bagasse Ash and its Behaviour in Aggressive Environments

G. Nithin Kumar Reddy<sup>1</sup>, G. Harsha Vardhan<sup>2</sup>, S. Vijaya Bhaskar Reddy<sup>3</sup>

<sup>1</sup> Department of Civil Engineering, Assistant profecer, Geethanjali College of Engineering

<sup>2</sup> Department Civil engineering, B.Tech final year, Vardhaman College of Engineering

<sup>3</sup> HOD, Department of civil engineering, C M R Technical Campus

**Abstract:** The researches has shown that every one ton of cement manufacture releases half ton of carbon dioxide, so there is an immediate need to control the usage of cement. On the hand materials wastes such as Sugar Cane Bagasse Ash is difficult to dispose which in return is environmental Hazard. The Bagasse ash imparts high early strength to concrete and also reduce the permeability of concrete. The Silica present in the Bagasse ash reacts with components of cement during hydration and imparts additional properties such as chloride resistance, corrosion resistance etc. Therefore the use of Bagasse ash in concrete not only reduces the environmental pollution but also enhances the properties of concrete and also reduces the cost. This project mainly deals with the replacement of cement with Bagasse ash in fixed proportions and analysing the effect of magnesium sulphate on SCBA blended concrete. The concrete mix designed by varying the proportions of Bagasse ash for 0%, 5%, 10%, 15%, 20%, 25% the cubes are been casted and cured in normal water and 5% magnesium sulphate solution for ages of 7, 28 and 60 days, the properties like slump cone test and compaction factor test for fresh concrete and compressive strength for hardened concrete are verified and results are analysed.

### I. Introduction

The present work is to carry out a detailed analysis of the Concrete mix designs for various grades of concrete (M35 and M40) with different percentages of SUGARCANE BAGASSE ASH (0%, 5%, 10%, 15%, 20%, 25%). Cubes are subjected to normal chemical curing and Testing the specimens at various ages. Plotting graphs and comparing the compressive strengths of blended concrete cubes in normal and chemical curing. Ordinary Portland cement is the most commonly used building material throughout the world and it will retain its status in near future also because of demand and expansion of construction industry all over the world. Further the greatest challenge before the concrete construction industry is to serve the two pressing needs of human society, namely the protection of environment and meeting the infrastructure requirements of our growing population Structures which are constructed in aggressive environments are liable to be subjected to acidic attack. One of such major problems is sulphate attack against concrete structures due to which there will be loss of weight and reduction in strength of concrete. Contaminated ground water, seawater, industrial effluents are some of the sources of sulphate that attack on concrete. The use of blended cements have shown a sharp results in resisting the sulphate attack on concrete, sugarcane bagasse ash which shows pozzolanic properties is being used as a partial replacement in concrete in regular intervals of 5% upto 25%. SCBA is being produced from sugar manufacturing units as a waste material which will be grinded to the fineness less than cement for obtaining good bonding between cement and SCBA. This project discusses the very severe exposure of magnesium sulphate on concrete.

Bagasse is a by-product from sugar industries which is burnt to generate power required for different activities in the factory. The burning of bagasse leaves bagasse ash as a waste, which has a pozzolanic property that would potentially be used as a cement replacement material. It has been known that the worldwide total production of sugarcane is over 1500 million tons. Sugarcane consists about 30% bagasse whereas the sugar recovered is about 10%, and the bagasse leaves about 8% bagasse ash (this figure depend on the quality and type of the boiler, modern boiler release lower amount of bagasse ash) as a waste, this disposal of bagasse ash will be of serious concern. Sugarcane bagasse ash has recently been tested in some parts of the world for its use as a cement replacement material. The bagasse ash was found to improve some properties of the paste, mortar and concrete including compressive strength and water tightness in certain replacement percentages and fineness. The higher silica content in the bagasse ash was suggested to be the main cause for these improvements. Although the silicate content may vary from ash to ash depending on the burning conditions and other properties of the raw materials including the soil on which the sugarcane is grown, it has been reported that the silicate undergoes a pozzolanic reaction with the hydration products of the cement and results in a



## The Boggulakonda Gabbros, Prakasam District, Andhra Pradesh, India: A Rich Source of Building Material

M. Maria Kumar<sup>1</sup>, G. Vamshi Krishna<sup>2</sup>, S. V. Bhaskar Reddy<sup>3</sup>,  
R. Anil Kumar<sup>4</sup> and J. Ratnakar<sup>1</sup>

Department of Geology, Osmania University, Hyderabad - 500007<sup>1</sup>

Department of Applied Geochemistry, Osmania University, Hyderabad-500007<sup>2</sup>

Department of Civil Engineering, CMR Technical Campus, Hyderabad.<sup>3</sup>

Department of Civil Engineering, JNTU College of Engineering, Hyderabad<sup>4</sup>

