# **3.3.4:** NUMBER OF RESEARCH PAPERS PER TEACHER IN THE JOURNALS NOTIFIED ON UGC WEBSITE DURING THE LAST FIVE YEARS

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**3.3.4 Number of research papers per teacher in the Journals notified on UGC website during the last five years (8)**

| Year | 2018-19 | 2017-18 | 2016-17 | 2015-16 | 2014-15 |
|---|---|---|---|---|---|
| Number | 92 | 45 | 29 | 18 | 18 |

Principal
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# A STUDY ON STOCK PRICE MOVEMENT IN BANK NIFTY

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## ABSTRACT:

Investing in equity market is always a complicated process and it requires some amount of intelligence and informationbase. Stock Market Indices are acting as barometer to measure the performance of shares from various sectors. Everysectoral indices are showing the behavioural pattern of stocks of the same sector and the behavioural pattern of one sectormay likely impact on other sectors too. Normally performance of banking sector stocks will influence the performance ofother sectoral stocks. Hence, an attempt is made in this study to know the nature and extent of influence by banking sectorwith other sectors during the bull and bear market phase. Pearsonian correlation coefficient technique is applied to findthe nature and extent of influence by banking sector with other sectors and it was found that there is a positive correlationbetween banking stock index and most of the other sectoral stock indices..

**Keywords:**Stock Market Indices, Bull and Bear Market, Correlation coefficient.

## INTRODUCTION: NIFTY & BANKING

NIFTY - The India Limited National Stock Exchange has protected within the record about the High Performance Study Group regarding New Stock Exchanges. It is advocated so the National Stock Exchange (FIs) furnish quantities because of who buyers bear a correct of access. On the groundwork regarding the recommendations, NSE was once published by means of Drive Financial Institutions in conformity with the Indian Government and protected as a taxable enterprise within November 1992.

Investors not only like return, but also they dislike risk. Whileinvesting in capital market, investors are always concernedabout the market movements or changes in the value of capitalmarket index.The development of regulated and well structuredmarket with latest technology attracts the institutional investorsas well as the HNI and retail investors. Initially, only stock market index was formed to measure the market performance andlater on the indices for various sectors were developed to measure the performance of each sector. These indices are providingauthentic and comprehensive information to investing community and it gives an idea to take decision regarding their equityinvestments.During the later part of last decade (2008 to 2010)the impact of global meltdown was very severe and most of theglobal indices were falling down and Indian equity market alsofollowed the same trend. The effort taken by the monetary authorities of various countries started to yield the fruits on theearly part of

# A STUDY ON MUTUAL FUNDS

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**Abstract:** Mutual funds mobilize the savings of the people and channelize it to the money and capital market. One of the main advantages of mutual funds over any other investment to small investor is that they give small investors access to professionally managed, diversified portfolio of equities, bonds and other securities, which is rather impossible for a small investor to create with a small amount of capital he/ she owns. Mutual funds constitute a very important component of the capital market in developed countries and are now becoming vibrant in emerging markets like India. The origin of mutual funds industry in India can be traced in the enactment of the Unit Trust of India (UTI) Act in 1963. Due to historic reasons, the UTI enjoyed the total monopoly in the initial years and until now continues to maintain the largest market share. The industry has now moved from complete monopoly to that of a monopolistic competition. Presently, the share of Net Assets of mutual funds is more than 7 percent of India's gross domestic product (GDP). Also, the monies accredited to mutual funds form an adequate part of gross domestic savings (GDS) in the country. This indicates the important place of mutual funds as an investment vehicle in the country. Majority of the money parked in mutual funds come from the institutional segment including corporates, banks and foreign institutional investors (FIIs). In which, corporates segment alone account for about 90 percent of institutional AUM. The participation of retail investors in AUM stands quite low, which shows the ample opportunity to be tapped by the industry in coming years. The industry is dominated by the top 10 mutual fund players who control more than 80 percent of the AUM while the bottom 10 mutual fund players control less than 1 percent of the AUM. Geographically, 87 percent of AUM is covered by the top 15 cities of country.

**Key words:** Mutual Funds, Treynor Index, Sharpex Index, Maximum Returns, Minimum Risk.

## 1. INTRODUCTION

Individual investors have developed keen interest within the capital market, attaining higher returns and capital gains in conjunction with transaction concessions. Since little or no investors typically haven't got adequate time, knowledge, expertise and resources for directly approaching the capital market, they have to believe associate intermediate that undertakes wise investment choices and provides the advantages of skilled experience. This is often what an investment company will.

Mutual funds square measure dominated by SEBI. SEBI has the authority to issue pointers and to supervise and regulate the in operation of mutual funds through Mutual Funds rules, 1993 square measure amended from time to time.

Mutual funds offer stability arid property to the exchange conjointly.

An investment company could be a pool of investment managed professionally for the aim of buying varied securities and culminating them into a powerful portfolio which is able to supply enticing returns over and on top of the riskless returns that ar presently being offered by the market. Investment Company could be a money product that invests in stocks or bonds. Owning a investment company is like obtaining smaller slice of associate apple. Investors get units of the fund in proportion to their investments. Suppose a investment company has total assets of $5000 and somebody invests $500, he/she can get 100 percent units of the fund.

## 2. OBJECTIVES OF THE STUDY

The objectives of the study is to analyses, alright the growth pattern of open-end investment company exchange Republic of India and to guage performance of varied schemes floated by most popular mutual funds in public fund in public and private sector.

- To review relating to the Mutual Funds in Republic of India.
- To calculate the danger returns of elite mutual funds schemes in Republic of India.
- To check mutual funds of elite schemes on the idea of their come back and Sharpe Index.
- To give the suggestion that open-end fund theme is best to take a position's

# A STUDY ON ASSET ALLOCATION OF MUTUAL FUNDS

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**Abstract:** An investment is a commitment of funds made with the expectation of some return in the form of capital appreciation. Different investment avenues are available to the investors such as fixed deposits, insurance, post office savings/ national savings certificate, gold/e-gold, bonds, public provident fund (PPF), real estate, shares, commodities, etc. Mutual fund is one of the important investment vehicle that offer good investment prospects to the investors. Mutual fund is a trust that pools the savings of various individuals by issuing units to them and then invests it in various securities such as shares, debentures and bonds as per the stated objectives of the scheme. Further, this investment revenue offers several benefits to the investors as diversification, professional fund management, liquidity, transparency etc. Today a wide variety of mutual fund schemes are available for the investors such as Open-ended, Close-ended, Interval, Growth, Income, Balanced, Equity Linked Saving Schemes (ELSS) and Exchange Traded Funds (ETF), etc. These schemes are catering to the investors' needs, risk and return tolerance. Thus, the present study undertakes the measure and analyze these critical issues by applying various tools and techniques as Analysis of Variance (ANOVA), factor analysis and ranking method. A sample of 119 open-ended mutual fund schemes have been analyzed during the period 01 April, 2006 to 31 March, 2012. Data has been gathered from the official website of Association of Mutual Funds in India, Reserve Bank of India, Security and Exchange Board of India, Bombay Stock Exchange, Value Research and mutual fund companies.

**Keywords:** Asset Allocation, Mutual Funds, Maximum Returns, Minimum Risk

## 1. INTRODUCTION

The theory is that the capitalist will reduce risk as a result of every plus category incorporates a totally different correlation to the others; once stocks rise, as an example, bonds usually fall. At a time once the exchange begins to fall, land could begin generating above-average returns

The amount of AN investor's total portfolio placed in every category is set by a plus allocation model. These models are designed to replicate the private goals and risk tolerance of the capitalist.

Any additional, individual plus categories is sub-divided into sectors (for example, if the plus allocation model needs four-hundredth of the full portfolio to be invested with in stocks, the portfolio manager could advocate totally different allocations at intervals the sector of stocks, like recommending a particular share in large-capitalization, mid-cap, banking, producing, etc.)

## 2. OBJECTIVES OF THE STUDY

- To minimize volatility and. maximizing return
- The method involves dividing your cash among classes that don't all reply to a similar economic process within the same means at a similar time.
- To determine supported your age, lifestyle, goals and risk taking appetency.
- For example a conservative capitalist are told to carry five hundredth in equity mutual funds, forty fifth in debt mutual funds and five-hitter in gold funds.

## 3. SCOPE OF THE STUDY

This project includes the ways of study risk come analysis, applied math techniques like risk, average come, variance, Variance, Sharpe quantitative relation, Treynors quantitative relation, plus allocation are used for the analysis.

The study considers designated prime 5 open-end investment company firms of 2019 for the amount of four year three Months period particularly are IDBI, AXIS, ICICI, RELIANCE, and HDFC.

# A STUDY PERFORMANCE EVALUATION OF PUBLIC & PRIVATE SECTOR MUTUAL FUNDS IN INDIA

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**ABSTRACT:** Indian Financial System was rejuvenated with the introduction of multiple financial institutions, financial services and financial instruments in the post LPG era. This process has opened doors to the private business entities also to start new financial institutions and offer various financial services and instruments. One such institution was mutual funds. Many a number of private corporate houses have started mutual funds immediately after government / SEBI permission. Amount the first entrants Reliance Mutual Funds is one and it has significant contributions to the Mutual Fund services. In the current study 10 top performing schemes offered by Reliance Mutual Funds are selected to make a comparative study on the risk and return offered by these funds. From the study it is observed that among the selected funds Reliance Small cap fund is considered as a fund with moderate risk as well as moderate returns, against which the Reliance Bank Fund is considered as high risk with high returns.

**Key Words :** Mutual Funds , Reliance , Risk, Return, Jensen , Sharpe, Treynor,.

## 1. INTRODUCTION

The Indian financial system is based on four basic components Financial Market, Financial Institutions, Financial Service, and Financial Instruments. All play important role for smooth activities for the transfer of the funds and allocation of the funds. All the four components are inter connected. To boost the economic system intermediation of these four components are vital. Mutual funds as a Financial Institution offer financial services as well as financial instruments to the investors and helps in boosting the financial markets. The contribution of mutual funds for the growth and development of directly financial markets and indirectly for the

boost of economy cannot be undermined. Though mutual fund as a institution started working way back from 1964 with the formation of UTI, the real growth of the institution and becoming as a major player in the economy can be seen only after1990 economic reforms.

The financial system comprises of financial institutions, instruments and markets that provide an effective payment and credit system that facility the channeling of funds from savers to the investors of the economy. Indian Mutual Funds have emerged as strong financial stability to the financial system. Mutual Funds have opened new vistas to investors and imported much needed liquidity to the system.

Mutual Funds are dynamic financial institutions, which play a crucial role in an economy by mobilizing savings and investing in the capital markets savings and the investing in the capital markets. Therefore, the activities of Mutual Funds have both short and long term impact on the savings and capital market and national economy.

Mutual Funds provide households an option for portfolio diversification and relative risk aversion through collection of funds from the households and makes investments in the stock and the debt market.

Mutual fund is a mechanism for pooling the resources by issuing units to the investors and investing funds in securities in accordance with objectives as disclosed in offer document.

# A STUDY ON TECHNICAL ANALYSIS OF DERIVATIVE STOCK FUTURES

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## ABSTRACT:

This research report attempts to gather literature from various sources to answer three relevant questions regarding the growth and model of derivatives in India. This article analyzes recent trends in derivatives in emerging institutional markets. Obstacles to broader and more appropriate refinancing of the derivatives market and the weaknesses associated with currently available sources. The main trends in emerging market derivatives include an increase in derivatives and a stagnation or decline in bank loans and stock issues. As a result of a series of policies, derivatives have become a relevant source of funding in some Indian markets. The paper also briefly reviews significant changes in financing the growth of the derivatives market in India and examines its impact on existing theories of law, finance and corporate governance. It analyzes the potential limits of organizational growth in the derivatives market and examines the impact of integration and diversification on antitrust policy.

