

## Improving the Search Mechanism for Unstructured Peer-to-Peer Networks using Statistical Matrix Form

SUDHA. V<sup>1</sup>, BHANUPRIYA. R<sup>2</sup>, DIVIYA. S<sup>3</sup>

<sup>1</sup>Assistant Professor, Dept of CSE, Dr. T. Thimmaiah institute of Technology, Kolar Gold Fields, India.

<sup>2</sup>Dept of CSE, Dr. T. Thimmaiah institute of Technology, Kolar Gold Fields, India.

<sup>3</sup>Dept of CSE, Dr. T. Thimmaiah institute of Technology, Kolar Gold Fields, India.

**Abstract:** In a traditional file search mechanism, such as “flooding,” a peer broadcasts a query to its neighbors through an unstructured Peer-to-Peer (P2P) network until the Time-To- Live (TTL) decreases to zero. A major disadvantage of flooding is that, in a large-scale network, this blind-choice strategy usually incurs an enormous traffic overhead. In this paper, we propose a method, called the Statistical Matrix Form (SMF), which improves the flooding mechanism by selecting neighbors according to their capabilities. The SMF measures the following peer characteristics: the number of shared files, the content quality, the query service, and the transmission distance between neighbors. Based on these measurements, appropriate peers can be selected and thereby reduce the traffic overhead significantly. The SMF can be integrated in P2P applications so that it will perform new search mechanism. Our experimental results demonstrate that the SMF is effective and efficient. For example, compared with the flooding search mechanism in dynamic unstructured P2P networks, the SMF reduces the traffic overhead by more than 80 percent. Moreover, it achieves a good success rate and shorter response times.

**Keywords:** Unstructured Peer-To-Peer Networks, Flooding Search Mechanism, Traffic Overhead, Statistical Matrix Form.

### I. INTRODUCTION

Generally, Peer-to-Peer (P2P) networks can be classified as: structured P2P networks, which are based on centralized management (e.g., Chord[2], Pastry [8]), and unstructured P2P networks, which are built on a distributed search mechanism (e.g., Gnutella [5], Frost Wire [4]). Although both types allow users to participate in a fully distributed cooperative network, unstructured P2P networks give participants more freedom to exchange resources and services. The major disadvantage of unstructured P2P networks is that their basic search mechanism, “flooding,” incurs an enormous traffic overhead. To resolve this issue, numerous search mechanisms have been proposed to replace or improve the flooding mechanism [10], [15], [21]. In this paper, our object is to improve the flooding mechanism by exploiting the scalability of unstructured P2P networks. We propose a method that statistically analyzes query messages in terms of the following four characteristics: Processing Ability (PA), Effective Sharing (ES), Index Power (IP), and Transmission Efficiency (TE). The PA of peers is analyzed to determine which peers leech the most resources without giving feedback [9]. The ES refers to the number of files that a peer shares, and can be used to classify a peer’s sharing capability. It has been shown that, in a network, very few peers share a large number of files, so that the quality of the files influences the sharing capability. The IP measures the number of files that a peer records in the index cache, and can also be used to analyze the number of responses in the cache content. Finally, the TE is utilized to measure the distance between

peers in order to prevent inefficient routing. We represent the four characteristics in a matrix form called the Statistical Matrix Form (SMF). To adjust the values of the matrix, we utilize a standard deviation technique to determine an overall ranking of a query peer’s neighbors. As a result, the performance of the flooding search mechanism can be improved by only sending query messages to the top-k ranked neighbors of a query peer for some k determined by careful analysis, instead of sending messages to all the peer’s neighbors. The performance evaluation demonstrates that the response time and traffic overhead can be reduced significantly, while the computation overhead is acceptable.

### II. RELATED WORK

Numerous search mechanisms have been proposed to reduce the large amount of unnecessary traffic generated by flooding based search mechanisms in unstructured P2P networks. The flooding technique sends query messages to all the logical neighbors of a query peer, except the incoming peer, until the Time-To-Live (TTL) decreases to zero or the query receives response. It has been shown that the Random Walk (RW) approach reduces the exponentially increasing flood traffic caused by randomly choosing a neighbor to send a query message until sufficient responses are generated [22]. Although the amount of traffic can be reduced, the RW search mechanism suffers from two fundamental problems. First, it is essentially a blind search because, in each step, a query is forwarded to a random peer. Second, if the query arrives at a peer that is already overloaded with traffic, the



## A Survey on Different Implementation Categories of Process Migration and Different Process Migration Algorithms

REVATHI. S<sup>1</sup>, SANDHYA. R<sup>2</sup>, SUDHA. V<sup>3</sup>

<sup>1</sup>Assistant Professor, Dept of CSE, Dr.TTIT, KGF, India.

<sup>2</sup>Assistant Professor, Dept of CSE, Dr.TTIT, KGF, India.

<sup>3</sup>Assistant Professor, Dept of CSE, Dr.TTIT, KGF, India.

**Abstract:** The most interesting research and the challenging technique is the development of load balancing strategy especially in the distributed operating system and in distributed systems. The load balancing can be done in many ways one of the most popular variant is the process migration. The load in distributed operating system and in distributed system can be balanced by process migration technique. This survey paper helps in understanding the most important implementations categories of process migration mechanisms. Also, describes the different process migration algorithms.

**Keywords:** Migration, Microkernels.

### I. INTRODUCTION

Process migration[1] is an abstraction of moving a process from one node to another node in the network of nodes. It is a very powerful and useful mechanism for balancing the load on distributed system. There are two types of process migration. (1) Preemptive process migration, which suspends the running process in the sender machine, transfer the process state to the destination machine, where it executes further is called preemptive migration. (2) Non-Preemptive process migration, it involves transferring of process that have not begun its execution. The migration can be done in both homogeneous and heterogeneous environment.

### II. DIFFERENT IMPLEMENTATION CATEGORIES OF PROCESS MIGRATION

- Unix- like system early work.
- Unix- like system supporting transparent migration
- System with message passing interface
- Microkernel
- User- space migration
- Application- specific migration

#### A. Unix-Like System Early Work

Provides operating system level migration, as it is optimized for underlying hardware architecture. It is hardware dependent, migration complexity is low due to lack of infrastructure and transparency of migration is limited. Eg: XOS, Worm, Demos/MP and Butler.

XOS [2]	XOS is a Xerox operating system, to facilitate migration it represents the process and its state. The process work object (PWO) encapsulates process state, stack pointers and registers. The process migration is achieved by the movement of PWO objects between XOS nodes.
Worm[3]	Worm is self-replicating computer program residing on one or more machines. Migration is achieved by the movement of worm from one machine to another by occupying needed resources and replicating itself. Worm is aware of network topology.
Butler[4]	It supports both remote execution and process migration. Process migration is only through remote invocation. Migration occurs when the guest process appears at the machine where the resource exceeds, leads to the transfer of complete state of guest process to new node, it also provides security, protection and autonomy.
Demos/MP[5]	Process migration is fully transparent. A process can be moved during its execution and continue its execution on another processor with the support of message passing, location-independent communication. Kernel participate in process migration therefore it is hardware dependent

#### B. Unix-Like System Supporting Transparent Migration

Requires major changes to the underlying kernel, migration complexity is high as it is operating system dependent, migration is fully transparent. There are approaches for addressing distribution and migration. (1) Distribution at lower level of a system. Eg: Mosix/Spirit. (2) Distribution at higher level. Eg: Locus.



## A Survey on Different Implementation Categories of Process Migration and Different Process Migration Algorithms

REVATHI. S<sup>1</sup>, SANDHYA. R<sup>2</sup>, SUDHA. V<sup>3</sup>

<sup>1</sup>Assistant Professor, Dept of CSE, Dr.TTIT, KGF, India.

<sup>2</sup>Assistant Professor, Dept of CSE, Dr.TTIT, KGF, India.

<sup>3</sup>Assistant Professor, Dept of CSE, Dr.TTIT, KGF, India.

**Abstract:** The most interesting research and the challenging technique is the development of load balancing strategy especially in the distributed operating system and in distributed systems. The load balancing can be done in many ways one of the most popular variant is the process migration. The load in distributed operating system and in distributed system can be balanced by process migration technique. This survey paper helps in understanding the most important implementations categories of process migration mechanisms. Also, describes the different process migration algorithms.

**Keywords:** Migration, Microkernels.

### I. INTRODUCTION

Process migration[1] is an abstraction of moving a process from one node to another node in the network of nodes. It is a very powerful and useful mechanism for balancing the load on distributed system. There are two types of process migration. (1) Preemptive process migration, which suspends the running process in the sender machine, transfer the process state to the destination machine, where it executes further is called preemptive migration. (2) Non-Preemptive process migration, it involves transferring of process that have not begun its execution. The migration can be done in both homogeneous and heterogeneous environment.

### II. DIFFERENT IMPLEMENTATION CATEGORIES OF PROCESS MIGRATION

- Unix- like system early work.
- Unix- like system supporting transparent migration
- System with message passing interface
- Microkernel
- User- space migration
- Application- specific migration

#### A. Unix-Like System Early Work

Provides operating system level migration, as it is optimized for underlying hardware architecture. It is hardware dependent, migration complexity is low due to lack of infrastructure and transparency of migration is limited. Eg: XOS, Worm, Demos/MP and Butler.

XOS [2]	XOS is a Xerox operating system, to facilitate migration it represents the process and its state. The process work object (PWO) encapsulates process state, stack pointers and registers. The process migration is achieved by the movement of PWO objects between XOS nodes.
Worm[3]	Worm is self-replicating computer program residing on one or more machines. Migration is achieved by the movement of worm from one machine to another by occupying needed resources and replicating itself. Worm is aware of network topology.
Butler[4]	It supports both remote execution and process migration. Process migration is only through remote invocation. Migration occurs when the guest process appears at the machine where the resource exceeds, leads to the transfer of complete state of guest process to new node, it also provides security, protection and autonomy.
Demos/MP[5]	Process migration is fully transparent. A process can be moved during its execution and continue its execution on another processor with the support of message passing, location-independent communication. Kernel participate in process migration therefore it is hardware dependent

#### B. Unix-Like System Supporting Transparent Migration

Requires major changes to the underlying kernel, migration complexity is high as it is operating system dependent, migration is fully transparent. There are approaches for addressing distribution and migration. (1) Distribution at lower level of a system. Eg: Mosix/Spirit. (2) Distribution at higher level. Eg: Locus.



ISSN 2395-1621

# FPGA Implementation of Block FIR Filter With Optimized Area and Delay

<sup>#1</sup>Prof. Ruckmani Divakaran, <sup>#2</sup>Jayanthi S.K., <sup>#3</sup>Lavanya N., <sup>#4</sup>Auxilia V., <sup>#5</sup>Bhavani V.



<sup>1</sup>hod.ece@drtit.edu.in  
<sup>2</sup>jayanthisst@gmail.com  
<sup>3</sup>lavanyanarayan94@gmail.com  
<sup>4</sup>auxilia.trans@gmail.com  
<sup>5</sup>bhavanivenkateshan@gmail.com

<sup>#12345</sup>Dept. of Electronics and Communication Engineering, Dr. T. Thimmaiah Institute of Technology Visvesvaraya Technological University, Belagavi, Karnataka, India

## ABSTRACT

Many of the Finite Impulse Response (FIR) filter applications require block processing. This block processing is generally supported by direct form FIR filter. But transpose form FIR filter has many advantages like it is inherently pipelined and supposed to offer higher operating frequency to support higher sampling rate. In order to utilize these advantages, we have realized the block FIR filter in transpose form configuration. We have derived a general architecture for the proposed transpose form block FIR filter for reconfigurable applications. We have used the concept of ROM LUTs to store the filter coefficients. We have used Vedic Multiplier for realizing Inner Product Unit needed for computing the product of input samples and filter coefficients. The performance comparison is made between the architecture implemented using the Vedic multiplier and the architecture implemented using the Wallace Tree multiplier. The proposed structure using the Vedic Multiplier consumes significantly less area and involves less delay than the structure implemented using the Wallace Tree Multiplier. The synthesis results shows that the proposed structure using the Vedic Multiplier consumes less number of LUTs and slices compared to the architecture implemented using the Wallace Tree Multiplier.

Keywords— Finite Impulse Response(FIR), Look Up Table(LUT), FPGA.

## ARTICLE INFO

### Article History

Received : 4<sup>th</sup> May 2016

Received in revised form :  
6<sup>th</sup> May 2016

Accepted : 12<sup>th</sup> May 2016

Published online :

17<sup>th</sup> May 2016

## I. INTRODUCTION

Finite Impulse Response (FIR) filter play a crucial role in many signal processing applications in communication systems. A wide variety of tasks such as spectral shaping, matched filtering, interference cancellation, channel equalization, etc. can be performed with these filters. Many of these tasks require large order FIR filters in order to meet the precise frequency specifications. Also for high speed digital communication, these filters need to support high sampling rate. But as the filter order increases, the number of multiplications and additions needed for computing the filter output also increases. The real time implementation of large order FIR filter is a difficult task because there is no redundant computation available in the FIR filter algorithm. Filter coefficients very often remain constant and known a priori in signal processing applications. This feature has been utilized to reduce the complexity of realization of multiplications. Block-processing method is widely used to

derive high-throughput hardware structures. It not only provides throughput-scalable design but also improves the area-delay efficiency. The derivation of block-based FIR structure is easy when direct-form configuration is used, whereas the transpose form configuration does not directly support block processing. But transpose form structures has many advantages like inherent pipelining and higher operating frequency. To utilize these advantages, we have realized block FIR filter in transpose form configuration. We have used Vedic Multiplier for realizing this architecture. Performance comparison is made between architectures implemented using Vedic multiplier and Wallace Tree multiplier.

Principal  
 Dr. T. Thimmaiah Institute of Technology  
 Oorgaum, K. G. F- 563120



# Kannada Characters and Numerical Recognition System using Hybrid Zone-Wise Feature Extraction and Fused Classifier

Kavya.T. N\*, Pratibha.V, Priyadarshini. B. A  
Dept. of Electronics and Communications Engineering  
Dr.T.Thimmaiah Institute of Technology  
Kolar Gold Fields-563120, Karnataka, India

Vijaya Bharathi. M, Vijayalakshmi.G.V  
Dept. of Electronics and Communications Engineering  
Dr.T.Thimmaiah Institute of Technology  
Kolar Gold Fields-563120, Karnataka, India

**Abstract**— Character recognition is an important area of research in pattern recognition. Recognition of handwritten characters is difficult because of different writing styles, mood of a person, size of handwritten characters and aging of documents. Kannada characters are symmetric and curvy in nature, hence difficult to recognize in an offline system. In this project for Kannada character script, there is no commercially available database; hence we created our own database. The input image is preprocessed and features are extracted by dividing an image into zones and applying distance metric and pixel density algorithms on the zoned image. These features are combined to form a feature vector. This feature vector is given to the classifier for recognition. k-Nearest Neighbor (kNN) and Linear Discriminant Analysis (LDA) is used for classification. The classifier results are compared and the best result for each character is considered (fusion of classifiers). The overall accuracy of 94.6% for vowels, 84.7% for consonants and 98% for numbers were obtained.

**Keywords**— Kannada, Pre-processing, Feature Extraction, Zones, Distance Metric, Pixel Density, Classification, KNN, LDA.

## I. INTRODUCTION

Pattern recognition and artificial intelligence have been evolving steadily, but only when they are harnessed together, machines will acquire the ability to exploit images like humans [1]. Character recognition is an extensively researched field in pattern recognition, artificial intelligence and machine vision, as it is used in various applications such as postal code identification, automatic plate number recognition, digital libraries, mails etc. Offline recognition of handwritten characters is difficult due to different writing styles, size and shape of the written character and in some cases the person's emotional state also affects the writing style of the character. In India people use more than one language in their day to day life. Each language has its own character set. But there are a lot of similarities between characters among the different languages. Hence it is necessary to design a recognition system for an individual language. Kannada is an official language of Karnataka state, it has 49 characters and its writing style is left to right. The few works done on character recognition so far are: M. Hanmandlu et al used zone / grid based feature extraction for handwritten Hindi numerals where they divided each character image into 24 zones and found distance of each pixel with respect to an absolute reference point [2]. Panyam Narahori sastry et al used zoning method for feature extraction and nearest neighbor classifier on Telugu character set and obtained 78% accuracy [3]. Prema K.V. et al used Gabor

transform to extract features of printed Kannada script and obtained 93.8% accuracy [4]. S. V. Rajashekaraaradhya et al used zone and distance metric based feature extraction method for handwritten Kannada digit recognition and obtained 97% accuracy [5].

In this paper we have detailed our work in different sections, section II gives the details about the proposed method for Kannada character recognition. In section III we have shown the results obtained by using the proposed system. Section IV gives the conclusion and the future work.

## II. METHODOLOGY

The Fig. 1 below shows the flow chart for Kannada characters and numbers recognition. The handwritten Kannada character to be recognized is acquired in the form of a grey scale cropped images, this image is preprocessed using size normalization, binarization and thinning to make it more suitable for further analysis. The features are extracted from the preprocessed image by dividing it into zones, finding the distance from centroid of image and zone centroid to each foreground pixel in the zones and finding the density of foreground pixels in each zone. These features are combined together to form a feature vector. The classifier is priorly trained with the features of the training set images. The feature extracted from the testing set is given to the classifier for the recognition of the character.

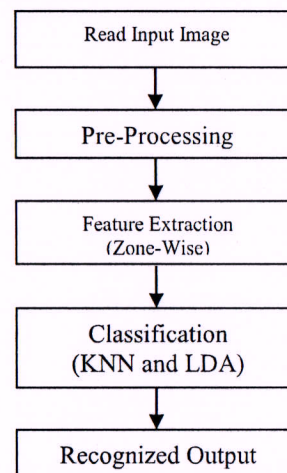


Fig. 1. Flow Chart for Kannada Character Recognition



# Early Detection of Myocardial Ischemia for Predicting Stenosis using Frangi Vesselness Filter

Inbalatha.M<sup>1</sup>, Dr.Kalaivani.S<sup>2</sup>

<sup>1</sup> Research Scholar, SENSE, VIT, Vellore, Tamil Nadu, India

<sup>2</sup> Associate Professor, SENSE, DSP Division, VIT, Vellore, Tamil Nadu, India

**Abstract:** Myocardial Ischemia is a leading disease in causing deaths worldwide which leads to heart attack. This condition occurs when there is a starvation of oxygenated blood supply to the heart which creates the dead cells. Henceforth it necessitates timely diagnosis of diseases using the real images of Cardiac Computed Tomography Angiogram images. Preprocessing is done with median filters and Canny edge detectors followed by Hessian based Frangi Vesselness filter by applying confined thresholding that detects curve structures. It is followed by morphological operations like erosion and dilation for segmentation of branches of coronary arteries. The proposed mathematical model explains rate of change of blood in coronary arteries using Euclidean distance. Also we have classified the levels of heart attack as normal, initial, mild and critical using k-NN (k- Nearest Neighbor) classifier. By mathematical calculations length, width, area, perimeter, pressure of blood, blood flow and percentage Stenosis for different age groups both for men and women are calculated and verified with simulation results.

**Keywords** - , Blood flow , Coronary Artery Disease , and Stenosis.

## I. INTRODUCTION

Myocardial Ischemia, in medical terms heart failure is the major cause of human deaths in all over the world. The word 'Myocardial' represents 'heart' and 'Ischemia' represents 'reduction of blood supply'. The symptoms of myocardial Ischemia are the chest pain at angina pectoris, neck or jaw pain, shoulder or left arm pain, fast heartbeat, excessive sweating and fatigue.

In human when there is a stumbling block in arteries due to the plaque deposition generates an ongoing decrease in oxygenated blood supply to the heart. Owing to this sign, the cardiac channels become contracted and coarsen which leads to reduction in blood stream. This leads to starvation of oxygen rich blood which kills dead cells and damaged heart muscles. Heart attack can arise in whichever oldness cluster of males and females. Owing to the improper blood flow the Systolic and Diastolic action of the heart upturns the speed of Cardiac Cycle.

The objective of this work is to speedy discovery of the risk aspects of heart attack with non-intrusive mode by radiologists for quick diagnosis [1]. Currently, the medical care schemes intensely count on medical information system by extracting data from medical images with improvements of digital image

processing. There are many existing image processing methods to source significant data from real Cardiac Computed Tomography Angiogram images for predicting the disease. Mainly preprocessing is through median filter to eliminate noise from the acquired input CCTA image. Secondly Segmentation of left coronary arteries is obtained by applying Global Thresholding technique followed by Hessian based Frangi Vesselness Filter which detects the curve like blob structures then followed by erode and dilate morphological operations for segmentation of coronary arterial branches. Extent of stenosis condition in the individuals are measured by calculating the sectional area of blocked and unblocked coronary arteries. To end with classification has been completed with k-Nearest Neighbour Classifier for categorisation of severity of the disease. These simulation results help in forecasting the risk factors of heart attack at a premature period.

## II. METHODOLOGY

The methodology intends the subsequent successive ladders for timely estimation of heart attack and Stenosis detection.

1. Firstly, abstraction of Coronary arteries of the left ventricle from the CCTA image.
2. Secondly, revealing of Stenosis from the vessel filtered segmented arteries.
3. Thirdly, compute cross sectional area of healthy and diseased cardiac arteries.
4. Fourthly, construction of feature table for length, width, area, perimeter, pressure, blood flow, and Stenosis for different age groups of both men and women. flow
5. Finally, endorsing the amplitude of stenosis with the simulation results and classified into different levels of Stenosis like normal, initial, mild and critical.

## III. MATERIALS AND METHODS

All the algorithms for this work were completely implemented in Mat lab R2013a with the image processing tool.

Image acquisition is an essential process in image processing systems. The acquired datasets from the Radiology department of R.L.Jalappa hospital, Kolar are 2D real Cardiac Computed Tomography Angiogram images with different age groups of men and women which is considered as the input image for detection of stenosis. It consists of 9 male patients and 6 female patients with different levels of blockage of arteries and one normal patient of different age groups of 30 years to



# Implementation of Wide Band FM Receiver on RTL-SDR

Jahnavi. S, Pooja C. B, Santro Leeona FM  
Dept. of Electronics and Communications Engineering  
Dr.T.Thimmaiah institute of Technology  
Kolar Gold Fields-563117, Karnataka, India

Asst. Prof. Vijayageetha. R  
Dept. of Electronics and Communications Engineering  
Dr.T.Thimmaiah institute of Technology  
Kolar Gold Fields-563117, Karnataka, India

**Abstract**— Signal Processing is found to be a very important area in communication field. Signal processing concepts in real time can be easily understood and demonstrated using Software Defined Radio. This paper focuses on GNU Radio, an open source software acting as a simulation tool to drive the receiver hardware. Here a wideband FM receiver is implemented with RTL-SDR on/using GNU Radio. A frequency of 92.7 MHz signal is received from the receiver is processed with a python script on GNU Radio. Other radio frequency signals can also be received by this receiver. This proposed method of using RTL-SDR for reception of signals is more significant and cheap compared to other hardware. RTL-SDR, python and GNU Radio combine together into low cost experimental kit with real radio signals for various sources.

**Keywords**— Wideband FM, Software Defined Radio, RTL-SDR, GNU Radio, python Script, SWIG (Simplified Wrapper and Interface Generator).

## I. INTRODUCTION

Communication most of the time requires much cabling and wiring, just like MOD-BUS, PROFI-BUS, CAN-BUS, Ethernet etc; which requires large cost for both installation and management. To overcome this we go for wireless communication like Wireless Ethernet etc which eliminates the cabling issue and decreases the cost of maintenance. Once the decision between wired or wireless communication is made the decision making does not stop here, the decision to choose among various wireless technologies is a big decision. One among those wireless technologies is a Software Defined Radio (SDR). Over 93% of mobile infrastructure market utilizes SDR technology, and further growth to support mobile data demand will simply drive more SDR base stations. The key motivation behind this project is that with the use of SDR technology the circuit size can be reduced with less complexity and better SNR. The adaption of wireless communication also has few disadvantages like:

- Commercial wireless network standards are continuously evolving from 2G to 2.5G/3G, 4G and so on. Each generation networks differ significantly in link layer protocol standards causing problem to subscribers.
- Migration from one network generation to the other is costlier.
- The Air-interface and link-layer protocol differ across geographies [1] i.e., the European wireless networks are TDMA based while the USA standards are CDMA based. This creates a problem for the subscriber during the deployment of global facilities.

- Deployment issues occur not only during roaming but also during rolling-out new features.


SDR technology overcomes all these problems by enabling implementation of radio functions in networking infrastructure as software modules which runs on a generic hardware platform. This eases migration from one generation to other as well as during roaming.

In 2001, compared to earlier radios SDR became major change as the functionality was predominantly realized in software. During that time the SDR's hardware was predominantly computers and data buses rather than IF/RF. In 2005, a brief study of digital quadrature transformation for Software Defined Radio (SDR) systems was done and proposed two generalizes SDR receiver schemes. Among those two one can reduce AD sampling speed by 2 times and the other lowers both output data rate and AD sampling speed. In 2012, there was evolution of modern radio communication applications using SDR technology such as Radar, electronic warfare and signal intelligence. This made possible to implement SDR transceiver using Simulink, MATLAB and Xilinx. In 2013, wireless communication became the hottest area and SDR is revolutionizing it. Many open sources like USRP (Universal Software Radio Peripheral) and GNU Radio were used commonly to experiment on SDR. In 2015, GNU Radio was mainly focused and used as simulation tool for driving the SDR transceiver hardware.

This paper is grouped as follows: Section (2) having brief description of Software Defined Radio, followed by RTL-SDR in section (3), GNU Radio in section (4), Block diagram and its implementation in section (5) results in section (6) and finally conclusion in section (7).

## II. SOFTWARE DEFINED RADIO

A Radio system in which all the signal processing or all physical layer functions are implemented using software is nothing but a Software Defined Radio (SDR) [2]. If the function of any physical layer has to be modified then the hardware has to be redesigned which is costlier, so we define the functions in software which are flexible and reconfigurable [3] [4]. The evolution of SDR goes from military to civilian environments. Speakeasy [5] was the first operational SDR that was developed by United States' Navy between 1991 and 1995. Both SDR software [6] and hardware [7] are available at low prices.

  
Principal  
Dr. T. Thimmaiah Institute of Technology  
Ootgaum, K. G. F-563120



## Comparative Analysis of 2-Level and 4-Level DWT for Watermarking and Tampering Detection

(Tulasi M R, Vardhini R Narasimhan, Shilpa R, Neha Anjum)<sup>1</sup>,

(Ms. Manjushree K Chavan, Assistant Professor)<sup>2</sup>

<sup>1,2</sup>(Department of Electronics and Communication, Dr. T. Thimmaiah Institute of Technology, Kolar Gold Fields-563 120, India)

---

**ABSTRACT :** With the advancement in the technology, there has been increase in the volume of information. This has led to the copying and illegal data hacking. Watermarking has become a serious issue in the network security. Attackers are using the different tools for the data extraction. Duplicating of images is also a major issue in the present world. Hence, to overcome from this problem, the DWT and the SPIHT algorithm is used for the watermarking and hash vectors are generated to detect the tamperers. There are different techniques for the watermarking process; among these DWT seems to be the most efficient method. The 2- Level and 4-Level DWT operation is performed on the image, where 4-Level and 2-Level MSE and PSNR values are compared. From the comparison, it will be theoretically proved that 4-level is more accurate and secure than 2-Level.