**Abstract:** Selection of suitable building material for construction of civil structures, irrespective of size, is of utmost importance because the strength and longevity of structure depends on physical and chemical properties of earthy material such as porosity, permeability, structure, texture, grain size, hardness, colour, mineralogy and whole rock chemical composition. In general, igneous rocks serve as the best earthy construction materials because of their physical and chemical properties. Since the igneous rocks are primary rocks which are formed by solidification of magma over varying temperature and pressure conditions, they show variation in colour, texture, mineralogy and hardness. An important igneous rock called 'gabbro' which forms the lower crust (the upper layer of earth's interior upto 36 km depth), is one of the best material for civil construction work. Gabbros are dark coloured (melanocratic) intrusive igneous rocks with coarse grained texture formed at deep seated conditions in the crust. The gabbro plutons of Prakasam alkaline rock province are emplaced within the Precambrian amphibolite and granite gneiss and their emplacement is tectonically controlled. Boggulakonda is one area in the Prakasam District that is occupied by gabbroic rocks. The province has experienced four episodes of folding. The F3 fold axis trending NNE-SSW coincides with the orientation of the gabbro plutons. Gabbro has a variety of uses in the construction industry. It is used for everything from crushed stone base materials at construction sites to polished stone counter tops and floor tiles. Gabbros are known to contain economic mineral deposits. Gabbros containing significant amounts of the mineral ilmenite are mined for their titanium content. Elsewhere, gabbros are mined to yield nickel, chromium and platinum.

**Keywords:** Gabbro, Igneous rock, Magma, Earth's Crust, Province, Building Material, Boggulakonda, Prakasam District, Andhra Pradesh.

### I. Introduction

Earthy building material can be defined as 'any hard or soft material formed by natural processes of magmatism, sedimentation, metamorphism and weathering of rocks over geological time and space'. The products of these processes include igneous rocks (formed from magma and lava including plutonic, hypabyssal and volcanic rocks), sedimentary rocks (formed by weathering, transportation and deposition of sediments including clastic and non-clastic rocks), metamorphic rocks (formed by regional and contact metamorphism including granulites, amphibolites, greenschists, glaucophane schists, zeolites, hornfelses and marbles of various types). Among all the igneous rocks, a plutonic rock called 'gabbro' (and its hypabyssal equivalent 'dolerite') may be considered as an important 'earthy building material' that has been variously described as 'black granite', 'galaxy granite' etc. Gabbroic rocks occur in abundance in Prakasam District of Andhra Pradesh. The igneous intrusive rocks that formed during Mesoproterozoic-Neoproterozoic period (1600-542 million years) in the Prakasam District of Andhra Pradesh were identified to define an igneous province called 'Prakasam alkaline rock province' (see Fig. 1; Table 1) by Professor Dr. Dr. Chervala Leelanandam (Dept of Geology, Osmania University, Hyderabad), the doyan of Indian Geology, in 1981 and explained in detail in 1989 [1,2].



## Influence of Mineral admixtures on Compressive strength of Ternary concrete with different Water binder ratios

Vijaya Bhaskar Reddy Suda<sup>1</sup>, P.Srinivasa Rao<sup>2</sup>

Professor and Head, Dept of Civil Engineering, CMR Technical Campus, Hyderabad, T.S. India<sup>1</sup>

Professor and Principal, Dept of Civil Engineering, J.N.T.U. College of Engineering, Hyderabad, T.S. India<sup>2</sup>

**Abstract:** The use of pozzolans such as Micro silica (MS), Ground Granulated Blast Furnace Slag (GGBS), Fly ash, Metakaolin, Rice husk ash etc. in cement concrete, individually as a mineral admixture (MA) has been studied widely. Information available is less, when both MS and GGBS together are present in blended concretes. Therefore the present study is directed towards developing a better understanding on the combined performance of MS and GGBS on the strength properties of Ternary concrete over an Ordinary concrete. An extensive experimentation was carried out to arrive at optimum level of MS and GGBS. Three controlled concrete mixtures and twelve ternary concrete mixtures were prepared for each water cement ratio i.e. (0.55, 0.45, and 0.35) in three groups, according to their binder content. Ternary concretes were obtained by adding MS (5%, 10% and 15%) and GGBS (20% 30% 40% and 50%) to the ordinary Portland cement. Compressive strength characteristic of ternary concrete (TC), for all the combinations were determined at 7, 28, and 90 days. Ternary concrete have exhibited good improvements on ordinary concrete. The experimental results showed that, the strength properties of Ternary concrete increases with increase in cement replacement level (CRL) of cement replacement materials (CRM) i.e. MS and GGBS. After an optimum point, at around 40% of the total binder content, the addition of MS and GGBS does not improve the strength properties.