**KEYWORDS:**Derivative, Finance, Market Industries and Growth.

## INTRODUCTION

As Indian securities markets evolve, market participants, investors and regulators are exploring various ways in which risk management can be efficiently implemented through the introduction of derivatives markets. By using derivative products, it is possible to partially or fully transfer price risks by blocking asset prices. As instruments of risk management, these generally have no influence on the fluctuations in the underlying asset prices. Derivatives are risk management instruments whose value is derived from a base value. The underlying asset may be bullion, index, stock, bonds, currency, interest, and so on. Banks, investment firms, corporates and investors can use derivatives to hedge risks, gain access to cheaper money and earn profits. Derivatives should grow even faster in the future.

However, the emergence of modern derivative contracts is due to the need for farmers to protect themselves from a decline in their harvest due to a late monsoon or overproduction. The first futures contracts are due to the Yodoya rice market in Osaka, Japan, around 1650. These were obviously standardized contracts that made them very similar to today's futures. The Chicago Board of Trade (CBOT), the largest futures exchange in the world, was founded in

# A STUDY ON INSTABILITY OF INDIAN STOCK MARKET

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## ABSTRACT:

Stock Market is one of the most vibrant sectors in the financial system, marking an important contribution to economic development. Stock Market is a place where buyers and sellers of securities can enter into transactions to purchase and sell shares, bonds, debentures etc. In other words Stock Market is a plate form for trading various securities and derivatives. Further, it performs an important role of enabling corporate, entrepreneurs to raise resources for their companies and business ventures through public issues. Today long term investors are interested to invest in the Stock market rather than invest anywhere. The Bombay Stock Exchange (BSE), the National Stock Exchange (NSE) and the Calcutta Stock Exchange (CSE) are the three large stock exchanges of Indian Stock Market. The main objective of present study is to present review of literature related to Indian Stock Market to study the Indian Stock Market in depth. The study would facilitate the reader to know the past, current and future trend or prospects of Indian Stock market. This study would provide guidelines to investor to maximise profit with minimize risks. High degree of volatility in the recent times in the Indian market has led to more development in the future.

**KEYWORDS:** Securities, Derivatives, NSE, BSE, Public Issue, Maximise Profit, Minimize Risk.

## INTRODUCTION

As a part of the process of economic liberalization, the stock market has been assigned an important place in financing the Indian corporate sector. Besides enabling mobilizing resources for investment, directly from the investors, providing liquidity for the investors and monitoring and disciplining company managements are the principal functions of the stock markets. The main attraction of the stock markets is that they provide for entrepreneurs and governments a means of mobilizing resources directly from the investors, and to the investors they offer liquidity. It has also been suggested that liquid markets improve the allocation of resources and enhance prospects of long term economic growth.

Stock markets are also expected to play a major role in disciplining company managements. In India, Equity market development received emphasis since the very first phase of liberalization in the early 'eighties. Additional emphasis followed after the liberalization process got deepened and widened in 1991 as

# Future-Realistic Flying Car

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**Abstract**: As the number of vehicles are increasing at a very high rate on the roads and it is almost becoming impossible to travel, there needs to have a solution for the traffic congestion. Many methods were tried and almost every method has some or the other drawback. The only solution for reducing the traffic congestion is to have triple mode car, which should run on road, water and should fly in the sky. This will definitely reduce the traffic congestion and will also provide or perhaps helps to start a thought process in designing the same concept car. These cars will be useful for different section of people in terms of commercial and personnel use. People can travel on their own or can use the same for delivery of goods from one place to another and even for lifting patients from a place to nearby hospital. Which means this car can be a life saver vehicle. Many issues needs to be addressed in order to make it a safe triple mode car. Here we have to design a car with road safety measures ,safety measures necessary to fly and also we need to take care of safety measures to run on water It has become inexcusably obvious that our technology has exceeded our humanity. **Albert Einstein.**

## Introduction:

'Flying car', 'Street car', 'swimming car' a triple mode car will help to fulfill the long pending dreams of aviation, automobile, and navy enthusiasts. As this car will bring the best in 3 worlds. The basic purpose of this car is to solve the problems pertaining to traffic congestion on roads, where we find many people getting struck every day in this traffic which not only damages their health and also waste lot of time on travelling. The concept here is to see that this car not only allow people to travel on road but also to fly in the sky depending on the requirement and distance to travel, apart from swimming in the water. The car will have to cater to different needs of the people and will help the future generation to travel in the manner they prefer. The designing of this car will have multiple obstacles as it has to satisfy the regulation of the 3 different worlds. Tech titans like Uber, Amazon, and Google have all laid out ambitious plans for filling the skies with autonomous aircraft. Uber wants to move people

around with flying taxis, and Airbus is committed to producing this kind of vehicle.

Meanwhile Google and Amazon are hoping to deliver packages with much smaller drones. All see the potential for fleets of unmanned aerial vehicles that can pilot themselves. But to make that vision a reality, we're going to need a new breed of sense and avoid technology. Echodyne, a Bellevue, Washington-based startup, believes it has the answer. The company announced preliminary test results from field trials of its MESA-DAA radar system today. It says the device, which is barely larger than smartphone, is capable of detecting even small aircraft at a distance 1.8 miles in varying weather conditions. The company says this breakthrough is driven by the use of meta materials, which allow the radar to eliminate moving parts, making the hardware smaller and more battery efficient without sacrificing range.

A lot of modern automobiles are now equipped with radar systems, in fact Tesla recently announced that it would be focusing on radar as the core technology in its autonomous driving system. But even long-range automotive radar from the likes of Bosch and Delphi only claim a range of a few hundred meters. They also

# CUSTOMER EXPERIENCE MANAGEMENT [CEM] – A CRITICAL OVERVIEW

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**ABSTRACT:**

The aim of Customer relationship management is to enhance relationship with customers and builds customer loyalty. Research suggests, however, that service quality and customer satisfaction may be declining as customer often receives service and quality that falls well below their expectations, in this concern creating customer experience is bound to play vital role in business environment for getting competitive advantage over market competitors and enhances companies long run profitability and sustainable development. Many companies have seen customer experience management (CEM), as a successor to customer relationship management (CRM). This conceptual paper is critically overview the concept of Customer experience management.

**Keywords:** Customer Experience, Customer Satisfaction, Consumer Behaviour etc.

## 1. INTRODUCTION

Present business scenario the term Customer experience has been so widely used; according to academicians and practitioner's opinion, customer relationship management has not created the expecting levels of value for customers and profitability for organizations. So, Customer experience management may be an integrating framework that overcomes the theoretical and practical limitations of customer relationship management. The term customer experience has been receiving increased attention from practitioners and academics in the recent past. Review of literature reveals the concept of Customer Experience was first conceived in the mid-1980s when, along with the mainstream literature in consumer behavior that deemed customers as rational decision makers, a new experiential approach offered an original view to consumer behavior is given by Holbrook and Hirschman, (1982). The concept of Customer Experience came more relevantly to the fore in the 1990s with Pine and Gilmore's book titled 'Experience Economy' (1999).

# Non-conventional Low Power Circuit Design Techniques

N. Raj, P. Anil Kumar, A.K. Singh and P. John Paul

*Abstract*— **In this paper, few non-conventional circuit design techniques has been reviewed. The techniques discussed are widely used for realizing low power analog circuits by operating the circuits at low voltage. The discussed techniques are: Bulk Driven, Floating and Quasi-floating Gate followed by operation of Bulk Driven in Floating and Quasi-floating Gate mode. In all the approach, the threshold voltage restriction is removed from the input signal path. The adverse effect is reduced performances of MOSFET parameters compared to conventional gate driven MOSFET shown in this paper through simulations. The simulations are done with the help of HSpice simulator on 180nm technology.**

*Index Terms*-**Bulk Driven, Floating gate, Quasi-floating gate, threshold, low power.**

## I. INTRODUCTION

THE trend of CMOS technology scaling towards increasing density of components on chip and prolonging lifespan of battery powered portable and implantable medical devices has pushed the research to adopt hybrid techniques for realizing low voltage (LV) low power (LP) circuits. Though such techniques provide promising results but at the same time shows degraded characteristics [1, 2]. In modern technology era, especially for low voltage analog circuits the threshold voltage has been continuously an obstacle during design requirements. In this regard, the minimum supply voltage cannot be scaled below the threshold voltage of MOSFET. Few widely adopted low voltage (LV) low power (LP) techniques which have proved its potential are subthreshold (weak inversion) region [3], level shifter technique [4], Bulk Driven technique [5], Floating Gate (FG) structure [6], Quasi-floating Gate (QFG) structure [7, 8], and Bulk driven floating/quasi-floating Gate (BDFG/BDQFG) structure [9]. These LV LP techniques are categorized as non-conventional technique. Depending upon the desired performance parameter enhancement, the selection of technique is done. The main disadvantage of using these techniques is visible in low transconductance compared to gate driven (GD) MOSFET which results in low bandwidth analog circuits. The key features of FG and QFG MOST lies in terms weighted sum operation of multi input capacitive connection and makes the threshold scalable favouring low voltage operation. However, comparing the features of FG with QFG MOST, the QFG MOST gained potential interest. The main disadvantage with FG MOST is the initial charge trapping at FG node and also the DC convergence issue which is not the case with QFG MOST. Also the QFG MOST shows improved gain-bandwidth product and wide-band operation over FG MOST. Besides floating gate technology, another widely acceptable low power approach is using the BD MOST which has gained popularity due to simple structure. Also the technique best suits to medical devices since the biological signals are of low amplitude (in range of micro to milli volts) and low frequency range (fraction of a hertz to kilohertz) [10]. However, the poor body transconductance of BD MOST forces its application limited to low gain low frequency application. In this context, BDFG/BDQFG technique improved the frequency characteristics of BD MOST. These structures combine the features of BD with FG/QFG MOSFET [9] due to which transconductance is increased and also the frequency range. The paper is organised as follows. Section II covers the brief discussion on non-conventional circuit design techniques highlighting the important features. The supporting simulations for these techniques are shown in Section III followed by conclusion in Section IV.

## II. LOW POWER CIRCUIT DESIGN TECHNIQUES

In this section, the low voltage low power techniques namely: BD, FG, QFG, BDFG and BDQFG are included.

### *A. Bulk Driven (BD) MOSFET*

The conventional MOS transistor (MOST) is a four terminal device, i.e. drain (D), gate (G), source (S) and bulk (B) whose fourth terminal, the bulk is usually connected either negative/positive supply for N-channel/P-channel transistor, respectively, or

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# A Framework for Underwater Image Enhancement and Object Detection

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***Abstract*— the underwater images are distorted due to the light absorption and scattering. The enhancement techniques used to improve the quality of the underwater images are based on the level of noise introduced and also the water quality. Underwater image enhancement processing is necessary to detect desired or suspicious objects under the sea. This paper describes an improved image enhancement and object detection for the underwater images in YCbCr space and canny edge detection for underwater images. The edge detection is done for each Y, Cb and Cr components separately and are combined to get more accurate edge detected underwater image. The morphological process is also applied to obtain the thin edges and the identified objects parameter like area, length, width, etc are also calculated. The results obtained from the proposed method helps efficient object detection.**

**Keywords—** ***underwater images, color segmentation, histogram, number of edges.***

## I. INTRODUCTION

The quality of underwater image plays a vital role in scientific missions such as monitoring sea life, taking census of populations of fish and biological environments. Capturing images underwater is challenging, due light reflection from the water surface and scattering of light by water particles inside the sea. color change due to varying degrees of light attenuation for different wavelengths. Thus the acquired under water images have low contrast with color distortion. Several researchers proposed different techniques for underwater image enhancement and detection. The underwater image processing differs from normal image processing due to noise and poor illumination [1], [2]. Conventional techniques use color equalization for enhancing the underwater images. Images enhanced using these techniques are not giving promising results for edge detection, desired parameters extraction and analysis. In particular, blue and green colors are dominant in underwater images. The colors like yellow and red almost disappear while we go increasing depth. So, efficient image enhancement and edge detection is required for underwater analysis.

The color components are not separated in RGB model. Because of it, image enhancement and accurate object detection is not possible. Meanwhile YCbCr model separates the input image into three components and gives flexibility in modifying images. In this paper, the algorithm enhances the brightness, visibility and contrast of underwater images. The enhanced image is subjected to edge detection. The proposed technique uses YCbCr model for processing. Enhancing the luminance component in this model automatically enhances the brightness of the image without disturbing Cb and Cr components.