**KEYWORDS** –2-Level DWT, 4-Level DWT, SPIHT Algorithm, Tampering Detection, Watermarking.

---

### 1. INTRODUCTION

Watermarking is a process of hiding the information. Watermarking can be done in two domains. One is spatial domain and the other is transform domain. Spatial domain transformation is the easy way to insert the watermark and is less complex. And it is not robust against the attacks. Transform domain transformation is bit complex compared to the spatial domain; they are robust and uses simple image processing operations. In transform domain, DWT is preferred because the transformation is done in the wavelet domain and the image security increases. For the watermarking process, we consider two images they are host image and watermark image. The host image covers the watermark image and hence the embedded information is not visible. Even if the data is extracted by different means like fax, mail, messages and the image format is changed by cropping, resizing the data hidden is not lost. Digital watermarking helps in protection of illegal authorization, duplication and alterations. Tampering detection is the process of detecting the changes with respect to the original image. The change that has occurred are said to be the tamperers. For the detection of tamper, we consider to images. One is host image and the other is the tampered image. The host image is the watermark image and tampered image is the watermarked image. The hash vectors are generated and 64 features are extracted from the image.

### 2. METHODOLOGY FOR WATERMARKING

For the watermarking the two images are considered. The watermark image is embedded by host image. The flow of digital watermarking is as shown in the Fig. 2.1. In this stage, the RGB components i.e. Red, Green, and Blue components are separated and DWT operation is applied separately for both the host image and watermark image. The SPIHT encoding and decoding operation is applied only to the watermark image. The resultant components of the host image are added with the watermarked image by multiplying scaling factor to the watermark image. And finally the inverse DWT operation is performed to the newly obtained watermarked image. The filtering operation is performed to remove the noise added during the transformation. The filter used here is median filter; it is a non-linear and is very effective at removing noise. There are different parameters to theoretically prove the image efficiency and robustness. Among these MSE and PSNR values of the watermarked image is calculated. The MSE is the average of the squares of the difference between the deviations from the original. PSNR is the ratio of the maximum power of the signal to the power of the corrupting noise. The DWT operation and the SPIHT algorithm will be further explained in detail. The watermarking process is done using two-level DWT and four-level DWT separately [1].



# Autonomous monitoring of the automobile parameters for road safety

Kalai Selvi V<sup>1</sup>, Dr. K S Gurumurthy<sup>2</sup>, Kanimozhi S<sup>3</sup>

<sup>1</sup> M Tech, School of ECE, Reva University, Karnataka, India

<sup>2</sup> Senior Prof., School of ECE, Reva University, Karnataka, India

<sup>3</sup> Asst. Prof., Dr. TTIT, KGF, Karnataka, India

\*\*\*

**Abstract** - The number of people dying in road accidents is increasing day by day. It is very important to bring in autonomous system to prevent accidents. Accidents occur due to various reasons. It could be due to over speed, ill health of the driver, bad condition of the vehicle etc. In this paper we present a scheme to monitor the automobile parameters like speed, tyre pressure, driver's health condition etc., autonomously from the safety stand point. The main aim is to design a digital controller that can monitor number of parameters using RFID technique in real time. Here in this work we demonstrate this scheme with one parameter namely the speed of the automobile. The speed of a vehicle will be monitored in real time and reduce the same if the speed crosses a set limit. This is achieved by building an embedded module with a Display and Control unit, customized to fit into an automobile dashboard. ARM 7 microcontroller is used as the main hardware and 'Embedded C' is used for coding. Field trials give expected results out of the proposed scheme.

**Key Words:** RFID, Automobile, Speed limit, ARM 7, Danger zone

## 1. INTRODUCTION

The report is in reference to 2013 and 2015 information collected from 178 collaborating countries, throughout the globe, over a million humans die in road accidents each and every year and 20-25 million human obtain injuries. The major reason has been found to be the over speed of the automobiles. Prevention is constantly higher than therapy. The speed of the automobiles will be monitored and reduce the same if speed crosses a set limit. This would be achieved by building an embedded module with a Display and a Control unit, customized to fit within vehicle's dashboard.

The proposed module comprises of two separate units namely Zone transmitter unit in danger zone (accident zone) and receiver unit in the running vehicle. Whenever the vehicle moving within the accident (transmitter) zone found to cross the road speed limits, the vehicle speed is

controlled by the proposed system and the driver will not have any control over the throttle. The control of the driver over the throttle is restored once the vehicle comes out of the accident zone. The entire project works on the signals sent and received by RFID technology tag. The current speed of vehicle is sent to ARM microcontroller and the ARM microcontroller sends out the control signal to reduce the fuel flow to the carburetor to reduce the speed to the prefixed speed. This will be done with the relay arrangement. The Embedded C will be used for the software part. This automation built into an automobile will help in reducing the accidents, and increasing the fuel economy. This system will be compact and low-price

**1.1 Methodology:** the description for existing and proposed methodology is given below.

**a. Existing method:** in this method Adaptive cruise control (ACC) which has radar sensor measures the distance to the vehicle in front and its relative speed and uses this information to gather the position of the vehicle in is in same or different lane. ACC is thus able to adapt the vehicle speed to match the speed of the vehicle travelling in front and maintain the safe distance from it by radar sensor [6]. But there is no speed control mechanism in real time near the hospital zone/ school zone.

**b. Proposed method:** here we develop two separate modules transmitter module and the receiver module. Transmitter / Zone transmitter unit in danger zone and receiver in the running vehicle. Whenever the vehicle moving within the accident (transmitter) zone found to cross the road speed limits, the vehicle speed is controlled by the proposed system and the driver will not have any control over the throttle. The control of the driver over the throttle is restored once the vehicle comes out of the accident zone. The entire project works on the signals sent and received by RFID tag-reader.

**2. Literature Survey:** Throughout the earlier years many devices and technologies has been utilized to provide road safety and accordingly to reduce accidents occurring due to speed violation for example Radar sensor [6], average





# A MULTIMODAL BIOMETRIC RECOGNITION SYSTEM BASED ON DECISION LEVEL FUSION FOR USER AUTHENTICATION

Vijayalakshmi G. V. and Mohana C.

Department of Electronics and Communication Engineering, Dr.T. Thimmaiah Institute of Technology, Oorgaum, Kolar Gold Fields, Karnataka, India

E-Mail: [vijugv@gmail.com](mailto:vijugv@gmail.com)

## ABSTRACT

In the traditional authentication methods like passwords, smart cards etc., there is lack of security, hence to overcome this biometrics is used. In case of single modal biometric there is a chance of misuse and the accuracy is also less, hence to achieve good authentication accuracy and to improve security multimodal biometrics is used. The project work on 'A Multimodal Biometric Recognition System Based on Decision Level Fusion for User Authentication' was carried out using face, iris and fingerprint Databases. The features such as Gabor filter, GLCM (Gray Level Co-Occurrence Matrix), Affine Moment and LBP (Local Binary Patterns) were extracted from the face, iris and fingerprint respectively. The classification of face and iris images was performed using LDA (Linear Discriminant Analysis) and that of fingerprint images was performed using  $k$ -NN ( $k$ -Nearest Neighbor) from the features extracted. The performance of the classifier was evaluated using confusion matrix. From the evaluation the authentication accuracy of 97.5%, 98% and 99.3% were obtained for iris, fingerprint and face respectively. Also, the single biometrics were fused using decision level fusion based on majority logic function to achieve highest accuracy and an authentication accuracy of 99.6% was obtained after fusion.

**Keywords:** authentication, decision level fusion, gray level co-occurrence matrix, fusion, multimodal biometric recognition.

## 1. INTRODUCTION

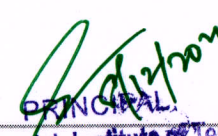
In present years, authentication based on biometric has been significant improvement in providing accuracy and reliability by offering good performance [1]. With a view to increase individual security, the government of India has introduced Aadhaar which gives unique identity to each individual by using biometrics such as iris, face and fingerprint [2]. In current year's biometric techniques plays a very important role in identifying the individuals. Using passwords, Personal Identification Numbers (PIN), smart cards etc. there is a chance of forgetting the passwords, stealing of smart cards and hacking of sensitive records by the malicious users hence to overcome this biometrics helps to identify the correct person, since the biometrics characteristics cannot be stolen, misplaced or changed [3]. Biometrics with single modal has constraints like high error rate, noise; non-universality and uniqueness, hence by using multimodal biometric accuracy can be increased, while vulnerability to spoofing can be reduced. The important part in multimodal biometrics is the fusion of various biometrics. Image Fusion is the method of combining significant information from two or more images into a single image, the resultant image will be more informative than any of the input images.

## 2. RELATED WORK

In today's world authentication plays a very important role in identifying the individual, hence biometrics plays a very important role in providing the security against malicious user who try to steal individual personal details. In this section the research carried out by various authors is reviewed for understanding the concepts of fusion techniques for providing authentication accuracy.

The authors in [4, 5] proposed a fusion technique; since the single modal biometric possesses many problems to overcome this multimodal biometric is used. The two single modal biometric traits iris and fingerprint are taken. The use of multi-modal biometrics produces higher performance than the single modal biometrics. The accuracy of iris is 97.5% and that of fingerprint is 96%. Fusion is carried out using fuzzy logic at decision level, the iris is weighted with 80% and fingerprint is weighted with 20%. The accuracy of the fused multimodal biometrics is 98.3%. Hence, the use of multimodal biometrics gives better results. The authors in [6] proposed a facial feature extraction method based on FPD (Face Part Detection) and (GLCM) Gray Level Co-Occurrence Matrix. GLCM is used to extract texture features and FPD is based on bounding box method. The performance factors such as accuracy and execution time was measured. On comparison of the outcomes of the two algorithms it was observed that extracting the features using GLCM involved minimum execution time and it resulted in good performance accuracy when compared to the FPD.

The author in [7] proposed a feature level fusion for face and fingerprint. The features are first extracted from the individual biometrics. The feature from the face is extracted using scale invariant transform (SIFT) and the feature from the fingerprint is extracted is minutiae matching. The features are matched based on point pattern matching or Delaunay triangulation. The accuracy obtained with face feature extraction is 93.95% and that of fingerprint is 92.64%. The accuracy obtained after fusion is 98.51%.

  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F- 583120



Full Length Research

# An improved frequency based agglomerative clustering algorithm for detecting distinct clusters on two dimensional dataset

Madheswaran M.<sup>1\*</sup> and Sreedhar Kumar S.<sup>2</sup>

<sup>1</sup>Department of Electronics and Communication Engineering (ECE), Mahendra Engineering College, Mallasamudram-637503, Tamilnadu, India.

<sup>2</sup>Department of Computer Science and Engineering (CSE), KS School of Engineering and Management, Bangalore-560062, India.

Received 12 July, 2017; Accepted 11 October, 2017

In this study, a frequency based Dynamic Automatic Agglomerative Clustering (DAAC) is developed and presented. The DAAC scheme aims to automatically identify the appropriate number of divergent clusters over the two dimensional dataset based on count of distinct representative objects with higher intra thickness and lesser intra separation. The Distinct Representative Object Count (DROC) is introduced to automatically trace the count of distinct representative objects based on frequency of object occurrences. It also identifies the distinct number of highly comparative clusters based on the count of distinct representative objects through sequence of merging process. Experimental result shows that the DAAC is suitable for instinctively identifying the K distinct clusters over the different two dimensional datasets with higher intra thickness and lesser intra separation than existing techniques.

**Key words:** Dynamic automatic agglomerative clustering, clusters, intra thickness, intra separation, distinct representative object count.

## INTRODUCTION

Agglomerative hierarchical clustering is an unsupervised clustering technique to cluster the dataset into a hierarchical tree structure form through a sequence of merging based on similarity metrics (Han and Kamber, 2006). In recent years, this clustering approach is applied to Machine Learning, Pattern Recognition, Data Mining, Text Mining, Spatial Data Base Application, Web Application, Dig Data, Image Analysis, Information

Retrieval and Bioinformatics (Douglass et al., 1992; Martin et al., 2000; Cadez et al., 2001; Fogs et al., 2001). In general, the agglomerative hierarchical clustering scheme is classified into divisive and agglomerative categories (Pakhira, 2009; Jain, 2010; Jain et al., 1999; Frigui and Krishnapuram, 1997). The divisive method continuously divides the dataset into smaller clusters until each cluster consists of a single object.

\*Corresponding author. E-mail: madheswaran.dr@gmail.com.

Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](#)

PRINCIPAL  
Dr. T. Thirumalaiah Institute of Technology  
Gurgaon, K. G. F-563120



# A New Dynamic Data Cleaning Technique for Improving Incomplete Dataset Consistency

Sreedhar Kumar S<sup>1\*</sup>

KS School of Engineering and Management /Department of CSE, Bangalore, 560106, India  
E-mail: sree\_me\_261177@yahoo.co.in

Meenakshi Sundaram S<sup>2</sup>

GSSS Institute of Engineering and Technology for Woman / Department of CSE, Mysuru, 570016, India  
E-mail: 1965sms@gmail.com

Received: 05 May 2017; Accepted: 03 July 2017; Published: 08 September 2017

**Abstract**—This paper presents a new approach named Dynamic Data Cleaning (DDC) aims to improve incomplete dataset consistency by identifying, reconstructing and removing inconsistent data objects for future data analysis process. The proposed DDC approach consists of three methods: Identify Normal Object (INO), Reconstruct Normal Object (RNO) and Dataset Quality Measure (DQM). The first method INO divides the incomplete dataset into normal objects and abnormal objects (outliers) based on degree of missing attributes values in each individual object. Second, the (RNO) method reconstructs missed attributes values in the normal objects by the closest object based on a distance metric and removes inconsistent data objects (outliers) with higher missed data. Finally, the DQM method measures the consistency and inconsistency among the objects in improved dataset with and without outlier. Experimental results show that the proposed DDC approach is suitable to identify and reconstruct the incomplete data objects for improving dataset consistency from lower to higher level without user knowledge.

**Index Terms**—Dataset Quality Measure, Identify Normal Object, Missing Attributes, Object Consistency, Object Inconsistency, Outlier, Reconstruct Normal Object.

## I. INTRODUCTION

Data cleaning is a pre-processing technique to improve the accuracy of the data analysis system by identifying, removing and reconstructing abnormal data objects in the existing dataset or database [1-3]. Typical data errors occur due to the misuse of abbreviations, data entry mistakes, duplicate records, missing values, spelling errors and outdated codes which can directly affect the data analysis results in various field applications like Data Mining, Data Warehousing, Image Processing, Machine Learning, Bioinformatics and Biomedical [4]. Presently the trend in the data cleaning research includes duplicate detection, missing attribute value detection, missing value modification, outlier detection, logical confusion detection and redundant data processing [5].

Identifying and reconstructing the missed attribute value in the inconsistent data objects or records in incomplete dataset is an important task in the data cleaning technique [6]. Generally, the missing data problem in incomplete dataset is classified into three classes: Missing Completely At Random (MCAR), missing At Random (MAR) and Missing Not At Random (MNAR). Many authors have suggested major that the issue in existing data cleaning techniques is that they follow an approximation statistical procedure to reconstruct the missed data value in the inconsistent data object by randomly selecting neighborhood object or randomly defining the missed data value through the user. To overcome this, in this paper, a new Dynamic Data Cleaning scheme is proposed to improve the dataset consistency through following steps:

- 1) Identifying normal objects and outliers (abnormal object) based on the degree of missing attributes
- 2) Removing outliers and reconstructing missed attributes in normal objects by closest objects based on the distance metric without user input
- 3) Estimating the dataset quality based on object consistency and inconsistency measures.

This paper is organized as follows: related work is discussed in Section II. Section III contains details of the proposed approach. The dataset quality measure and complexity analysis are discussed in sections IV and V respectively. Finally, the Experimental results and performance measures are discussed in Section VI. Conclusions and scope for further research are drawn in Section VII.

## II. RELATED WORK

Several data cleaning techniques have been reported in the past [7-11] namely Imputation, Partial Imputation, Partial Deletion, Full Analysis and interpolation which used to handle missing data problem in inconsistent dataset or incomplete database. The two standard techniques like Expectation Maximization (EM) and



# Inherent Approach of Medical Image Pixels Classification Using an Improved Agglomerative Clustering Technique

Madheswaran M.<sup>1</sup>, Sreedhar kumar S.<sup>2\*</sup> and Ravi R<sup>3</sup>

1. Department of ECE, Mahendra Engineering College, Namakkal Dt.-637503, Tamilnadu, INDIA

2. Department of CSE, KS School of Engineering and Management, Bangalore-560074, INDIA

3. Department of CSE, JJ College of Engineering and Technology, Trichy-620009, INDIA

\*sree\_me\_261177@yahoo.co.in

## Abstract

*This paper presents, an approach of Inherent Image Pixels Classification (IIPC) using an improved agglomerative clustering scheme. It aims to trace the distinct number of dissimilar patterns over the medical gray scale images automatically using improved agglomerative clustering scheme for deeper investigation and analysis. The IIPC approach consists of Clustering and Validation stages. The clustering stage aims to automatically identify the appropriate number of divergent clusters over the medical image dataset based on count of distinct representative objects. Next, the IIPC approach estimates the intra similarity and intra divergence in each individual cluster in the result of medical image dataset. Experimental results show that the IIPC approach is better suited for spontaneous identification of appropriate number of distinct clusters in medical gray scale images with higher intra thickness and lower intra divergences.*

**Keywords:** Clustering, Inherent Image Pixel Classification, Intra Thickness, Intra Divergence, Validation, Medical Image.

## Introduction

Image segmentation is a key process in image analysis and identification and is defined as the process of dividing digital image pixels into different numbers of sub regions based on pixel intensity homogeneity<sup>1</sup>. The goal of image segmentation is to simplify or change the representation of an image into a version that is more meaningful and easier to analyze and identify.<sup>2</sup>

Recently, as many researchers have been reported in <sup>3,4</sup> the segmentation process is applied in many pattern recognition applications like image compression, image editing, pattern identification, biometric process, image retrieval, video segmentation. The result of image segmentation is a set of group that collectively covers the entire image, and the quality of the result depends on the quality of the image <sup>5</sup>. Many authors reported in <sup>6-9</sup> that the Agglomerative Hierarchical Clustering (AHC) technique is not suitable for the image segmentation process due to many factors, which include:

- (1) Failure to automatically identify the appropriate number of distinct clusters in image.
- (2) Consumption of excessive resources in iteration.
- (3) Generation of large numbers of hierarchy levels and a segmentation result that is not unique due to the stochastic decimation applied at each level.
- (4) The need for a separate technique to trace the distinct number of regions or clusters or segments over the hierarchical clustering tree.

To overcome the issues in the existing cluster based image segmentation, in this paper, an Inherent Image Pixel Classification scheme is proposed to identify distinct number of dissimilar clusters with good accuracy over the medical gray scale images in spontaneously based on improved agglomerative clustering scheme.

## Related Works

Several methods are available for the image segmentation process including the edge, region and clustering based methods reported in <sup>10</sup>.

In <sup>11,12</sup>, researchers reported on the edge-based method, which uses edge information to determine the boundaries of objects and form the closest regions that belong to the objects in the image.

The main drawback in the edge-based method is that it suffers from spurious edges and can produce erratic results at times. <sup>2</sup> reported that the region-based method partitions the image into connected regions through grouping of neighboring pixels with similar intensity levels based on the initial seed point or pixel. The drawback in the region based segmentation as discussed in <sup>13</sup> was that segmentation quality is based on the initial seed point or pixel and the powerful cue of contour continuity is not exploited.

Another technique is histogram-based segmentation reported by <sup>14, 15</sup>. Generally, the histogram computes the peaks and valleys surrounding the pixels in the image to locate the clusters in the image. A refinement of this technique recursively applies the histogram seeking method to find the clusters in the image and divide them into smaller clusters <sup>16, 17</sup>. The drawback of this technique is that the process used to identify the significant peaks and valleys in the image may be quite complicated.

PRINCIPAL

Dr. T. Theimaiah Institute of Technology



# A SURVEY ON DIFFERENT FILE HANDLING MECHANISMS IN HDFS

Revathi S<sup>1</sup>, Saniya Kauser<sup>2</sup>, Sushmitha S<sup>3</sup>, Vinodini G<sup>4</sup>

<sup>1</sup>Assistant Professor, Dept of CSE, Dr.TTIT, Karnataka, India

<sup>2</sup>UG Student, Dept of CSE, Dr.TTIT, Karnataka, India

<sup>3</sup>UG Student, Dept of CSE, Dr.TTIT, Karnataka, India

<sup>4</sup>UG Student, Dept of CSE, Dr.TTIT, Karnataka, India

\*\*\*

**Abstract** - Hadoop is a software framework for distributed processing of large datasets across large clusters of computers. Hadoop framework consists of two main layers. They are Hadoop Distributed file system (HDFS) and Execution engine (Map Reduce). HDFS has the property of handling large size files (in MB's, GB's or TB's), but the performance of HDFS degrades when handling small size files. The huge numbers of small files impose heavy burden on NameNode of HDFS, correlations between small files were not considered for data placement. There are three common mechanisms to handle the small files in HDFS like Hadoop Archive (HAR), Sequence File and TLB MapFile. In order to improve the access efficiency and to quickly locate a small files, a common strategy is to merge small files into large ones. This paper discusses the different small file handling mechanism like Hadoop Archive (HAR), Sequence Files, TLB-MapFile and compares them.

**Keywords:** Hadoop, HDFS, HAR, Sequence File , TLB-MapFile

## 1. INTRODUCTION

Hadoop is an open-source software framework[1], which offers cost-efficient solution to store, manage and analyze a large amount of data, it provides distributed processing and storage of huge data across thousands of computers[2]. Google initiated the idea of hadoop to store and process a large information through web and now it is adapted by other web giants like, Facebook, Twitter, LinkedIn, Yahoo, etc, The Hadoop comes with two layers called MapReduce framework and Hadoop Distributed File System (HDFS).

**1.1 MapReduce framework:** MapReduce is a core component of the Apache Hadoop software framework[3]. It is parallel programming model for processing and generating large data sets. generally it is the execution unit of hadoop framework[4]. It uses map function to process a key/value pair in order to generate a set of key/value pairs, and a reduce function that combines all intermediate values associated with the same intermediate key. It is based on two functions called map and reduce. MapReduce provides good fault-tolerant, with each node periodically reports its status to a master node.

**1.2 HDFS:** is a distributed file system designed to store and process large datasets [3]. HDFS is scalable and fault-tolerant, which is organized on low-cost hardware. HDFS provides efficient access to application data and is suitable for applications that have large data sets. HDFS provides a stable storage layer for the distributed application. HDFS has a master/slave architecture and consisting of three main components [4]: NameNode, DataNodes and Clients, as shown in Figure 1.

1. Name node: a master server that manages the file system namespace and regulates access to files by clients.
2. Date Nodes: a number of DataNodes, usually one per node in the cluster, which manage storage attached to the nodes that they run on.

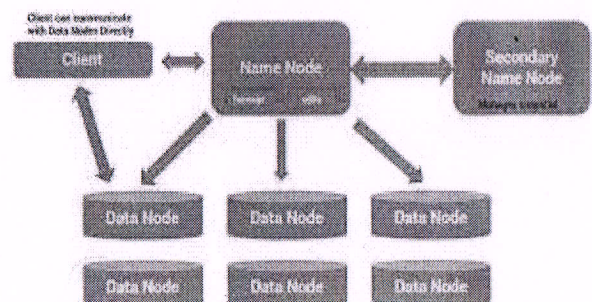


Figure 1: Components of HDFS

However storing and accessing a large number of small files impose a big challenge to HDFS because of two main issues:

1. The Namenode Memory is highly consumed by large numbers of files
2. Doesn't considers file correlations for data placement.

Based on the analysis of small file problem, an efficient approach is designed for HDFS to reduce the memory consumption of NameNode, and to improve the storage and access efficiency of small files.

## II. Small File Handling mechanisms:

The three common mechanisms are HAR, sequence files and TLB-MapReduce [5].



## ACF ALGORITHM FOR ECG SIGNAL IMPLEMENTATION

<sup>1</sup>JENITHA A, <sup>2</sup>ELUMALAI R

<sup>1</sup>Dept. of Electronics & Communication EPCET, Bangalore, India

<sup>2</sup>Dept. of Electrical and Electronics NHCE, Bangalore, India

E-mail:<sup>1</sup>28jenitha@gmail.com, <sup>2</sup>elumalai.epcet@gmail.com

**Abstract** - It is believed that the ECG signal is a standard signal for the control of heart rate and diagnose various cardiac problems. In an ECG signal, the most important feature is the QRS complex. The duration of the QRS complex and the height gives a lot of data that allows the doctor to assess the condition of the human heart. However, the ECG signal is noise and other artifacts which hamper the analysis of the signal with bare eyes different algorithms are developed to extract features from the ECG signal. But here we have implemented two algorithms PAN - TOMPKINS and ACF (autocorrelation algorithm) to find the QRS complex of the 12-lead ECG signal. Correlation function is used here to determine whether the ECG signal is normal or abnormal signals are called arrhythmias. MATLAB is used for the simulation of both the algorithms and the same is also implemented in Xilinx FPGAs. This approach provides accurate for the analysis of ECG results in real time.

**Key Words** - Pan Tompkins Algorithm, Autocorrelation Function Algorithm, Band Pass Filter, Differentiator , Moving Window.

### I. INTRODUCTION

The electrocardiogram is considered a diagnostic tool that provides the report on the electrical activity of the heart is recorded using skin electrodes. The technique used for the measurement of the ECG signal is a non-invasive technique which means that the signal is measured on the surface of the human body. If there is no disturbance of the heart rate or rhythm or morphological, the change indicates a cardiac arrhythmia, however, this can be determined by analysis of the ECG signal. ,, Tachycardia Ventricular premature beats, beat fusion, etc. It was the most common arrhythmia. In a P-wave duration and amplitude ECG - QRS - T contains very useful information on the nature of heart disease. Depolarization and re polarization of sodium and potassium ions in human blood result in ECG signal electric waves calls.

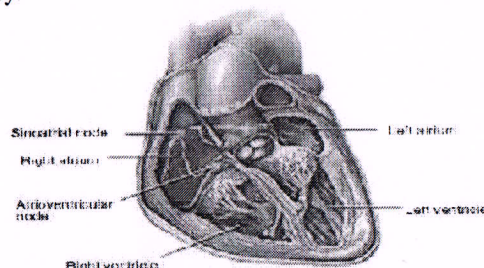
From the analysis of the ECG waveform, they can be obtained the following formations of the human heart:

- Provides information on the relative size of the camera and the position of the heart.
- Provides information on the origin and spread of momentum. It provides information on changes in the concentration of electrolytes.
- Gives information on heart rhythm and conduction disturbances.
- Provides information on the effects of different drugs on the heart.
- It provides information about the extension of myocardial ischemia.

However, no ECG signal provides data related to the contraction of the heart or pump function. Heart Anatomy The human heart consists of 4 rooms, ie, 2 atria, 2 ventricles and various AV and SA nodes. The two upper chambers are called right and left atria and the two lower chambers are called the right and left

ventricles. The atria and ventricles are connected by fibrous tissue and non-conductive Artia keep electrically isolated from the ventricles. The oxygen-poor or deoxygenated blood from different parts of the body is received by the superior and inferior vena cava to the right atrium and passed. Once the blood is received, the right atrium contracts and thereby forcing blood to flow to the right ventricle, the ventricles.

Lungs for purification. The blood is purified in the lungs and deoxygenated blood becomes oxygenated blood. This oxygenated blood from the lungs is received by the left ventricle and the left atrium through the pulmonary veins and is pumped to the body.