**Keywords:** Compressive strength, CRL, CRM, GGBS, Micro Silica, Ordinary Portland cement and Ternary concrete.

### I. Introduction

In the recent past, good attempts have been made for the successful utilization of various industrial by products such as (fly ash, micro silica, rice husk ash, ggbs, and metakaolin.etc.) to save environmental pollution by reducing the utilization of cement, without compromising the present requirements of huge infrastructure like high-rise buildings, large span bridges, etc. Otherwise rapid production of cement is required to meet the huge demand and it leads to the release of hazardous gasses such as CO<sub>2</sub> and NH<sub>4</sub> in to the atmosphere which creates severe environmental problems. It has been reported that over 90% of carbon dioxide emissions from the concrete industry are attributable to Portland cement clinker production, and approximately one tonne of CO<sub>2</sub> is generated for making one tonne of clinker (Malhotra, 2004). [1]. The scarcity of natural raw material, depleting energy resources, problems of disposal of waste materials and global warming due to emission of green house gases are the long – term results of rapid industrialization. Every industry tries its best to combat and minimizes these global problems in concrete construction; the primary route is to reduce the content of ordinary Portland cement (OPC) in concrete. Micro silica (MS) and Ground Granulated Blast furnace Slag (GBS) are Mineral admixtures (MAs) which can utilize both heat and calcium hydroxide generated during hydration of cement. Because of these reason, they can become good cement replacement material (CRM), as recognized now in IS: 456-2000 (Rajamane, 2001: BIS, 2000) [2]. The engineering benefits from the use of mineral admixtures in concrete result partly from their particle size distribution characteristics, and partly from the pozzolanic and cementitious reactivity. When OPC is replaced by GGBS the rate of gain of strength of concrete is slower at early age, and this limits its use in concrete where early age strength is desirable. To overcome this problem Micro silica is employed with GGBS in ternary concrete and it increases early strength of concrete by formation of secondary C-S-H gel at early stages due to fast pozzolanic reaction. The synergic effect of CRMs in ternary blend cement system enhances mechanical properties as well as make the resultant concrete durable (Mullic 2007). [3] It is well documented the use of fly ash along with ggbs in concrete results in a significant improvement in the mechanical properties of concrete, but researchers are yet to arrive at a unique conclusion regarding the use of GGBS along with micro silica. The present investigation was aimed to determine the combined influence of Micro silica and GGBS on the compressive strength of ternary concrete.







## Design And Drafting of Hvac, Central Air Conditioning System For An Office Building

K. Ratna Kumari<sup>1</sup>, A. Raji Reddy<sup>2</sup>, M. Vidya Sagar<sup>3</sup>

<sup>1</sup> Assistant Professor, Mechanical Department, Cmrtc, Jntuh, Hyderabad, Telangana, India

<sup>2</sup> Professor & Director, Cmrtc Mechanical Department, , Hyderabad, Telangana, India

<sup>3</sup> Professor, Mechanical Department, Jntuceh Hyderabad, Telangana, India

**Abstract :** The heating, ventilation, and air-conditioning (HVAC) system is arguably the most complex system installed in a building and is responsible for a substantial component of the total building energy use. A right-sized HVAC system will provide the desired comfort and will run efficiently. Right-sizing of an HVAC system is the selection of equipment and the design of the air distribution system to meet the accurate predicted heating and cooling loads of the house. Right-sizing the HVAC system begins with an accurate understanding of the heating and cooling loads on a space; however, a full HVAC design involves more than just the load estimate calculation; the load calculation is the first step of the iterative HVAC design procedure. This strategy guideline discusses the information needed to design the air distribution system to deliver the proper amount of conditioned air to a space. Heating and cooling loads are dependent upon the building location, siting, and the construction of the house, whereas the equipment selection and the air distribution design are dependent upon the loads and each other.

**Keywords:** heating, ventilation, and air-conditioning (HVAC), air handling unit, refrigeration cycle, heat load estimation, u factor

### I. Introduction

Many of the situations requiring mechanical ventilation also need a degree of air conditioning. To summarize, those situations most likely to require air conditioning are:

1. Rooms subject to high solar gains, such as south facing rooms especially those with large areas of glazing.
2. Rooms with high equipment densities such as computer rooms and offices which make extensive use of IT.
3. Rooms in which environment (temperature, dust or humidity) sensitive work is being carried out such as operation theatres and microprocessor manufacturing units.

#### 1.1 Basic Refrigeration cycle

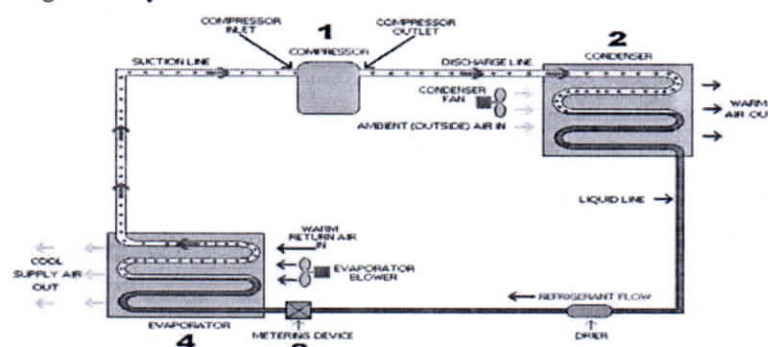


Fig: 1.1 Basic Refrigeration cycle

**Compressor:** An air compressor is a device that converts power (using an electric motor, diesel or gasoline engine, etc.) into potential energy stored in pressurized air (i.e., compressed air)

**Condenser:** A condenser is a device or unit used to condense a substance from its gaseous to its liquid state, by cooling it. In so doing, the latent heat is given by the substance, and will transfer to the condenser coolant.

**Expansion Valve:** A thermal expansion valve (often abbreviated as TEV, TXV, or TX valve) is a component in refrigeration and air conditioning systems that controls the amount of refrigerant flow into the evaporator thereby controlling the superheating at the outlet of the evaporator.