Object detection in underwater image is difficult since the object edges are affected due to light reflection on water surface. Also in deep water, the boundary of the object is not detected accurately due to dark of the object and poor illumination. The enhanced images produce an improved edge detection results. In this paper section II describes the literature survey and section III describes the proposed work. Section IV and V explains the results with evaluation measurements and session VI concludes the paper.

## II. EXISTING WORK

Edge detection is most widely used in image processing and analysis of the underwater images such as feature description image segmentation, pattern recognition, etc. The classic edge detection methods require pre-processing for efficient underwater images. So pre-processing is a key factor for obtaining efficient feature extraction. In [3], object detection in underwater image is described. In that paper, first the RGB image is converted into blue image and then LOG operator is used for edge detection.

# Analysis of Energy Efficient Tracking In Wireless Sensor Networks

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**ABSTRACT:**

When a problem is large or difficult to solve, computers are often used to find the solution. Traditional methods of finding the answer may not be enough. It is in turning to nature that inspiration can be found to solve these difficult problems. Nature-inspired algorithms are among the most powerful algorithms for optimization. This paper tends to provide a detailed information of the firefly algorithm in tracking method that can reduce by an accurate estimation of the target location. we will compare the firefly algorithm with the particle swarm optimization. Energy saving is the critical issue for object tracking in sensor networks. The number nodes surrounding the mobile target should be responsible for observing the target to save the energy consumption and extend the network lifetime. Simulations and results indicate that the proposed firefly algorithm is superior to particle swarm optimization .In particle swarm optimization the present location of the object and by probability best and Global best the future location of the object is determined and energy consumption is more compared to firefly algorithm .In firefly algorithm the past, present and future locations and path of the object is determined, the accuracy is more and the time consumption is less in the mobile target.

**KEY WORDS**: Tracking ,particle swarm optimization ,Mobilty based Tracking,Firefly.

**INTRODUCTION:**

Object tracking has a great deal of attention in recent years. The reason is that object tracking has found its way in many real world applications, for example Surveillance ,Vision based control, and robotics ,and in military regions. Sensors are used to collect information about moving target position and to monitor the moving pattern in sensor field .wireless sensors networks must rely on the sensors used and collaborative signal processing to dynamically manage nodes resources and effectively process distributed information. Along the direction, moving target tracking will be accuracy and fault tolerance and missing target recovery. In all tracking process more energy is consumed for messages are transmission between the sensors nodes or between the sensor and sink. In target tracking application the sensor nodes which can sense the target at a particular time are kept in active mode, while the remaining nodes are to be in inactive mode so to conserve energy until the target approaches to nodes. The sensor whose sensing range contains the queried object will reply to the query. Clearly, this approach is inefficient because a considerable amount of energy will be consumed when the network scale is large or when the query rate is high. The power consumption is one of the most critical issues in object tracking. Energy dissipation in sensors is different, depending on the condition of the each sensor. Therefore each sensor must minimize the battery for longevity of network operation. The object tracking algorithm should be designed in such a way that result in good quality tracking with low energy consumption by using the firefly algorithm.

This paper aims to introduce the new Firefly Algorithm and to provide the comparison study of the FA with PSO algorithms. We will first outline the particle swarm optimization, then formulate the firefly algorithms and finally give the comparison about the performance of these algorithms. The FA optimization seems more promising than particle swarm optimization in the sense that FA can deal with wireless sensor network more efficiently and naturally.

**OPTIMIZATION AND TRACKING:**

**Optimization** is defined as finding an alternative with the most cost effective or highest achievable performance under the given constraints, by maximizing desired factors and minimizing undesired ones. In comparison, maximization means trying to attain the highest or maximum result or outcome without regard to cost or expense. Practice of optimization is restricted by the lack of full information, and the lack of time to

# Mobility based Energy Efficient Tracking using Firefly Algorithm in Wireless Sensor Network

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**ABSTRACT:**

This paper is about the Tracking of moving object by using firefly algorithm in wireless sensor network . Firefly algorithm is can determine the path ,position and locations (past, present and future) of the object. Firefly algorithm is a met heuristic optimization algorithm that represents the social behavior of the fireflies, The fireflies attraction depends on brightness of the firefly. The speed and accuracy of the firefly algorithm is better compare to existing algorithms. In sensor network the power consumption is more (by using the nodes) to track the object. To over come this problem we activate the nodes which are near to the object and reaming nodes are in rest(sleep mode) position. The Simulations and results indicate that the proposed firefly algorithm is superior to existing metaheuristic algorithms.

Keywords: Tracking, firefly algorithm,
Mobility based tracking,

**INTRODUCTION:**

Object tracking has a great deal of attention in recent years.The reason is that object tracking has found its way in many real world applications, for example Surveillance, Vision based control,and robotics ,and in military regions. By using the firefly algorithm sensors are used to collect information about moving target position and to monitor the moving pattern in sensor field .wireless sensors networks must rely on the sensors used and collaborative signal processing todynamically manage nodes resources and effectively process distributed information. Along the direction,moving target tracking will be considered in wireless networks. Moving target continuously reports the position to a central base station. The open issues in object tracking are detecting the moving objects change in direction, varying speed of target precision, prediction accuracy and fault tolerance and missing target recovery. In all tracking process more energy is consumed for messages are transmission between the sensor nodes or between the sensor and sink. In target tracking application the sensor nodes which can sense the target at a particular time are kept in active mode,while the remaining nodes are to be in inactive mode so to conserve energy until the target approaches to nodes.The sensor whose sensing range contains the queried object will reply to the query. Clearly, this approach is inefficient because a considerable amount of energy will be consumed when the network scale is large or when the query rate is high. The power consumption is one of the most critical issues in object tracking. Energy dissipation in sensors is different,depending on the condition of the each sensor. Therefore each sensor must minimize the battery for longevity of network operation. The object tracking algorithm should be designed in such a way that result in good quality tracking with low energy consumption by using the firefly algorithm.

**OPTIMIZATION AND TRACKING**

I. Optimization:-

It is defined as finding an alternative with the most cost effective or highest achievable performance under the given constraints, by maximizing desired factors and minimizing undesired ones. In comparison, maximization means trying to attain the highest or maximum result or outcome without regard to cost or expense. Practice of optimization is restricted by the lack of full information, and the lack of time to evaluate what information is available.optimization includes finding "best available" values of some objective function given a defined domain.

II. Tracking:-

A process of determining the current and past locations Tracking system track the moving target in a WSN(Wireless sensor network) by sensing the capability of sensors. since sensor nodes have limited battery power and replacement of

# Multimode polymer Optical Fiber for Multiplexed Transmission

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**Abstract: Data traffic is growing exponentially due to the emergence of various network services. Although the transmission capacity of optical fibers has dramatically increased thanks to advanced communication technologies such as Copper based technologies but Copper based technologies suffer strong susceptibility to electromagnetic interferences and have limited capacity for digital transmission as well as the presence of crosstalk. Compared to these copper based technologies, optical fiber has smaller volume; it is less bulky and has a smaller weight. In comparison with data transmission capability, optical fiber offers higher bandwidth at longer transmission distances. The main objective of Polymer Optical Fiber(POF) to integrate voice, video, and data streams over all-optical systems as communication signals make their way from LANs down to the end user by Fiber-To-The-x (FTTx), offices, and in-homes. This paper reviews the major achievements of our polymer optical Fiber based MMF research and development.**

**Keywords:** Graded index polymer optical Fiber, wavelength division multiplexing, Multimode optical Fiber, LAN.

## 1. INTRODUCTION

At present, twisted pair and coaxial cables are commonly used as the physical medium to deliver telecom services within the customer's premises. However, these two transmission medium suffer from serious shortcomings when they are considered to serve the increasing demand for broad-band services. For instance, twisted pair has a limited bandwidth and it is susceptible to electromagnetic interference (EMI). Coaxial cable offers a large bandwidth, but it poses practical problems due to its thickness and the effort required to make a reliable connection. Moreover, the coaxial cable is not immune to EMI. Optical fiber is extensively used for long-distance data transmission and it represents an alternative for transmission at the customer premises as well. Optical fiber connections offer complete immunity to EMI. Optical silica-glass fibers, however, are not suitable for use within the customer premises because of the requirement of precise handling, and thus, the high costs involved. Polymer optical fibers are very attractive for use within the customer premises with their easy handling and low cost. This is mainly due to their relatively thick core. In fact, several polymer fiber-based systems are commercially available. However, these systems are based on the use of the multimode step index polymer optical fiber (SI-POF), whose bandwidth distance product is limited to a few MHz km.

The way toward broad-band POF systems is opened by the use of graded-index polymer optical fiber (GI-POF). The high bandwidth of the GI-POF (typically 2 GHz km) compared to SI-POF, is attributable to the graded-index profile in the core. The transmission media used at present are not suited for provisioning high-bandwidth services at low cost. For instance, today's wiring in LANs is based mainly on copper cables (twisted pair or coaxial) and silica (glass) fiber basically of two kinds: single mode optical fiber (SMF) and multimode optical fiber (MMF). Copper based technologies suffer strong susceptibility to electromagnetic interferences and have limited capacity for digital transmission as well as the presence of crosstalk. Compared to these copper based technologies, optical fiber has

# A Review on Trends and challenges of grid-connected photovoltaic systems

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***Abstract:***

This paper presents a literature review of the recent developments and trends pertaining to Grid-Connected Photovoltaic Systems (GCPVS). In countries with high penetration of Distributed Generation (DG) resources, GCPVS have been shown to cause inadvertent stress on the electrical grid. A review of the existing and future standards that addresses the technical challenges associated with the growing number of GCPVS is presented. Maximum Power Point Tracking (MPPT), Solar Tracking (ST) and the use of transformer-less inverters can all lead to high efficiency gains of Photovoltaic (PV) systems while ensuring minimal interference with the grid. Inverters that support ancillary services like reactive power control, frequency regulation and energy storage are critical for mitigating the challenges caused by the growing adoption of GCPVS.

## *II.INTRODUCTION*

It is generally accepted in the scientific community that human activity is affecting climate change and that a majority of this impact comes from fossil fuel combustion caused by the electric utility industry [3]. Conventional fossil-fuel generating facilities have in past met the majority of global electrical energy demands. However, environmental and climate change implications of fossil fuel-based generation present serious challenges to society and the environment [1]. Distributed Generation (DG), particularly Photovoltaic (PV) systems, provides a means of mitigating these challenges by generating electricity directly from sunlight.

Unlike off-grid PV systems, Grid-Connected Photovoltaic Systems operate in parallel with the electric utility grid and as a result they require no storage systems. Since GCPVS supply power back to the grid when producing excess electricity (i.e., when generated power is greater than the local load demand), GCPVS help offset greenhouse gas emissions by displacing the power needed by the connected (local) load and providing additional electricity to the grid. As such, during peak solar hours (maximum solar irradiance), fewer conventional generation plants are needed. In addition, GCPVS reduce Transmission and Distribution (T&D) losses. Although average T&D losses amounted to 5.7% in the U.S. in 2010, losses during peak hours are higher [2]. For example, the estimated T&D losses for Southern California Edison and Pacific Gas & Electric exceeded 10% in 2010 [4]. Locating DG assets close to loads can help to partially mitigate these losses.