**Fig 1 Heart Anatomy**

In the human heart, electrical pulses are generated by the SA node (sinoartial). The generated pulses are spread around the heart initiating myocardial contraction. Depolarization is a process through which the electric impulses generated propagate through excitable tissues. A current of ions is generated by the depolarization of the heart muscle, then a voltage drop occurs through the resistive body. This voltage is detected by the electrodes are fixed on the surface of the body. Therefore, the ECG is only a record of the existing voltage drop across the skin, which is due to the ionic current flow caused by myocardial de polarization. The propagation of electrical impulses that is the result of the de-





# True-Motion Estimation Algorithm and Its Application to Motion-Compensated Temporal Frame Interpolation

Shashi Kiran.S<sup>1</sup>, Srinivas Babu.N<sup>2</sup>, Ruckmani Divakaran<sup>3</sup>, Mohmad Ashiq.A<sup>4</sup>, Arun Kumar.B<sup>5</sup>, Rohit.J<sup>6</sup>

Assistant Professor, Dr. TTIT, K.G.F<sup>1,2</sup>

HOD of ECE, Dr. TTIT, K.G.F<sup>3</sup>

Students, Dr. TTIT, K.G.F<sup>4,5,6</sup>

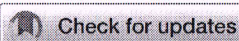
**Abstract:** Motion estimation (ME) has a vital role in video coding and several video processing applications, such as denoising, de-interlacing, and frame rate up-conversion (FRUC) or frame interpolation. ME is employed to exploit the temporal correlation between video frames either to reduce the temporal redundancy for video coding applications or to improve the visual video quality for video processing applications. One might argue that some of these video processing applications may potentially utilize the existing motion vectors (MVs) from the decoder via MV post-processing to keep the complexity low; however, this may not usually be a feasible option. This infeasibility could be due to either difficulty of using MVs or lack of available MVs. As video coding and video processing applications are often implemented separate intellectual properties (IPs) in hardware[12], it may be very difficult to share the MVs between decoder and other video processing applications due to bandwidth, latency, storage, and design specification reasons. Besides, some of these video processing applications may be employed either before the encoding or after the decoding, and some of them may be employed at both places; if it is employed before the encoding then MVs are not available, as a result ME needs to be performed. For example, FRUC is employed only at the display side after the decoder; de-interlacing and de-noising, however, can be utilized in both places. Where as in true motion estimation the mainly it goes to detect the motion object as closely as possible by using the block matching algorithm, and then after the estimation of the true motion vector fields it helps to produce the motion compensated temporal frame interpolation. This methods is gives the more video quality and the smoothness with the flow of frames. The main aim of this paper is to determine the motion (moving) object in the video sequences this method is called as true motion estimation by adopting the implicit and explicit smoothness constraint on block matching algorithm. After finding true motion vector also called as coherent motion vector field is used to produce the good temporal interpolated frames between existing frames this gives good video with easily flowing one after the other by smoothly and continuously. After getting the interpolated frames the performance metrics like PSNR (peak signal to noise ratio) and SSIM (structural similarity) between the interpolated frames and the original frames.

**Keywords:** PSNR (peak signal to noise ratio) and SSIM (structural similarity), FRUC, motion vectors (MVs).

## I. INTRODUCTION

Motion estimation (ME) has a vital role in video coding and several video processing applications, such as denoising, de-interlacing, and frame rate up-conversion (FRUC) or frame interpolation. ME is employed to exploit the temporal correlation between video frames either to reduce the temporal redundancy for video coding applications or to improve the visual video quality for video processing applications. One might argue that some of these video processing applications may potentially utilize the existing motion vectors (MVs) from the decoder via MV post-processing to keep the complexity low; however, this may not usually be a feasible option. This infeasibility could be due to either difficulty of using MVs or lack of available MVs. As video coding and video processing applications are often implemented separate intellectual properties (IPs) in hardware[12], it may be very difficult to share the MVs between decoder and other video processing applications due to bandwidth, latency, storage, and design specification reasons. Besides, some of these video processing applications may be employed either before the encoding or after the decoding, and some of them may be employed at both places; if it is employed before the encoding then MVs are not available, as a result ME needs to be performed. For example, FRUC is employed only at the display side after the decoder; de-interlacing and de-noising, however, can be utilized in both places. Where as in true motion estimation the mainly it goes to detect the motion object as closely as possible by using the block matching algorithm, and then after the estimation of the true motion vector fields it helps to produce the motion compensated temporal frame interpolation. This methods is gives the more video quality and the smoothness with the flow of frame.





Cite this: *RSC Adv.*, 2017, 7, 40664

Received 31st July 2017  
Accepted 2nd August 2017  
DOI: 10.1039/c7ra08443a  
[rsc.li/rsc-advances](http://rsc.li/rsc-advances)

# Glycerol–water mediated centrifuge controlled green synthesis of oleic acid capped PbS quantum dots for live cell imaging†‡

M. Vijaya Bharathi,<sup>ab</sup> Kaustab Ghosh<sup>\*a</sup> and Priyanka Paira<sup>\*b</sup>

Glycerol–water mediated convenient synthesis of PbS quantum dots (QDs) is introduced utilizing distinctive precipitation strategies. It is exceptionally fascinating to observe that the aforementioned factor assumes a major role in the capping process, stability as well as purity and crystalline nature of the QD. Strong red fluorescence from QDs in the HeLa cell makes these materials suitable for deep tissue imaging.

## Introduction

Quantum dots (QDs) have received incredible attention from researchers as functional materials due to their quantum confinement effect, shape and size dependent optical properties and stable, narrow fluorescence peaks. Colloidal semiconductor PbS QDs, having a vast exciton Bohr radius of 18 nm,<sup>1</sup> offer tunable luminescence over visible and NIR regions (400–2500 nm) by controlling the dot size.<sup>2–4</sup> In the limit of strong confinement, the third order nonlinear optical response of PbS QDs is relied upon to be thirty times that of GaAs and one thousand times that of CdSe materials, which is exceptionally attractive for photonic and optical switching device applications.<sup>5</sup> Different routines have been suggested to synthesize PbS quantum dots.<sup>6–13</sup> PbS QDs capped with b-lactoglobulin were synthesized in aqueous medium using microwaves and used for examining 293T cells.<sup>14</sup> Core-shell PbS–CdS QDs were synthesised using cation exchange method for a duration of 1–48 hours. Likewise, core PbS QDs were synthesized using GSH and used for examining the lymph system, cerebral blood vessels, and breast tumor.<sup>15</sup> The RNase-A assisted PbS QDs in the attractive NIR-II window were also synthesized in aqueous medium using microwaves.<sup>16</sup> Oleic acid capped PbS QDs with a size <2 nm were synthesized previously.<sup>17</sup> One-step synthetic

protein G)-coated PbS QDs for the imaging of breast tumors at the cellular and whole-body level was already developed.<sup>18</sup>

It should be noted that amongst these routines is the Cademartiri synthesis route<sup>19</sup> that employs lead chloride with elemental sulphur as the precursor in oleylamine as the solvent. Herein, trioctylphosphine (TOP) can be added to oleylamine solvent as a capping agent to accomplish great control of QD size tenability and reproducibility. Notwithstanding, the utilization of TOP and trioctylphosphine oxide (TOPO) improves the toxicity of the nanoparticles that are unacceptable for *in vivo* applications and are risky, expensive and unsatisfactory for mass production of PbS QDs.<sup>20</sup> Comparable issues emerged when these PbS QDs were procured in aqueous solution utilizing a mixture of thioglycerol and dithioglycerol as stabilizing agents or utilizing dihydrolipoic acid as a stabilizer at room temperature.<sup>21</sup> PbS QDs were also prepared in aqueous medium utilizing capping material such as 1-thioglycerol/dithioglycerol,<sup>22</sup> dihydrolipoic acid,<sup>23</sup> L-cysteine,<sup>24</sup> apoferritin<sup>25</sup> and luciferase.<sup>26</sup> Among these coated QDs, those coated with 1-thioglycerol/dithioglycerol have tuneable emission in a second NIR window. However, PbS QDs capped with 1-thioglycerol and dithioglycerol are non-biocompatible and cytotoxic. An alternate paramount perspective is the virtue of the colloidal QDs as the impurities create a deep energy level in the band gap and disable device performance. The carrier mobility of these materials, which relies upon the scattering mechanism, is a function of crystal flawlessness and purity.<sup>27,28</sup>

## Results and discussion

From the abovementioned perspective, in this study, we report the synthesis of pure PbS colloidal QDs utilizing sol–gel method with less poisonous and green precursors, for instance, sodium sulfide, which is inodorous and less dangerous than organic sulphur.<sup>29</sup> We utilized different precipitation techniques for eliminating the unreacted precursor and solvents for obtaining purified PbS QDs for different applications. The synthesis was

<sup>a</sup>School of Electronics Engineering(SENSE), VIT University, Chennai Campus, Tamilnadu, India. E-mail: [kaustab@vit.ac.in](mailto:kaustab@vit.ac.in)

<sup>b</sup>Department of Chemistry, School of Advanced Sciences, VIT University, Vellore-632014, Tamilnadu, India. E-mail: [priyanka.paira@vit.ac.in](mailto:priyanka.paira@vit.ac.in); Fax: +91-416-2243092; Tel: +91-416-2243091

† Electronic supplementary information (ESI) available. See DOI: 10.1039/c7ra08443a

‡ Led acetate, oleic acid, sodium sulphide, glycerol, PBS buffer, MTT reagent, DMSO, trypsin was purchased from Sigma Aldrich. DMEM media was purchased from Himedia. Cancer HeLa cell line and normal kidney cell line (HEK 293) was obtained from NCCS, Pune.





## PERFORMANCE APPRAISAL OF DWT AND PCA BASED CARDIAC ECG ARRHYTHMIAS DIAGNOSIS WITH K-NN CLASSIFIER

<sup>1</sup>INBALATHA.M, <sup>2</sup>KALAIVANIS

<sup>1</sup>Research Scholar, SENSE, VIT, Vellore, Tamil Nadu, India

<sup>2</sup>Associate Professor, SENSE, DSP Division, VIT, Vellore, Tamil Nadu, India  
E-mail: <sup>1</sup>inbalathaphd@gmail.com, <sup>2</sup>kalaivani.s@vit.ac.in

**Abstract-** Empathy of heart infirmity refined as disorder is real complex in medicinal ground. A standard diagnosis tool Electrocardiogram (ECG) signal is picked to distinguish regular and arrhythmias heart weary. This research exertion develops a unique sketch for feature extraction technique based on Discrete Wavelet Transform (DWT) and Principal Component Analysis (PCA). The objective of this effort is to succeed a resourceful arrhythmia discovery classification that can clue to high vibrating early heart diagnosis. Euclidean minimum distance norm is nearly new to find least possible distances and k- nearest neighbor classifier is used to classify the heart beats. Faithfully thirteen signals from the MIT-BIH arrhythmias ECG Database has been used for the training and testing the k-NN classifier. In the simulation result, DWT features works worthy for the classifier with the utmost accuracy of 94.4% whereas the accuracy is solitary 70.8% by PCA

**Keywords-** Cardiac arrhythmia, ECG, DWT, k-NN classifier, PCA.

### I. INTRODUCTION

Heart is the most vital structure of humanoid body. Rendering to World Health Organization (WHO) Cardiovascular Disease (CVD) is the topmajorsickness. This grounds more people to expire every single year. In turn every distinct year 9.4 million demises arise andbesides in this 45 percentage of deathsarise due to coronary heart sickness [1]. The innovative peer group of medical cure has been reinforced by Hi-Tech computerized progressions. Signals chronicled from the human body provide appreciated information about the actions of its body portion[2]. Customary practices of Clear investigation of ECG for doctors are difficult and time overwhelming job [3].Pictorial investigation desires knowledge to recognize the attained problems in ECG [4]. Electrocardiogram is an investigation that is made on the heart to identify the defects in the cardiac cycle by exploring the electricalevents of the human heart by assigning 12 prime electrodes over the human surface. As a result each electrode identifiesspecificvital morphological features in the ECG gesture.The small fluctuations in amplitude and interval of ECG cannot be resoluteprecisely by the stark-naked eye andECG patterns may consume to be experimentalover numerousperiods,therefore there is a requirement for computer assisted diagnosis scheme[5].This overlay a fashion for Computer ECG. In computerized ECG the programmed classification of heart bug into normal and abnormal arrhythmia is prepared in an automated mode.

### II. ARRHYTHMIA

Arrhythmia is anillness of the heart rhythm [6]. The heart can wearyexcessivelywild (Tachycardia), excessivelyrelaxed (Bradycardia), or uneven. Arrhythmia is caused due to the heart's electrical

conduction system during the occurrence of irregular contraction and relaxation of the heart, different nerve messages signals the heart, blocking of signals and also whensignals travel in new pathways through the heart. The causes of arrhythmia may be due to heart attack, enlarged heart by birth, blood pressure, and also due to bad practices like smoking, alcohols and drugs. Every so oftendoses used to treat one form of arrhythmia will roota different type of strange heart rhythm. Indications can be very slight, or they may be stark or even dangerous. Specific of the indications during arrhythmia are extreme panicking, faintness, chest- pain, wooziness, and anemia.

### III. ELECTROCARDIOGRAM

Electrocardiogram is an investigation that is made on the heart to isolate the flaws in the cardiac cycle by discovering the electrical actions of the humanoid heart using 12 probes over the body surface. ECG also called as Electrophysiology study (EPS) is the totality of the electrical motion, when enlarged and documented for just a few seconds.Period and voltage evaluation of P, Q, R, S, and T waves are the most keycharacteristics of an ECG signal. The morphology and the time extents of thesefeature bits are real fact used for finding the disease as shown in Fig. 1.

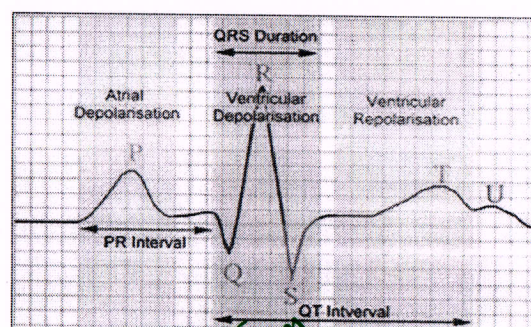


Fig.1.Sample ECG Signal.



# RFID and Pose Invariant Face Recognition Based Automated Security System

Tamil Vani .R<sup>1</sup>, Ruckmani Divakaran<sup>2</sup>, Vinitha Shree .G.R<sup>3</sup>, Revathi .R<sup>3</sup>, Nalini .P<sup>3</sup>, Khutija Kubra<sup>3</sup>

Assistant Professor, Dr. TTIT, K.G.F<sup>1</sup>

HOD of ECE, Dr. TTIT, K.G.F<sup>2</sup>

Students, Dr. TTIT, K.G.F<sup>3</sup>

**Abstract:** Conventional methods of using Barcodes that requires line of sight, pricing discrepancies, scanning problems, label damage, financial and equipment cost causes inaccuracy in entering the information and barcode scanners eventually breakdown causing scanning problems. Therefore, Radio Frequency Identification (RFID) technology is proposed that uses radio waves to transfer from an electronic tag called RFID tag, attached to an object, through a reader for the purpose of identifying and tracking the object. RFID technology which is a matured technology that has been widely deployed by various organization as a part of their automation system. In this study, an RFID based system has built in order to produce a compact and reliable smart security system using RFID and face verification is presented here. The RFID system identifies the student using the RFID card and further identity verification of the student is carried out using face recognition technique. RFID uniquely identifies the student based on the card number, then Viola- Jones algorithm is used to verify face of the students using face image of the student. The performance of the system is carried out with RFID code and face recognition.

**Keywords:** RFID card, RFID reader, Viola-Jones Algorithm.

## I. INTRODUCTION

The most common method of tracking entry of students in the college is the ID cards which have to be inspected manually, for a college of larger strength, this method is cumbersome and time consuming. Hence, the current traditions of inspecting ID cards manually are unreliable and students effortlessly counterfeit the system. Other reliable methods which are sparsely used because of the cost of implementation include the fingerprint recognition system. They offer reliable performance but there are three common issues like false acceptances, false rejections and change in sizes or form/pattern over time. Recently Radio-frequency identification (RFID) based system is significantly used in all the institutions. They are useful for identifying the student but it cannot reliably verify the student who is using it. A student can easily mark bogus attendance for his friend using his card. Then, a secret pin along with RFID is used to verify the student but they too could be easily shared or lost by the students. Hence Face recognition with RFID system used the photograph to identify and verify the faces of the individual student. This approach suggests that the face recognition is viable biometric identification of the future. A compact and reliable automated college gate control system using face verification and RFID is presented in this proposed project. The RFID system identifies the student using the RFID card and further identity verification of the student is carried out using face recognition technique. RFID Uniquely identifies the student based on the card number. The performance of the system is tested for frontal face verification. The schematic diagram of the proposed scheme is shown in block diagram. The system is designed to first identify the student and verify the respective student biometrically. It increases the security and accuracy because of two levels of authentication. RFID Systems has evidences to be the smartest way for student identification. Several biometric verification methods exist like Iris, Face, Fingerprint, etc. Face verification robust method of biometric verification. RFID System uses the RFID cards to identify the student. Face Verification System uses an individual verify the face of each student exclusively. Once the student is identified and is verified the gate is opened. If RFID Card is unidentified by RFID System then it is rejected reporting unrecognized student. If RFID card identification succeeds and face verification failed then proxy person is detected and hence identity of fraud student is known. Thus, the system is designed to be fool-proof against proxy college entry. The system is flexible enough to suit to different conditions by just sending an SMS to alter the working of it. The face verification can be deactivated in cases of functions and large gatherings. RFID student identification system here, every student is provided with an RFID card. RFID cards are assigned a unique 10 digit RFID card numbers by the manufacturer. The card number is only readable and therefore it is mapped to their respective student USN number in a RFID database. Low frequency (125 KHz) RFID card is used which could only be detected at a range from the RFID reader. Thus, collisions of RFID0 cards are avoided. Smart RFID proximity contactless card Reader 125 KHz is used for testing in real-time Students must show the RFID card in front of RFID reader and then it is checked for a match in the database of card numbers. Then success



# Detection of Exudates in Retinal Images using Support Vector Machine

Amreen Taj. C, Annapoorna. M<sup>1</sup>, Deepika. K.H<sup>1</sup>, Keerthi Kumari. B. A.<sup>1</sup>,  
Kanimozhi. S<sup>2</sup>

<sup>1</sup>(Electronics and Communication Engineering, Dr. T. Thimmaiah Institute of Technology, / Vishwesvaraya Technological University, Karnataka, India)

<sup>2</sup>(Assistant Professor, Department of ECE, Dr.T.Thimmaiah Institute of Technology)

(Electronics and Communication Engineering, Dr. T. Thimmaiah Institute of Technology, / Vishwesvaraya Technological University, Karnataka, India)

**Abstract** - Diabetic retinopathy (DR) is a micro vascular complication of long-term diabetes and it is the major cause of visual impairment because of changes in blood vessels of the retina. The presence of exudates is one of the primitive signs of DR and the detection of these exudates in the first step in automated screening for DR. Hence, exudates detection becomes a significant diagnostic task, in which digital retinal imaging plays a vital role. Exudates are yellow white lesions with relatively distinct margins.

This paper presents detection of exudates in retinal images using Support Vector Machine (SVM). The input retinal image is pre-processed using median filter and Adaptive histogram equalization technique. The pre-processed image is segmented using K-means clustering algorithm. Exudates are normally detected by their high gray level variations and we have used Support Vector Machine to perform this task. The performance of the algorithm has been prospectively tested by using DIARETDB1 database.

**Keywords**—Diabetic Retinopathy, Exudates, GLCM, K-means clustering, Support Vector Machine.

## 1. INTRODUCTION

Diabetic Retinopathy is the common retinal complication associated with diabetes. It is a major cause of blindness in both middle and advanced age groups. DR is not painful and hence visual loss is often symptom, when treatment becomes less effective. If it is diagnosed at an early and still asymptomatic stage, laser photocoagulation is one of the effective treatments which prevent visual loss from macular oedema. The International Diabetes Federation reports that over 50 million people in India have this disease and it is growing rapidly. Therefore regular screening is the most efficient way of reducing the vision loss. Before the development of computer aided diagnostic tool various methods have been introduced. Retinal image analysis – concepts, application and potential [1] by N. Patton et al. in 2006, they have used matched filter, morphological

processing and neural network, it is unclear from current studies whether the detection of retinal micro vascular changes has additional predictive value. Automated system was proposed by Abramoff et al. [2] in the year 2008, in which set of optimally adjusted morphological operators were used and thresholding operation was applied. In the year 2010 the author named M. Cree et al. published paper on automated screening of Diabetic Retinopathy [3] in which non – mydriatic digital color fundus cameras were used to capture color images of the retina and these retinal images are examined to detect the presence of exudates. In the year 2012 Yazid et al. [4] have applied an inverse surface thresholding technique for the automated detection of exudates from color fundus images. In the same year Harangi [5] have identified the regions containing exudates in retinal images by using grey scale morphology and then active contour based method was used to extract the precise borders of the candidates. In this paper, we review the suitable tool and method for segmenting high resolution retinal images. The proposed method involve K-means clustering algorithm based segmentation and classification using SVM.

## 2. BLOCK DIAGRAM

Detection of exudates in the retinal images by using Support Vector Machine (SVM) involves the following blocks as mentioned in Figure 1. The input retinal image from the database is fed to the pre-processing block to remove the noise and to enhance the contrast of the image then the next step is image segmentation, in which the image is segment into five clusters. Next the features of the optic disc is extracted and based on SVM classification the result is displayed whether the given retinal image contains exudates or not. In feature extraction Grey Level Co-Occurrence Matrix (GLCM) is used to extract both GLCM and statistical parameters. The GLCM parameters are namely Energy,





# Evaluation of Hardness and Compression Properties of Aluminum Alloy Using Taguchi's Optimization Technique

Dileep. R<sup>1</sup>, H. Ghanashyam Shenoy<sup>2</sup>, Pruthvi H M<sup>3</sup>

<sup>1</sup>PG Student, <sup>2</sup>Professor, <sup>3</sup>Associate professor, Department of Mechanical Engineering,  
Dr. T. Thimmaiah Institute of Technology-KGF, Karnataka

**Abstract :** In recent years Aluminium and its alloys are becoming more and more popular in the manufacture of automobile and its body parts. One of the most commonly used aluminium alloy for structural application is AL 7075 alloy. In this paper the study focus on the mechanical and tribological properties of AL 7075 alloy by varying the percentage of alloying elements. Taguchi method is used to optimize the number of specimens with specific composition. The experiments consist of 9 tests according to L9 orthogonal array. However signal to noise ratio analysis has been carried out to determine optimal parametric conditions which yield maximum compression strength and maximum hardness. Finally we found the best confirmative specimens for the future studies.

**Keywords:** AL 7075 Alloy, Taguchi's Technique, Die Casting, compressive strength, Hardness Number.

## I. INTRODUCTION

Aluminium is the most widely found metal on the planet. Aluminium is produced with Bauxite as raw material, which is a clay like soil type found mostly in a belt around the equator. Aluminium is bluish-white in appearance in its purest form and very ductile in nature. The name Aluminium was derived from a Latin word 'alumen'. Aluminium is also the 3<sup>rd</sup> most available element on earth's crust. Aluminium is a soft, lightweight and silvery metal which is also called as the "Wonder Metal Of The 20<sup>th</sup> Century" for its amazing properties which paved its way into commercial use. Aluminium alloys are alloys in which the predominant material is aluminium (Al) along with copper, silicon, manganese, magnesium, zinc and tin. Alloys are basically classified into wrought and cast alloys, which are further classified as heat treatable and non-heat treatable alloys. Aluminium alloy 7075 is an aluminium alloy, with zinc as the primary alloying element. It is strong, with strength comparable to many steels, and has good fatigue strength and average machinability. It has lower resistance to corrosion than many other Al alloys, but has significantly better corrosion resistance than the 2000 alloys. Its relatively high cost limits its use to applications where cheaper alloys are not suitable. Aluminium 7075 is the major alloy in 7000 Series and Zinc is the major alloying element in this series. Aluminium 7075 possesses high static strength and is used in airframe structures and for highly stressed parts.

The Taguchi method involves reducing the variation in a process through robust design of experiments. The overall objective of the method is to produce high quality product at low cost to the manufacturer. In this work L9 is sufficient. Taguchi experimental design of experiments suggests L9 orthogonal array, where 9 experiments are sufficient to optimize the parameters. Based on main factor, the variables are assigned at columns, as stipulated by orthogonal array. The last column can be kept dummy, but no row should be left out. Once the orthogonal array is selected, the experiments are selected as per the level combinations. It is important that all experiments are conducted.

S/N ratio: In Taguchi's design method the design parameters (factors that can be controlled by designers) and noise factors (factors that cannot be controlled by designers, such as environmental factors) are considered influential on the product quality.

## II. MATERIALS AND METHODS

### A. Material Compositions

The material used for present work was AL 7075 alloy. Table 1 shows the composition of Aluminium-7075 alloy according to ASM standards is as shown below.



## Graph-based loop extraction for automatic analysis of a water pipe distribution network and comparison with EPANET


Manish Kumar Mishra

See all articles by this author  
[Search Google Scholar for this author](#)

Article

 Check for updates

7

Article information 



### Abstract

This study introduces a new approach for automatic water pipe distribution network analysis by four integrated algorithms using graph theory, which are algorithms of minimal loop extraction, automatic initialization, automatic updating of initial discharges, and automatic pressure calculation at nodes. Object-oriented concepts have been used to design the algorithms for efficient data handling. The present integrated approach reduces the dependency of different processes involved in the analysis. The nested breadth first search traversal is used in the first algorithm to extract the loops without subdividing the graphical network. The initialization of pipes in loops is performed by satisfying the continuity equation at nodes in the second algorithm. The initialization, in the loop, is done in such a way that the adjacent loop will carry the residual discharge. Friction in the pipes is calculated iteratively for all flow types. Updating of discharge in pipes is according to the simultaneous loop flow adjustment method in the third algorithm. Initial discharges in the pipes of the loop in network are updated by corrective discharge in the loop according to the direction. The algorithm of nodal pressure calculation is done in the fourth algorithm, which is based on the energy equation in terms of pressure on the reference node. The results obtained by the proposed work are matched with EPANET software, in which the graphical display of the network is more user friendly and has the desired accuracy.

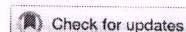
### Keywords

Pipe network, graph traversal, nested breadth first search, simultaneous loop flow adjustment method, graphical user interface

  
PRINCIPAL

Dr. T. Thimmaiah Institute of Technology  
Oorgaam, K. G. F- 563120





## Effect of feed particle size and feed NGM on the cleaning performance of a Jig

Subha Ranjan Paul and S. Bhattacharya

Department of Fuel and Mineral Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, India

### ABSTRACT

Jigging is a commonly practised method to separate particles of different relative densities. Effect of feed particle size and feed size consist appears to be significant on the cleaning performance of a Jig. Most of the constituent size fractions of the Jig feed show different separation characteristics in terms of commonly used performance parameters. Though some literature suggest significant role of Near Gravity Material (NGM) in misplacement, in case of the Batac Jig studied under this investigation, NGM contributes very little to the misplacement of material.

### KEYWORDS

Misplacement; NGM; organic efficiency; performance; tromp curve

### Introduction

Dense Media Bath (DMB), Dense Media Cyclone (DMC) and Jigs are the most extensively used coal cleaning equipments worldwide. India is no exception. Thermal coal after crushing down to <50 mm is typically cleaned by Jigs, whereas metallurgical coal by DMC after crushing down to <38 mm. Some of the metallurgical coal cleaning plants use Jigs for secondary cleaning to recover a middling product for utility usage. Typical feed size range in Jig-based plants for thermal coal cleaning is 50 × 13, 50 × 10, 50 × 6 mm and for metallurgical coal cleaning is 20 × 0.5 mm. In both the cases, particularly the latter one, feed size consist is rather wide. Performance of coal cleaning equipment in terms of separation efficiency is most commonly assessed by the following parameters.

Tromp curves, also known as partition curves, which compare the ideal and actual separation curves and the difference, if any, arising between the two curves known as Error Area

$E_p$ , Probable Error in Separation: It is mathematically defined as:

$$E_p = \frac{(d_{25} - d_{75})}{2}$$

where,  $d_{25}$  and  $d_{75}$  indicate 25% and 75% probability respectively, also known as partition numbers, for the particles to report to a given product. The numerical value of  $E_p$  captures the shift of the actual partition curve from the ideal curve. The sharpness of separation for a specific density separation process, processing a particular size of coal is defined by the Imperfection (I)

$$I = E_p / [d_{50} - 1] \text{ (for water based processes, e.g. jigs)}$$

Percentage misplacement of clean coal to reject, assuming a separation between clean coal and reject, amount of clean coal in %, as calculated from partition curve or obtained from single cut float–sink test at the cut density (CD) also known as cut point density, represented usually by  $d_{50}$ , which ideally should be reporting to the float product but had reported to sink product.