## Investigation on Performance of Shell and Tube Heat Exchanger with Assorted Baffle Parameters

Levicus John<sup>1</sup>, Khasim Sharif Sk<sup>2</sup>, D.Jagadish<sup>3</sup>, K. Phaneendra Kumar<sup>4</sup>

<sup>1</sup>(Assistant professor, Mechanical Department, CMRTC/JNTUH, India)

<sup>2</sup>(Assistant professor Mechanical Department, CMRTC/JNTUH, India)

<sup>3</sup>(professor, Mechanical Department, VFSTR, India)

<sup>4</sup>(professor& principal, Mechanical Department, VLITS, India)

**Abstract:** Shell and Tube heat exchangers (STHXs) are extensively used in the ever growing process industry requirements. With the advancement in the technology used in the STHXs we have seen a tremendous use of the helical baffles to improve the heat transfer performance. From varying angles to sizes and shapes of the helical baffles our priority is mainly to compare and study the performance improvements from segmental baffles to helical baffles. In this paper an experimental setup has been made for both Shell and Tube heat exchangers with segmental baffles (STHXsSB) and Shell and Tube Heat exchangers with Helical Baffles (STHXsHB). The helical baffles used here are discontinuous-helical baffles. The widely used Bell-Delaware method is used to validate the experimental data.

**Keywords:** Baffles, Blade Angle, Heat exchanger, helical baffles, pressure drop

### I. Introduction

Ever since the industrial revolution in the Eighteenth century we have been ultimately dependent on Energy. Energy however comes in various forms broadly classified as high grade energy and low grade energy, high grade energy being Electricity and the low grade energy being other various forms of energy such as Heat energy. Low grade energy may be available to us and it is our responsibility to utilize it efficiently especially when energy sources are being depleted at a very high rate on this planet. Every bit of energy which is being wasted is without doubt useful to us. Keeping this in mind we see an important study in heat exchangers which deals with low grade energy that is heat energy or in other words Thermal energy[1]. Thermal energy loss in the process industry is a significant issue due to the high temperatures and multiple heat intensive processes involved. High-grade thermal energy is typically recovered within processes. However, lower grade heat is often rejected to the environment. The benefits of capturing and utilizing low grade thermal energy are highly dependent on the qualities and properties of the heat in the waste streams. The temperature of the low grade heat stream is the most important parameter, as the effective use of the residual heat or the efficiency of energy recovery from the low grade heat sources will mainly depend on the temperature difference between the source and a suitable sink [2].

#### 1.1. HEAT EXCHANGERS

A heat exchanger is a device used to transfer heat between two or more fluids. The fluids can be single or two phase and, depending on the exchanger type, may be separated or in direct contact. Devices involving energy sources such as nuclear fuel pins or fired heaters are not normally regarded as heat exchangers although many of the principles involved in their design are the same.

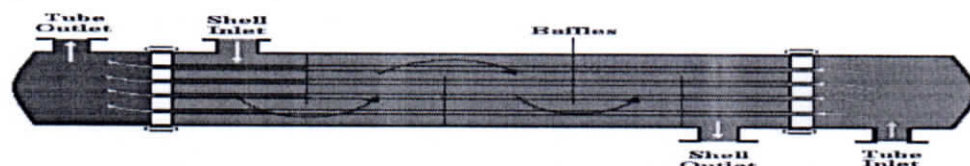


Figure-1.Heat exchanger

- Front end—this is where the fluid enters the tube side of the exchanger.
- Rear end—this is where the tube side fluid leaves the exchanger or where it is returned to the front header in exchangers with multiple tube side passes.
- Tube bundle—this comprises of the tubes, tube sheets, baffles and tie rods etc. to hold the bundle together.
- Shell—this contains the tube bundle.



## Cold-Pressed Jute Fibre Composite Tensile Properties Effect on Hygrothermal Treatment

Nagaraj<sup>1</sup>, Khasim Sharif Sk<sup>2</sup>, D.Jagadish<sup>3</sup>, K. Phaneendra<sup>4</sup>

<sup>1,2</sup>(Assistant professor, Mechanical Department, CMRTC/ JNTUH, India)

<sup>3</sup>(Professor, Mechanical Department, VFSTR, India)

<sup>4</sup>(Professor & principal, Mechanical Department, VLITS, India)

**Abstract:** The growing environment awareness demands the use of nature fibres as reinforcement materials in commercial. The natural fibres however are hydrophilic in nature and their composites undergo environmental degradation during service, hydrothermal conditioning on as received jute fabric at different temperatures of cold press has been studied in the present investigation. These composites are usually subjected to various loading conditions. Therefore, an attempt has been made to study the tensile properties of the composites. Fractography studies were carried out to study the fracture surface. It is noticed that the major mode of failure is due to fiber pullout and matrix cracking. The result from the hydrothermal studies shows the decrease in strength values of the composites on prolong exposure to humid

**Keywords:** Cashew nut shell, Cold pressed jute, hydrothermal treatment, Silica sand

### I. Introduction

Over the last thirty years composite materials, plastics and ceramics have been the dominant emerging materials. The volume and number of applications of composite materials have grown steadily, penetrating and conquering new markets relentlessly [1]. Modern composite materials constitute a significant proportion of the engineered materials market ranging from everyday products to sophisticated niche applications. The composites industry has begun to recognize that the commercial applications of composites promise to offer much larger business opportunities than the aerospace sector due to the sheer size of transportation industry. Thus the shift of composite applications from aircraft to other commercial uses has become prominent in recent years. Unlike conventional materials (e.g., steel), the properties of the composite material can be designed considering the structural aspects [2]. The design of a structural component using composites involves both material and structural design. Composite properties (e.g. stiffness, thermal expansion etc.) can be varied continuously over a broad range of values under the control of the designer. Kelly very clearly stresses that the composites should not be regarded simple as a combination of two materials. In the broader significance; the combination has its own distinctive properties [3]. In terms of strength to resistance to heat or some other desirable quality, it is better than either of the components alone or radically different from either of them.