This paper is organized as follows: section II summarizes the current state and trends of the PV market. Section III discusses regulatory standards governing the reliable and safe operations of GCPVS. In section IV we discuss the technical challenges caused by GCPVS. Since there are a number of approaches for increasing the output power of PV systems, i.e., Maximum Power point tracking (MPPT), Solar Tracking (ST), a combination of both [5] or by using transformless inverters, section V examines each method independently. We present evidence that these methods can indeed help improve the efficiency of GCPVS. In section VI, we explore recent developments in inverter technology and conclude with the changing role of GCPVS inverters in

# EXHAUST MANIFOLD OPTIMIZATION OF BURNING MULTI-CYLINDER IC ENGINE BY USE OF THERMAL ANALYSIS

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***Abstract*— Exhaust manifold is one of the critical components of IC engine for improving the volumetric efficiency. The volumetric efficiency of the engine can be increased by reducing the backpressure in the exhaust manifold. This work analyzes the flow through two different models of exhaust manifold using CFD. The design of exhaust manifold is modified to get optimal geometry. The analysis results of two models are compared for back pressure. By comparing the results of two models the decrease in back pressure is found which ensure improvement in volumetric efficiency of the engine.**

***Keywords*— *Exhaust Manifold, CFD, Multi-Cylinder SI Engine, Back Pressure.***

## I. INTRODUCTION

An exhaust manifold collects the exhaust gases from multiple cylinders into one pipe. It is attached downstream of the engine and is major relevance in multi-cylinder engines where there are multiple exhaust streams that have to be collected into a single pipe. When an engine starts its exhaust stroke, the piston moves up the cylinder bore, decreasing the total chamber volume. When the exhaust valve opens, the high pressure exhaust gas escapes into the exhaust manifold or header, creating an exhaust pulse comprising three main parts: The high pressure head is created by the large pressure difference between the exhaust in the combustion chamber and the atmospheric pressure outside of the exhaust system. As the exhaust gases equalize between the combustion chamber and the atmosphere, the difference in pressure decreases and the exhaust velocity decreases. This forms the medium-pressure body component of exhaust pulse. The r e ma i n i n g exhaust gas fo rms the lo w pressure tail component. This tail component may initially match ambient atmospheric pressure, but the momentum of the high and medium pressure components reduces the pressure in the combustion chamber to a lower than atmospheric level . This relatively low pressure helps to extract all the combustion products from the cylinder and induct the intake charge during the overlap period when both intake and exhaust valves are partially open. The effect is known as scavenging. Length, cross-sectional area, and shaping of the exhaust ports and pipe works influences the degree of scavenging effect. *Seenikannan et al.* [1] analyzed a Y section exhaust manifold system experimentally to improve engine performance. This paper investigates the effect of using various models of exhaust manifold on CI engine performance and exhaust emission. *Yasar Deger et.al* [2] had done CFD-FE-Analysis for the Exhaust Manifold of a Diesel Engine aiming to determine specific temperature and pressure distributions. The fluid flow and the heat transfer through the exhaust manifold were computed correspondingly by CFD analyses including the conjugate heat transfer. *Dr. Kutaiba et.al* [3] made an approach to estimate of flow characteristic in inlet and exhaust manifolds of internal combustion engines using a four-stroke variable compression ratio single cylinder gasoline engine. In the experimental work, the compression ratio was varied from 7 to 11 at variable speed with constant throttle opening, where engine performance was obtained. *Scheeringa* [4] studied analysis of Liquid cooled exhaust manifold using CFD. Detailed information of flow property distributions and heat transfer were obtained to improve the fundamental understandings of manifold operation. A number of computations were performed to investigate the parametric effects of operating conditions and geometry on the performance of manifolds. *Gopal et al.* [5] has conducted experimental analysis of flow through the exhaust manifold of a multi cylinder Petrol engine of a contessa engine of 20 hp at maximum speed of 2000 rpm and then analyzed using FLUENT [1].

## II. BACK PRESSURE

Back pressure usually refers to the pressure exerted on a moving fluid by obstructions against its direction of flow. Back pressure caused by the exhaust system of an automotive

# *Reduction Of Hub Diameter Variation By Using Sqc Technique*

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***Abstract*—** In this study, the control parameters for grinding process are improved for reduction in diameter variation while keeping up quality standards in a cp1h high pressure pump's cylinder head hub diameter manufacturing company. The Statistical quality control technique which is a powerful tool to design optimization for quality is used to find the optimal control parameters. The present paper deals with one of the quality issues resolved by using SQC tools and methodology in diesel systems plant.

***Keywords*—statistical quality control; CNC Grinding machine;Diameter; Cause and effect diagram; gage R&R;**

## I. INTRODUCTION

Parts that require fine surface finishes and extremely close tolerance are candidates for precision grinding; precision grinding is becoming increasingly important for automotive industries. High pressure pumps have to produce 1600-1800bar pressure by eliminating all losses, these can to achieve by its components which are used. Cylinder head is the one of the important part in the high pressure pump, It's hub diameter play a very important role, if diameter is higher cannot do assemble, if less then fuel leakage will happen and it's diameter tolerance is 36µm. Hub diameter is grind by using CNC machine these can be grind by skilled operator. The CNC grinding machine is unstable process. Bahmuller CNC grinding machine Module have diameter variation, it can't to predictable nature for this reason operator can't maintain diameter within specification, by this critical condition 3% of parts rejection found. In this project reduce rejection rate to 0% by using effective steps by using SQC tools and techniques.

## II. PROBLEM IDENTIFICATION AND FORMULATION

The important defects that occur during the production of cylinder head are Patch on hub diameter, Patch on internal diameter, patch on face, internal diameter, Hub diameter low and Hub diameter high etc. when the percentage of defects for various defects. Were drawn shown in the figure1. Hub diameter high and low was found to be of major concern and was contributing 80% of the defects.

# *ERECTION /INSTALLATION OF MECHANICAL DEVICES &COMPARATIVE STUDY OF ELECTRO STATIC PRICIPITATOR IN SUPER THERMAL POWER PLANT*

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***Abstract*—The growth of any country is measured by the electrical power consummation for capita. In the developed countries like USA, Japan there electrical power 2400 W per capita where as in India the power consummation per capita is around 800 W In this regard the National Thermal Power Corporation (NTPC) Ltd has entered in program of power generation to the country.**

**The National Thermal Power Corporation (NTPC) Ltd was set up and accelerates power development in India since in 1975. National Thermal Power Corporation (NTPC) Ltd Kudgi to build the best 800 MW units of global standards promoting inclusive growth.**

**As an inspection of the receiving and storing of material at site to build the auxiliaries (Fenced lockable open yards and Covered lockable area in sheds inspection.) Inspection of the plant component and to control the inventory in a site. Study the plane and procedure of installation of plant components.**

**The plant design parameters like collection efficiency, Specific Collection Area, Aspect Ratio etc. are determine and comparing of above parameters between the NTPC Kudgi and National Thermal Power Corporation (NTPC) Ltd Ramgundam is under taken.**

**Test the Electro Statics Precipitators (ESP) components in a ground level testing methods, Kerosene test method, spirit and water level method, Gauge method and Alignment method etc.**
**The solid waste from power plant is used in making of bricks.**

***Keywords*—*ESP;super thermal power plan;NTPC;sulphuri acid plant;***

## I. INTRODUCTION

Coal & Hydro have been the main source of generation of electricity in power plant. A steam power plant continuously converts the energy stored in fossil fuels like coal, oil, etc. or fissile fuels like uranium, thorium etc into shaft work and ultimately into electricity.

The steam power plant work under principle of Rankine cycle. In an operation first energy release from burning of stem is

# Wear studies on AL6061/Graphite & AL6061/Graphite/Albite AMC's

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**Abstract-** This paper describes the abrasive wear rate of AI (6061) alloy reinforced with graphite composites and AL6061/Graphite composites reinforced with Albite particulates. The present investigation is on the wear behavior of AL6061/Graphite composites and AL6061/Graphite/Albite composites. The 'vortex method' of production was employed in which the particulates were dispersed in to the vortex created by stirring the molten metal by means of a mechanical agitator. The Albite and Graphite were coated to enhance interface bonding so as to improve wear properties. The sliding distances and percentage of reinforcements of the composites were varied. Addition of Albite particulates had a considerable influence on the wear rate compared to AL6061/Graphite composite and matrix alloy. Dry sliding wear behavior of AL6061 based composites has been investigated using a pin-on-disc wear-testing machine. Amongst the investigated composite wear samples , a comparative analysis was carried out. The composites containing both Albite and Graphite exhibited a transition from mild to severe wear depending on sliding distance and applied load. Two modes of wear have been identified to be operative based on the detail examination of wear surface, wear debris and analysis of the wear data. The transition from mild wear to severe wear was influenced by the applied load, sliding distance, hardness and strength of the composite material.

***Key words:*** *Aluminum, Composites, Albite, Graphite, wear*

## I INTRODUCTION

New materials for high performance tribiological applications have been one of the major incentives for the development of aluminium-based metal matrix composites (MMCs). MMC's have received attention because of their improved specific strength, good wear resistance, higher thermal conductivity, than ceramics, lower coefficient of thermal expansion (CTE)**[1-4].** The incorporation of ceramic materials in an Al-alloy increases its load bearing capacity, and hence the load and sliding speed range within which dry sliding wear is mild**[5,6]**. This has been investigated in detail by many researchers and opens new opportunities for the employment of Al-based metal matrix composites (MMC) in applications where sliding resistance of concern. The investigation of the wear behaviour of Al-based MMC against friction materials is receiving particular attention because of the possibility of using these materials for disc brakes in automotive application. In comparison to conventional cast iron disc, Al MMC discs offer promising advantages such as, lower density and higher thermal conductivity. Investigators have also reported that friction and wear behaviour of Al MMCs against, organic as well as semi-metallic friction materials. Each of these alloys acting as matrix of composite materials will provide it with diverse properties determined by its state, the reinforcement's percentage[7] and the nature of matrix particles interface[8].There is no doubt that the nature of matrix hardener phase will influence decisively the latter and this will do so upon wear resistance.

The incorporation of Albite and Graphite reinforcements in an AL-alloy increases, its load bearing capacity and hence the load and sliding speed range within which dry sliding wear is mild. This has been investigated in detail by many researchers and opens new opportunities for the employment of Al-based metal matrix composites in applications where sliding resistance is of concern. The investigation of the wear behavior of Al-MMCs

# DESIGN OF I.C.ENGINE AIR COOLING FINS USING FEA ANALYSIS

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## ABSTRACT

Fins are basically mechanical structures which are used to cool various structures by the process of conduction and convection.It is important for an air-cooled engine to utilize fins for effective engine cooling to maintain uniform temperature in the cylinder periphery.

An attempt is made in this paper Design of IC Engine Air Cooling Fins with varying the fin pitch 10 mm and 20mm by modeling in Pro/E (creoparametric1.0) by taking the outer diameter of cylinder is 78 mm, inner diameter of cylinder is 62 mm, length of the cylinder is 120 mm and cylinder material as Aluminum, Fin material as copper.By using modeling procedure Assembly of cylinder & fins with surrounding airis done.

By using ANSYS software, the thermal analyses of IC engine air cooling fins is carried-out by discretization of numbers nodes are 21223. Shape of the element is Tetrahedral. By taking Ethylene Glycol Temperature Maximum of 120°C and heat release rate through the fins can be obtained by varying the Fin pitch .The heat release from Internal Combustion engine cylinder air cooling fins with six numbers of fin pitch 10 mm and 20 mm are obtained as the 21.02 W and 31.04 W. then the results are validated by comparing the Experimental and Ansys results and are with in the limits. Hence the work can be extended to Increase Rate of heat transfer by varying fin pitch. Changes like tapered fins, providing slits and holes in fins geometry can be made and the optimization of fins can be done with the help of ANSYS results.By keeping fins at an angle, changing the materials heat transfer can be improved.

## 1.0 INTRODUCTION

Extended fins are well known for enhancing the heat transfer in IC engines. However, liquid-cooling system enhances better heat transfer than air-cooling system, the construction of aircooling system is very simpler. Therefore it is important for an air-cooled engine to utilize the fins effectively to obtain uniform temperature in the cylinder periphery.

# Bio-Electronic Approach for Various Adders Circuit Design

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**Abstract—**

The DNA atom is indubitably the most effective medium known for DNA's capacity to code, store data as a methods for information stockpiling. Be that as it may, till now, DNA atom has discovered little use in registering applications. For starting registering application with DNA atom, it requires to plan DNA transistors which can be used to outline essential entryways to actualize Boolean rationale. Strangely some current inquires about have demonstrated that it's especially conceivable to plan a three terminal transistor like gadget engineering by controlling the stream of RNA polymerase along DNA with particular integrases. Alongside that, as of late, basic test plans for acknowledging different essential Boolean rationale capacities have been shown effectively with DNA particle. Till now the test configuration was in multi strand form. Show work received, altered and expanded such DNA rationale door idea to execute plan, reenactment and execution examination of different viper circuits in a solitary strand mold. Adders are a standout amongst the most broadly advanced segments in the computerized incorporated circuit plan and important piece of Digital Signal Processing. In this work the plan of different adders, for example, Ripple Carry Adder, Carry Look Ahead Adder, Carry Save Adder and Carry Select Adder are talked about and are thought about on the premise of their execution parameters, for example, delay and the count of mistake rate.