**CONTACT** Subha Ranjan Paul ✉ [spaul394@gmail.com](mailto:spaul394@gmail.com) 📠 Department of Fuel and Mineral Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, India

Color versions of one or more of the figures in the article can be found online at [www.tandfonline.com/ueso](http://www.tandfonline.com/ueso).

© 2017 Taylor & Francis Group, LLC

  
**PRINCIPAL**  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F- 563120





# PREDICTION OF SPECIFIC ENERGY IN ROCK CUTTING WITH ARTIFICIAL NEURAL NETWORK

Vijaya Raghavan\*, Murthy.Ch.S.N

---

## Abstract:

In this rock cutting research, the bits used are point attack bits of  $45^\circ$ ,  $50^\circ$ ,  $55^\circ$  and  $65^\circ$  angles for each bits, the experiment is conducted on  $45^\circ$ ,  $55^\circ$  and  $65^\circ$  attack angles. Keeping the RPM constant, varying the cutting force and torque during cutting, the depth of cut was measured and the cut material is collected and weighed. The objective is to estimate the specific energy during cutting process and to study the influence of attack angle on specific energy. From the experimental data, comparison of the results obtained were compared with Artificial Neural Network [ANN] to predict the cutting force and specific energy for the measured depth of cut and the results reveal that, the combination of  $65^\circ$  bit angles with  $55^\circ$  attack angle has produced optimum depth of cut with less cutting force and specific energy is increased with increase in depth of cut.

Issue: 17-Special Issue

Year: 2017

Pages: 1955-1965

*Dr. T. Thirumalaiah*  
8/12/2021  
PRINCIPAL  
Dr. T. Thirumalaiah Institute of Technology  
Oorgaam, K. G. F- 563120





# Study on Assessment and Prediction of Specific energy in rock cutting with Artificial Neural Network (ANN)

Vijaya Raghavan<sup>1</sup>, Ch.S.N.Murthy<sup>2</sup>

1. Ph.D. Scholar, Department of Mining Engineering., National Institute of Technology Karnataka, Surathkal, India; Email: raghavan\_pp@rediffmail.com

2. Professor, Department of Mining Engineering., National Institute of Technology Karnataka, Surathkal, India; Email: chsn54@gmail.com

## Publication History

Received: 22 March 2017

Accepted: 05 May 2017

Online first: 08 May 2017

Published: July-September 2017

## Citation

Vijaya Raghavan, Ch.S.N.Murthy. Study on Assessment and Prediction of Specific energy in rock cutting with Artificial Neural Network (ANN). *Indian Journal of Engineering*, 2017, 14(37), 167-190

## Publication License



This work is licensed under a Creative Commons Attribution 4.0 International License.

## General Note



Article is recommended to print as color digital version in recycled paper.

## ABSTRACT

In this rock cutting research, the bits used are point attack bits of 45°, 50°, 55° and 65° angles for each bits, the experiment is conducted on 45°, 55° and 65° attack angles. Keeping the RPM constant, varying the cutting force and torque during cutting, the depth of cut was measured and the cut material is collected and weighed. The objective is to estimate the specific energy during cutting process and to study the influence of attack angle on specific energy. From the experimental data, comparison of the results obtained were compared with [Artificial Neural Network (ANN)] to predict the cutting force and specific energy for the measured depth of cut and the results reveal that, the combination of 65° bit angles with 55° attack angle has produced optimum depth of cut with less cutting force and specific energy is increased with increase in depth of cut.

Keywords: Rock cutting, Bits, Specific Energy, rock properties, ANN





# Face detection based attendance monitoring system in colleges

Sharmila Kumari N, Pavithra C, Jyothi V, Monisha P D, Mohammed Khan, Nisha Rani

CSE dept Dr.T.T.I.T, K.G.F, INDIA

Sharmila.nesan@gmail.com, Jyothivarada47@gmail.com, pdmonisha95@gmail.com, nishunisha1819@gmail.com, khuzai254@gmail.com, pavi626chidambaram@gmail.com

**Abstract**— Students attendance in the classroom is very important task and if taken manually wastes a lot of time. There are many automatic methods available for this purpose i.e. biometric attendance using fingerprint, Swiping cards.

The cost for biometric reader is very high, and it is not effective to recognize the finger print at one go. Swipping cards is subjected to forgery as students can sent their card with friends to mark attendace. In this project we propose a cost effective , highly responsive system for face detection in which forgery is totally avoided.

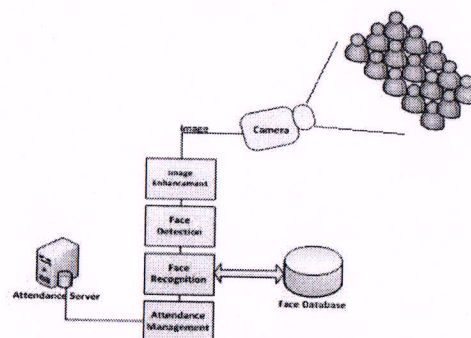
**Keywords**—*component; formatting; style; styling; insert (key words)*

## I. INTRODUCTION

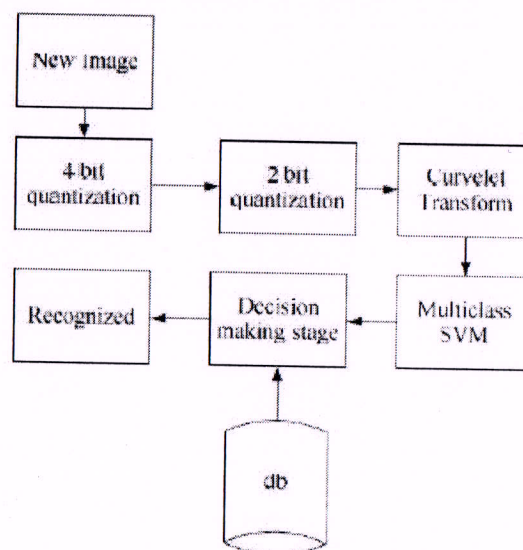
Maintaining the attendance is very important in all the institutes for checking the performance of students. Every institute has its own method in this regard. Some are taking attendance manually using the old paper or file based approach and some have adopted methods of automatic attendance using some biometric techniques. But in these methods students have to wait for long time in making a queue at time they enter the classroom. Many biometric systems are available but the key authentication is same is all the techniques. Every biometric system consists of enrolment process in which unique features of a person is stored in the database and then there are processes of identification and verification. These two processes compare the biometric feature of a person with previously stored template captured at the time of enrollment. Biometric templates can be of many types like Fingerprints, Eye Iris, Face, Hand Geometry, Signature, Gait and voice. Our system uses the face recognition approach for the automatic attendance of students in the classroom environment without students' intervention. Face recognition consists of two steps, in first step faces are detected in the image and then these detected faces are compared with the database for verification.

Direct use of pixel values as features is not possible due to huge dimensionality of the images. One way to

handle huge dimensionality in face recognition problems is to employ dimensionality reduction tools on some kind of transformation domain. Nowadays, multiresolution analysis is often performed as a preprocessing step to dimensionality reduction. The most popular multiresolution analysis tool is the wavelet transform. It has enjoyed a wide-spread popularity in the field of face recognition. In wavelet analysis an image is usually decomposed at different scales or resolutions using a wavelet basis vector.



## 2. Block Diagram of Face Recognition System



PRINCIPAL

Dr. T. Thimmaiah Institute of Technology  
Oorgaam, K. G. F- 563120



# FLOOD ALERTING SYSTEM THROUGH WATER LEVEL METER

Sophia S

Assistant professor, Dept. of computer science and Engineering, Dr. T. Thimmaiah institute of technology, Karnataka, India

\*\*\*

**ABSTRACT:** The main important thing that occurs after and along with the disaster is information dissemination. One such disaster is flood, in this paper we make use of IOT internet to thing allows the use of devices that help the people to take the decision during such disaster. In this paper, sensor is used to measure the water level in river streams and lakes. Micro model is designed and constructed with sensor to measure experimentally the water container in controlled environment. The Micro model is programmable electronic board connected to electrical resistances that are placed at particular height within the water container. When the water rises and reaches the resistor, the impedance will vary that shows the different height of water level. Thereby the sensor transmits the information through the WiFi to Computer and also be seen in smart phones. From this users can see the water level in the river. At last micro model is examined under manipulated environment and acceptable results are obtained.

**Keywords:** IOT, Sensor, Node MCU ESP8266, Arduino

## 1. INTRODUCTION

The most vital thing some time recently, amid and after calamity is the dispersal of data. There exist a few sorts of cataclysmic events, it is realized that surge is a standout amongst the most hazardous since they have enough dangerous energy to change the course of streams, clear away and wreck whatever is in their way. Our inspiration for this work depends on all harms caused in our locale because of surges; this cataclysmic event has made many individuals endure harm to their homes and losing their effects [1].

The IOT enables items to be detected as well as controlled remotely crosswise over existing system framework, making open doors for more straightforward mix of the physical world into PC based frameworks, and bringing about enhanced effectiveness, precision and monetary advantage notwithstanding decreased human intervention [2].

It is critical to comprehend lacks in strategies and procedures for measuring water level in streams. CONAGUA right now screens stream levels in a mechanized manner on their site, thus unmistakable for everybody at any area, yet particularly for those living close riverbanks. In any case, it is realized that observing is not programmed since a gage plays out this undertaking by measuring stream stages with a limn metric manage, at that point, the information

gathered are caught physically and are shown on the CONAGUAs website [3].

Be that as it may, the above acquires lack the estimation procedure on the grounds that the information might not have been precisely caught and brought to where this data could be past the point of no return for help or arranging a save system.

The way that the information gathering of levels of water bodies is executed by a man and it conveys perils and postponements in the spread of data. One of these dangers is imperiling the individual who comes to make a move, as heavy rains access to the measuring focuses are to a great degree convoluted, and in instances of conceivable flooding these postponements are pivotal to rescuing assets and particularly the lives of individuals living in zones at risk. Because of the costly cost of gages to gauge water level and the significance of creating cautioning frameworks for measuring levels in streams that add to shield lives of subjects who occupy locales in threat of flooding, we display a water level sensor in light of water conductivity[4].

A sensor is introduced to gauge water level in waterways, lakes, tidal ponds and streams. For such reason and to demonstrate the idea, a pilot extend is outlined through a small scale display that is built with a water level estimation sensor in view of basic open circuit and is tentatively tried under a controlled environment[5].

The micro model is performed on the premise of a programmable electronic board (NODEMCU 8266), an electronic circuit that is situated at a particular tallness over a water container [6]. At the point when the water level ascents for various stature, the data from the water level sensor is transmitted by means of Wi-Fi to a tablet, at that point this data is likewise observed in Smartphone's, the place clients can see the water level in waterways. At long last, the miniaturized scale display is tried by test tests under a controlled domain and palatable outcomes are obtained [7]. Problem definition is the water level was measured physically and refreshed on the site utilizing limn metric run the show. In any case, the information might not have been precisely caught and the gages utilized are excessively costly so sensors have been utilized to acquire the exact an incentive to ready occupants at low-lying region about the adjustments in the level of water.



& Technology

Issue : 4

ge : ( 213)

Online ISSN : 2454-762X.

P-ISSN : 2454-762X.2018.00026.4

## body structure by modal analysis

Manjunatha, Kumar K. Mohan

Engineering, Dr T Thimmalah Institute of Technology, Visvesvaraya Technological University, KGF, Karnataka, India

Email id: [manjunatha.babu@rediffmail.com](mailto:manjunatha.babu@rediffmail.com)

January, 2019.

### Abstract

ment method of road transportation. The look of the vehicle body depends mainly on driving the execution requirement underneath separated from those of the street conditions. The model investigation moreover modal basic associate analysis of an enunciated Element Method. In this project, the bus body was dealt with modal analysis with different boundary and loading conditions. Mode of Aluminium with shell and without shell to determine the deformation and corresponding six natural frequencies were obtained. The expected result was predicted in a body with shell which yields minimum deformation and it was found to be optimum cor

### Keywords

Mode shape, Deformation, Self weight, Shell, Frequency.

*K. Srinivasan*  
PRINCIPAL  
Dr T Thimmalah Institute of Technology  
Gurgaon, K. G. F- 563120



# Prototype Designing of Coin Based Sensing Water Filling System

Prabhakaran M. N

Dept. of Mechanical Engineering,  
Dr. T.T.I.T, Oorgaum,  
VTU, Karnataka, India.

Sampath. A

Dept. of Mechanical Engineering,  
Dr. T.T.I.T, Oorgaum,  
VTU, Karnataka, India.

**Abstract**— A prototype is being prepared by using different sensors, relay and motors, which can be electronically connected with a micro controller in order to detect and dispense water when we insert a coin inside the machine. By detecting the shape of the coin by the sensors the known quantity of water will be dispense with the help of relay system and a rectifier.

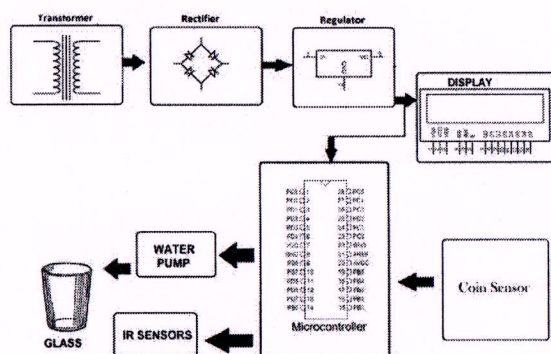
**Keywords**—Sensors; Micro Controller ; Relay; Rectifier

## I. INTRODUCTION

With the improvement in the technology there are many advanced devices and machines that are useful to the mankind. One of them is coin operated telephone. As we know the function of it and how it works. With the same technology used we are going to design a project which is based on liquid (water, cool drinks). Coin Operated Water Dispensing System as the name indicates it is based on coin operation. It has been specially designed for use on Railway station, Bus depots, public places etc. This system is based on microcontroller. The inputs to the microcontroller are coin and output in the form of water. Looking at the specifications required for Water Dispensing System and for simplicity of our application, microcontroller was found to be best suited. The use of microcontroller in any electronic equipment makes it compact and user friendly. We equipped our equipment very handy and cheap.

## II. DESIGNING DETAILS

### A. LIST OF COMPONENTS.

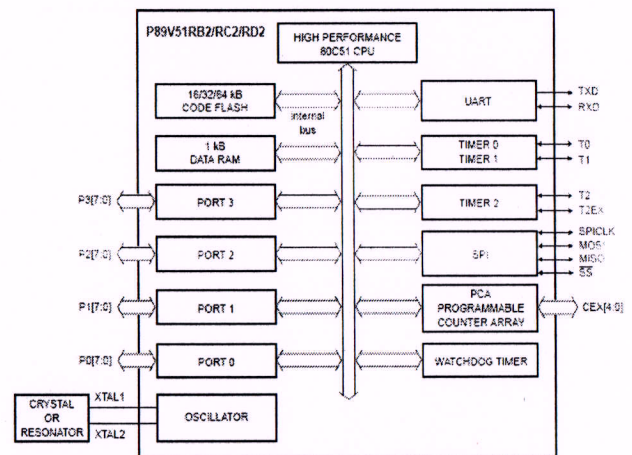


- Transformer
- Rectifier
- Regulator
- Metal sensor
- 8051 Microcontroller
- IR Sensors

- LCD Display
- Water Pump

The main center part of the project is the microcontroller. Here we are using the 8051 based Philips P89V51RD2 microcontroller.

### B. Block diagram of 8051 micro controller



### • PORT 0

PORT0 is an 8-bit open drain bi-directional I/O PORT. As output PORT, each pin can sink eight TTL inputs. When are written to PORT0 pins, the pins can be used as high impedance inputs.

PORT0 can also be configured to be the multiplexed low-order address/data bus during accesses to external program and data memory. In this mode, P0 has internal pull-ups. PORT0 also receives the code bytes during Flash programming and outputs the code bytes during program verification. External pull-ups are required during program verification.

### • PORT 1

PORT1 is an 8-bit bi-directional I/O port with internal pull-ups. The PORT1 output buffers can sink/source four TTL inputs. When logic 1s are written to PORT1 pins, they are pulled high by the internal pull-ups and can be used as inputs. As inputs, PORT1 pins that are externally being pulled low will source current because of the internal pull-ups.

PORT1 also receives the lower order address bytes during flash programming and verification. In addition, P1.0 and P1.1 can be configured to be the timer/counter 2 external count input (P1.0/T2) and the timer/counter 2 trigger input (P1.1/T2EX).



# A Study of Compact Test and Stress Intensity Factor on Developed Welded Duplex Stainless Steel

Balasubramaniam N S<sup>1</sup>, Dr. P D Sudersanan<sup>2</sup>, Dr. H G Shenoy<sup>3</sup>, Dr. Aprameyan S<sup>4</sup>

Asst. Professor, Department of Mechanical Engineering, Dr.T.Thimmaiah Institute of Technology, K.G.F, India<sup>1</sup>

HOD & Professor, Department of Mechanical Engineering, Dr.T.Thimmaiah Institute of Technology, K.G.F, India<sup>2</sup>

Professor, Department of Mechanical Engineering, Dr.T.Thimmaiah Institute of Technology, K.G.F, India<sup>3</sup>

HOD & Professor, Department of Mechanical Engineering, C.Byregowda Institute of Technology, Kolar, India<sup>4</sup>

**ABSTRACT:** The purpose of this study is to subject the DSS to thermal ageing (TA) temperatures such as 475°C respectively and for the further study TIG welding is carried out in a view to understand how exactly the thermal ageing is influencing the degree of brittleness in developed welded DSS of TA475. Compact test examination was carried out for developed welded TA475 in which the investigation helps to find the severity of brittleness. The results obtained from the compact test conclude that the grade TA 475 exhibits better mechanical properties due to lack of ferrite, carbide precipitation and irregular grain orientations. This paper relates the study of compact test (test for stress intensity factor,  $K_{IC}$ ) on the selected developed welded TA 375.

**KEYWORDS:** Duplex Stainless Steel (DSS), thermal ageing, brittleness, precipitation, compact test.

## I. INTRODUCTION

The duplex stainless steel (DSS) family was introduced commercially about 1920's mainly intended for the pulp and paper industry. Original duplex Alloys suffered from brittleness and low ductility. A second generation with improved Weld-ability, mainly due to higher additions of nitrogen, was developed in the early 80's. Duplex Stainless Steels are extremely corrosion resistant, work hardenable alloys. Their microstructures consist of a mixture of austenite and ferrite phases. This two-Phase structure of ferrite and austenite combines the beneficial effects of the phases and allows the steel to obtain high strength (ferrite) and toughness (austenite) even at low temperatures.

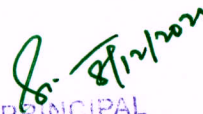
## II. RELATED WORK

There are five types of specimens ( Fig.1.) that are permitted in ASTM standards that characterize fracture initiation and crack growth (stress intensity factor,  $K_{IC}$ ). Although no single standard follows all five configurations, and the configuration available are,

- a. Compact Test Specimen (CT)
- b. The Single Edge Notched Bend (SENB)
- c. The Arc-shaped Specimen (AS)
- d. The Disc-shaped Specimen (DS)
- e. The Middle Tension Specimen (MT)

A) Each specimen configuration has three important characteristics:

1. The crack length (a)
2. The thickness (B) and
3. The width (W)

  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F- 563120



 Open Access  Subscription or Fee Access

## A COMPREHENSIVE REVIEW OF NOVELTY OF FRICTION STIR WELDING OF ALUMINIUM – MAGNESIUM ALLOYS FOR ADVANCED ENGINEERING APPLICATIONS

Ramesha K, Santhosh N, Raman Bedi, Sudersanan P.D

### Abstract

Aluminum and magnesium based alloys are majorly finding their applications in industries like automobile, aerospace and sports applications. The joining of these dissimilar alloys is very difficult by using traditional fusion welding technique inherently because of the "brittle Inter Metallic Compounds (IMC)" like  $Mg_2Al_3$  and  $Mg_{17}Al_{12}$ . In order to enhance the joint strength, the formation of inter metallic compounds due to friction stir welding has to be characterized at the first. The friction stir welding is one of the latest solid state techniques used to join the dissimilar alloys of magnesium and aluminum. "In the current paper some important welding parameters and **their** effects on weld quality are discussed along with the mechanical properties of the weld joint". Thus the main aim of this paper is to get an overview of recent research progress in "welding of dissimilar aluminum alloys and magnesium alloys to give a platform for future research based on the extensive review of the literature".

**Keywords:** Friction, Stir, Welding, Aluminium, Magnesium, Alloys, Inter, Metallic, Compounds.

  
PRINCIPAL

Dr. T. Thirumalaiah Institute of Technology  
Oorgaam, K. G. F- 563120



## Empirical study on twisting force using Taguchi doe technique during drilling of hybrid FRP laminate

N. Rajesh Mathivanan<sup>1</sup>, Manjunatha Babu N. S.<sup>2,\*</sup>, K. Vijaya Kumar<sup>3</sup>

1. Department of Mechanical Engg,  
PES Institute of Technology (PES University), Bangalore, India
2. Department of Mechanical Engg,  
Dr. T Thimmaiah Institute of Technology, VTU, KGF, India
3. Senior Manager, Hindustan Aeronautics Limited, Bangalore, India  
manjunatha.babu@rediffmail.com

**ABSTRACT.** Objective: The onset of the empirical approach presented in this paper leads to evaluation on the Influence of the Feed Rate, Cutting Speed, and Tool Material on Torque while drilling Prepared Hybrid FRP Laminate using CNC programmed machine.

**Findings:** The influence of cutting condition (feed rate, cutting speed and tool material) on torque were studied and examined.

**Technique:** Design of experiments (DOE) was conducted for the control analysis of the drilling parameters on the response variable (Torque or Twisting Force) by utilizing Taguchi's L27 array the design obtained through Multilevel factorial design in commercial software Minitab 17 to find whether the response variable is minimized by major and/or minor control factors.

**Result:** The percentage deviation of Cutting Speed signifies that torque was least affected rather than other considered factors. The minimum torque was reached in case of cutting speed compared to feed rate and tool material at all levels of factors studied through distinctive main effects plots.

**RÉSUMÉ.** Objectif: Le début de l'approche empirique présentée dans cet article conduit à une évaluation de l'influence du débit d'alimentation, de la vitesse de coupe et du matériau de l'outil sur le couple lors du perçage du stratifié FRP hybride préparé à l'aide d'une machine programmée par CNC.

**Découvertes:** L'influence des conditions de coupe (vitesse d'avance, vitesse de coupe et matériau pour outils de coupe) sur le couple a été étudiée et examinée.

**Technique:** La conception des expériences (DOE) a été réalisée pour l'analyse de contrôle des paramètres de forage sur une variété de réponse (couple ou force de torsion) en utilisant la matrice L27 de Taguchi. La conception obtenue par le biais de la conception factorielle

  
PRINCIPAL



# Size by Size Separation Characteristics of a Coal Cleaning Jig

Subha Ranjan Paul<sup>1</sup> · Sumantra Bhattacharya<sup>1</sup>

Received: 11 March 2017 / Accepted: 12 January 2018  
© The Indian Institute of Metals - IIM 2018

**Abstract** Jigging is essentially a cleaning process to separate particles of different relative densities. Usually the jig feed is narrowly sized, however the definition of settling velocity indicates that particle size possibly plays certain role in the process of separation. Limited work is available in published literature on the separation characteristics of constituent size fractions of the feed that has been subjected to jigging. The present communication examines size by size separation characteristics of a Batac jig cleaning metallurgical coal. The characteristics have been measured by Probable Error in Separation, Imperfection and Organic Efficiency. Effect of NGM on the separation characteristics, if any, has also been investigated.

**Keywords** Coal cleaning jig · Separation characteristics · Size by size · NGM

## 1 Introduction

Thermal coal cleaning in India for power plants is mostly carried out under legislative compulsion at 30–34% ash for coal being railed to distances greater than 1000 km, to urban sensitive areas and to critically polluted areas. This particular Government of India (GOI) legislation was made effective in the year 2001, principal objective being “transport load” reduction for the Indian Railways. Since June 2016, the distance has been amended to 500 km. Cleaning upto the indicated ash level generally provides a

clean coal yield of 60–70–80%. Approximately with the same ash content, sometimes a lower yield level of clean coal is obtained for cement plants. Besides, thermal coal cleaning is carried out in India for DRI plants at 20–25–30% ash and naturally provides a reduced yield of clean coal, usually below 50%. Jigs, both dry and wet appear to be the preferred cleaning equipment. Dry jigs are quite common in small capacity captive plants. Focus is on obtaining a dry product immediately suitable for use in DRI and cement plants. Relatively large capacity merchant and captive cleaning plants generally use wet jigs. Jigs are also used in some of the metallurgical coal cleaning plants to produce clean coal at an ash content of 18–19–20%. In spite of inferior separation efficiency, jigs appear to be preferred because of relatively low cleaning cost and high cut density requirement in the range of relative density (RD) greater than 1.7 coupled with unusually high cost of quality magnetite essential for dense media separation.

Three washability curves (cumulative float curve, cumulative sink curve and relative density curve) are essential to understand the cleaning characteristics of coal. Performance of coal cleaning equipment in terms of separation efficiency can be assessed by a number of methods and measures. These include:

- Organic Efficiency,  $E_{org}$ , defined as the ratio of the actual plant yield of the clean coal to the “washability” yield at the same ash
- $E_p$  (Ecart Probable Moyen-EPM) also known as Probable Error in Separation, mathematically defined as:

$$E_p = \frac{(d_{25} - d_{75})}{2}$$

✉ Subha Ranjan Paul  
spaul394@gmail.com

<sup>1</sup> Department of Fuel and Mineral Engineering, IIT(ISM)  
Dhanbad, Dhanbad, India





# Prediction of cuttability from rock cutting resistance

by V. Raghavan and Ch.S.N. Murthy

## Synopsis

The objective of this investigation is to predict rock cuttability from measurements of rock cutting resistance (RCR) during the cutting process and to study the influence of mechanical properties on the depth of cut achieved. Point attack bits with angles of 45°, 50°, 55°, and 65° were used and the experiments were conducted at attack angles of 45°, 55°, and 65°, keeping the rotation speed constant while varying the cutting force and torque during cutting. The depth of each cut was measured and the cut material collected and weighed. The experimental data were compared using an artificial neural network (ANN) and finite element method (FEM) to predict RCR for the measured depth of cut. The results reveal that a 55° attack angle produced the optimum depth of cut.

## Keywords

rock cuttability, rock properties, artificial neural network, finite element method, rock cutting resistance.

## Introduction

Cutting machines such as shearers, roadheaders, and continuous miners are used extensively throughout the world for the excavation of rock in mining and civil operations. As theory relating to the mechanical excavation of rock has evolved over time, so too has the utilization of these machines, often substituting for traditional drill-and-blast methods, resulting in increased safety and performance and reduced operating costs.

The method by which these rock cutting machines work is influenced by a number of factors (Neil *et al.*, 1994). Machine design, machine power, intact rock properties, and rock mass properties all play a pivotal role in determining the efficiency of the rock cutting process (Karakas *et al.*, 2005). As Roxborough (1987) explained, the engineer has a choice over what size and type of machine to use for a particular excavation, but has no influence over the rock formation that will be encountered without changing the design criteria of the project. Since it is the rock mass, and not machine selection, that governs cuttability, an investigation into the rock mass properties and their effect on cuttability is warranted.