Beghezan defines as "The composites are compound materials which differ from alloys by the fact that the individual components retain their characteristics but are so incorporated into the composite as to take advantage only of their attributes and not of their short comings", in order to obtain improved materials[4]. It explains composite materials as heterogeneous materials consisting of two or more solid phases, which are in intimate contact with each other on a microscopic scale. They can be also considered as homogeneous materials on a microscopic scale in the sense that any portion of it will have the same physical property

### II. Components of A Composite Material

In its most basic form a composite material is one, which is composed of at least two elements working together to produce material properties that are different to the properties of those elements on their own. In practice, most composites consist of a bulk material (the "matrix"), and a reinforcement of some kind, added primarily to increase the strength and stiffness of the matrix.

#### 2.1. Role of matrix in a composite

Many materials when they are in a fibrous form exhibit very good strength property but to achieve these properties the fibers should be bonded by a suitable matrix. The matrix isolates the fibers from one another in order to prevent abrasion and formation of new surface flaws and acts as a bridge to hold the fibers in place. A good matrix should possess ability to deform easily under applied load, transfer the load onto the fibers and evenly distributive stress concentration.



# Digital Video Quality Enhancement Based On Weighted Guided Filtering Scheme

L.Madhavi<sup>1</sup>, N.Bhaskar<sup>2</sup>

<sup>1</sup>Department of CSE, JNTU University, Hyderabad, India  
Email: madhavi.lingireddy@gmail.com

<sup>2</sup>Department of CSE, JNTU University, Hyderabad, India  
Email: bhaskar4n@gmail.com

**Abstract**— We present a weighted guided image filter (WGIF) to improve filtering and avoid halo artifacts. We know that the previously used local filtering-based edge preserving smoothing technique suffers from halo artifacts and also some drawbacks. To overcome this problem we are introducing an extension method called WGIF method. In this paper WGIF method is applied on digital videos for acquiring high quality. Actually this method is introduced by incorporating an edge-aware weighted into an existing guided image filter (GIF). It has two advantages of both global and local smoothing filter in such a way that its complexity is  $O(N)$  and avoids halo artifacts. The output of WGIF results in better visual quality and avoid halo artifacts. WGIF used in image enhancement, image haze removal.

**Keywords**—Edge-preserving smoothing, weighted guided image filter, edge aware weighting, detail enhancement, haze removal.

## I. INTRODUCTION

In human visual perception, edges provide an effective and expressive stimulation which is important for neural interpretation of a scene. In the fields of image processing and in many computational photography employ smoothing techniques which could preserve edges better [1],[4]. In smoothing process an image to be filtered is typically decomposed into two layers: a base layer composed by homogeneous regions with sharp edges and a detail layer formed by either noise, e.g., a random pattern with zero mean, or texture, e.g., a repeated pattern with usual arrangement. There are two types of edge-preserving image smoothing techniques: global filters such as the weighted least squares (WLS) [4] filter and local filters such as bilateral filter (BF) [9], trilateral filter, and their accelerated versions, as well as guided image filter (GIF) [14]. Though the global optimization based filters frequently yield

excellent quality, they have high computational cost. Comparing with the global optimization based filters, the local filters are generally simpler. However, the local filters cannot conserve sharp edges like the global optimization based filters.

Halo artifacts were usually produced by the local filters when they were adopted to smooth edges [14]. Major reason that the BF/GIF produces halo artifacts was both spatial similarity parameter and range similarity parameter in the BF were fixed. But both the spatial similarity and the range similarity parameters of the BF could be [16] adaptive to the content of the image to be filtered. Unfortunately as pointed out, problem with adaptation of the parameters will destroy the 3D convolution form. We introduce in present paper, an edge-aware weighting technique and incorporated into the GIF to form a weighted GIF (WGIF). Local variance in  $3 \times 3$  window of pixel in a guidance image is applied to calculate the edge-aware weighting. The local variance of a pixel is normalized by the local variance of all pixels in guidance image. The normalized weighting is then adopted to design the WGIF. As a result, halo artifacts can be avoided by using the WGIF. Similar to the GIF, the WGIF also avoids gradient reversal. In addition, the intricacy of the WGIF is  $O(N)$  for an image with  $N$  pixels which is the same as that of the GIF. These features allow many applications of the WGIF for single image detail enhancement, single image mist removal, and fusion of differently exposed images.



# An Application of Internet of Things for Smart Home

B. Ravinder<sup>1</sup>, Dr. K Srujan Raju<sup>2</sup>

<sup>1</sup>Department of IT, Vardhaman College of Engineering, Hyderabad, India

<sup>2</sup>Department of CSE, Professor & Head, CMR Technical Campus, Hyderabad, India

**Abstract**— In this paper, we present one of the pilot application i.e., a smart room, which is an interactive intelligent environment dealing with awareness, intelligence, and natural interaction issues. The main aim of SMART ROOM is whenever we lock the room and if any electronic devices are ON, it senses the LIGHT and TEMPERATURE, it automatically turns off all the devices. Now a day, we generally forget to switch off the electronic devices. SMART ROOM IS THE BEST SOLUTION. So that we can save electricity.