**Keywords— DNA, RNA, Transistors, Logic Gates, Ripple Carry Adder, Carry Look Ahead Adder, Carry Save Adder, Carry Skip Adder, Carry Select Adder.**

## I. INTRODUCTION

The universe of gadgets begins with a material called "semiconductor" which can be actuated to lead or stop the stream of electrons or gaps. Si has been the prevailing gadgets material since the last 50% of the twentieth century. It must be evident that the fruitful advancement of Si gadgets took years and decades. In traditional electronic circuits transistors are executed to process, store and exchange flag or information with the stream of electrons or openings. Where as at least two transistors together shape a rationale entryway, which enables a PC to oversee numerical operations. From the earliest starting point to till date, the primary point of the gadgets business is to create all the more intense chips. In that procedure, creators have scale transistors in size to deliver littler, speedier, control effective chip at bring down cost [1]. The net consequence of this transistor scaling activity is on account of the transistor to achieve the physical, specialized and financial breaking points. And furthermore that has created little, quicker chips, past a specific breaking point, the quantity of silicon iotas in the protecting layer of a transistor is never again adequate to keep the spillage of electron that makes the circuit abbreviate [1]. To defeat these impediments the researchers and technologists are searching for new materials, inventive structures and progressive plans to acknowledge dependable transistor like activity in such little space [2]. Most novel materials accessible today are at the initial step, where specialists are attempting to comprehend their properties and attributes of transistors created utilizing them. By and by all through the world a few gatherings of researchers, looks into and

# ENERGY-EFFICIENT SECURE DATA AGGREGATION FRAMEWORK (ESDAF) PROTOCOL IN HETEROGENEOUS WIRELESS SENSOR NETWORKS

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**ABSTRACT** - Wireless Sensor Networks (WSNs) are constrained in terms of memory, computation, communication, and energy. In the existing secure data aggregation techniques, reduction in the energy consumption is not much discussed and combined solution for both integrity and authentication is not addressed. Data aggregation is a very important technique, but it gives extra opportunity to the adversary to attack the network, inject false messages into the network and trick the base station to accept false aggregation results. This paper presents an energy-efficient secure data aggregation framework (ESDAF) protocol WSN. The goal of the framework is to ensure data integrity and data confidentiality. ESDAF uses two types of keys. Base station shares a unique key with each sensor node that is used for integrity and the aggregator shares a unique key with each sensor node (within that cluster) that is used for data confidentiality. Sensor nodes calculate a message authentication code (MAC) of the sensed data using shared key with base station, which verifies the MAC for message integrity. Sensor nodes encrypt the sensed data using shared key with aggregator, which ensures data confidentiality. Proposed framework has low communication overhead as the redundant packets are dropped at the aggregators.

**Keyword:** Wireless Sensor Network (WSN), Message Authentication Code (MAC), Energy-Efficient Secure Data Aggregation Framework (ESDAF).

## 1. Introduction

### 1.1. Wireless Sensor Networks

Wireless sensor networks comprises of the upcoming technology that has attained noteworthy consideration from the research community. Sensor networks comprise of many small, low cost devices and are naturally self-organizing ad hoc systems. The function of the sensor network is monitoring the physical environment, collect and transmit the information to other sink nodes. In general the range of the radio transmission for the sensor networks are in the orders of the magnitude which is smaller than the geographical extent of the intact network.

# COMBINATION OF IRIS FEATURE AND PALM PRINT FEATURES FOR SECURITY APPLICATIONS

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***Abstract—***

A Biometric framework is basically an example acknowledgment framework that makes utilization of biometric characteristics to perceive people. Confirmation frameworks based on just a single biometric methodology may not satisfy the necessities of requesting applications as far as properties, for example, execution, adequacy and uniqueness. The greater part of the unimodal biometric frameworks have issues, for example, clamor in gathered information, intra-class varieties ,between class varieties, non all inclusiveness and so forth some of these restrictions can be overwhelmed by various wellspring of data for setting up character; such frameworks are known as multimodal biometric frameworks. In this paper a multimodal biometric arrangement of iris and palm print in light of wavelet parcel investigation is depicted. The most remarkable phenotypic component obvious in a man's face is the point by point surface of each eye's iris. Palm is the internal surface of a hand between the wrist and the fingers. palm print is alluded to vital lines, wrinkles and edges on the palm. The obvious surface of a man's iris and palm print is encoded into a conservative succession of 2-D wavelet bundle coefficient, which create a "component vector code". \in this paper, we propose a navel multi determination approach in light of Wavelet Packet Transform (WPT) for surface examination and acknowledgment of iris and palm print. The advancement of this approach is persuaded by the perception that overwhelming frequencies of iris surface are situated in the low and center recurrence channels. With a versatile limit, WPT sub pictures coefficients are quantized into 1,0or-1as iris signature. This mark introduces the neighborhood data of various irises. By utilizing wavelet parcels the extent of the biometric mark of code achieved is 960 bits. The mark of the new example is thought about against the put away example in the wake of figuring the mark of new info design. Recognizable proof is performed by processing the hamming separation.

***Keywords*—Biometric, iris pattern, palm print, multimodal, wavelet packet transform, score level fusion**

## 1. INTRODUCTION

The word iris is generally used to denote the colored portion of the eye. It is a complex structure comprising muscle, connective tissues and blood vessels [1]. The image of a human iris thus constitutes a plausible biometric signature for establishing or confirming personal identity. Further properties of the iris that makes it superior to finger prints for automatic identification systems include, among others, the difficulty of surgically modifying its texture without risk, its inherent protection and isolation from the physical environment, and its easily monitored physiological response to light. Additional technical advantages over finger prints for automatic recognition systems include the ease of registering the iris optically without physical contact. Besides the above fact, the process of feature extraction is easier due to its intrinsic polar geometry.

Palm is the inner surface of a hand between the wrist and the fingers. Palm print is referred to principal lines, wrinkles and ridges on the palm. The principal lines are formed between the $3^{rd}$ and $5^{th}$ months of pregnancy and superficial lines appear after we born. Although the principal lines are genetically dependant, most of the other creases are not so. Even identical twins have different palm prints.

# ESTIMATION OF SOME BIOMASS SPECIES AND THIER PROPERTIES FOR POWER GENERATION POTENTIALS

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## ABSTRACT

India is an energy needing country. India has most of the energy resources but limited. Now a days, energy demand leads to use of conventional energy resources (i.e. fossil fuels, such as hard coal, lignite, oil and natural gas) which cause critical environmental problems like global warming due to increase in greenhouse gases which can bring drastic change in environment. Renewable energy sources release less pollution to atmosphere. So If the country wants to meet its energy demand and to be less dependent on importing energy and to minimize greenhouse gas effect and to keep environment safe then it should use renewable energy sources. Rapidly increase in energy demand and world pollution due to use of conventional fuel, scientists looked for alternatives as renewable energy sources. Among all the renewable energy sources, biomass considered as an important source of power production due to its wide availability, lower ash content and low Cox, SOx and NOx emission to the atmosphere. In this article, five different portion(leaf, new branch, main branch, bark and root) were taken from residues of two different woody biomass species and three fruit husk/peel of which don't have any commercial use. These species are Vachellia nilotica(local name- Babool), Azadirachta indica(local name- Neem), Musa acuminata(local name- Banana),

Cocos nucifera (local name- coconut) and Arachis hypogaea(local name- Groundnut). Proximate analyses and gross calorific values (GCV) of all the biomass sample were determined. Among all the biomass species studied, the fixed carbon content (FC) in Coconut husk was found to be the highest (i.e. 25wt.%) while Neem leaf has the lowest value(i.e. 11wt%), the volatile matter content (VM) in main branches of Neem is the highest(i.e. 74wt.%) While Groundnut husk has the lowest (i.e. 57wt.%) among all studied biomass samples. The ash content (A) in Neem root is the highest (i.e. 17wt.%) while Babool main branch has the lowest ash content (i.e. 1wt.%). Among all thirteen biomass species studied, husk of Coconut and bark and new branches of Neem are found to be high in moisture content (i.e. 11wt.%) while bark of Babool is found to be the lowest (i.e. 7wt.%).

# DETERMINANTS FOR CUSTOMER INTENDED USE OF SELF SERVICE TECHNOLOGIES

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**Abstract:**

The last decade has seen an increased focus by business world on using modern technologies to deliver their services. The introduction of self-service technologies (SSTs) opens for businesses for the potential of improving productivity and service quality while cutting costs. In fact, introduction of self-service technologies has not been proven to be quite successful. Research on the usage of technology based self services has mainly focuses on antecedents of attitude towards and corresponding behavior intentions to use Focusing on the moderating effects of age, education and gender as key demographic variable. Finally, the conceptual paper is taking support from the literature to exploring the determinants for intended usage and perceived behavior of consumers towards the self-service technologies.

**Keywords**: Self-Service Technologies, Customer Determinants, Technology Interfaces, Perceived Bahaviour etc.

## 1. INTRODUCTION

The Rapid acceptance of modern information and communication technologies in day to day business activity is an important for long term trend in the business world given byRust (2001). Consequently, business environment has increasingly considered innovative options for delivering services to their customers (Bobbitt and Dabholkar 2001, Dabholkar, Bobitt and Lee 2003, Quinn 1996). As a result, the mode of service provision and production is increasingly turned towards the use of self service technologies (SSTs), thereby Meuter et al (2005) explained enabling customers to produce a service encounter independent of direct service employee involvement.The infusion of technology is dramatically changing the nature of service encounters which has been traditionally conceptualized as a high-touch, low-tech phenomenon,within technology based self-services, man-to-man interaction is substituted by man-machine interaction said by Bitner, Brown and Meuter (2000). From a customer's

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# The Comparison of Non-Cooperative Spectrum Sensing Techniques in Cognitive Radio

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**Abstract:** *The Cognitive radio is the emerging wireless communication system. In the fundamental wireless communication system, the static allocation of spectrum is used and that directed to the problem called spectrum scarcity. Mitola was suggested the idea of cognitive radio in 1998. Spectrum sensing is an important and motivating issue in Cognitive radio. Spectrum sensing is the technique to find the primary user transmission in the assigned licensed spectrum band. In this paper the comparison of non-cooperative spectrum sensing techniques is done.*

***Index terms-*** *Primary User, Secondary User, Spectrum Sensing, Energy Detection, Match Filter Detection, Cyclostationary Detection, Cognitive Radio.*

## I. INTRODUCTION:

In cognitive radio(CR), the users that have been given the utmost priority on the use of the particular spectrum are identified as Primary Users(PU) and the users with the lower priority on the use of spectrum are identified as Secondary Users(SU). Our main motive is to make spectrum usable for the SUs without affecting interference to the PUs. This can be done if the SUs sense the PUs transmission before its own transmission. The secondary users check whether there is any active receiver within the range of the secondary user. If active primary user presence there then secondary user cannot transmit the signal because it will cause the interfering to the primary user. So to avoid the interference problem to the primary user it is required to continuously check the presence of any active primary receiver.

The secondary user's necessity to continuously check the activities of the primary users to find the spectrum holes. Spectrum holes are separate as the spectrum bands that can be used by the secondary user without producing interference to the primary users. This process of finding the spectrum holes is called the spectrum sensing. A cognitive radio may be furnished with different forms of cognitive capabilities i.e. a CR may sense the On/Off status of the PUs, or it can be measure the interference power level at primary receiver. Since a CR may be organized with different cognitive capabilities, it can access the radio spectrum in different ways. There are two spectrum access models we have [1]: 1) the opportunistically access model and 2) the concurrent spectrum access model. In the first model a CR user senses the spectrum to detect spectrum holes shown in fig 1. As it detects the one or multiple spectrum holes, it reconfigures transmission parameters (Ex., carrier frequency, bandwidth, and modulation scheme).