It has been well documented that a number of rock strength characteristics can adversely affect cutting performance (Rostami, 2011). There is an almost linear relationship between rock strength and cutting force required (Hood and Roxborough, 1992). Similarly, it has been found that abrasivity of rock tends to increase with rock strength (Jacobs and Hagan, 2009), and laboratory testing has focused on attempting to find which rock strength properties best describe this relationship. Specific energy is extensively used to evaluate rock cuttability (Tiryaki and Dikmen, 2006). It is a measure of the force required to excavate a unit volume of rock, and hence is a measure of the relative cuttability of a particular rock. McFeat-Smith and Fowell (1977), in their well-known study, correlated rock strength properties with specific energy and found that the cutting performance of cutting machines diminished with specific energy.

Recent studies have focused on an array of properties in an effort to estimate rock cuttability, with strong correlations found between the uniaxial compressive strength and specific energy for a number of different rock types (Speight, 1987). Material hardness, sonic velocity, Young's modulus, and other rock properties that indirectly relate to rock strength have been correlated with specific energy, with varying degrees of statistical significance. To date, however, the most reliable indicator of cuttability has been based on the uniaxial compressive strength of rock.

From a mining perspective, further investigations to confirm the validity and correlation between rock strength parameters and cuttability would be useful in the estimation of machine performance. The ability to predict cutting performance from direct and

\* Department of Mining Engineering, National Institute of Technology Karnataka, Surathkal, India.

© The Southern African Institute of Mining and Metallurgy, 2018. ISSN 2225-6253. Paper received Jun. 2017; revised paper received Dec. 2017.



# Type of Supervised Text Classification System for Unstructured Text Comments using Probability Theory Technique

Sreedhar Kumar S, Syed Thouheed Ahmed, Nisha Bai, Vinutha B A

**Abstract:** In this paper, an improved sentimental text analysis system called Probability Based Text Classifier (PBTC) is presented. It aims to train the existing unstructured text command set and to classify the sampled text command belongs into positive or negative polarity based on probability theory and supervised concepts. It consists of three stages pre-processed, training and classification. In the first stage, the proposed (PBTC) system identifies the relevant and irrelevant words in the unstructured text command set based on pre-determined text pattern model. In the second stage it identifies two dissimilar classes over the preprocessed text command set based on predetermined text pattern model and simple probability theory concepts. Next stage, the PBTC identifies the sample test text command without class label belong on which class based on Naive Bayes scheme and trained existing text command set. Experimental result shows that the proposed (PBTC) system is well suitable to train the unstructured text command set and classify the new text command belongs into positive or negative polarity with higher accuracy

**Keywords:** Classifier; Probability Based Text Classifier; Unstructured Text Command; Text Pattern; Supervised; Sentimental Analysis.

## I. INTRODUCTION

Generally, the text classifier is a supervised concept that uses to identify distinct polarities such as positive or negative over the unstructured text commands or user review from the different online sources namely social media networks (facebook and twitter), online product sales and online services such as education, health, entertainment, travels etc., for deeper analysis and predication for future business development. Today's the social media networks plays a big role in the world society. For the simple example of the social media networks namely Twitter and facebook that are provided very big platform for the people to raise their views on various topics, current issues and things going on in the world<sup>[1]</sup>. The system called sentiment analysis that uses to identify the polarity of a given unstructured text in the document, sentence, or feature and the expressed opinion in a document, a sentence or an

entity feature is positive, negative, or neutral. For a good example of the polarities that the sentiment classification looks, for instance, at emotional states such as "wrong", "enjoy", and "poor" etc.,. The main application of the sentiment analysis is that to process and classify the customer related materials likely consumer reviews and survey responses, online social media and healthcare information for applications that range from marketing to customer service to clinical medicine based on unsupervised and unsupervised methods<sup>[2,3,4,5]</sup>. This paper is presented a type of sentiment analysis system called probability based text classifier (PBTC) and its intentions to train the existing online unstructured user reviews or commands of consumer product and classify the recent user review belongs into which polarity. This paper is organized as follows: related work is discussed in Section 2. Section 3 contains details of the proposed PBTC system. The result and discussion is presented in Section 4. Conclusion drawn is in section 5.

## II. RELATED WORK

In the last decades many of the authors reported distinct text classifiers techniques that intentions to analysis and categorize the unstructured text commands from different sources likely social media network, consumers commands of online product and reviewers commands of different online services such as movie, travels, bank, education, medication etc., which belongs to positive or negative polarity for future predication and business development. The comparative analysis is made by Heba et al.<sup>[5]</sup> on sentiments analysis to exhibit how effective they are in missing sentimental data in twitter under various experimental environments. Studying purpose the STS (Standard Testing Sentiment Data base) is used. Experimental results indicate that naïve Bays for multinomial data perform other classification in tweet sentiment analysis. In<sup>[6]</sup> the authors Mehra et al. have presented a procedure that used to analysis and categorize the user tweets into positive or negative class based Naïve Bayes and fuzzy classifiers. The author presented an experimental result by evaluating datasets and corresponding classification results shows that proposed system gives more efficiency in precision, Accuracy and Recurrence in classifying the tweets.

The algorithm Specific Action Rule Discovery on Grabbing Strategy (SARGS) is used by Jaishree Ranganathan et al. in<sup>[7]</sup> to perform analysis of many meta actions generated for implementing an algorithm in spark driven system made by Apache and traditional Hadoop system. Both techniques use the twitter

Revised Manuscript Received on September 22, 2019.

Sreedhar Kumar S\*, Department of Computer Science and Engineering, Dr. T Thimmaiah Institute of Technology, VTU, Kolar Golad Field, Karnataka, India

Syed Thouheed Ahmed, Department of Computer Science and Engineering, Dr. T Thimmaiah Institute of Technology, VTU, Kolar Golad Field, Karnataka, India

Nisha Bai, Vinutha B A, Department of Computer Science and Engineering, Dr. T Thimmaiah Institute of Technology, VTU, Kolar Golad Field, Karnataka, India

\*Corresponding author; \*Email: sree.dr.2018@gmail.com



# A brief survey of unsupervised agglomerative hierarchical clustering schemes

Sreedhar Kumar S<sup>1\*</sup>, Madheswaran M<sup>2</sup>, Vinutha B A<sup>1</sup>, Manjunatha Singh H<sup>1</sup>, Charan K V<sup>1</sup>

<sup>1</sup> Department of CSE, Dr. T Thimmaiah Institute of Technology, Kolar Gold Field, Karnataka-563120, India

<sup>2</sup> Department of ECE, Mahendra Engineering College, Namakkal Dt.-637503, Tamilnadu, India

\*Corresponding author E-mail: sree.dr.2018@gmail.com

## Abstract

Unsupervised hierarchical clustering process is a mathematical model or exploratory tool aims to provide the easiest way to categorize the distinct groups over the large volume of real time observations or dataset in tree form based on nature of similarity measures without prior knowledge. Dataset is an important aspect in the hierarchical clustering process that denotes the behavior of living species depicts the properties of a natural phenomenon and result of a scientific experiment and observation of a running machinery system without label identification. The hierarchical clustering scheme consists of Agglomerative and Divisive that is applicable to employ into various scientific research areas like machine learning, pattern recognition, big data analysis, image pixel classification, information retrieval, and bioinformatics for distinct patterns identification. This paper discovered a brief survey of agglomerative hierarchical clustering schemes with its clustering procedures, linkage metrics, complexity analysis, key issues and development of AHC scheme.

**Keywords:** Agglomerative Hierarchical Clustering; Clustering Process; Distance Metric; Divisive Hierarchical Clustering; Similarity Measure; Linkage Method.

## 1. Introduction

Unsupervised hierarchical clustering technique is an oldest clustering scheme and is utilized to identify the finite number of dissimilar clusters over the dataset in hierarchy manner based on data objects similarity. The result of the hierarchical clustering scheme is represented in the form of binary tree structure or dendrogram. Basically, it consists of two types Divisive Hierarchical Clustering (DHC) and Agglomerative Hierarchical Clustering (AHC). In DHC is a top-down method, it starts with  $n$  data objects in single large cluster and recursively splitting the cluster into  $n$  smaller clusters with single data object and it requires higher computational cost  $O(2^n)$  (Athman et al 2015) [2]. Similarly, the AHC is a bottom-up method that starts with  $n$  clusters, each of which includes exactly one object (William et al 1984). It recursively partitions the dataset into a tree structure through a series of merge operations based on proximity measures. And finally, it forces all the clusters into a single cluster. Many authors suggested according to the clustering performance of hierarchical clustering based on several parameters that is the AHC scheme consumes lower computational cost compare to DHC method. The merge operation is an important process in the AHC technique that is used to find the closest cluster pair with a minimum distance and merged into single cluster based on clustering linkage method (Lance & Williams 1967) [24]. The clustering linkage method computes the distance between the two closest clusters with a set of object pairs and is classified into several types, namely Single Linkage (SLINK) [19], [21], [36], [35], Complete Linkage (CLINK) (Defays 1977) [8], Unweighted Pair Group Method with Arithmetic Mean (UPGMA) or Average Linkage [19], [51], Weighted Average Linkage or Weighted Pair Group Method Average (WPGMA) [19], [29], Centroid Linkage or Unweighted Pair Group Method Centroid (UPGMC) [37], Median Linkage [15], [16], Wards Method (Ward 1963) [42] and Pair-wise Nearest Neighbor [4], [12], [30].

## 2. Traditional AHC scheme

AHC is a one of the powerful traditional unsupervised hierarchical clustering method, it intentions to separate the distinct clusters over the large data points based on nature of similarity in sequence of merging operations without prior knowledge.

### 2.1. AHC procedure

Generally, the AHC start with  $n$  individual clusters with single data object as defined  $X = x_i$  for  $i = 0, 1, \dots, n$ , where  $X$  denotes the dataset or cluster set,  $x_i$  represents the  $i^{th}$  cluster or data object in cluster set  $X$  and  $n$  is the size of dataset or cluster set  $X$ . Next, it





## REMOTE DATA INTEGRITY CHECKING AND PROXY DATA UPLOADING IN PUBLIC CLOUD

**Premalatha D**

M.Tech Student, Dept. of CSE, Kuppam Engineering College, Kuppam, Andra Pradesh, India

**K.N Dharanidhar**

Assistant Professor, Dept. of CSE, Kuppam Engineering College, Kuppam, Andra Pradesh,

### ABSTRACT

In cloud computing, Public cloud servers are used by users to store data. As more clients are using the public more security needs to be incorporated. More and more clients would like to store their data to public cloud servers (PCSs) along with the rapid development of cloud computing. New security problems have to be solved in order to help more clients process their data in public cloud. The users will delegate its proxy to process his data and upload them, when the client is restricted to access PCS. Data integrity maintenance is also an important security problem in public cloud storage. It enables the users to check whether their outsourced data are kept intact without downloading the whole data. From the security problems, we propose a novel proxy-oriented data uploading and remote data integrity checking model in attribute oriented cryptography with formal definition, system model, and security model. Then, a concrete AOC protocol is designed using the graph based approach. The proposed AOC protocol is provably secure based on the hardness of computational Diffie-Hellman problem. Our AOC protocol is also efficient and flexible. Based on the original client's authorization, the proposed AOC protocol can realize private remote data integrity checking, delegated remote data integrity checking, and public remote data integrity checking.

### 1. INTRODUCTION

#### 1.1 Cloud computing

**Cloud computing** is the use of computing resources (hardware and software) that are distributed as a service over a network (typically the Internet). The name comes from the common use of a cloud-shaped symbol as a generalization for the complex setup it contains in system diagrams. Cloud computing assigns remote services with a user's data, software and calculation. Cloud



# Intellectual Green Corridor for Crisis Wellbeing Transference

Inbalatha.K, Palaniswamy K.M

**Abstract-** Traffic is a major concern for most of the metropolitan cities of the world. The design proposes a notion for Traffic Control System which is more imaginativethan currently existing schemes. The system automatically affords a distinctive lane in which entirely the red signal indication will be turned spontaneously to green intended for the ambulance. Subsequently this assists the ambulance instantly in reaching its destination within stint. In accumulation to the Traffic Control Scheme, wellbeing specialist care Scheme displays the patient long-suffering state of affairs resembling heartbeat, blood pressure. This system comprises of dedicated intellectual smart ambulance with GPS, GSM and smart mobile solicitation beside with Internet of Things (IoT). The patient's state of affairs will be directed to the medical wing over cloud. The information of the patient is sent to the hospital via GSM module and blood bank gets information only if the condition is chosen as serious. The projected effort stays targeted to plan and progress an operative traffic control scheme for smart ambulance. The outcomes of the recommended traffic control model transports upright decline of time by clearing the traffic very fast and protect the patient's lifespan at the most primitive.

**Keywords:** Blood pressure, Internet of Things, Metropolitan, Smart Ambulance.

## I. INTRODUCTION

In crisis situation, every single instant is essential in saving an individual's life. Researchers and traffic engineers have developed several traffic signal priority strategies for EVs to pass intersections quickly and safely [1]. The objective of the efficient effort is to custom the every second resourcefully to rescue individual. Nowadays countless lives are being perished before hand the one grasps the hospital in ambulance or due to shortage of basic data about the state of the patient and the hindrance caused due to this. The proposed work is designed to hoard the life at the most primitive.

The foremost endeavor of the mission is that while the patient is in ambulance in urgent situation the ambulance should arrive the hospital utmost fast and to drive all necessary information and state about the patient to hospital for the earlier preparations for the treatment. The traffic control system provides a unique corridor in which entirely red signal indication will be turned spontaneously to green intended for the ambulance. Subsequently this assists the ambulance instantly in reaching its destination within stint by which that patient gets needed treatment on time along with this system patient parameters are also measured. In the current method we don't have programmed mechanism traffic control, in arrears to this ambulance is not able to get in touch with the hospital earlier.

Revised Manuscript Received on September 22, 2019.

Inbalatha.K, Assoc. Prof, Dept. of ECE, Dr.T.Thimmaiah Institute of Technology, KGF, inbalathaphd@gmail.com  
Palaniswamy K.M, Professor, Dept. of ECE, Dr.T.Thimmaiah Institute of Technology, KGF, mail2kmo@gmail.com

Dr. T. Thimmaiah Institute of Technology

Retrieval Number: B11570982S101972019@IJRTE  
DOI:10.35940/ijrte.B1157.0982S1019

The method includes effectual smart ambulance with GPS, GSM and smart phone application like Blynk through IoT. The previous works to monitor patient's conditions were performed using Micro- Electro Mechanical System (MEMS) and Bluetooth communication was used to transfer the data [2]. In the proposed system the patient's factors will be examined in ambulance and the information will be directed to the nearest hospital, at that juncture ambulance will decide on the lane to hospital and traffic signal in this direction will be turned to green using RFID reader and RFID tag, microcontroller changes the state of the signal. Heart Rate measurement is done using photoplethysmograph method. LM-35 is used to measure the patient's body temperature and these parameters were sent to a PC in ambulance via serial communication besides this data was sent to the hospital server, in addition in traffic control part an RF transmitter on the ambulance was communicated with the RF receiver mounted on the signal post [3]. With emergency vehicle clearance, the traffic signal turns to green as long as the emergency vehicle is waiting in the traffic junction. The signal turns to red, only after the emergency vehicle passes through [4]. Often the patient's parameters will be directed to the hospital to get the ideas from the specialists in the hospital to supervise patient's situation. This venture is embattled to plan and progress a real-time intellectual emergency conveyance model.

## II. WORKS REVIEW

In the period of smart metropolises, citizens face various difficulties concerning wellbeing issues like not receiving treatment on time. 'Green Corridor' is the model by which patient will get the required treatment on instant [5]. In sensible motorcar completely different sensing elements like pulse sensor, blood pressure, ECG will be judging condition of the essence parameters, the status of these parameters will be send to hospital's catalog, concurrently traffic signals will be operated by using GPRS communication through cloud. As the smart ambulance will get into the range of 100m, in which entirely the red signal indication will be turned spontaneously to green intended for the ambulance. The communication will be done by GPRS through cloud. A two-level strategy at signalized intersections for preventing incident-based urban traffic congestion by adopting additional traffic warning lights [6].

Intelligent traffic control method considers the priority for crisis conveyances based on the kind of an incident and a process to detect and respond to the hack of traffic signals that have been proposed [7]. An experiment employing a simulation software package, namely Simulation of Urban Mobility (SUMO) was conducted. Researchers discussed about the process to reduce traffic congestion by making





# **IOT ENABLED CARBON DIOXIDE AND CARBON MONOXIDE MONITORING AND CONTROL TO REDUCE AIR DETERIORATION FROM VEHICLES**

Ashwini.R<sup>1</sup>, Balaji.R<sup>2</sup>, Naveen.R<sup>3</sup>, Sweeta.S<sup>4</sup>, Dr.Palaniswamy K M<sup>5</sup>  
<sup>1,2,3,4</sup>Student, Guide<sup>5</sup>, Electronics & Communication Engineering Department,  
Dr.T. Thimmaiah Institute of Technology, Oorgaum, KGF.  
Email:ashwinimay1997@gmail.com<sup>1</sup>, balajibharadwaj1234@gmail.com<sup>2</sup>,  
naveenrk1524@gmail.com<sup>3</sup>, sweetathanish@gmail.com<sup>4</sup>, drpalaniswamy@drttit.edu.in<sup>5</sup>

## **Abstract**

Due to the increase in the amount of heat trapping gases, the earth is getting Warm day by day, thus leads to global warming. CO and CO<sub>2</sub> are the main types greenhouse gases. The main goal of this paper is to reduce the greenhouse effect by real time monitoring and controlling of CO<sub>2</sub> and CO emitted by vehicles and industries using IOT. The Internet of Things (IoT) provides internet connectivity to a various devices and everyday things that use embedded technology to communicate and interact with the outside environment. In this paper, Here the CO<sub>2</sub> and CO detector intelligent is used to save the CO<sub>2</sub> and CO levels in different areas. The model is cost effective and can be easily manufactured and installation is possible where ever it is necessary.

**Index Terms:** Global warming, Greenhouse effect, Internet of Things (IoT), Environment.

## **I. INTRODUCTION**

Environmental problem arises due to air pollutants from vehicles and trucks are growing rapidly day by day, which are creating respiratory diseases and skin diseases. Transportation alone creates responsible for 50% of carbon monoxide in the air. This carbon monoxide(CO) shows degradation impact on human health such as chronic obstructive pulmonary disease (COPD) and increases the cause for cancer. The effect of air pollution is very large in cities such that 70% of the total air pollution has been polluted due to vehicles.

All vehicles emits gases, and the problem occurs when the emission is beyond the standardized values. The main reason for this abnormal emission level is due to incomplete combustion of fuel supplied to the engine

## **II. LITERATURE SURVEY**

Prachi Shahane, Preeti Godabole et al [1] have explained that due to rise in the amount of heat trapping gases day by day the earth gets warmer thus leading to global warming. CO<sub>2</sub> contributes the maximum pollution in greenhouse gases the main aim of this project is to reduce the green effect by real time monitoring and controlling of CO<sub>2</sub> emission using intellectual IoT. The internet of things (IoT) extends internet connectivity to a multiple range of devices that apply embedded technology to connect and interact with the external environment, all via internet.

P. vlacheas, R. Giaffreda, V. stavroulaki, et al [2] IOT has given an article for upcoming smart cities. In this article the main issues that may prevent IOT from playing this critical role, such as the heterogeneity among connected objects and the undependable nature of associated services were discussed. A cognitive management frame work for IOT is proposed here as solution for real-world objects.

John A.Stankovic, et al[3] have discussed various topics as sensing, actuation, communication and control become even more sophisticated and ubiquitous Here it is shown that how there is a significant overlap in these communities, sometimes from slightly different perspectives..





## PARTIAL PRODUCT ARRAY HEIGHT REDUCTION USING RADIX-16 FOR 64-BIT BOOTH MULTIPLIER

Jenitha.A<sup>1</sup>, Ashwini S<sup>2</sup>, Bharath Reddy S<sup>3</sup>, Dinesh Kumar R<sup>4</sup>, Sahana R<sup>5</sup>

<sup>1</sup>Assoc. Prof, Dept. of ECE, Dr.TTIT, jenitha@drttit.edu.in

<sup>2,3,4,5</sup>Student, Dept. of ECE, Dr.T.T.I.T, bharathreddy601@gmail.com

### ABSTRACT

We describe an optimization for binary radix-16 (modified) Booth recoded multipliers to reduce the maximum height of the partial product array of columns to  $\frac{n}{4}$  for  $n = 64$ -bit unsigned operands. This is contrast to the conventional maximum height of  $(n + 1)/4$ . Therefore, a reduction of one unit in the maximum height of partial product is achieved. The reduction may add flexibility during the design of the pipelined multiplier to meet the required design goals, it may allow further optimizations of the partial product array reduction stage in the area/delay/power and/or may allow additional addends to be included in the partial product array without increasing the delay. The method that can be extended to the Booth recoded multipliers, signed multipliers, combined signed/unsigned multipliers, and other values of  $n$ .

**Keywords:** Partial Product, Booth recoded multipliers

### 1. INTRODUCTION

Binary multipliers are a widely used building block element in the design of microprocessors and embedded systems, and therefore, they are an important target for implementation optimization. Current implementations of binary multiplication follow the steps of 1) recoding of the multiplier in digits in a certain number system 2) digit multiplication of each digit by the multiplicand, resulting in a certain number of partial products 3) reduction of the partial product array to two operands using multi operand addition techniques and 4) carry-propagate addition of the two operands to obtain the final result.

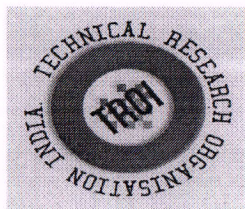
The recoding type is a key issue, since it determines the number of partial products. The usual recoding process recodes a binary operand into a signed-digit operand with digits in a minimally redundant digit set [7], [8]. Specifically, for radix- $r$  ( $r = 2^m$ ), the binary operand is composed of no redundant radix- $r$  digits (by just making groups of  $m$  bits), and these are recoded from the set  $\{0, 1, \dots, r-1\}$  to these  $\{-r/2, \dots, -1, 0, 1, \dots, r/2\}$  to reduce the complexity of digit multiplications. For  $n$ -bit operands, a total of  $n/m$  partial products are generated for two's complement representation, and  $(n + 1)/m$  for unsigned representation. The maximum column height may determine the delay and complexity of the reduction tree, In this extra column of one bit could be assimilated (with just a simplified three bit addition) with the most significant part of the first partial product without increasing the critical path of the recoding and partial product generation stage.

The result is that the partial product array has a maximum height of  $n/2$ . This reduction of one bit in the maximum height might be of interest for high-performance short-bit width two's complement multipliers (small  $n$ ) with tight cycle time constraints that are very common in SIMD digital signal processing applications. Moreover, if  $n$  is a power of two, the optimization allows to use only 4-2 carry-save adders for the reduction tree, potentially leading to regular layouts. These kind of optimizations can become particularly important as they may add flexibility to the "optimal" design of the pipelined multiplier.

Optimal pipelining in fact, is a key issue in current and future multiplier (or multiplier-

PRINCIPAL





## A MULTISCALE APPROACH BASED AUTOMATIC SHIP DETECTION

<sup>#1</sup>Associate Prof. Vijaya Geetha. R, <sup>#2</sup>Chetan. S, <sup>#2</sup>K. Deepika, <sup>#2</sup>Kishore. R, <sup>#2</sup>Likitha.S

<sup>1</sup>Dept of Electronics and Communication Engineering, Dr. T.Thimmaiah Institute of Technology,  
Visvesvaraya Technological University, Belagavi, Karnataka, India  
[vijayageethabe@gmail.com](mailto:vijayageethabe@gmail.com)

<sup>2</sup>Dept of Electronics and Communication Engineering, Dr. T.Thimmaiah Institute of Technology,  
Visvesvaraya Technological University, Belagavi, Karnataka, India  
[kishorereddy27.kv@gmail.com](mailto:kishorereddy27.kv@gmail.com)

### Abstract

This paper presents a new method for ship detection. It uses SAR image obtained by passing pulses of microwave signal and recording the reflected signal. SAR image is used for ship detection because it functions irrespective of weather conditions even at day and night. Speckle noise is inbuilt in SAR images are formed by recording the radar echo signals of EM signal multiplicative with granular noise; this noise degrades the quality of SAR images. Pre-processing is done using Lee filter to remove the speckle noise. Quality measurement like SNR, PSNR, SSIM and ENL is done. Image profile is verified to find effective noise suppression. After pre-processing the SAR image is enhanced using DWT (discrete wavelet transform) this wavelet transform preserves high frequency information and reduces artifacts. Enhanced image consists of many information from which the relevant image has to be extracted this process is called as feature extraction, feature extraction is done using k-means Clustering algorithm were the given data is grouped into k number of clusters. Finally, the ship detection image is obtained and it is compared with the ground truth image, quantitatively the ship Detection image is evaluated using confusion matrix. The Outcomes obtained from confusion matrix are True Positive, True Negative, False Positive, False Negative, Sensitivity, Specificity, Precision, False positive rate, Error rate, Accuracy, False alarm rate.

**Keyword:** SAR image, Lee filter, discrete wavelet transform(DWT), k-means clustering algorithm and performance measures.

### I.INTRODUCTION

Ship detection plays an important role in maritime piracy, Border control, defence and maritime security, maritime spatial Planning etc. Ship can be easily identified in image taken from Space, These two or three dimensional images are formed by sending Pulses of electromagnetic radiations in the microwave wavelength region from the radar which is on board, these pulses are received and recorded to form the high resolution Synthetic Aperture Radar (SAR) image are – RADARSAT-1, RADARSAT-2, TerraSAR-X, Tandem-X, COSMO SKYMed 1, 2, 3 and 4 sentinel-1A and sentinel-1B. SAR image are less influenced by the time and weather conditions than the optical images, SAR sensors carries effectiveness at any time of the day and night. Hence, SAR image promote the development of new automatic ship detection. We propose a system to detect the ships using synthetic aperture radar images. The SAR images are pre-processed using enhanced Lee filter to remove the speckle noise. The output of the lee filter is enhanced by DWT and further feature extraction is done using k-means clustering algorithm to extract the ship from the complex background.