## I. INTRODUCTION

Recent advances in intelligent computer systems and communications have created the necessary conditions for the networking of a wide variety of heterogeneous devices. This led to the integration of short-range mobile transceivers into everyday life objects and has enabled new forms of communication between objects and even between people and objects. The concept of smart devices, i.e. the inclusion of software, identifiers and networking to devices typically not computerized, led to the "Internet of Things" (IoT) [1] [2]. The main feature of this technology is the integration of heterogeneous sensing and action elements (actuators) in a distributed system which performs different actions based on the information gathered by the sensors combined with the requirements of the particular application. Intelligent information systems enable the processing of multimodal data collected by the sensors, so as to reconcile heterogeneous information and safe conclusions on the facts giving rise to the activation of the necessary actions to address the consequences of these events. Moreover, the availability of new (smart) energy meters allows for real-time monitoring of energy consumption and provides a unique opportunity of using energy more efficiently.

Such applications make the home a bit smarter, but they're not really intelligent. That's because most home-automation

devices are loners: They don't work with each other. They're made by different manufacturers, and by the way, they lack privacy and security protection. IEEE is working with industry to build an architecture that provides connectivity; simultaneously, it is developing standards and addressing security concerns.

The smart room is a great example of where many technology and business domains start interacting and leveraging the Internet of Things [3].

We use components like arduino board which is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. GSM modem which is a specialized model which accepts a SIM card and operates over a subscription to a mobile operator just like a mobile phone. We used sensors like IR, LM35 and a DC motor.

## II. LITERATURE SURVEY

The Internet of Things (IoT) is predicted to become one of the most significant drivers of growth in various technology markets. Most current standardization activities are confined to very specific verticals and represent islands of disjointed and often redundant development. The architectural framework defined in this standard will promote cross-domain interaction, aid system interoperability and functional compatibility, and further fuel the growth of the IoT market. The adoption of a unified approach to the development of IoT systems will reduce industry fragmentation and create a critical mass of multi-stakeholder activities around the world. This standard defines an architectural framework for the Internet of Things (IoT), including descriptions of various IoT domains, definitions of IoT domain abstractions, and identification of commonalities between different IoT domains. The architectural framework for IoT provides a reference model that defines relationships among various IoT verticals (e.g., transportation, healthcare, etc.) and common architecture elements. It also provides a



# Analysis and Classification for Big Data Computing Techniques: A Retrospective Study

Shriya kumari<sup>1</sup>, Dr. K Srujan Raju<sup>2</sup>, P. Satyavathi<sup>3</sup>

<sup>1</sup>Department of CSE, CMRTC, JNTU, Hyderabad  
Email: [shriya.thakur@gmail.com](mailto:shriya.thakur@gmail.com)

<sup>2</sup>Department of CSE, CMRTC, JNTU, Hyderabad  
Email: [drksrujanraju@gmail.com](mailto:drksrujanraju@gmail.com)

<sup>3</sup>Department of CSE, CMRTC, JNTU, Hyderabad  
Email: [satya.potlapalli@gmail.com](mailto:satya.potlapalli@gmail.com)

**Abstract**—Big data, defined as a massive dataset based of the five V's volume, velocity, variety, veracity and value[1]. The world is connecting and producing a huge amount of data from applications like social media, e commerce, internet, sensors, health care, informatics, net banking etc. There are few major challenges of these datasets: data collection, data analysis, data enrichment, data distribution, data security and privacy. These datasets play a vital role in any of the application areas. There are various tools and techniques which are developed to manage Big data. There are mainly two processing techniques to process these datasets: Batch processing and Non batch processing. Different application areas use different tools and techniques depending upon the efficiency and capability of managing different forms of data produced by them. In this paper we have suggested some of the efficient tools and techniques for managing the data produced by a particular application area by analyzing and comparing all the possible techniques to manage Big data.

**Keywords**— Big data, Datasets, Hadoop, MapReduce, computing techniques.

## I. INTRODUCTION

Big data is a collection of different forms of data such as Structured, Unstructured and Semi structured datasets. Big data is generated by all the applications around us like social media and internet which is transmitted by mobile devices and different sensors. Big data is defined by gartner as "A high volume, high velocity and/or high variety information assets that demand cost effective, innovative forms of information processing that enable enhanced insight, decision making and process automation." The data is growing exponentially and has reached from bits to bytes and now bytes to zetabytes in last 2 to 3 years. It is being produced by several application areas such as Social Networking, Natural Language Processing, Digital Forensics, Bio Informatics, Sensor Networks, GIS, Medical Sciences, Weather Forecasting, [www.ijaers.com](http://www.ijaers.com)

Human Behavior Monitoring, Cloud Control System, Multimedia, Net Banking etc. As big data is being produced in different forms it is imperative to use different tools and techniques to process these datasets. The two major processing techniques often used to manage Big Data is: Batch processing and Non Batch Processing.

## II. BIG DATA TOOLS AND TECHNIQUES

Big data is processed using two main processing techniques:

- i) Batch Processing
- ii) Non Batch Processing

**2.1 Batch Processing:** The data is accumulated over a certain period of time and then it is processed to produce desired output. MapReduce framework is used in batch processing. MapReduce is a programming model used for distributed computing. It is done in 2 computation stages: Map and Reduce. Another framework which is often used in batch processing is Hadoop which is an open source framework used in distributed environment. It uses two components: HDFS and MapReduce to store and process Big data[6]

**2.2 Non Batch Processing:** In non batch processing, the input of data is continuous and processed in small period of time. There are two categories of non batch processing:

**2.2.1 Real time Big data processing:** It is done by two processes such as

A. In memory computing : It is a technique which is used to minimize the computation time of MapReduce. It is used to efficiently minimize the execution time of jobs. The frameworks used in this technique are Apache Spark, GridGain, XAP etc.