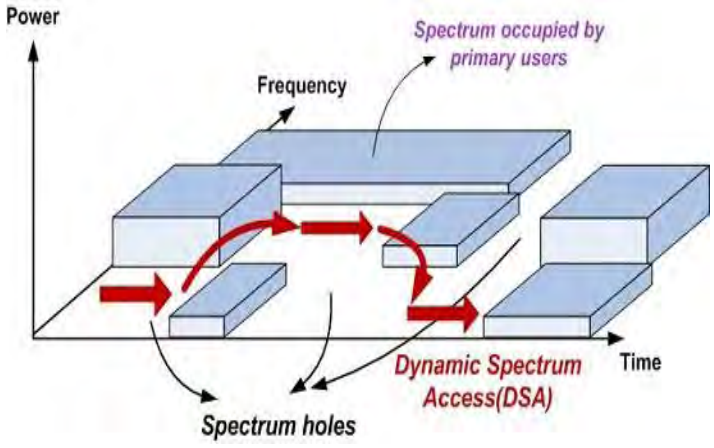


Fig.1. CR users opportunistically access the spectrum hole

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# The Point of view in Khushwant Singh's "Posthumous''

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**Abstract**: *This paper is concerned with the analysis of „Point of view" in Khushwant Singh's Short story "Posthumous". It makes an attempt to investigate how Khushwant Singh achieves his spatio-temporal, ideological and psychological perspectives through his language. He continuously interferes with the comprehension of the readers by guiding them in terms of locating the places and time through his spatio-temporal perspective. He also influences the feelings of the readers by communicating his ideas through his psychological perspective. He also presents the mindset of his characters by describing the commonly accepted social practices in the society through his ideological perspective. Point of view on spatio-temporal, ideological and psychological planes helps the narrator achieve his purpose effectively. Point of view is a much discussed and rigorously explored area in fiction studies, whether in the stylistics framework or any other framework of literary criticism and theory. Point of view basically refers to the way a story is told, the mode of its narration. Point of view concerns, produces, results in, perspectives on, evaluations of, events and characters. It is about influencing readers to form certain opinions, or not to form certain opinions.*

***Keywords:*** *Ideological, Psychological, spatio-temporal*

**Introduction**: This paper presents the stylistic analysis of the short story ―Posthumous" written by Khushwant Singh. Khushwant Singh is a well-known Indian English Writer and a famous essayist. He got well equipped by background, education, exposure and experience to view the Indian scene from a wider angle without any sentimental attachment. He is known more for his books of jokes and his column *With Malice Towards All.* He has penned books on religion, Sikhism, and history of Sikhs and Delhi. He is a man who loves life fully and deeply as is evident in his books. The ironic mode that he adopted also enabled him to look at the human scene with detachment.

**The Summary of "The Mark of Vishnu":**

In ―Posthumous" the author is ill in bed, and he fancies that he is dead. He is curious to know the responses and reactions of his friends and acquaintances to his supposed death. Perhaps the headline in the *Tribune* would read; ―Sardar Khushwant Singh Dead". The obituary notices would perhaps be adulatory and public men of eminence would call at his house to pay their last respects. Wreaths would be laid by ministers and judges on his body. Generous tributes would be paid to the high qualities of head and heart of the departed personality, and his funeral would be attended by large number of people. Thus, his imagination created all kinds of situations, and he visualized a series of scenes of persons consoling his widow and children for their irreparable loss. As this process became operative, he wrote; ―I feel very sorry for myself and for all my friends. With difficulty I check the tears which want to express sorrow at my own death. " But it actually transpired that the ‗Tribune' published only a very brief obituary notice at the bottom of page three, column one about the Sardar. Shafi, the reporter, perhaps tried to settle old scores with Sardar by relegating him to an insignificant place. Lawyer friends of the Sardar, Mr. and Mrs. Qadir, who were expected to call at the house, did not arrive, Mr. Khosla, a pompous bureaucrat and a high court judge, was too engrossed in writing his diary to take much notice of the Sardar's death. So the Khoslas did not appear either. When the imaginary funeral started, the author's inward eye could spot only a few black-robed lawyers, one artist, one communist, and a few others. The hearse was drawn by a bony, brown horse. The lawyers left the procession on the way. The artist and the Communist had had a heated discussion, and they also disappeared. But soon a professor arrived riding a bicycle and tried to console the author's wife by reciting quotations from the Bhagavad Gita ―Ike a man casts off old garments to put on new ones… So does the soul, etc." Between the professor's two legs, a little dog appeared licking his trousers. The author found that everyone left the hearse and that only the Tonga driver remained to carry out his last journey. The cart driver stopped under a peepul tree and the author, now awake in the hearse, contemplated three alternative courses left open to him. He could either give himself up to the scorching flames with the hope of being reborn in a better world, or escape from the hearse into brothels, or quietly return to his home and his humdrum existence. Since he could not decide on a course of action, he wished to flip a coin to decide. At that crucial point, this fantastic and funny reverie abruptly came to an end.

For the study of Point of View in fiction, in an influential publication on prose composition, the narratologist Boris Uspensky proposed a four-way model (Uspensky, 1973). This model was later revised and refined by Roger Fowler. So it is probably referred as the ‗Fowler – Uspensky model'. The four components indentified by the Fowler – Uspensky model of point of view are as follows:

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# THE DEVELOPMENT OF FIXED POINT THEORY-Review

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**Abstract:** *In this paper, we study the observations of progressive results in the fixed point theory. Given a review on some important results from start to at present scenarios.*

***Keywords:*** *Fixed Point, Metric Space, Contraction mapping*

**Subject Classification:** 54H25, 47H10

## 1. INTRODUCTION

The theory of fixed point is one of the most powerful tool of modern mathematical analysis. Theorem concerning the existence and properties of fixed points are known as fixed point theorem. Fixed point theory is a beautiful mixture of analysis, topology & geometry which has many applications in various fields such as mathematics engineering, physics, economics, game theory, biology, chemistry, optimization theory and approximation theory etc. Fixed point theory has its own importance and developed tremendously for the last one and half century. The purpose of the present paper is to study the development of fixed point theory

**Definition**: Let X be a non-empty set. A function $T : X \to X$ is called a self map on X . A point $z \in X$ is called a fixed point of a self map $T: X \to X$, if $T(z) = z$

For example the function $T : [0,1] \to [0,1]$ defined by $T(x) = x^2$ has exactly two fixed points . This function is uniformly continuous on [0, 1]

The function $S : R \to R$ defined by $S(x) = x + 1$ has no fixed point in R.

## 2. HISTORY OF FIXED POINT THEORY

In the 19th century The study of fixed point theory was initiated by Poincare and in 20th century developed by many mathematicians like Brouwer, Schauder, Kakutani, Banach, Kannan ,Tarski , and others.

**Brouwer fixed point theorem**

In 1912, Brouwer published his famous fixed point theorem. The theorem states that **Theorem 1.** If B is a closed unit ball in $R^n$ and if $T: B \to B$ is continuous then T has a fixed point in B .

**Remark:** The Brouwer's fixed point theorem guarantees the existence of fixed point. But it does not provide any information about the uniqueness and determination of the fixed point. For example, the function $T : [-1,1] \to [-1,1]$ defined by $T(x) = x^3$ is continuous and has three fixed points in [- 1,1] . Many authors have given different proofs to this theorem. Most of them are topological in nature. This theorem is not true in infinite dimensional spaces.

**Schauder's fixed point theorem**

in 1930 Schauder was given The first fixed point theorem in an infinite dimensional Banach space . The theorem is stated below:

**Theorem 2** If $T: B \to B$ is a continuous function on a compact, convex subset B of a Banach space X then f has a fixed point.

Remark: The schauder fixed point theorem is very important and has several applications in economics, game theory, approximation theory etc. In the above theorem Schauder imposed a strong condition of compactness on B. Schauder relaxed this condition and established the following classical result

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# KINETICS AND MECHANISM OF CINNAMYL ALCOHOL BY BENZYLTRIMETHYL AMMONIUMDICHLOROIODATE

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**ABSTRACT**

*BENZYLTRIMETHYL AMMONIUM DICHLORO IODATE is used as a reagent for iodination and chloro iodination for many organic compounds because of its stable nature. However, the oxidation of alcohols, in particular unsaturated alcohols in the presence of BTMACI is not much known. In the present study, the oxidation of unsaturated alcohol, cinnamyl alcohol is carried out. The corresponding aldehyde is identified and kinetics of the oxidation reaction which is studied and found to be a first order reaction with respect to BTMACI. The effect of concentration of alcohol, oxidant and temperature on reaction rate is also studied. Depending on kinetics and activation parameters, a suitable mechanism is proposed for cinnamyl alcohol by the formation of intermediate active species between BTMACI and $ZnCl_2$.*

## INTRODUCTION

Synthesized BTMACI is known as a good halogenating agent (1-3). Among various Benzyltrimethyl ammonium polyhalides, BTMACI is widely used because of its stable character. Addition of Zinc Chloride makes BTMACI more soluble in acetic acid, generating a complex which serves as an excellent halogenating agent. Moriwaki et.al (4) have reported successful halogenation of aromatic acetyl derivatives by BTMACI in acetic acid in the presence of $ZnCl_2$. Fujisaki et.al (5) used BTMACI in the formation of chloroiodo adducts of alkenes. Auria et.al (5,6) reported the use of BTMACI as iodinating agent of Thiophene derivatives. The use of BTMACI in the oxidation of some Thioacids was reported by Suri et.al (7). The reaction was found to be first order with respect to Thio acids and BTMACI.

Oxidation of primary alcohols (8), hydroxy acids (9) and organic sulphides by BTMACI was studied by Jai Narain Vyas University, JODHPUR. However the use of BTMACI has not been extended to unsaturated alcohols. In the present study, the oxidation of cinnamyl alcohol in the presence of BTMACI is taken up. It is also aimed to study the effect of concentration of Substrate and oxidant and the effect of termperature on reaction rate. Based on kinetics and activation parameters a suitable mechanism is proposed for the oxidation of cinnamyl alcohol.

## EXPERIMENTAL

Cinnamyl alcohol (FLUKA) is purified by recrystalisation, is used. BTMACI is dissolved in acetic acid in the presence

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# Improvement of resonance frequency in Sub woofer Driver

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**Abstract—***Present days reproducing of sound with good quality has great demand and increasing day by day .Ideally, the high-fidelity equipment,like high end audio systems,power amplifiers,audiophile,home audio system must produce less noise and distortion and a flat frequency response within the human listening frequency range.A lot of research is going on to develop popular type of system for reproducing music since from 1970's.the audio equipment must produce the sound of audible rang i.e,for healthy young person it ranges from 20Hz to 20,000Hz.the electrical technology is so developed that audio receivers can produce humans range quite easily.the out put of audio signal produced by high-fidelity systems should be again feed into the suitable audio drivers which can reproduce the sound,because of this reason the demand of production of quality loudspeakers has increased and producing human range frequency drivers is not that easy and also expensive.miniature has great demand.At present the parameters that influence the production of low frequency is presented.The thiele parameters that influences for the production of low frequency drivers is discussed ,they are Peak Diaphragm Displacement Volume ($V_d$),suspension compliance ($C_{ms}$),Displacement-Limited acoustic power output rating($P_{AR}$),the voice coil movement in one direction without leaving the uniform magnetic field ($X_{max}$),the air compliance inside the box($V_{as}$),excursion limit ($X_{lim}$),the speaker cone surface area that is connected to rubber($S_D$) and the weight of the cone assembly and the driver radiation mass load($M_{ms}$).the resonance frequency of any driver generally depends on the reciprocal of stiffness and effective mechanical mass of the driver these in turn depends on other parameters.by improving them drivers for producing low frequency can be constructed.*

***Key words—****thiele parameters, resonance frequency , suspension compliance, excursion limit, Total mechanical mass of driver,maximum linear peak excursion, Displacement-Limited acoustic power output rating*