*[Handwritten signature]*  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Goragum, K. G. F- 553120





## **IOT BASED SMART FOOD MONITORING SYSTEM**

<sup>1</sup>Professor Rajesh Kumar Kaushal, <sup>2</sup>Harini. T, <sup>3</sup>Pavithra Lency.D, <sup>4</sup>Sandhya.T, <sup>5</sup>Soniya.P

<sup>1</sup>Dept of Electronics and Communication Engineering, Dr. T. Thimmaiah Institute of Technology, Visveswaraya Technological University, Belagavi, Karnataka, India

<sup>2,3,4,5</sup>Dept of Electronics and Communication Engineering, Dr. T. Thimmaiah Institute of Technology, Visveswaraya Technological University, Belagavi, Karnataka, India

### **Abstract**

**In the era of technology advancement, everything requires monitoring and controlling. This paper proposes an IoT framework for facilitating food monitoring for protection of the food, so that it would not get contaminated due to surrounding conditions during storage and transportation. In present scenario, the work done is in terms of the sensed value that have been recorded and a detailed analysis has been performed but automated controlled alternatives are not present. The proposed solution analyzes temperature, moisture, light as these parameters affect nutritional values of food items such as fruits and vegetables, and makes the analysis results accessible to the user via a mobile application(sms).**

**A web server is used for storage of data values sensed in real time and also for analysis of results. User is alerted via messages along with locations of the shipment whenever an emergency occurs in this solutions, heterogeneous sensors for various domains are employed for sensing the condition of food.**

**Key words: Food monitoring, IoT, Sensor.**

### **I. INTRODUCTION**

Food is the main energy source for the living being; as such food quality and safety have been in the highest demand throughout the human history. Internet of things (IoT) is a technology vision to connect anything at any time and anywhere. Utilizing IoT in the food supply chain (FSC) enhances the quality of life by

tracing and tracking the food condition and live sharing the obtained data with the consumers or the FSC supervisors. Currently, full application of IoT in the FSC is still in the developing stage and there is a

big gap for improvements. Food safety and hygiene is a major concern in order to prevent food wastage. The quality of food needs to be monitored and it must be prevented from routing and decaying atmospheric factors like temperature, humidity and darkness. Therefore, it is useful to deploy quality monitoring devices at food stores. These quality monitoring devices keep a watch on the environmental factors that cause or pace up decay of the food. Later, the environmental factors can be controlled like by refrigeration, vacuum storage etc.,

A food contamination can occur in the production process, but also a large part caused by the inefficient food handling because of inappropriate ambient conditions when the food is being transported and stored. There are many factors leading to food poisoning, typically changes in temperature and humidity are important factors. So the monitoring system capable of measuring temperature and humidity variability during transport and storage is of prime importance. Today almost everybody is getting effected by the food they consume, it's not only about the junk food, but all the packed foods, vegetables, products consumed and used in daily life, as all of them do not offer quality since their temperature, moisture, oxygen content vary from time to time. Majority of consumers only pay attention to the information provided on the packaging, i.e., the amount of ingredients used and their nutritional value, but





## IMPLEMENTATION AND VERIFICATION OF RISC PROCESSOR ON FPGA USING CHIPSCOPE PRO TOOL

<sup>1</sup>Prof Ruckmani Divakaran, <sup>2</sup>Srinivas Babu .N, <sup>3</sup>Shashi Kiran .S, <sup>4</sup>Byrareddy .H.C

<sup>1</sup> Head of Department, Department of Electronics and Communication, Dr. TTIT, KGF,  
hod.ece@drttit.edu.in

<sup>2</sup> Assistant Professor, Department of Electronics and Communication, Dr. TTIT, KGF,  
srinivas.b@drttit.edu.in

<sup>3</sup> Assistant Professor, Department of Electronics and Communication, Dr. TTIT, KGF,  
shashikiran@drttit.edu.in

<sup>4</sup> PG Scholar, M.Tech in Digital Communication and Networking, Dr. TTIT, KGF,  
byra22@gmail.com

### Abstract

The advanced microprocessors are widely used for most of the complex systems. A silicon chip of fingernail-size may exhibit entire high performance guaranteed processor, higher cache memory and logic needed for interfacing with external devices. Reduced Instruction Set Computing (RISC) is a CPU (Central Processing Unit) design mechanism based on the vision in which exhibits basic instruction set and yields better performance after comparison with microprocessor architecture and it has the capacity to perform the instructions through microprocessor cycles per instruction. In this paper, the Cost-effective and efficient RISC Processor is designed. The RISC Processor design includes Fetching, decoding, Data and instruction memory, and Execution units. The Execution unit contains ALU (Arithmetic and Logical Unit) Operations. The RISC Processor design is synthesized and implemented using Xilinx ISE Tool and simulated using Modelsim6.5f. The implementation is done by Artix-7 FPGA device and the physically debugging of the RISC Processor, and ALU Units are verified using Chipscope pro tool. The performance results are analyzed in terms of the Area (Slices, LUT's), Timing period, and Maximum operating frequency. The comparison of the RISC Processor is made

concerning previous similar architecture with improvements.

**Key words:** RISC Processor, ALU Unit, Execution, Fetching, decoding, Verification, FPGA

### I. INTRODUCTION

The earlier days of the processor design has witnessed a quest for higher performance in computer models and architectures. To achieve significant performance, technology advantages, better architecture and optimization in the compiler technology. As per this technology, the machine performance can be increased in proportion with the technology enhancement which can be available for everyone.

The design of the processor is manufactures using semiconductor devices, the printed circuit board (PCB), etc. The operation of any processor depends on the instructions used in it. These instructions include the computation/manipulation of the data values by using the registers, changing/retrieve the values of the read/write memory, performing the relational test among the data values and to have the control over the program flow.

The design of a processor considers the areas like: (i) data paths like 'Arithmetic Logic-Unit (ALU) and pipelines', (ii) a control unit which helps in controlling the data paths, (iii) considers the register files (memory components), (iv) clock circuits, (v) library of



## Performance Evaluation of Nonlinear PI Controller on the Laboratory Type Spherical Tank Process

T. Bhuvanendhiran<sup>1</sup> and S. Abraham Lincon<sup>2</sup>

<sup>1</sup>Research Scholar, <sup>2</sup>Professor, <sup>1&2</sup>Department of Electronics and Instrumentation Engineering,  
Annamalai University, Annamalai Nagar, Tamil Nadu, India  
E-Mail id: tbhuvanendhiran@yahoo.co.in

**Abstract** - In this paper, the implementation of Nonlinear PI controller based on error square type is designed and adopted to control of level in a spherical tank process. By use of black box model the system is found as a First order plus Dead Time model (FOPDT). Then the controller tuning strategies has been adopted namely Direct synthesis (IMC), Skogestad (IMC PI), and Nonlinear PI (error square type) tuning. Among all the three controllers tuning the error square type based Nonlinear PI tuning method shows better control performance than the other two controller tuning in terms of performance indices like Integral Square Error (ISE), Integral Absolute Error (IAE) and Time domain specifications.

**Keywords:** Nonlinear PI, Direct Synthesis IMC PI, Nonlinear Process, SIMC, System Identification

### I. INTRODUCTION

In Different Industrial Automation Control Systems, the PID control schemes are widely used for a long time [1]. The PID controller is the most common form feedback and consist of in many different forms but limited to more complex Nonlinear system due to lack of efficiency. Due to this reason, Nonlinear PI controller is implemented in much Industrial process, where the parameters are depending on quantity of system error. Generally, a nonlinear combination can provide additional degrees of freedom to obtain better control performance [2-5]. The conventional linear PID controller is modified by use of nonlinear characteristics in recent years [6]. However, an advanced control strategies are adopting in different nonlinear processes, still much research has been going on in tuning the PID controller to achieve better control performance for many processes like large dead time, integrating process and first order process with Dead time (FOPDT) model. Wang *et al.*, [7] have discussed about PID controller design using LMI approach. Visioli [8] designed a PID plus feed forward controller for an inverse model system. Astrom and Hagglund [9] have proposed the new tuning rule to give a robust performance for a process with essentially a step response. Toscano [10] have proposed simple PI/PID controller based on numerical optimization approach. Nithya *et al.*, [11] have discussed about the control aspects of spherical tank using Internal Model based Controller (IMC) PI tuning setting in real time. They discussed that the IMC gives better performance in tracking the set point and load changes with faster settling time and exhibit less over shoot with no oscillation.

In this Research work, a Nonlinear PI control algorithm (error square type tuning) was implemented to a spherical tank process to increase the better control quality at different operating regions. The performance indices have been compared with two tuning methods i.e., direct synthesis IMC PI and Skogestad IMC PI tuning.

### II. SYSTEM DESCRIPTION

#### A. Spherical Tank Process

A sphere is a very strong structure. The even distribution of stresses on the sphere's surfaces, both internally and externally, generally means that there are no weak points. That's why a drop of water forms a spherical shape when under free fall, in short; it achieves a shape where all the resultant stresses neutralize when no external force is acting on it. Moreover, they have a smaller surface area per unit volume than any other shape of vessel. This means, that the quantity of heat transferred from warmer surroundings to the liquid in the sphere, will be less than that for cylindrical or rectangular storage vessels. It is used in many applications in Petroleum Industries, Paper Industries, Water treatment plants and Chemical Industries etc., [12].

#### B. Mathematical Modeling of Spherical Tank Process

Fig.1 shows the schematic diagram of spherical tank level system, in which the control input  $u$  is being the in- flow rate ( $m^3/s$ ) and the output  $x$  is the fluid level ( $m$ ) in the spherical tank.

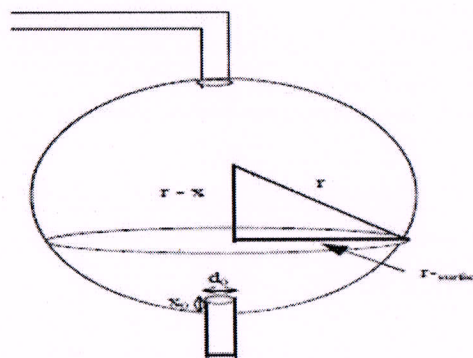


Fig. 1 Schematic diagram of Spherical Tank Level Process



# Packet Collision Avoidance in Energy Efficient CC-MANETs

Srinivas Babu N<sup>1</sup>, Pomila Srinivasa Murthy<sup>2</sup>, Sainath P A<sup>2</sup>, Vishnu J K<sup>2</sup>

<sup>1</sup>Assistant Professor, ECE dept., Dr. T. Thimmaiah Institute of Technology, K.G.F, Karnataka, India

<sup>2</sup>Students, ECE dept., Dr. T. Thimmaiah Institute of Technology, K.G.F, Karnataka, India

**Abstract**—Content centric network (CCN) totally transform the host centric network architecture to content centric network architecture. Different researchers studied CCN for Mobile ad hoc networks (MANETs) for efficient communication. MANET in CCN faces various issues of flooding of interest packet and data packets, broadcasting on broken edges, power consumption, and reestablishment of the connection with mobile nodes. In this paper, we proposed an efficient multicasting and collision avoidance (EMCA) protocol in content centric MANETs (CCMANETs). It minimizes the interest packet and data packet flooding in the network by applying check on the content store (CS) and pending interest table (PIT). EMCA also maintains the unique routing table (RT) at each node. RT extracts information from interest packets. If the path breaks during the data packet unicasting then data packet custodian node uses RT entries to select the second best path for unicasting. The simulation results of EMCA shows better results than AIRDrop because AIRDrop uses broadcasting on broken edges. EMCA achieves high throughput with less network load and minimum battery consumption. It also minimizes packet flooding in the network to ensure less packet collision rate. EMCA provides better content based communication protocol and ensures more successful communication in dynamic topology. In this project, we present an efficient multicasting and collision avoidance (EMCA) protocol in content centric MANETs (CCMANETs). Our proposal is based on a tone system to provide more efficiency and better performance. The protocol consists of a new construction method for mobile nodes using a clustering approach that depends on distance and remaining energy to provide more stability and to reduce energy consumption. In addition, we propose an adjustment to the typical multicast flow by adding unicast links between clusters.

**Keywords**—AIRDrop, MANETs, Clustering.

## I. INTRODUCTION

Mobile Ad Hoc Networks (MANETs) are comprised of mobile nodes in a dynamic environment. Mobile nodes are infrastructure less and can change the position in various directions. During the communication, mobile nodes also act as a router and can send or receive data from nodes. They can be used for various purposes like a battlefield, emergency, disaster etc. But MANETs have the issue of battery drainage, broken edges, assigning an IP address to new nodes and reestablishment of the network.

Internet assigns unique IP addresses to each device and satisfies each request through the specific server. Current

Internet architecture ensures end-to-end connectivity during the whole communication process. But now the user is more interested in content instead of end-to-end connectivity. Current Internet architecture has issues of mobility, heterogeneity of network, heterogeneity of data and scalability.

Ad hoc networking with the advantages of fast deployment and easy device replacement has drawn more and more attention, which can provide various services such as communication, storage, and computing for a range of applications. Mobile ad hoc networks (MANET) can be used in rural or emergency scenarios that lack of infrastructure coverage. Since the MANET is self-organized, the wireless nodes may join and quit the network randomly; thus, the communication connectivity is short-lived, and the network topology formed with the short-lived links varies dynamically. In such kind of networks, when nodes are moving out of the network, the contents may vanish if the contents are delivered based on TCP/IP but can still remain in CCN-based networks.

Due to above mentioned issues researchers proposed Content Centric Networking (CCN), a unique content name based Internet architecture, which ensures communication through the unique name of content rather than IP address [1]. CCN maintains three types of table forward information base (FIB) pending interest table (PIT) and content store (CS).

Node store data in its cache and keep its record in CS. Request broadcasted in interest packet and response sends the provider in the data packet. Consumer broadcasts the interest packet, a relay node receives interest packet checks its CS if content not found in CS then PIT entry is maintained and forwards the interest packet to another node according to FIB.

Currently, various researchers are working on different domains of CCN like security, privacy, trust, naming, routing and caching. We particularly focus on routing in CCN. Various researchers proposed and implemented different CCN based routing protocols. Some of them provide energy efficiency while others are providing routing efficiency. Some research papers provide both strategies [2] but use broadcasting on broken edges which consume high power as a number of nodes grow in the network.



## STRUCTURAL DESIGN ANALYSIS OF BYPASS CASING FOR AN AERO ENGINE

K.S. Senthil kumar<sup>1</sup>, R. Sharath<sup>2</sup>, N.S. Manjunatha Babu<sup>2</sup>, K. Mohan Kumar<sup>2</sup>, P. Nazar<sup>1</sup>

<sup>1</sup>Gas Turbine Research Establishment, DRDO, Bangalore.

<sup>2</sup>Dr.T. Thimmaiah Institute of Technology, KGF.

**Abstract** - Bypass casing is situated between the intermediate casing and load ring. Bypass casing houses the core of an aero engine and forms the skin of the engine body. In the present work a structural design analysis of bypass duct for an aero engine is considered. The main objective of this work is to reduce the weight, while meeting the strength and buckling requirements. In order to achieve this objective different types of grid stiffened patterns are analyzed. The types of grid-stiffeners used in this study are Ortho-grid and Iso-grids. Grids when arranged in 60° pattern is known Iso-grids; when oriented in 90° pattern is termed as Ortho-grids. Finite Element model of the bypass duct is generated and carried out the structural analysis for internal pressure and temperature with respect to the critical operating condition and evaluated the strength margins. Buckling analysis is carried out for different configurations of bypass duct and computed buckling factor for different configurations. Iso-grid configuration which meets strength and buckling requirements with the weight reduction of 15% is finalized.

**Key Words:** Bypass Duct, Ortho-grid, Iso-grid, Finite Element Model, Strength and Buckling factor.

engineering. The types of grids Ortho-grid and Iso-grid are shown in Fig 1 and Fig 2 respectively.

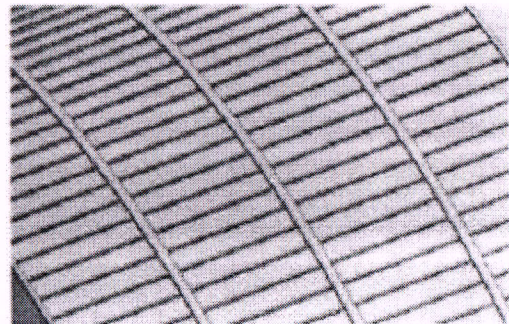


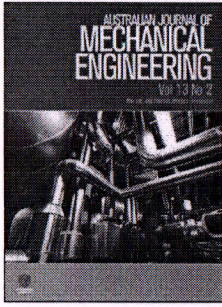
Fig -1: Ortho-grid Stiffened patterns



PRINCIPAL

Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F- 563120





## Influence of machining parameters on the response variable during drilling of the hybrid laminate

N. S. Manjunatha Babu, N. Rajesh Mathivanan & K. Vijaya Kumar

To cite this article: N. S. Manjunatha Babu, N. Rajesh Mathivanan & K. Vijaya Kumar (2019): Influence of machining parameters on the response variable during drilling of the hybrid laminate, Australian Journal of Mechanical Engineering, DOI: [10.1080/14484846.2019.1704492](https://doi.org/10.1080/14484846.2019.1704492)

To link to this article: <https://doi.org/10.1080/14484846.2019.1704492>



Published online: 19 Dec 2019.



Submit your article to this journal [↗](#)



Article views: 15



View related articles [↗](#)



View Crossmark data [↗](#)

*8/12/2021*  
PRINCIPAL  
Dr. T. T. Thirumalaiah Institute of Technology  
Ongem K. G. F. 563120



# TESTING AND FE ANALYSIS OF ADVANCED COMPOSITES FOR AUTOMOTIVE STRUCTURES

Harish C, Manjunatha Babu N S, Mohan Kumar K

Harishcvlin1000@gmail.com

Department of mechanical engineering, Dr.T.Thimmaiah institute of technology, kolar., India

**Abstract-**The composites are gaining popularity in the present era and are going to replace about 50% to 75 % of the metals in the future. The contemporary development in the present advanced composite industry shows that the ACM's (Advanced Composite Materials) are going to lead future automotive and aerospace industries. so the present work involves the characterization and testing LCFT( Long Carbon Fiber Thermoplastic) polymer matrix and LGFT( Long Glass Fiber Thermoplastic) polymer matrix as an automotive structure and its strength to stiffness ratio being high are compared with the present material in use and the best suitable material would be suggested for stable structure. The work involves the development of the composite drive shaft on testing for the structural strength under static conditions. The various tests were performed with the advanced composites on establishing material properties and the same was simulated in the FEA (Finite Element Analysis). The results extracted from the actual testing and simulation could conclude that the driveshaft made of advanced composite material was found to be the best one. The known fact in the recent developments of the composites is that the advanced composites are stronger than regular metal alloys.

**Key Words:** ACM, LCFT, LGFT, FEA

## I. INTRODUCTION

The use of composites in the aerospace and automotive sector has become aggressive in recent years. this is because of the advanced properties of high-end composites which makes them fit as an alternative material to metal alloys. a contemporary issue with the metal alloys is their strength to weight ratio and special applications. as the advance composites are taking over many structural applications. in the near future 50 to 70% of the aerospace and automotive structures will be of advanced composites. many automotive manufacturers are using composites in their sport models. the main constraint is the weight hence composites are mainly developed to reduce the curb weight of the vehicle and to improve efficiency, structural stability and so on.

The important component is the driveshaft transfers power from the engine to the differential to the drive wheel. so the driveshaft of sabaru impreza car has been considered for the research. the sabaru impreza has 2 piece driveshaft and needs to be suggested for a single piece with metal or advanced composites. so to analyze the condition the research is been conducted.

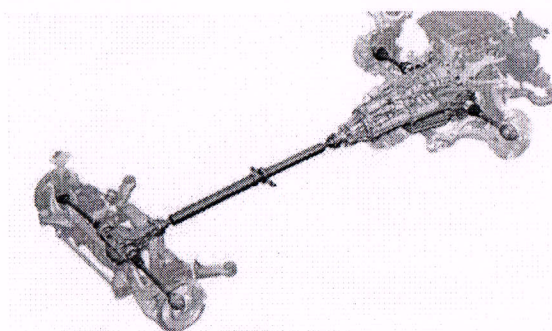


Figure 1.shows the drive train arrangement of an Automotive vehicle

The author [1]has worked on the design and analysis of composite driveshaft. The driveshaft made of steel is analyzed with the shaft made of composite that is carbon epoxy and the study shows that composite shaft provides enough evidence of strength over steel drive shaft of two pieces and the composite shaft was recommended for the use in Ashokleyland truck model 6DT120. The main motive behind the research was to develop the single shaft composite over the two-piece shaft. The analysis has been done to see the deflection, stresses, and strains for steel drive shaft and composite driveshaft. The researchers[2] have worked on the weight reduction of drive shaft of an automobile using the composites as a material in place of steel shaft. Here the drive shaft of heavy truck was modeled in ANSYS software and conventional drive shaft of two pieces was modeled as single composite driveshaft and was analyzed for bending and natural frequency.





# RATIONAL DESIGN METHODOLOGY FOR DESIGN OF UNDERGROUND CAVERNS, A CASE STUDY

<sup>1</sup>Syed Ariff, <sup>2</sup>John Gladious <sup>3</sup>Vikram P

<sup>1</sup>Principal & Prof Dept of Mining Engg Dr T.T.I.T KGF

<sup>2</sup>Associate Prof Dept of Mining Engg Dr TTIT, KGF

<sup>3</sup>Asst Prof Dept of Mining Engg, Dr TTIT, KGF

## ABSTRACT

Discontinuum modeling Universal Discrete Element Code ( UDEC ) to study the rock mass response due to excavation and its long term stability analysis is used world wide. It is important to calibrate and ascertain the computed values by modeling with the monitoring of the excavations using instrumentations. The instrumentation using Magnetic ring multi point bore hole extensometers ( MRMPBX ) is used for monitoring the deformation of walls of the Sardar Sarovar Powerhouse.

To calibrate the numerical model and to assess the long term stability of the excavations, extensometers were installed in the upstream and downstream walls of the powerhouse cavern. The locations of the instruments were selected based on the results of numerical modeling, where the maximum deformations are expected. The results of instrumentation and numerical modeling are compared. The computed displacements compare well with those observed through instrumentation.

**Keywords:** Stress Analysis, Extensometers, Micrometer, End Anchor, Zero Position

## 1. INTRODUCTION

Stress analysis is being carried out using discontinuum modeling to study the rock mass response due to excavation of the powerhouse. In order to calibrate the numerical model, it was proposed to investigate the rock mass behavior through instrumentation. The present instrumentation was installed after the powerhouse was excavated.

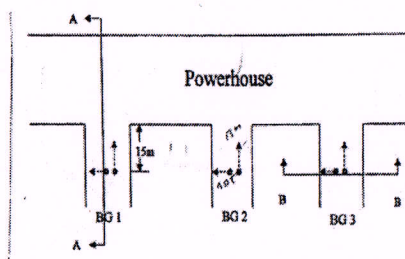
## 2. OBJECTIVE

The objective of this investigation is to install instruments to study,

1. The deformations of the walls and,
2. Assess the long term stability of the powerhouse
3. Compare the results with those of numerical modeling.

## 3. INSTALLATION OF THE INSTRUMENTS

The locations for installation of the instruments were selected based on the results of numerical modeling, where the maximum deformations are expected. Out of these twelve instruments, six of them were installed during first week of February and two of them were installed during June 12 – 14. Rests of the extensometers were installed during November 2000. Six to nine anchors were installed in each of the boreholes depending on the availability of depth of drill holes.



**Fig1** Schematic diagram of the power house showing location of extensometer in bus-gallery plan view





## STUDY OF UTILIZATION OF FLY ASH AS A PARTIAL REPLACEMENT FOR CEMENT IN CONCRETE

<sup>1</sup>Dr. Syed Ariff, <sup>2</sup>John Gladious J, <sup>3</sup>Ajith M, <sup>4</sup>Uthaman A, <sup>5</sup>Vasantharaja Sand, <sup>6</sup>Vetrivel V

Department of Mining Engineering, Dr. TTIT, KGF, Karnataka, India.

<sup>1</sup>principal@drttit.edu.in, <sup>2</sup>john@drttit.edu.in,

<sup>3</sup>ajithvasanth1998@gmail.com, <sup>4</sup>uthaman1907@gmail.com, <sup>5</sup>vasanthpooja30@gmail.com,

<sup>6</sup>vetriv090@gmail.com

### ABSTRACT

Mining industry produces a large quantity of waste every year resulting in severe damage to the environment. The wastes that are produced during mining should be efficiently disposed or effectively reused for any other productive purposes. Coal and lignite mining results in considerable dust pollutions very specifically the coal beneficiation process produces extensive amount of ashes. These ashes can be utilized in construction materials rather than dumping as landfill. When dumped as landfills, these ashes have the tendency to be carried away by the wind resulting in massive damage to the surrounding environment. This study is made to investigate whether this fly ash can be used as an ingredient in concrete preparation as a partial replacement for cement by studying the strength properties of fly ash mixed concrete. The strength properties of concrete when certain percentage of cement in the concrete is replaced with fly ash are studied. The replacement percentage of cement is maintained at 10%, 20%, 30%, 40% and 50% and the samples are tested in the laboratory after the curing period of 21 days. The workability, tensile strength, compressive strength and shear strength of the fly ash mixed concrete sample are determined. Similar tests are conducted on concrete with no fly ash content and both results are compared to find the optimum amount of fly ash that can be replaced without compromising the quality of the concrete. By utilizing fly ash as partial replacement to cement the percentage of

CO<sub>2</sub> emitted due to cement manufacturing can also be considerable reduced.

**Keywords:** Opencast, Tailing, Waste Rock, Fly Ash, Concrete, Tensile Strength, Workability Test

### INTRODUCTION

#### 1.1 Mine Wastes:

The wastes are generated by the mining industry which is mainly during the process of extraction, beneficiation and processing of minerals. Extraction which is the first phase that consists of initial removal of ore from the earth crust and it is done by the process of blasting which results in generation of large volume of waste. That is useless for the industry and is just stored in big piles within the mine lease area, and sometimes, on public land. In this way a large amount of waste is generated by the process.

The big scale of the mine, greater is the quantum of waste generated. Out of the two major types of mining methods (opencast and underground). The Opencast mining methods have more pollution intensive as they generate 8 to 10 times more quantities of waste compared to the underground mines.

#### 1.1.1 Some major types of waste generated:

##### 1) Waste rock:

Mine generates two types of waste rock overburden and mine development rock in Mining operations.

Surface mines that are developed results to Overburden while mine development rock is a byproduct of mineral extraction in underground mines.





## **NONEL INITIATION FOR ECO-FRIENDLY BLASTING**

John Gladious J<sup>1</sup>, Janarthanan R<sup>2</sup>, Preethivi R<sup>3</sup>, Rajakumar S<sup>4</sup>, Ramadoss R<sup>5</sup>  
Department of Mining Engineering, Dr.T.Thimmaiah Institute of Technology KGF,  
Karnataka, India

<sup>1</sup>john@drtit.edu.in, <sup>2</sup>janarthanan.jee@gmail.com,  
<sup>3</sup>preethivi.ravi1997@gmail.com, <sup>4</sup>rajasiva2015@gmail.com, <sup>5</sup>ramadossariyalur@gmail.com

### **ABSTRACT**

**Blasting is an essential component in mining and one of the most economical method of rock excavation applicable to both surface and underground mines. The effect of blasting arising from the mining operation is one of the fundamental problems in the mining industry. Rock fragmentation also plays a pivotal role in large scale mining because of its direct effect on cost of drilling, blasting, secondary blasting, crushing and there-by affecting the overall cost of production. The research investigates the effect of initiation device on environment and the production cost. The objectives of the research were achieved through field measurement and data collection. Various informations pertaining to blasting agents and accessories used for blasting operations were also collected. The results revealed that the flyrock, noise and vibration generated during blasting with NONEL are found to be minimal as compared to the safety fuse and the electrical methods. It is also observed that NONEL initiation increases blasting efficiency and also optimize the cost of blasting.**

**Keywords: NONEL, Booster, Blast Hole Drilling, Mine – PNR Mines, ANFO, Detonators**

### **INTRODUCTION**

Blasting is the process of breaking of bulk rock masses into loose forms, using explosive compounds. Here, the primary role is played by the explosives. The explosives are the substances or devices used in blasting. The explosives are used to produce a volume of rapidly expanding gas that exerts sudden

pressure on its surroundings and break the mass into pieces. There are three common types of explosives used for blasting as chemical, mechanical, and nuclear explosives. The first chemical explosive was gunpowder. Germans manufactured gunpowder in the early 1300s. A detonator is a device used to trigger this explosive device. Detonators can be chemically, mechanically, or electrically initiated. Different explosives require different amounts of energy to detonate. Detonation is a necessity for the explosive to get triggered for blasting.