B. Real time queries over Big data: It is an optimized technique used for real time input queries



# Study of Wireless Sensor Networks its Security Issue, Challenges and Security Management

Suvarna Gothane<sup>1</sup>, Dr. M. V. Sarode<sup>2</sup>, Dr. K. Srujan Raju<sup>3</sup>

<sup>1</sup>CMR Technical Campus, Hyderabad, India  
Email: gothane.suvarna@gmail.com

<sup>2</sup>Jagadambha College of Engineering and Technology, Yavatmal, India  
Email: mvsarode2013@gmail.com

<sup>3</sup>CMR Technical Campus, Hyderabad India  
Email: ksrujanraju@gmail.com

**Abstract**— Wireless Sensor Network (WSN) is promising topic of technical, social, and economic importance. The sensing technology combined with processing power and wireless communication makes it rewarding for being exploited great quantity in future. The inclusion of wireless communication technology also incurs various types of security threats. Meanwhile, supplying privacy and security is an inseparable part of this technology. Without providing enough security, the promising benefits of this flourishing technology will be misused and worthless. In this paper we investigate the security related issues and challenges in wireless sensor networks. We identify the security threats, review proposed security mechanisms for wireless sensor networks. We also discuss the holistic view of security for ensuring layered and robust security in wireless sensor networks.

**Keywords**—Wireless Sensor Network, Security in WSN, Security Management.

## I. INTRODUCTION

A sensor is a device that measures a physical quantity and converts it into a signal which can be read by an today mostly electronic instrument. In a sensor network, many tiny computing nodes called sensors are scattered in an area for the purpose of sensing some data and transmitting data to nearby base stations for further processing. A sensor node, also known as a mote. Node in a wireless sensor network can perform gathering sensory information, some processing, and communicating with other connected nodes in the network. The transmission between the sensors is done by short range radio communication. The base station is assumed to be computationally well-equipped whereas the sensor nodes are resource-starved. Each of these scattered sensor nodes has the capabilities to collect data and route data back to the base station. Data are routed back to the base station

by a multi-hop infrastructure-less architecture through sensor nodes.

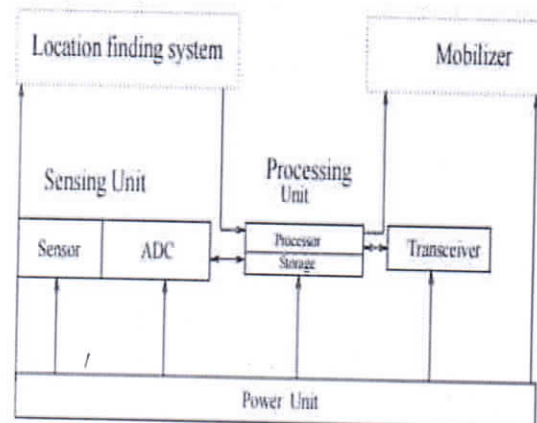


Figure: The components of a sensor node.

Due to adhoc nature and resource limitations of sensor network providing a right key management is challenging[1]. Wireless Sensor Networks (WSN) are emerging as both an important new tier in the IT ecosystem and a rich domain of active research involving hardware and system design, networking, distributed algorithms, programming models, data management, security and social factors [2], [3], [4]. Application of wireless Sensor networks offer economically viable solutions for a variety of applications. For example, monitor factory instrumentation, pollution levels, freeway traffic, and the structural integrity of buildings. Other applications include climate sensing and control in office buildings and home environmental sensing systems using various sensors for temperature, light, moisture, and motion. Sensor networks are key to the creation of smart spaces, which embed information technology in every day home and work environments. Common application area covers military applications, environmental monitoring, classroom/home, health and habitat monitoring, detecting



# GIS Based Land Information System for CMR Group of Institutions

Mr.Tara.Saikumar<sup>1</sup>, Dr. K.Srujan Raju<sup>2</sup>, Dr. Avala Raji Reddy<sup>3</sup>

<sup>1</sup>Associate Professor & IEEE CMRTC SBC, Department of ECE, CMR Technical Campus, Hyderabad, INDIA  
Email:Tara.sai437@gmail.com

<sup>2</sup>Professor & Head Department of CSE, CMR Technical Campus, Hyderabad, INDIA  
Email:ksrujanraju@gmail.com

<sup>3</sup>Professor & Director, Department of ME, CMR Technical Campus, Hyderabad, INDIA  
Email:director@cmrtc.ac.in

**Abstract**— This research work is dedicated to create a land information system on areas of CMR GROUP OF INSTITUTIONS, Medchal Road, Hyderabad. The main task of the work is to establish a land information database which is based on an Open Source Geographic Information System. The main function of the work is starting with acquisition of existing geo data and information, maintenance, utilization and transferring of data. This research work will be helpful to establish a structured database, multi user access to the database, avoid data redundancy of different organization and follow international standards for geographic information. In this paper, applications of Remote Sensing and GIS for various advance classification techniques together with their accuracy based on performance evaluation, on land use studies are given emphasis. The study has been conducted on CMR GROUP OF INSTITUTIONS, a part of Rangareddy district, Telangana, INDIA. The results obtained have been used to generate final land use map of the college. The framework of a national land use and land cover classification system is presented for use with remote sensor data. The establishment of a land information system for CMR GROUP OF INSTITUTIONS will contribute to the National Land Information System. The project demonstrates that Land Information Systems can be created using Open Source GIS software. Promoting the use of Open Source GIS software, enhancing data quality and knowledge exchange are the main aims to be followed further. The results will promote good governance and provide fact based information to decision makers and government.