## 1. INTRODUCTION:

A great demand is there for studio monitors,bookshelf speakers,sub woofer systems which are useful for the production of sound in radio studios,film making,recording studios and television studios.for designing them we should know and have a sound knowledge of the performance data of every individual loud speaker while constructing enclosure.many affordable methods was proposed and presented to audio engineering society.Thiele and small made many efforts and discovered the parameters which can give the relation between enclosures and speakers.they named it as "thiele-small parameter" thiele was a senior engineer of design and development for Australian broadcasting commission and small is a common wealth post graduate research student in the school of electrical engineering at university of Sydney.the general parameters which give the performance data are

$S_d$ - Total piston radiating area of driver [$m^2$].
$X_{max}$ - The linear excursion of driver [mm].
Re - DC resistance of coil [ohms].
Le - Inductance of voice coil [H].
$F_s$ - Driver free air resonance [Hz]. Point at which driver impedance is maximum.
$F_3$ - -3 dB cutoff frequency [Hz].
$V_{as}$ - It is the volume of air that has the same stiffness as the driver's suspension when acted on by a piston of the same area ($S_D$) as the cone.
$V_d$ - Maximum linear volume of displacement of the driver [$m^3$].
$Q_{ms}$ - Q of driver due to mechanical losses at resonance[dimensionless].
$Q_{es}$ - Q of driver due to electrical losses at resonance [dimensionless].
$Q_{ts}$ - Q of driver due to all losses at resonance [dimensionless].
$C_{ms}$ - Mechanical compliance which is reciprocal of stiffness of driver [m/N].
$M_{ms}$ - total mechanical mass of driver which including air load and measured in [mg] or total moving mass of a driver including air loads

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# DETERMINATION OF PANTOPRAZOLE IN BULK AND PHARMACEUTICAL FORMULATIONS BY VALIDATED RP-HPLC METHOD

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4. *Professor , Mallareddy College of Engineering, Hyderabad.*

## ABSTRACT

A sensitive, highly specific validated, stability indicating RP-HPLC method for the determination of Pantoprazole in bulk and pharmaceutical dosage forms. The method was developed using Luna CN (250×4.6 mm,5µm) and a mixture of Water: Acetonitrile in the ratio of 30:70 v/v was used as mobile phase at a flow rate of 1.0 mL/min with UV detection at 215 nm for Pantoprazole. The retention time of the drug was 3.7 minutes. The developed method was validated for specificity, linearity, precision, accuracy and robustness as per ICH guidelines. Linearity was found in the range of 10-150 µg/ml. The mean recovery of the drug was 102.0 %. The proposed method could be used for routine analysis of Pantoprazole in their dosage forms and the method is accurate, precise, simple, sensitive and rapid and can be applied successfully for the estimation of Pantoprazole in bulk and in pharmaceutical formulations without interference and with good sensitivity.

***Keywords:*** Liquid Chromatography, Pantoprazole, dosage forms, determination, Validation

## INTRODUCTION

### Drug Profile

Pantoprazole **[**6-(difloromethoxy)-2-[3,4-imethoxy pyridine-2-yl)mehylsulfinyl]-1H-benzimadazole. M W**:** 383.36 g/mol, $C_{16}H_{15}F_2N_3O_4S$ and Freely soluble in water.] is a proton pump inhibitor[1-5] (PPI) that suppresses the final step in gastric acid production by covalently binding to the ($H^+$, $K^+$)-ATPase enzyme system at the secretory surface of the gastric parietal cell. This effect leads to inhibition of both basal and stimulated gastric acid secretion, irrespective of the stimulus. The binding to the ($H^+$, $K^+$)-ATPase results in a duration of antisecretory effect that persists longer than 24 hours for all doses tested (20 mg to 120 mg).

Pantoprazole[6-13] is contraindicated in patients with known hypersensitivity to any component of the formulation or any substituted benzimidazole. Hypersensitivity reactions may includeanaphylaxis,
anaphylactic shock,angioedema,bronchospasm,acute interstitial nephritis,and urticaria.Short-term treatment (7 to 10 days) of patients with gastroesophageal reflux disease (GERD) who have a history of irritation of the esophagus. It may be used for conditions that cause your body to make too much stomach acid (eg, Zollinger-Ellison syndrome).

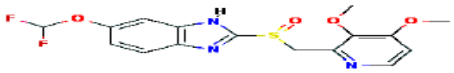

**Fig 1: Pantoprazole Structure**

Pantoprazole sodium For Delayed-Release Oral Suspension, 40 mg has been shown to be comparable to PROTONIX (pantoprazole sodium) Delayed-Release Tablets in suppressing pentagastrin-stimulated MAO in patients (n = 49) with GERD and a history of EE. In this multicenter, pharmacodynamic crossover study, a 40 mg oral dose of PROTONIX for delayed-release Oral Suspension administered in a teaspoonful of applesauce was compared with a 40 mg oral dose of PROTONIX Delayed-Release Tablets after administration of each formulation once daily for 7 days. Both medications were administered thirty minutes before breakfast. Pentagastrin-stimulated (MAO) was assessed from hour 23 to 24 at steady state.

Several analytical methods[14-28] have been reported for the determination of Methyl hydroxyl benzoate in pure drug, pharmaceutical dosage forms and in biological samples using spcetrophotometry, liquid chromatography, electro kinetic chromatography high performance thin layer chromatography either in single or in combined forms.

## MATERIALS AND METHODS

### Instrumentation:

Waters HPLC containing LC 20AT pump and variable wavelength programmable UV-Visible detector and Rheodyne injector was employed for investigation. The chromatographic analysis was performed on a Luna CN 5µm (4.6 x 250 mm) or equivalent. Degassing of the mobile phase was done using a Unichrome ultrasonic bath sonicator. A Ohaus Analytical balance was used for weighing the materials.

### Chemicals and Solvents:

The reference sample of Pantoprazole(API) was obtained from Sun Pharma Pvt Ltd. The Formulation Pantoprazole was procured from the local market. Acetonitrile used was of HPLC grade and purchased from Merck Specialties Private Limited, Mumbai, India.

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# An Efficient Feature Selection Technique for Keystroke Authentication Based on Low Impact Biometric Verification

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***ABSTRACT:*** *Advances in the field of Computer science and Technology also make Information Security an inseparable part of it. In order to deal with security, Authentication plays an important role. This paper presents a review on the biometric authentication techniques and some future possibilities in this field. In biometrics, a human being needs to be identified based on some characteristic physiological parameters. A wide variety of systems require reliable personal recognition schemes to either confirm or determine the identity of an individual requesting their services. The purpose of such schemes is to ensure that the rendered services are accessed only by a legitimate user, and not anyone else. By using biometrics, it is possible to confirm or establish an individual's identity. The position of biometrics in the current field of Security has been depicted in this work. We have also outlined opinions about the usability of biometric authentication systems, comparison between different techniques and their advantages and disadvantages in this paper.*

***Keywords:***

## 1. Introduction

Computer systems and networks are now used in almost all technical, industrial, and business applications. The dependence of people on computers has increased tremendously in recent years and many businesses rely heavily on the effective operations of their computer systems and networks. The total number of computer systems installed in most organizations has been increasing at a phenomenal rate. Corporations store sensitive information on manufacturing process, marketing, credit records, driving records, income tax, classified military data, and the like. There are many other examples of sensitive information that if accessed by unauthorized users, may entail loss of money or releasing confidential information to unwanted parties [1- 9].

Many incidents of computer security problems have been reported in the popular media [1]. Among these is the recent incident at Rice University where intruders were able to gain high level of access to the university computer systems which forced the administration to shut down the campus computer network and cut its link with the Internet for one week in order to resolve the problem. Other institutions such as Bard College of the University of Texas Health Science centre reported similar

breaches. Parker [10] reported that one basic problem with computer security is that the pace of the technology of data processing equipment has outstripped capability to protect the data and information from intentional misdeeds. Attacks on computer systems and networks can be divided into active and passive attacks [11-12].

Active attacks: These attacks involve altering of data stream or the creation of a fraudulent stream. They can be divided into four subclasses: masquerade, replay, modification of messages, and denial of service. A masquerade occurs when one entity fakes to be a different entity. For example, authentication sequence can be collected and replayed after a valid authentication sequence has taken place. Replay involves the passive capture of data unit and its subsequent retransmission to construct an unapproved access. Modification of messages simply means that some portion of a genuine message is changed, or that messages are delayed or recorded, to produce an unauthorized result.

Passive attacks: These are inherently eavesdropping on, or snooping on, transmission. The goal of the attacker is to access information that is being transmitted. Here, there are two subclasses: release of message contents, and traffic analysis. In the first subclass, the attack occurs, for example, on an e-mail message, or a transferred file that may contain sensitive information. In traffic analysis, which is more sophisticated, the attacker could discover the location and identity of communicating hosts and could observe the frequency and length of encrypted messages being exchanged. Such

# Design of Chaotic Behavior for programmable cellular automata based Symmetric Key Encryption Algorithm for Wireless Sensor Networks

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***ABSTRACT:*** *Cellular automata are highly parallel and distributedsystems which are able to perform complex computations.Cryptographic techniques are very important in these times dominated by the growth of digital information storage and transmission.CA are an attractive approach for cryptographic applications. They aresimple, modular logic systems that can generate good quality pseudorandombit streams as required in robust cryptographic systems. Furtheradvantage is that they can be easily and efficiently implemented. This paper focuses on using cellular automata in cryptography, thereby bringing the advantages of using cellular automata in cryptography.*

***Keywords:*** *Cellular automata, types of cellular automata, Cryptography, Advantages of using Cellular automata in cryptography.*

## 1.Introduction

In this age of information, communications and electronic connectivity, security is a topic of general interest that should never be underestimated. The security of data bases, of data communications, of Internet connections, of scientific research and of personal e-mail and phone calls are some examples where the encryption of data/information plays a major role. Therefore, cryptography has become an important field of research in theory and applications development.

Because of its importance, cryptography is nowadays a science by itself, strongly related to other modern research fields as complexity theory, chaos, dynamical systems, computing theory etc. The state-of-the art for the field of cryptography is probably classified as it has military applications, but for the public domain a good reference can be found in [1] and [2]. The *encryption* of a message/data file/other information is a process (algorithm) that modifies this message/data file/information making it completely unintelligible, except for the person who knows the encryption *key*. The *key* refers to the encryption algorithm that has been used - in fact, to the reverse algorithm that should be used for decryption - and the particular parameters that have been used during the encryption. The *decryption* algorithm should render the original message/file/information complete and unaltered. Encryption can be achieved by constructing two different types of ciphers—stream ciphers and block ciphers. A block cipher is one in which a message is broken into successive blocks that are encrypted using a single key or multiple keys. In a stream cipher the message is broken into successive bits or characters and then the string of characters is encrypted using a key stream. The *cryptographic scheme* refers to the assembly of encryption and decryption algorithms.

An ideal cryptographic scheme or algorithm has not been developed yet, as an ideal cryptographic scheme implies:

no data expansion during encoding process;
fast encoding algorithm;
small dimension key;
fast decoding algorithm;
correct and complete rendering of message after encryption/decryption;
invulnerability to attacks.

The last point is a major issue in cryptography; complex mathematical studies and research have to be done in order to establish the vulnerability of each cryptographic scheme. In simple words, this answers the basic question: how difficult is to break the code? This “difficulty” has to be established in terms of complexity, cost and computing time. Therefore, depending of the particular applications,sometimes it is enough to have a code and cryptographic scheme that requires a long search for the key, although the process is very simple. This is the situation for the briefcases with cipher, where the breaking process is quite simple: one has to try *all* possible numbers in order to find the right one. Cellular automata are applied with success in cryptography mainly because their vast phenomenology and apparently big complexity

# Aggressive and Community Auditing System with Clear Agreement for Cloud Data

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***ABSTRACT:*** *Cloud users no longer physically possess their data, so how to ensure the integrity of their outsourced data becomes a Challenging task. Recently proposed schemes such as "provable data possession" and "proofs of retrievability" are designed to address this problem, but they are designed to audit static archive data and therefore lack of data dynamics support. Moreover, threat models in these schemes usually assume an honest data owner and focus on detecting a dishonest cloud service provider despite the fact that clients may also misbehave. This paper proposes a public auditing scheme with data dynamics support and fairness arbitration of potential disputes. In particular, we design an index switcher to eliminate the limitation of index usage in tag computation in current schemes and achieve efficient handling of data dynamics.*

***Keywords:*** *Integrity, auditing, verifiability, arbitration, fairness.*

## Introduction

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the common use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. Cloud computing consists of hardware and software resources made available on the Internet as managed third-party services. These services typically provide access to advanced software applications and high-end networks of server computers.