#### **1.1) NONEL INITIATION:**

Non electric initiation system, NONEL, invented by Per Anders Persson (Nitro Nobel, later Dyno Nobel); introduced to market in 1972. NONEL products can be used with all cast boosters, dynamites and cap-sensitive explosives. Nonel is a shock tube detonator designed to initiate explosions, generally for the purpose of demolition of buildings and for use in the blasting of rock in mines and quarries. Instead of electric wires, a hollow plastic tube delivers the firing impulse to the detonator, making it immune to most of the hazards associated with stray electric current. To meet the ever increasing demand for many minerals, large opencast mines are being planned with high production capacities. To achieve these high production targets, huge explosive quantities are being initiated in a round. As the initiation system influences the blast results, it is necessary to select proper initiation system. Increasing economic pressures environmental constraints and safety mandates in recent years have called for precise focus on drilling and blasting operations in the mining industry. It is generally claimed by the manufacturers that non-electric shock tube system (NONEL)





## EXPERIMENTAL STUDY ON THE TREATMENT OF DAIRY WASTE WATER USING LOW COST NATURAL ADSORBENTS

Divya K S<sup>1</sup>, Dr.Syed Ariff<sup>2</sup> V Vaishnavi<sup>3</sup>, Sadiya Banu A S<sup>4</sup>, G Swetha<sup>5</sup>, Ravi Kiran S<sup>6</sup>  
<sup>1</sup>Assistant Professor, <sup>2</sup>Professor & Principal, <sup>3,4,5,6</sup>Students Department of Civil Engineering,  
Dr.T.Thimmaiah Institute of Technology, KGF  
Emailid:divya@drttit.edu.in<sup>1</sup>

### ABSTRACT

Dairy industry is the one of the pollution food industry and considering huge amount of water is used during production of milk and its products. The waste water contains dissolved sugars, proteins, and fat which is biodegradable and organic in nature. So that dairy waste water is considered as high concentration of organic matter and high BOD. It is estimated that dairy industries generate 2.5 to 3 litres of waste water per litre of milk processed. Such untreated waste water pollutes land and water bodies so that proper treatment of dairy waste water is necessary before disposal in the environment. The aim of present research work is to determine behaviour of various parameters of dairy waste water. An investigation of possible use of low cost natural adsorbents in their powdered form like rice husk, curry leaf, orange peel, neem leaf and rice husk in the treatment of dairy waste water. After conducting the experiments we found that the COD, BOD, Turbidity and pH of the dairy waste water is reduced.

**KEYWORDS:** Dairy waste water, Natural adsorbents, COD, BOD, Turbidity and pH

### INTRODUCTION

The dairy industry involves processing of raw milk, into products like consumer milk, butter, cheese, yogurt etc. Dairy industry contains high amount of organic constituents. So, it is needed to provide required treatment before discharge into the environment. The treatment mostly classified as aerobic and anaerobic treatment. Due to rapid industrial growth world's economy improve with rid growth but also that

make impact in terms of pollution on environment. Large concentration of pollutants in terms of quantity and quality of liquids, solids, and gaseous pollutants shows harmful effects on flora and fauna as well as on many areas on environment. Organic toxic waste (oil and grease (O&G)) causes ecology damages for aquatic organisms, plant, animal, and equally, mutagenic and carcinogenic for human being. They discharge from different sources to form a layer on water surface that decreases dissolved oxygen. O&G layer reduces biological activity of treatment process where oil film formation around microbes in suspended matter and water. This lead to decrease dissolved oxygen levels in the water. There are various methods of oil and grease removal that one of the examples is by using adsorption method. This method commonly uses activated carbon that is one Of the effective adsorbents. Although effective, the cost for activated carbon is expensive thus a study was conducted by using natural resources as alternative adsorbents for oil and grease removal. This study objective is to determine the ability of three adsorbents, which are curry leaf and neem as an adsorbent in removing oil and grease from wastewater. It involved the characterization of adsorbent and the performance studies of the adsorbent. Many technologies are in practice to treat the dairy wastewater and in the present study; an attempt was made to investigate the application of low cost adsorbents from orange peel for the treatment by considering the wastewater from local dairy form. Tones of orange peels were discarded and send to garbage as useless materials and it is very significant and even essential to find applications and uses for these peels, as the management of wastes nowadays





# STABILIZATION OF BLACK COTTON SOIL USING RICE HUSK ASH AND CRUMB RUBBER

<sup>1</sup>Silviya L, <sup>2</sup>Syed Ariff, <sup>3</sup>Priyanka P, <sup>4</sup>Murali B, <sup>5</sup>Suchandra Pradhan, <sup>6</sup>Krishne Gowda S

<sup>1</sup>Assistant Professor, <sup>2</sup>Professor & Principal, <sup>3,4,5,6</sup> Students

Department of Civil Engineering, Dr. T. Thimmaiah Institute of Technology, Oorgaum, K.G.F,  
Karnataka, India

Email id: silviya@drttit.edu.in

## ABSTRACT

Black Cotton Soil (BCS) is a major soil deposit in India. There is a presence of significant amount of mineral montmorillonite in BCS which is the reason behind the alternate swell-shrink property which occurs due to the changes in moisture content and has proven to be troublesome in carrying out civil engineering activities. To encounter this problem stabilization is in practice. The utilization of waste materials such as Rice Husk Ash (RHA), Crumb Rubber (CR) as soil stabilizers is being carried out in our research paper. As the disposal of scrap tyres and agricultural wastes has a potential negative impact on the environment causing pollution and finally affects the ecosystem, thus it is mandatory to make use of these wastes in an environmentally friendly way. The main objective of the paper is to study the geotechnical properties i.e. the Consistency limits, Unconfined Compression Strength, Compaction parameters and CBR characteristics. RHA and CR are blended along with BCS in different proportions and the geotechnical properties of stabilized soil samples are examined. Ultimately the results being computed are studied and the suitable soil stabilizer which proves to be effective enough to withstand the variations and resist the deformations is being suggested.

**Key Words:** Black Cotton Soil (BCS), Rice Husk Ash (RHA), Crumb Rubber (CR), Liquid Limit(LL), Plastic Limit(PL),

**Unconfined Compression Strength(UCS), California Bearing Ratio(CBR)**

## 1.INTRODUCTION

Black Cotton Soil is considered to be weak soil and has low stability against heavy loading. In order to withstand the heavy loading, the soil needs to be stabilized. By stabilizing the soil its engineering properties will be improved. BCS absorbs moisture from the surface during monsoon and exudes moisture by means of evaporation during summer season. Due to this property of soil it is recognized as an expansive soil. It is greyish to blackish in colour and contains montmorillonite clay mineral. Stabilization is a process of changing chemical properties of soil by adding stabilizers to increase the strength and stiffness of expansive (weak) soils. The stabilizers utilized in this research paper are Rice Husk Ash and Crumb Rubber.

## 2.MATERIALS

Black Cotton Soil taken for the investigation is procured from Mavinalli, Indi Taluk, Bijapur District. BCS is derived from basaltic bedrock and is alkaline in nature with low potassium and nitrogen content. Table 1 describes the properties of BCS alone.

*Table: 1 Properties of Black Cotton Soil*

Property	Value
Specific Gravity	2.78
Liquid Limit (%)	69
Plastic Limit (%)	37.5
Plasticity Index (%)	31.5

PRINCIPAL



# Experimental Study on Bituminous Mix using LDPE, Crumb Rubber and Mild Steel Chips in the Construction of Flexible Pavement

Teerthananda Sagar C S  
Assistant Professor, Civil Engineering  
Dr. T. Thimmaiah Institute of Technology,  
KGF, Karnataka, India.

Yashashwini M S, Ravichandra N,  
Architha N, Nikil V  
UG Students, Civil Engineering  
Dr. T. Thimmaiah Institute of Technology,  
KGF, Karnataka, India.

**Abstract** — In recent years, the use of plastic (LDPE), rubber from squandering to modify the mechanical possessions of bituminous fusions has become progressively important in highway engineering. There is presently much research devoted to the influence of this waste substantial on mix performance. This paper presents a study of the incorporation of plastic and crumb rubber. The results obtained show that plastic and crumb rubber improved the stiffness and stability of mixes. A part from the evident environmental benefits, adding this waste to asphalt mixes improves the long-term performance of road surfaces because it reduces the effect of traffic loads on the pavement. In this paper we are improving bitumen possessions and diminish cost of construction and mainly plastic and rubber disposal so that environment expansion can attain and its eco-friendly and also here we are profitable to diverge LDPE and crumb rubber content from 10% to 50% to increase the Marshall stability strength of the road and we have utilized mild steel as an admixture to increase the Marshall stability in rubber replacement. By the experimental analysis we got 20% and 20% optimum values for LDPE and Crumb Rubber respectively.

**Keywords:-** (Urbanization, Bituminous Mix, Eco-Friendly, Non-Biodegradable, Deformation)

## I. INTRODUCTION

India is a blooming country where conveyance shows a significant role. In India conveyance chiefly depends on the road network which as a road length of 5.6 million kilometers and stands as the second largest road network in the world. Discarded valorization has turn out to be crucial to a more efficient and sustainable development in the world in the present day. The reuse and reinsertion of waste substantial in the production chain reduces the consumption of basic commodities and, in many cases, even prevents the depletion of valuable natural resources. Moreover, it also alleviates the accumulation of waste at landfills, which is now a serious problem. Consequently, great efforts are currently being made to reuse waste material in production systems. As they are non-biodegradable, positioning them is a serious issue. Improper discarding of these waste plastic and tires causes harmful effects on the environment and human life. One of the temporary methods of disposing the waste plastic and tires is burning which releases the toxic harmful gases such as carbon di-oxide and carbon monoxide which results in the air pollution. Therefore, by partially replacing the bitumen with waste plastic and crumb rubber to certain extend the properties of flexible pavement like durability, solidity and strength can

be increased. When crumb rubber is added to the hot bituminous mix, it adequately increases the viscosity, lowers the penetration and increases the softening point of the bitumen. Carbon which is present in the rubber acts as an anti-oxidant and prevents the bitumen from aging and oxidation. The main objective of this study is to find the optimum percentage of waste plastic, crumb rubber and mild steel chips that can be partially replaced for bitumen to strengthen the surface course and reduce the cost of construction and also to provide an alternative solution for the disposal problem of waste plastic and crumb rubber.

## II. OBJECTIVES

1. To reduce the bitumen content by the addition of waste plastic and crumb rubber in the hot bituminous mix.
2. To know the stability of the modified bituminous pavement by conducting Marshall Stability test.
3. To minimize the cost of construction of the flexible pavement.
4. To reduce the environmental impacts, that arises during the disposal of waste tires.

## III. MATERIALS USED

### A. BITUMEN:

In the construction of flexible pavement, bitumen plays an important role in binding the aggregates together. Various grades of bitumen are 30/40, 50/60, 60/70, 80/100.

Desirable properties are,

- Bitumen provides a good resistance to surface wear.
- Reduces the surface water infiltration.
- Provides smooth and readable finish.
- Also provides structural support to the wheel loads.

### B. COARSE AGGREGATES:

The aggregates bind together with the help of binding materials such as bitumen. Aggregate are the major constituents of the pavement that should have high strength, durability, toughness, hardness etc. Aggregates used are of sieve size 16mm, 12mm, 12.5mm, 10mm, 4.75mm, 2.36mm and stone dust.

### C. LOW DENSITY POLYETHYLENE [LDPE]:

Low density polyethylene is a thermoplastic made from the monomer ethylene. It was the first grade of polyethylene.





## DESIGN AND DEVELOPMENT OF SINGLE AXIS SOLAR TRACKER OF SMART MONITORING SYSTEM USING IOT

<sup>1</sup>Kori Veerasha, <sup>2</sup>Swetha S.R, <sup>3</sup>Vijayalakshmi.S, <sup>4</sup>Dr.N.Lakshmipathy,

<sup>1,2,3</sup>Eight Semester UG Scholar Department of Electrical and Electronics Engineering, Dr.TTIT, Oorgaum, K.G.F – 563120, India

<sup>4</sup>Professor, HOD, Department of Electrical & Electronics Engineering, Dr.TTIT, Oorgaum, K.G.F – 563120, India

E-mail I.D:<sup>1</sup>veeranagouda048@gmail.com

<sup>2</sup>srsowetharamappa@gmail.com, <sup>3</sup>vijudevi24@gmail.com, <sup>4</sup>nlplakshmipathy@gmail.com

### ABSTRACT

Solar Energy has been the power supply of choice for Industrial applications, where power is required at remote locations. Solar energy great benefit is that, it is highly reliable and requires little maintenance so it's ideal in places that are hard to get to. Electric power from solar panels is derived by converting solar power from the rays of the sun into electrical current in the solar cells. The main challenge is to maximize the capture of the rays of the sun upon the solar panels, which in turn maximizes the output of electricity. A practical way of achieving this is by positioning the panels such that the rays of the sun fall perpendicularly on the solar panels by tracking the movement of the sun. This can be achieved by means of using a solar panel mount which tracks the movement of the sun throughout the day. A single-axis solar tracker follows the movement of the sun from east to west by rotating the structure along the vertical axis. The solar panels are usually tilted at a fixed angle corresponding to the latitude of the location. Our aim is to design and fabricate the system, which will automatically track the sun's position and accordingly change the direction of the solar panel to get the maximum output from the solar cell. A solar charge controller is also designed to charge the battery.

**Keywords:** Payload, H-bridge, Solar Panel, PSRAM, Parallel Inverter Circuit, French Physicist Gaston Planteand.

### I.INTRODUCTION

Solar Energy has been the power supply of choice for Industrial applications, where power is required at remote locations. Solar energy is also frequently used on transportation signaling e.g. Lighthouses and increasingly in road traffic warning signals. Solar energy great benefit is that, it is highly reliable and requires little maintenance so it's ideal in places that are hard to get to. Electric power from solar panels is derived by converting solar power from the rays of the sun into electrical current in the solar cells. The main challenge is to maximize the capture of the rays of the sun upon the solar panels, which in turn maximizes the output of electricity. A practical way of achieving this is by positioning the panels such that the rays of the sun fall perpendicularly on the solar panels by tracking the movement of the sun. This can be achieved by means of using a solar panel mount which tracks the movement of the sun throughout the day. A single-axis solar tracker follows the movement of the sun from east to west by rotating the structure along the vertical axis. The solar panels are usually tilted at a fixed angle corresponding to the latitude of the location. Our aim is to design and fabricate the system, which will automatically track the sun's position and accordingly change the direction of the solar panel to get the maximum output from the solar cell. A solar charge controller is also designed to charge the battery. A solar tracker is a device that orients a payload toward the sun. Payloads can be photovoltaic panels, reflectors, lenses or other optical devices. In flat-panel

PRINCIPAL

Dr. T. Thimmalah Institute of Technology  
Oorgaum, K.G.F. - 563 120.

ISSN (PRINT): 2393-8374, (ONLINE): 2394-0697, VOLUME-6, ISSUE-6, 2019

DOI: 10.21276/ijcesr.2019.6.6.41





## POWER THEFT PREVENTION SYSTEM USING IOT

Ashwitha K<sup>1</sup>, Gracy A<sup>2</sup>, Pooja sree M<sup>3</sup>, Somashekar B<sup>4</sup>, Dhayanand B R<sup>5</sup>  
Ashwithaashwitha400@gmail.com<sup>1</sup>, agracy021@gmail.com<sup>2</sup>, poojasreem22@gmail.com<sup>3</sup>

### Abstract

These days with emerging developments in all sectors and growing demands, electricity has become priority for every individual and every organization. The basic procedure for power supply includes power generation, power transmission and power distribution to the destinations. Naturally owing to few technical faults, losses may occur due to power dissipation by some devices. These losses can be minimized using the fast developing technology, but what about the other kind of losses? These are the losses caused deliberately by human beings for the sake of illegal access to the power distribution. This is power theft. In developing countries like India, power theft is one of the most prevalent issues which not only cause economic losses but also irregular supply of electricity. It hampers functioning of industries and factories, due to shortage of power supplied to them. It causes shortage of power supply to homes. It leads to loss of revenue by Government as individual enterprises may opt to install their own power generators, increases corruption in form of bribes and many more. Ultimately it is the country's economy which suffers along with the country's political reputation.

In this paper a simple design for single phase power theft identification and alert system is proposed which employs real time comparison method to compare the current ( $I_1$ ) at incoming side of the energy meter with that of the load side ( $I_2$ ), if both the  $I_1$  and  $I_2$  are same it is considered that there is no power theft occurred, if  $I_1$  is greater than  $I_2$  then it is considered as power theft has been occurred which is immediately intimated to the Electricity Board via Internet in Real time. On getting the notification on

smartphone the electricity board personal can disconnect the load remotely.

**Index Terms:** power theft, incoming side, outgoing side, controller, wifi adapter, sensors.

### I. INTRODUCTION

The transmission as well as distribution of electricity induces the large amount of loss of power. The quantity of this loss is rising day by day due to it the power authorities are facing losses in their profits a new method to identify the fraud customers is proposed.

There is a huge demand for electricity and there is always a mismatch between supply and demand. Satisfactory operation of power systems requires overall coordination of all the power system components. Attention and focus are given for generating power using both renewable and conventional sources of energy. But the transmission of power also plays a vital role in conveying power with minimal loss to the consumers. Hence proper maintenance of transmission as well as distribution network is mandatory for efficient and effective distribution of power. Though the losses associated with generation can be exactly formulated, there is no proper and precise quantification of transmission and distribution losses. Many parameters are involved and hence more data is required in addition to the sending end data. Also it is not only the technical parameters that influence transmission and distribution losses, but also the non-technical parameters. Power theft is one such parameter in developing countries. In India, the power theft is highly significant and it is approximately 420MW accounting to heavy revenue loss to power utilities.



# Reconstruction of MR Images using Sparse Signal Sequences in Frequency Domain

Deepak M D, Karthik P, Sreedhar Kumar S, Ravikumar H C

**Abstract:** A new strategy for signal acquisition has emerged called Compressed Sensing (CS). The compressed sensing has gained attention in the field of computer science, electrical engineering and mathematics. The Compressed Sensing is a mathematical approach of reconstructing a signal that is acquired from the dimensionally reduced data coefficients/less number of samples i.e. less than the Nyquist rate. The data coefficients are high frequency component and low frequency component. The high frequency components are due to the rapid changes in the images (edges) and low frequency correspond provide the coarse scale approximation of the image, i.e. fine continuous surface. The idea is to retain only coarse scale approximation of the image i.e. the significant components that constitute the compressed signal. This compressed signal is the sparse signal which is so helpful during medical scenarios. During the Medical Resonance Imaging (MRI) scans, the patient undergoes many kinds of difficulties like discomfort, patients are afraid of the scanning devices, h/she cannot be stable or changing his body positions slightly. Due to all these reasons, there can be a chance of acquiring only the less number of samples during the process of MRI scan. Even though the numbers of samples are less than the Nyquist rate, the reconstruction is possible by using the compressed sensing technique. The work has been carried out in the frequency domain to achieve the sparsity. The comparative study is done on percentage of different levels of sparsity of the signal. This can be verified by using Peak Signal Noise Ratio (PSNR), Mean Square Error (MSE) and Structural similarity (SSIM) methods which are calculated between the reference image and the reconstructed image. The finite dimensional signal has a sparsity and compressible representation. This sparsified data can be recovered from small set of linear, non-adaptive measurements. The implementation is done by using MATLAB.  
**Keywords:** Compressed sensing, Magnetic Resonance Imaging (MRI), Nyquist rate, Sparsity.

Magnetic Resonance Imaging [3] uses the radio waves and the electromagnetic waves to capture the internal organs of the body. MRI signals are generated mostly due to protons in the human body which is filled up mostly with water molecules. MRI scanning is a time consuming process to capture the details of the body parts. During the scanning, the patient undergoes a lot number of phenomenon activities like changing the body positions, doing a lot more respiratory activities, increasing his/her heart beats due to new medical environments or the scanning machine has undergone a alignment problems. Under these conditions, a good quality of MRI slice cannot be achieved. The best expression of the image can be selected by reducing the pain of the patients. Even if the numbers of samples in the image are less than the Nyquist rate, the reconstruction of the signal is possible from a small set of linear non-adaptive measurements [2, 35, 36, 37, 38]. The sparsity [4] is an inherent characteristic of many signals which enables the signal to be stored in far few samples or less no of significant data. This sparsity represents the compression of the signal. There are two types of compression methods. They are lossy compression and lossless compression. In case of lossy compression, the reconstructed image is not the same as that of original image. But in case of lossless compression, both the original and reconstructed image will remain the same. Discrete cosine transforms (DCT)[5,6,8,9,10], Discrete Fourier Transform (DFT) [7] and Discrete wavelet transforms (DWT) [11,12,13,14] are examples of lossy compression techniques. The lossless compression techniques are Portable Network Graph (PNG), ZIP, MP3 and etc.

## I. INTRODUCTION

As said in the abstract, Compressed Sensing [1] is new strategy for signal acquisition. CS is a signal processing technique whose vision is to reconstruct the signal by using very less number of samples than actually needed. The actual number of samples required to reconstruct the signal must be more the Nyquist rate. The Nyquist rate states that in order to fully regenerate a signal it should be sampled at a rate which is two times the maximum frequency [2].

## II. LITERATURE SURVEY

In the last three decades many of the authors reported distinct techniques to extract the features over the gray scale image in spatial [15-18,37] and frequency domains respectively. The author Badri in [19] has presented a compression method to process the gray scale image based on FFT and Sparse FFT techniques. The paper discusses about the concept of processing the data by using the DFT, FFT and Sparse FFT techniques. The comparative study of these techniques provides information regarding the impact of computations in number of operations.

The over all conclusion of the paper gives the information that sparse FFT is faster than FFT and FFT is faster than DFT with respect to number of operations in the processing.


Revised Manuscript Received on January 5, 2020

Deepak M D, Research scholar, Dept. of CSE, KSSEM, Bengaluru-560109, India. E-mail :deepak.m.d@kssem.edu.in,

Karthik P, Professor, Dept. Of ECE, KSSEM, Bengaluru-560109, India. E-mail karthik.p@kssem.edu.in,

Sreedhar Kumar S, Professor, Dep of CSE, Dr. TTIT, KGF, Kolar-563120, Karnataka, India. E-mail: sree.dr.2018@gmail.com,

Ravikumar H C, Assistant Professor, Dept. of ECE, Gousia Engineering college, Ramanagaram, India. E-mail: raviec40@gmail.com

  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Oorgaam, K. G. F- 563120



# IoT Based Automatic Control of Sun Tracking Solar Panel for High Power Generation

RuckmaniDivakaran, G. N. Nandini ,N. Pavithra, D. Priya, B. Y. Ramya R. Dharshini

Department of Electronics and Communication Engineering  
Dr.T.Thimmaiah Institute of Technology, Kolar Gold Fields  
dean@drttit.edu.in

**Abstract.** The conversion of sun light into electric energy through solar panels is significant compared to other renewable sources. The energy extracted from the solar panel depends on solar light incident on the solar panel, but the constant variation in the sun's position decreases the power generation efficiency. In order to extract maximal energy, the solar panel should face the sunlight at normal angle throughout the day. Solar tracker tilts the panel towards the sun light direction. The automatic sun tracking solar panel will harness a significant amount of energy from available sun light. Single axis type of solar tracker is used which has one degree of freedom of rotation. Closed loop tracking approach is used with LDR's, an ATmega2560 microcontroller and a DC motor forming the principal components of the circuit model. Based on the signals generated from LDR's, microcontroller provides signals to the motor for tilting the solar panel towards the direction of maximum incident sun rays, which will increase the power generation efficiency. The efficiency of the proposed system is 71%. The information regarding status of solar tracking system is shared through IoT.

**Keywords:** Solar tracker, LDR, ATmega2560 Microcontroller, DC motor, IoT.

## 1 Introduction

Conventional power resources like petroleum fuel, lignite and fossil gases are not only getting depleted but also pollute the environment. As energy consumption and demand level continue to rise with rising global population, hence there is a need of filling the gap through renewable energy. The most significant source of renewable energy is solar energy. Photovoltaic panels were introduced to use this solar energy. Solar panel is an array of solar cells arranged in an order it absorbs sun light and converts it into electrical energy. Solar cell is made up of semiconductor substance silicon. The availability of the solar energy is unlimited; harnessing it optimally presents a challenge because of the stationary nature of photovoltaic panels.

  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Oorgaam, K. G. F- 583120



# A Review: Spectral Efficiency Improvement Techniques

Channaveeramma E<sup>1</sup>

<sup>1</sup> Assistant Professor of ECE Department,  
Navodaya Institute of Technology, Raichur,  
Karnataka, India.

Dr. K. M. Palaniswamy <sup>2</sup>

<sup>2</sup>Professor of ECE Department,  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, Kolar Gold fields, Karnataka, India.

**Abstract** - Wireless communications has become one of the fastest growing areas in our modern life and creates enormous impact on nearly every feature of our daily life. In this paper, I briefed out survey on Spectral efficiency improvement techniques which can satisfy the demands of future wireless gadgets.

**Key Words:** Spectral efficiency, LDPC, NOMA, IM, SM, OFDM,

## 1. INTRODUCTION

With the invention of wide range of wireless devices such as smart phones, tablets, etc, which are capable of high-speed multimedia streaming, wireless data traffic has increased dramatically [1],[2]. Spectral efficiency, the average data rate per unit bandwidth becomes highly important. For example, in Spain, it is expected to bid 1.5 billion EUR on a total of 310 MHz in 4G frequency bands [3]. With this high rate of data traffic, congestion problems will definitely bother the wireless networks in the near future [4]. Therefore, improving bandwidth efficiency or spectral efficiency becomes essential for future wireless communication systems.

The type of Channel coding technique, modulation techniques and the multiple access technique selected plays important role in improving spectral efficiency. Essentially the high spectral efficiency is achieved when higher modulation order and lower code rate is selected, leading to the need of elevated performance error correcting code.

Channel coding started with the Claude Shannon's 1948 landmark paper [5]. The next few decades, the researchers concentrated on the development of practical coding schemes that could approach channel capacity defined by the Shannon on AWGN channels. But this goal was challenging and impossible until the development of Turbo codes and LDPC codes.

Turbo codes are also identified as the parallel-concatenated convolutional codes (PCCC). These codes avoid the confusion of structure and randomness through concatenation and interleaving respectively. Turbo codes provides remarkable efficiency in AWGN and flat-fading channels for moderately low BER where as it suffers from increased latency, poor performance at very low BER.

Low density parity check coder allows parallelizable decoder, more amenable to high code rates, possess lower error rate, superior performance in bursts without interleavers. Single LDPC can work better over collection of channels. The never ending demands of wireless communication are high speed,

more data transfer, Low signal to noise ratio, low bit error rate, efficient bandwidth utilization, and efficient error correction and detection techniques. This paper reviews various error correcting codes that can lead to get the improved Spectral efficiency and Bit Error Rate for a communication system.

## 1.1 SPECTRAL EFFICIENCY

**Spectral efficiency or bandwidth efficiency** refers to the amount of information that can be transmitted over a given bandwidth in a specific communication system.

The three main areas where spectral efficiency can be improved is with efficient channel coding techniques, bandwidth efficient modulation techniques and massive multiple access techniques. The fourth effort to improve the spectral efficiency is combining channel coding, modulation and multiple access techniques.

## 2 LITERATURE SURVEY

The research work carried out by K.M.Palaniswamy[6] shows that the Adaptive modulation based MC-CDMA system or OFDMA system includes Turbo encoder in Rayleigh fading environment analyzed the BER performance for M-ary PSK, M-ary QAM, M-Ary MHPM and M-ary CPM for BDBP (Bit Duration Bandwidth product) at 60ksymbols/sec. It is found that M-ary MHPM has achieved very low BER of upto  $10^{-7}$  due to Adaptive Modulation. The Turbo coder with 1/3 rating makes the system to work efficiently in adhoc environment at a constant BER concluding that MHPM is the best adaptive modulation system for both MC-CDMA and OFDMA accessing techniques.

HalaM.A.Mansour [7] presents analysis on the performance of various concatenated coding schemes such as serial concatenated convolutional code(SCCC), Parallel concatenated convolutional code(PCCC) and Parallel-serial concatenated convolutional code(P-SCCC) with M-ary PSK, M-ary QAM, FSK modulation techniques through AWGN channel. It is found that P-SCCC has better BER and SNR performance compared to PCCC and SCCC. Also P-SCCC-MSK combination of coding and modulation scheme performs better compared to P-SCCC-PSK and P-SCCC-QAM.