**Keywords**— Remote Sensing, Open Source GIS, Land Valuation, Land Information System, Geo-spatial database.

## I. INTRODUCTION

It is important to learn and use Geographic Information Systems and Remote Sensing data for our profession nowadays. Modern technologies like geo-data processing and earth observation data processing and analysis are needed for young researchers and students. This research work is dedicated to create a land information system of CMR GROUP OF INSTITUTION. The main task of the work is to establish a land information database which is based on an Open Source Geographic Information System. The main function of the work is starting with acquisition of existing geodata and information, maintenance, utilization and transferring of data [1-3]. This research work will be helpful to establish a structured database, multi user access to the database, avoid data redundancy of different organization and follow international standards for geographic information.

## II. HEADINGS

Remote sensing technique is defined as – The science and art of acquiring information about objects from measurements made at a distance without any physical contact with the objects. In modern usage, the term generally refers to the use of aerial sensor technologies to detect and classify objects on earth (both on the surface and in the atmosphere and oceans) by means of propagated signals (e.g. electromagnetic radiation emitted from aircraft or satellites). Remote sensing makes it possible to collect data on dangerous and inaccessible areas. Remote sensing applications include monitoring deforestation, depth sounding in coastal regions stand-off collection of data about dangerous border areas for military purposes, land use studies etc[3,5]. Remote sensing also replaces costly and slow data collection on the ground, ensuring in the process that areas or objects are not disturbed.



# Recommendation System for Smart Mobile Phone selection through e-commerce website using TOPSIS algorithm

Mrs.M.Sridevi<sup>1</sup>, Dr.R.Rajeshwara Rao<sup>2</sup>, Dr.M.Varaprasad Rao<sup>3</sup>

<sup>1</sup>Dept of CSE, Center for Advanced Computational Research (CACR), Anurag Group of Institutions (Autonomous), Hyderabad, India

Email: siri\_235@yahoo.com

<sup>2</sup>Dept of CSE, JNTU Kakinada, Vizianagaram, Andhra Pradesh, India

Email: raob4u@yahoo.com

<sup>3</sup>Dept of CSE, Center for Advanced Computational Research (CACR), Anurag Group of Institutions (Autonomous), Hyderabad, India

Email: vpr\_m@yahoo.com

**Abstract**—Now days purchasing of any smart mobile phones, specifically in the e-business market is very tough task to the customers due to day to day changes in various technical and operational parameter specifications like style, life of battery span, camera, radiation, RAM, ROM and cost etc. To choose and select a mobile in an optimized way, TOPSIS is one the selection procedure technique is adopted for this problem. This technique provides a base for decision - making processes where there are limited numbers of choices but each has a criteria of large number of attributes. In this paper some of the mobile manufacturer brands are considered with multiple criteria with various attributes and from an e-commerce website(s); which help us to select the best model and make of mobile using TOPSIS technique.

**Keywords**—MCDM, Mobile Selection, Normalized decision matrix, Positive and Negative Ideal solutions, Ranking, Relative closeness, TOPSIS.

## I. INTRODUCTION

Hwang and Yoon (1981) proposed that the ranking of alternatives will be based on the shortest distance from the Positive Ideal Solution (PIS) and the farthest from the Negative Ideal Solution (NIS)[1]. Hsu-Shih Shiha, et al (2007) investigated on extension of a Multi-Attribute Decision Making (MADM) technique, to a group decision environment. MajidBehzadian, et al (2012) had given review on state-of the-art survey of —Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) applications [14]. The purpose of the TOPSIS technique is to recommend an item with certain criteria.

In this paper the authors are proposed to implement TOPSIS algorithm for selection of mobile phone from various e-commerce websites. The paper is organized in four sections; in second section the methodology is used, the next section will deals with multi criteria selection model. The fourth section will provide the algorithm and experiment results and the last conclusion is given.

## II. METHODOLOGY

The objective of this work is to develop TOPSIS method for Smart Mobile Phone(SMP) selection. In order to comply with collecting quantitative and qualitative data for TOPSIS Smart Mobile Phone (TSMP) selection model that could be applied by a seven steps approach was performed to ensure successful implementation[4] [9] [10] [12] [15] [16]. The user or reviewer can express their preferences and ratings to choose an item from a given e-commerce website supplier. These ratings are certainly based on multiple criterion attributes [1] [2] [3] [5] [6] [7] [8] of an item. The preferences and ratings are recorded or stored in the data base of that supplier; this helps a new user to see the reviews and decides whether the item can purchased or not. The ratings or reviews are collected and normalized with respect to attributes. Then decisions are standardized and finalized. So, before taking a decision of positive solution these decision values have to be normalized. Once if any user decides that to buy an item from a supplier then the user has to generate a dialogue consists set of decisions.