The Adaptive modulation and Rate Coding[8] Multi-Carrier Code Division Multiple Access(AMRC-MC-CDMA) technique proposed by T Jaya[3] using BPSK,QPSK and M-ary PSK modulation schemes in AWGN channel compares the BER performance at various code rates and found that AMRC-

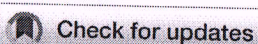




From the journal:

**New Journal of Chemistry**

## Green synthesis of highly luminescent biotin-conjugated CdSe quantum dots for bioimaging applications†

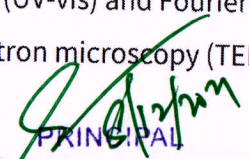


Vijaya Bharathi M.,<sup>ab</sup> Nilmadhab Roy,<sup>ID</sup> <sup>b</sup> Prithvi Moharana,<sup>b</sup> Kaustab Ghosh<sup>\*a</sup> and Priyanka Paira<sup>ID</sup> <sup>\*b</sup>

Author affiliations

### Abstract

Semiconductor nanoparticles with very small sizes of 2–20 nm (quantum dots) are very much attractive for their excellent photoluminescence property. Herein, this study portrays the green synthesis of highly fluorescent, water-soluble, semiconducting CdSe quantum dots (CdSe QDs) as the most potential cellular imaging tag. The stability of CdSe quantum dots has been achieved by capping with mercaptopropionic acid (MPA) as a stabilising agent, and then biotin was attached to quantum dots after surface modification with streptavidin to attain selective cancer cell targeting ability with enhanced conjugation efficiency, which can result in the easy detection of cancer cells growing in our body. The formation of the desired biotin-conjugated highly luminescent CdSe quantum dot has been well justified by photoluminescence (PL), ultraviolet-visible (UV-vis) and Fourier transform infrared (FTIR), X-ray diffraction (XRD), and transmission electron microscopy (TEM) techniques. The cancer cell imaging quality of the

  
PRINCIPAL  
Dr. T. Thirumalaiah Institute of Technology  
Oorgaam, K. G. F- 563120



# OTA Based 2<sup>nd</sup> Order Butterworth Filter For Mobile Communication using CMOS Technology

M Vijaya Bharathi, K Akshitha, MG Divyashree, BR Nagakrupa, J K Sindhu

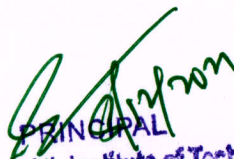
Department of Electronics and Communication Engineering  
Dr.T. Thimmaiah Institute of Technology, KGF, Karnataka India  
vijayabharathi@drttit.edu.in

**Abstract.** Communication is the process of transmitting knowledge from one person to another. Receivers have a vital role to play in communication. The main role of receivers is to replicate the message signal in electrical form from the wrapped transmitted signal. Receivers accept signals, such as radio waves and convert them into useful form. The type of receiver that is commonly used is the Direct Conversion Receiver (DCR) that translates the signal directly to the baseband frequency. In this paper, we are concentrating on the Low Pass filter to block unwanted signals from mixer stage. A 2nd order Butterworth filter is designed by implementing a active load differential amplifier & a active load common source amplifier, further the operational trans conductance is designed by using the above mentioned two circuits. The designed OTA is implemented with two capacitors at the input stage and at the output stage which makes it a Butterworth Filter.

**Keywords :** Butterworth Filter, Lowpass Filter, Operational Transconductance Amplifier, OTA, CMOS Technology. Gm-C filter

## 1 Introduction

The cellular or telephone network is a contact network where the last connection is wireless. The network is spread over land-based areas known as “cells”, each supported by at least one fixed-location transceiver, though more commonly, three cell sites or a base transceiver station. [1,2] Such base stations provide a cell with network coverage and can be used for the transmitting of speech, data and other forms of information. [3] A cell usually uses a separate range of frequencies from adjacent cells to prevent intrusion and to have assured service efficiency within each cell. The block diagram of communication system is shown as shown in Figure1.

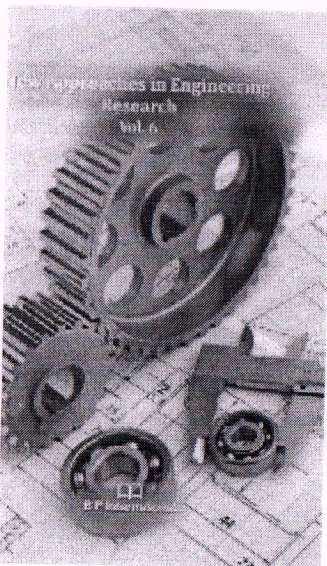
  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F- 563120



# New Approaches in Engineering Research Vol. 6

HOME ABOUT BOOKS TESTIMONIALS EDITORS CHARGES SUBMISSION CONTACT

Home / Books / New Approaches in Engineering Research Vol. 6 / Chapters



## Recent Advancement on Design and Implementation of Low Power Digital up Counter for Digital Beamforming

A. Jenitha ; R. Tamilvani

*New Approaches in Engineering Research* Vol. 6, 17 July 2021, Page 12-24

<https://doi.org/10.9734/bpi/naer/v6/11075D>

Published: 2021-07-17

View Article

Cite

Statistics

Share

### Abstract

For many years, beamformers have been utilised in applications like as surveillance and RADAR as communications. A high-speed, reconfigurable DUC module for digital beamforming developed in this project. A digital circuit that converts a complicated digital base band signal pass band signal is known as a digital up converter (DUC). A DUC is made up of a mixer, a direct synthesiser, and a series of interpolation finite impulse response (FIR) filters that are cascade filters were created with the help of MATLAB and Verilog code. Model Sim is used for simulation. Xilinx ISE is used for functional verification, as well as FPGA implementation on the Virtex-5 Pro.

**Keywords:** Beamformers; Direct Digitally Synthesized (DDS); Digital up Converter (DUC); Model



# Skin Cancer Recognition and Detection Using Machine Learning Algorithm

A. Jenitha, G. Amrutha, K.L. Kishore, K.R. Rohan, S.N. Sagar

Dr. T. Thimmaiah Institute of Technology

Visveswaraya Technological University

KGF, Karnataka India

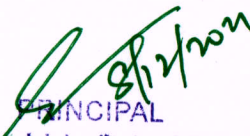
jenitha@drttit.edu.in

**Abstract.** In this paper, we concentrate on the identification of skin cancer. The skin images are taken from a medical database which is a pre-processed image, which is given as input for different machine learning algorithm. The algorithm used is KNN classifier, SVM classifier, and CNN model. where these classifiers will classify whether a given image is cancerous or non-cancerous image. In case of the KNN and SVM the output is 80%, hence in CNN model substantial improvement in accuracy of cancer detection is obtained & it can classify the cancerous & Non-cancerous images efficiently. The process was conducted for test data, training data and validation data using different-images. The training dataset was trained with 100 epochs. The process obtained the accuracy of 97% in training result. in testing result obtained is 95% of accuracy and 96% for validation testing.

**Keywords:** Skin Cancer, CNN, Melanoma, SVM, KNN, Machine Learning.

## 1 Introduction

In this project we try to use appropriate machine learning methods to form an efficient system for melanoma detection. For this process, the input-images are taken from medical institute. It consists of collection images taken from medical institute consisting of dataset about 10000 images of 3Gb [1]. Which contains variety of cancerous and non-cancerous images collected from different patients and it's a processed image examined by doctors across the world [2]. We have taken the images from medical website Kaggle [3]. The results show that the proposed system can out-perform previous methods. The remaining part of this paper is given as follows. In section II, the related works of this project is explained in detail. In section III, the proposed scheme is completely explained. Results of our method are given in section IV. section V concludes the paper.

  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F- 563120





## A feature based change detection approach using multi-scale orientation for multi-temporal SAR images

R. Vijaya Geetha & S. Kalaivani

To cite this article: R. Vijaya Geetha & S. Kalaivani (2021) A feature based change detection approach using multi-scale orientation for multi-temporal SAR images, European Journal of Remote Sensing, 54:sup2, 248-264, DOI: [10.1080/22797254.2020.1759457](https://doi.org/10.1080/22797254.2020.1759457)

To link to this article: <https://doi.org/10.1080/22797254.2020.1759457>



© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 12 Jun 2020.



Submit your article to this journal [↗](#)



Article views: 700



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)



## ENHANCEMENT OF MECHANICAL AND TRIBOLOGICAL PROPERTIES OF EPOXY BASED POLYMER WITH TALC & PTFE AS FILLERS

MOHAN KUMAR K<sup>1</sup> & Dr. V. VELMURUGAN<sup>2</sup>

<sup>1</sup>Associate Professor, Dr. T. Thimmaiah Institute of Technology, KGF, Karnataka, India

<sup>2</sup>Associate Professor, Centre for Nanotechnology Research (CNR), VIT- University, Vellore, Tamil Nadu, India

### ABSTRACT

SU-8, an epoxy based polymer is a promising material for fabricating MEMS 3D structures. However, they have poor tribological properties, which needs to be addressed for optimal performance. Many researchers have shown that PTFE (polytetrafluoroethylene) has low coefficient of friction, and Talc is been used for better wear durability; and hence this combination with any of the polymers has never been studied. To enhance the mechanical and tribological properties of SU-8, different weight percentage of Talc and PTFE concentration has been studied; and the results have shown that the right weight percentage of these two fillers (10P10T) have provided superior properties (Improved hardness and young's modulus with reduced friction coefficient) compared to pure SU-8 and hence can be used as coatings in MEMS devices that experiences lower contact stresses.

**KEYWORDS:** SU-8 Polymer, PTFE Powder, Talc Powder, Micro-Composites & Reciprocating Tribometer

Received: Mar 20, 2020; Accepted: Apr 10, 2020; Published: Apr 28, 2020; Paper Id.: IJMPERDJUN202013

### 1. INTRODUCTION

With an improvement in nanotechnology over a few decades, there has been an advancement in miniaturized components in the field of MEMS/NEMS devices due to its small size with high performance at relatively low cost; and hence finds its market in an immense number of applications including automobile and aerospace industries. Microsensors and microactuators are the most functional components in MEMS devices apart from microelectronics and microstructures; of which only MEMS microsensors are commercially available, while the MEMS microactuators are not yet commercialized due to high friction which hinders the smooth movement between two surfaces having relative motion [1]. MEMS devices have a high surface to volume ratio, because of its small size that varies from a single micrometer to few millimeters, the forces associated with the surface dominates the forces associated with the volume [3,10]. Between the contacting surfaces, surface forces like adhesion and friction play a predominant role leading to failure of the device functionality due to wear.

Silicon is the most conventionally used materials for MEMS devices for the past few decades, due to well-established design and process fabrication related to IC technology. But in the recent years, silicon is been replaced by SU8 (an UV curable epoxy based negative photoresist) as a structural material for most of the applications as compared to poly dimethylsiloxane (PDMS) & poly methylmethacrylate (PMMA)[2], due to its superior properties such as biocompatibility, low surface energy and compatibility of fabricating high aspect ratio componenets at extremely low cost. Despite the above advantages, there are many researchers across the globe who have put efforts in enhancing the poor mechanical and tribological properties of SU8 material. Texturing of SU-8 surfaces and coating with polymers have shown improvement in tribological properties. A cost effective SU-8 textures (3D



PAPER • OPEN ACCESS

# Wetting behavior of textured silicon surfaces- an experimental study

To cite this article: Mohan Kumar K and V Velmurugan 2020 *Mater. Res. Express* 7 054001

View the [article online](#) for updates and enhancements.

## You may also like

- [Stable Hollow-lifting Modules and related concepts](#)  
Saad Abdulkadhim Alsaadi
- [Fabrication of Biocompatible Hollow Microneedles Using the C-MEMS Process for Transdermal Drug Delivery](#)  
Bidhan Pramanick, Sergio Omar Martinez-Chapa and Marc J Madou
- [C and N Co-Doped CuO Hollow Microspheres Derived from Cu/Cu<sub>2</sub>O Assembles As High Performance Anode Materials for Lithium Ion Batteries](#)  
Sicen Yu, Zhouguang Lu, Fucong Lyu et al.

  
PRINCIPAL

Dr. T. Thirumalaiah Institute of Technology  
Oorgaam, K. G. F- 563120



The Electrochemical Society  
Advancing solid state & electrochemical science & technology

## 241st ECS Meeting

May 29 – June 2, 2022 Vancouver • BC • Canada

Extended abstract submission deadline: Dec 17, 2021

Connect. Engage. Champion. Empower. Accelerate.  
Move science forward



Submit your abstract







# Storm Water Harvesting in Urban Pavements by Using Pervious Concrete

<sup>1</sup>M.Maneela, <sup>2</sup>Ajith Kumar. B, <sup>3</sup>John Simson. J, <sup>4</sup>Sampra Stanley.R, <sup>5</sup>Thilak Bala Kumar.M

Department of Civil Engineering, Dr.T.Thimmaiah Institute of Technology, kolar gold field Karnataka,

<sup>1</sup>Associate Professor and HOD Dr.T. Thimmaiah Institute of Technology, KGF

<sup>2, 3, 4 & 5</sup> Final Year UG Students Dr.T.Thimmaiah Institute of Technology,KGF.

Email Id: hod.civ@drttit.edu.in, balathilak245@gmail.com

**Abstract:** Due to modern urban development and improper drainage system, flooding has become common in India. Study suggests that use of pervious concrete is cost effective and eco-friendly. The use of pervious concrete consists of high permeability, low strength and high porosity when compared to the normal pavement or normal concrete. The aggregates are single size bonded with only cement paste which also omits the usage of fine aggregates thereby forming intercellular structures, which allows the storm water to seep into ground for recharge of ground water table by reducing the runoff of water on the surface. During the excess flow of storm water which cannot percolate the ground water surface enters the storage tank which is provided adjacent to the roads or beneath the surface of the footpath. The water which is stored in the storage tank can be used for external applications. However the concrete surface affects the tyres and creates noise, by using pervious concrete or exposed aggregate concrete it can be reduced.

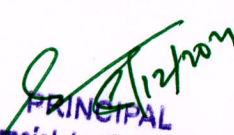
**Keywords:** Pervious concrete, storm water, ground water recharge, storage tank, external applications.

## I. INTRODUCTION

Pervious pavements are alternatives to traditional to asphalt and concrete. They permit water to undergo soil below, reduce storm water and recharge groundwater. Pervious pavements are utilized in many parts of the planet to enhance wet weather driving safety, reduce traffic noise and manage storm water runoff. Pervious and interconnected structure pore allows that water to simply penetrate into it and convert this sort of pavement to eco-friendly pavement. Pervious concrete is homogenous mixture of cement, aggregate/gravel and water where this sort of concrete is additionally called as no-fines concrete. Pervious concrete could even be a special high porosity concrete used for flat work applications that consents water from precipitation and other sources to undergo it, thereby reducing the runoff from a site and recharging spring water levels. Pervious

concrete are produced using large aggregates with little to no fine aggregates. Pervious concrete is traditionally utilized in parking areas, areas with high traffic, residential streets, pedestrian walkways, and green houses. It is an important application for sustainable construction and is one of many low impact development techniques employed by builders to project water quality. The use of pervious concrete is recognized as best management practice by US environment protection agency for providing first flush pollution control and storm water management. High impact development within the areas of transportation infrastructure by the development of conventional concrete pavements is transforming the natural pervious ground into an impervious land cover, the development of conventional impervious pavement systems has caused two major shifts within the local environment including changes of hydrological aspects and variations within the surrounding thermal ambience. Pervious pavements with reservoir structure of concrete paving-stones offer the likelihood for a decentralized, sustainable storm water management and source control in urban areas. Runoff from streets and parking areas with low traffic densities are often infiltrated to support spring water recharge and to scale back hydraulic stress in sewer systems, receiving waters and wastewater treatment plants. Infiltration can help to return the urban water cycle to its natural condition, increasing spring water recharge and evapotranspiration. Hence by evaluating the consequences of various admixtures of pervious concrete block the strength and permeability balance is decided. The most objective is to scale back the stagnant and runoff of the water by allowing it to percolate into ground surface.

Pervious concrete has very rough an uneven appearance thanks to the consistent of cement, coarse aggregate, admixtures (fly ash or pozzolana or ground granulated furnace slag (GGBS)) with little to no fines aggregates and water.

  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology

ISSN (Online) 2347-2812, Volume-8, Issue-8, 2020  
Gurgaon, K. G. F- 563120





# Experimental Study of Strength Characteristics on Self Compacting Concrete by Partial Replacement of Cementitious Materials

<sup>\*1</sup>Manjunatha Singh, <sup>2</sup>Chandrakala R, <sup>3</sup>Prashanth P, <sup>4</sup>Salma Begum K, <sup>5</sup>Saurav Chettri

<sup>1</sup>Assistant Professor Dr.T.Thimmaiah Institute of Technology, KGF.

<sup>2-5</sup> Final Year UG Students Dr.T.Thimmaiah Institute of Technology, KGF.

Department of Civil Engineering, Dr.T.Thimmaiah Institute of Technology, Kolar gold field, Karnataka,

Email Id: manjunathasingh2@gmail.com, cmr2533@gmail.com, Pprashanth0498@gmail.com, sallusalmabegumk@gmail.com, sauravchettri71@gmail.com

**Abstract :** In present scenario innovation in the construction industry is increasing rapidly. A self compacting concrete [SCC] is the one that is able to flow under its own weight and fills the formwork without any vibrators. This helps in increase of speed in construction and reduction of onsite man power. This project aims at highlighting the strength

Characteristics of self compacting concrete with combination and cementitious material like alccofine, GGBS and fly ash. Alccofine is a finer particle than the cement, silica etc which obtained from the slag of the high glass content. Investigation for a different mix proportional like 3 trails with 100% complete cement for first mix and 70% cement 10% GGBS 10% fly ash 10% Alccofine is for second mix and for third mix is of 70% cement 10% Alccofine 20% fly ash. self compacting testing have been carried out for fresh concrete and harden concrete as workability compressive strength, split tensile strength, flexural strength from viewpoint of making SCC with cementitious material as a successful outstanding concrete.

**Keywords—** Self compacting concrete, Alccofine, GGBS, Fly ash, compressive strength, Split tensile strength, flexural strength.

## I. INTRODUCTION.

Self-compacting concrete(SCC) is the one that settles down under its own weight and does not require any vibratory machine to settle down. It was first developed in Japan in 1988. When the construction industry was experiencing a decline in the availability of skilled labour in the late 1980s, to overcome the defects of workmanship this concrete came into picture. At first it was named as High Performance Concrete and later it was called by the name Self Compacting Concrete. SCC is a good alternative for conventional concrete especially

in congested formwork where compaction is not easy and in those situations work with SCC is preferred.

## OBJECTIVES

The main objective of the project work is to determine the strength characteristics of Self compacting concrete (SCC) when the cement is replaced by mineral admixtures in different proportion and hence graphs are plotted.

## II. METHODOLOGY AND MATERIALS

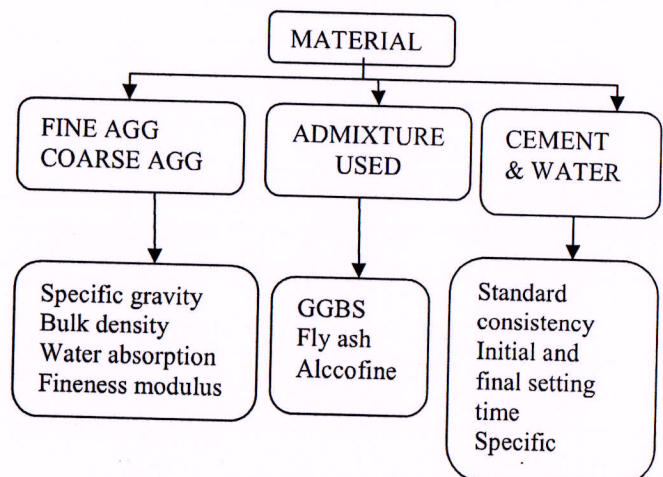


Fig 1: flow chart of methodology

### A. FINE AGGREGATES

The fine aggregates used for the project belongs to zone 2 the materials passing 4.75mm sieve are only considered as fine aggregated then it cleaned to remove unwanted particles.





# Safety on Roads under Low Visibility

Pooja.m<sup>1</sup>, Kishore Kumar .R<sup>2</sup>, Sachin.L<sup>3</sup>, Vineeth.A<sup>4</sup>, Mithun Chakaravarathy.J<sup>5</sup>

Department of Civil Engineering, Dr.T.Thimmaiah Institute of Technology, Kolar gold field Karnataka

<sup>1</sup>Assistant Professor Dr.T.Thimmaiah Institute of Technology, KGF.

<sup>2,3,4& 5</sup>Final Year UG Students Dr.T.Thimmaiah Institute of Technology, KGF.

Email : pooja@drtti.edu.in , micmithun1@gmail.com

**Abstract:** It is known that crashes tend to be severe in low visibility condition than under normal clear conditions. The effects of low visibility are one of the major concerns in the road safety. In this case the visibility tends to turn zero due to fog and heavy rainfall. In this study we bring in contrast the implementation and design of accident avoidance system using Arduino and ultrasonic sensors. The ultrasonic sensors can detect the static position of the vehicle and transmits information to the warning system and provides information to the driver behind. And we also use coding for this project in order to connect the ultrasonic sensors to Arduino. We use an Arduino software for connecting both the devices. After that we need to fetch the code and if it runs without any errors then the devices can be used.

**Keywords:** Low visibility, Fog, Arduino, Ultrasonic sensors.

## I. INTRODUCTION

Over Few Decades, Safety over Transportation is gaining attention because of frequent deaths around the world. Traffic Hazards is one of the major issues to be dealt with when it comes to transportation. Surveys have been conducted and found that the source of majority deaths across the world is due to road accidents. Hence there is a need to provide better transportation facilities that could reduce traffic hazards and save peoples life.

Adverse weather conditions in the atmosphere cause serious harm to road traffic system, especially under low-visibility conditions related to fog. Previous studies have found that traffic accidents are more likely to happen under low-visibility conditions, and most of them are secondary accidents or multi-vehicle collisions under low-visibility conditions, which leads to more serious consequences (Accident occurred in Yamuna Expressway in Greater Noida) The low-visibility conditions severely affect drivers' line of sight, which can lead to lack of judgment of road geometry and the real-time traffic flow system.

Human error is the most dominant factor in traffic

crashes. This error ranges from complete negligence (e.g., distracted or impaired driving) to limitations of human abilities (e.g., slower reflexes with age, low visibility in inclement weather). One limitation that is usually neglected is low visibility during drizzly weather. To reduce the frequency of crashes that occur in inclement weather, it is necessary to investigate the key factors associated with these crashes thoroughly. This study will help us to identify the effects of decreased visibility on the likelihood of crashes and the factors that influence crashes during periods of decreased visibility.

In this work, a warning system is designed using Arduino and ultrasonic sensors for accident detection and prevention.

Some of the major objectives that have been focused are

- Detection of static position or Accident of a vehicle.
- Warning the upcoming vehicles, through the warning system.

The structure of rest of the paper is discussed as below. Section II discusses about the Existing works, Section III discusses about Methodology, Section IV discusses about proposed work. Finally, Conclusion and References were discussed.

## II. EXISTINGWORK

Several Literature paper have been studied and analyzed for the System Design. Several pitfalls in the existing works have been identified. In one of the paper[1], the authors have mentioned the existing technologies and discussed about intelligent transportation system. The existing work is based on RFID and ARM controller to minimize the traffic hazards. However, RFID communication can only be effective when there is strong RF Signal strengths. In [2], VANETS technology is used to Avoid Traffic hazards using DSRC technique. In [3], Survey on various technologies have been considered such as VANETS, Wireless networks. In [4], IOT solution is provided to avoid road accidents. This survey paper could be used as a reference in the

PRINCIPAL

Dr. T. Thimmaiah Institute of Technology  
Ootgaum, K. G. F- 563120



# Printed Circuit Board Defect Detection Using Mathematical Expression in Image Processing

R. VijayaGeetha, M. VijayaBharathi

Department of Electronics and Communication Engineering  
Dr. T. Thimmaiah Institute of Technology, Kolar Gold Field, Karnataka

vijayageetha@drtit.edu.in

**Abstract.** in electronic circuit board, numerous methods have been developed to detect the faults presents on printed circuit board (PCB). It is important to identify the fault in order to investigate and recognize the root source of the defects. This method aims to identify and classify the faults presents on bare layered single PCB using easy mathematical expression. Proposed method have utilized by simple arithmetic and logical equations of NOT, SUBTRACT and XOR operation in image processing tool. Resultant image are classified by binary thresholding. Test image and printed PCB images have used for experiments and identified seven various defects on them. In industrial purpose, testing the manufacturing defects on huge number of PCBs using Image processing leads less consume time and effective way of detecting fault in metal prints.

**Keywords:** Arithmetic and logical expression, image processing and detection rate.

## 1 Introduction

As PCB is most important platform for the assembling of the electronic and mechanical components for final product outcome, on a composite, conductive and non-conductive layer sandwich. In general, the conductive layer is copper although aluminum, chromium and other metals are used, usually the non-conductive layer is a Epoxy and glass fibre-composite. With well developed circuitry with high productivity, boost complexity and circuit board performance, quality of the PCB can impact not only product efficiency but also influence on public protection. So it is very important, the components are placed correctly and exact copper routing is achieved for proper functioning of the system. Ambient, Temperature, Equipment, and defective activity will cause fault presence. Because of unavoidable defects occurrence in the manufacture of PCBs such as short circuit, Circuit breach, burr, fault, hole and other defects.

If any faults are found in the advanced stages of PCB production like etching of the extra copper, we have to discard the PCB [1]. Hence to avoid such faults, we adopt image processing technique to detect and correct the errors before the PCB goes for assembling of the components. The inspection of PCBs has two main processes: identification of defects and classification of defects. There are currently several algorithms



# Literature Review of Wireless Power Transfer

B.Somashekar<sup>1</sup>, Dr.Ganapathy D Moger<sup>2</sup>

<sup>1</sup>Associate Prof, Dr.TTIT, KGF,<sup>2</sup>Professor&HOD, EPCET, Bangalore

somashekar@drttit.edu.in mogergdm@gmail.com

## Article Info

Volume 83

Page Number: 11436 - 11442

Publication Issue:

May-June 2020

## Article History

Article Received: 19 November 2019

Revised: 27 January 2020

Accepted: 24 February 2020

Publication: 19 May 2020

## Abstract:

The present research work is to give brief carrying out and advancement in the field of wireless power transmission. The different methods of wireless power transmission like Mutual Induction, Electromagnetic transmission, wave coupling, Electrodynamics induction, Radio and microwave and Electrostatic Induction, are discussed. This study also helps us about the latest technologies, Advantages and disadvantages in this field.

**Keywords:** wireless power transmission, induction.

## I. INTRODUCTION

In the past, Electrical Engineers have overcome many challenges involving transmission of electrical power the continuous supply of power to the load center and dealing with dynamic parts. Now a days there are many tasks and challenges which have raised the load demand because of many applications of mobiles, Electrical Vehicles, Domestic Appliances, Robots in chemical and nuclear industries which are operating in different environments. Now the engineers

Has to design new method to transfer power to the load. WPT from the beginning era of power transfer time of Tesla has inadequately developed technology. Tesla main aim is to transfer power through WPT worldwide for distribution. But due to deficiency of financial resources and scientific knowledge of that time, he was not able to complete the task. Then onwards this technology has not been developed up to the level which would be relevant for practical purpose.

Research has always been intending to do something in future on and recent developments have been observed in this field. Despite advances wireless power transmission has not been used for commercial use and industrial Applications.

## II. LITERATURE SURVEY

- James C. Maxwell in 1864 showed using mathematical model the presence of radio waves.
- John H. Pointing in 1884 electromagnetic energy can be expressed using Pointing Vector.
- Heinrich Hertz in 1888 conducted an experiment and from the results the presence of radio waves by spark gap radio transmitter and said that in future, WPT can be done using radio waves in 19<sup>th</sup> century.
- The 1<sup>st</sup> person to develop the WPT technic is Nikola Tesla. Research started in the year 1891. In his lab at Colorado, he successfully tested by using at resonant circuit. The lamp was switched on with the help of 3 turns of coil at the receiving end [16]
- William C. Brown contributed to the modern technology using microwave power transmission which is very important in the present development of WPT. Brown developed a rectenna able to convert microwaves to DC current. In 1964 he conducted and showed WPT to power a helicopter by using microwave technology.

12/1/22  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
Ooragam, K.G.F. - 563 120.