*The goal of cloud computing is to apply traditional supercomputing, or high-performance computing power, normally used by military and research facilities, to perform tens of trillions of computations per second, in consumer-oriented applications such as financial portfolios, to deliver personalized information, to provide data storage or to power large, immersive computer games. The cloud computing uses networks of large groups of servers typically running low-cost consumer PC technology with specialized connections to spread data-processing chores across them. This shared IT infrastructure contains large pools of systems that are linked together. Often, virtualization techniques are used to maximize the power of cloud computing.*

*Characteristics and Services Models:*

The salient characteristics of cloud computing based on the definitions provided by the National Institute of Standards and Terminology (NIST) are outlined below:

On-demand self-service: A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service's provider[9].

Broad network access: Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and PDAs).

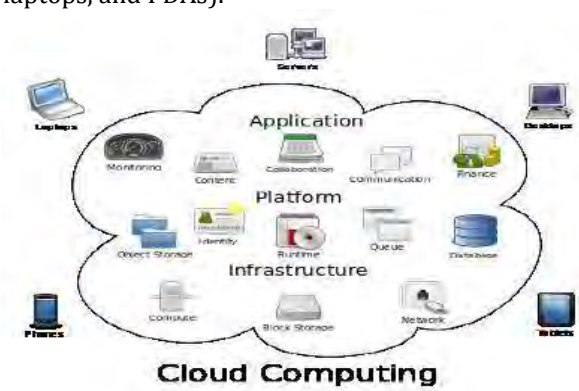


*Figure 1.Structure of cloud computing*

*Characteristics and Services Models:*

The salient characteristics of cloud computing based on the definitions provided by the National Institute of Standards and Terminology (NIST) are outlined below:

# Different Types of Machine Learning Techniques in Python programming

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***ABSTRACT:*** *When we hear "Machine learning", We will probably imagine a robot or something like the deadly Terminator as we see in movies. But, machine learning is involved not only in robotics[1], but also in many other applications. Now it is not just a futuristic fantasy, its already here. In fact, it has been around for decades in some specialized applications, such as Optical Character Recognition (OCR). But the first Machine Learning application that really became mainstream, improving the lives of hundreds of millions of people, took over the world back in the 1990s. It was the spam[2] filter. It does have all technical qualities to qualify as Machine Learning. It has, learned so well that you seldom need to flag an email as spam anymore. It was followed by hundreds of Machine Learning applications that now quietly power hundreds of products and features that you use regularly, from better recommendations to face recognition and voice search. This paper focuses on Explaining What is Machine Learning, why we need Machine Learning, Types of Machine Learning, Various Technologies available to implement Machine learning and how to use Python[3] as development environment for developing Machine Learning.*

***Keywords:*** *Machine Learning, training set, clustering, reinforcement, python, NumPy, SciPy, Scikit-learn, Python, pip, Spam, OCR, robotics.*

## INTRODUCTION

Machine learning is a subfield of artificial intelligence (AI). The goal of machine learning generally is to understand the structure of data and fit that data into models that can be understood and utilized by people [1]. Although machine learning is a field within computer science, it differs from traditional computational approaches. In traditional computing, algorithms are sets of explicitly programmed instructions used by computers to calculate or problem solve. Machine learning algorithms instead allow for computers to train on data inputs and use statistical analysis to output values that fall will within a specific range of given output values. [4] In this age of modern technology, there is one resource that we have in abundance is large amount of structured and unstructured data. In the second half of the twentieth century, machine learning has evolved that involved the development of self-learning algorithms to gain knowledge from that data to make predictions. Instead of requiring humans to manually derive rules and build models from analysing large amounts of data, machine learning offers a more efficient alternative for capturing the knowledge in data to gradually improve the performance of predictive models and make data-driven decisions. Not only is machine learning becoming increasingly important in computer science research, but it also plays an ever-greater role in our everyday life. Thanks to machine learning, we enjoy robust e-mail spam filters, convenient text and voice recognition software, reliable Web search engines, challenging chess players, and, hopefully soon, safe and efficient self-driving cars.

## II WHAT IS MACHINE LEARNING?

Machine Learning is the science of programming that gives computers the ability to learn without being explicitly programmed. Technically A computer program is said to learn from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E. [1] For example, your spam filter is a Machine Learning program that can learn to flag spam given examples of spam emails (e.g., flagged by users) and examples of regular (non-spam or ham) emails. The examples that the system uses to learn are called the training set. Each training example is called a training instance (or sample). In this case, the task T is to flag spam for new emails, the experience E is the training data, and the performance measure P needs to be defined; for example, you can use the ratio of correctly classified emails. This, performance measure is called accuracy and it is often used in classification tasks.

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# The Fault Tolerant Parallel Filters Implementation Based on Error Correction Codes

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***ABSTRACT:*** *As the many-sided quality of interchanges and flag handling frameworks increments, thus will the number of squares or parts that they need. As a rule, some of these parts add parallel, playing out a similar preparing on various signs. An average case of those components are computerized channels. The enlargement in unpredictability likewise presents unwavering quality difficulties and makes the necessity for blame tolerant usage. Specifically, it's in contestable that the means that channel sources of information and yields aren't bits however rather numbers empowers a superior security. This diminishes the insurance overhead and makes the number of repetitive channels freed from the number of parallel channels. The proposed plot is initial delineated and afterward diagrammatic with two discourse analyses. At last, each the viability in guaranteeing against blunders and also the expense are assessed for a field-programmable door exhibit usage.*

***Keywords:*** *Error correction codes (ECCs), filters, and soft errors.*

## INTRODUCTION

One established precedent is the utilization of triple measured excess (TMR) in which the outline is tripled and a dominant part vote of the yields are utilized to adjust mistakes. Another precedent is the utilization of blunder adjustment codes (ECCs) to secure the bits put away in memory gadgets [5]. For this situation, various equality checks are processed and put away in the memory so mistakes can be recognized and rectified when the information are perused. At last, for applications that have standard structure and properties, those can be abused to distinguish and remedy mistakes with a lower cost than TMR. This is the situation for some, flag handling circuits [6]. Much of the time, ECCs or particular assurance methods are joined with TMR to accomplish a total security. For instance, the ECC encoders and decoders might be secured with TMR to guarantee that they are not influenced by blunders. In those cases, TMR is utilized to secure a little piece of the circuit that can't be ensured by the ECC or the particular procedure.

The assurance of advanced channels has been generally examined. For instance, blame tolerant usage in light of the utilization of deposit number frameworks or math codes have been proposed [7], [8]. The utilization of decreased exactness replication or word-level insurance has been additionally considered [9], [10]. Another choice to perform blunder adjustment is to utilize two distinctive channel executions in parallel [11]. Each one of those systems center around the security of a solitary channel.

The assurance of parallel channels has just been as of late considered. In [12], an underlying method to secure two parallel channels was proposed. This plan was summed up in [13], where the utilization of a plan in light of ECCs was introduced. In this work, each channel was dealt with as a bit on an ECC, and extra channels are added to go about as equality check bits. This implies, for single blunder redress, the quantity of repetitive channels required is the same as the quantity of bits required in a customary single mistake revision Hamming code

For instance, for four parallel channels, three excess channels are required, while for eight channels, four repetitive channels are required. This plan along these lines altogether decreases the usage cost contrasted and that of TMR.

This concise investigations the insurance of parallel channels utilizing more broad coding systems. Specifically, a key distinction with ECCs is that both channel sources of info and yields are numbers. Thusly, not just a zero or a one can be utilized for the coding (as finished with ECCs). This can be misused, as appeared in whatever is left of this brief, to give blunder amendment by including just two excess channels paying little mind to the quantity of parallel channels. The

# High Frequency AC Link Dual Active Bridge Isolated Bidirectional Dc–Dc Converter for PV Application

**DRK. Mahesh & P. Manikya Rao & P. Poushya**
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***ABSTRACT:*** *In this paper, high repeat cooling association two fold dynamic platform separated bidirection aldc–dc converter for PV application is proposed.The proposed converter beats most of the issues associated wi that present open PV converters .Dual activebridge(DAB)convertershavebeenstandardinhighvoltage,lowandmediumpowerDC-DC applications, further more a center high repeat interface in solid state transformers.The proposed DAB has the upside of being used as a piece of high walk up/downconverters,whichoverseehighervoltages,whendivergedfromnormaltwo-level DABs.*

***Keywords:*** *Bidirectionalconverters,dc–dcconversion,and dualactivebridge.*

## INTRODUCTION

For the present, power transformation frameworks (PCSs) essentially utilize line-recurrence (LF)transformersto accomplish galvanic detachment and voltage coordinating [1]–[5].Apid improvement of appropriated era and vitality stock piling has prompted the expanding prevalence of PCSsasacontinuallyenduringkeyinterface[6]. Bethatasitmay,massive,substantial,misfortunes,an dboisterousLFtransformersimpedetheeffectivenes sandinfluencethicknessofPCSs.Lately,theutilizatio nofhighrecurrence(HF)transformerssetupofconve ntionalLFtransformersisthoughttobethecreatingp atternofcutting edge power transformation. Fig.1 demonstrates a similar photograph of 50- Hz LF and 20-kHz HF transformers. The upsides of HF transformers are low volume, light weight, and ease.Further more, high-recurrence join (HFL) PCSs in light of HFtransformerscanlikewisemaintainastrategic distance from voltage and current wave form bending broughtaboutbythecenterimmersionofLF transformers. Furthermore, when the exchanging recurrence is over 20 kHz,PCScommotioncanbesignificantlydecreased. Particularly,outofsightoffastextendofPCS;HFL-PCSs havewideapplicationprospects.

In the exploration of HFL-PCSs,disengaged bidirectional dc–dc converters(IBDCs) generally serve as the key circuit. Byand large, all of IBDCs can be developed from conventionalsecludeduni directionaldc–dcconverters (IUDCs,forexample,fly back IUDC can make double fly back IBDC, half-connector push–pullI UDC can form double half-connector double push–pullI BDC,andfull- connect IUDC can create double dynamic scaf fold IBDC. Actually, other than the IBDCs made out of IUDCswith the same sort, the IUDCs with distinctivesorts like wise can create IBDCs, for example, half-connect IUDC and push– pull IUDC can make a half- scaf fold push-pull IBDC in light of the fact that the half-extensionandpushforce structurescanwithstandhigh-andlow-sourcevoltages, separately, so this kind of IBDC can be utilized as a part of the application with a wide voltageextentanda bidirectionalforcestream.


Fig.1.Comparativephotoof50-HzLFand20-kHzHFtransformers

Like the order of conventional dc–dc converters in force gadgets, this paper introduces an arrangement of IBDC topology in light of the quantity of switches, The easiest IBDC topology is a double switch structure, for example, double flyback IBDC, double Cuk IBDC, and Zeta-Sepic IBDC . The run of the mill model of three-switch topology is forward-flyback IBDC . Four-switch topologies essentially contain double push-pull IBDC, push-draw forward IBDC, push pull- flyback, and double half- span IBDC . The commonplace model of five-switch topology is full-extension forward IBDC. The regular model of six-switch topology is half-full connect IBDC . Eight-switch

# INTEND INNOVATIVE TECHNOLOGY FOR RECOGNITION OF SEAT VACANCY IN BUS

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***ABSTRACT:*** *Contemporary comes close to readily available to locate the bus area do not anticipate the seat accessibility in bus when it gets to the boarding factor. In the active globe, waiting on a public transportation without recognition of either seat schedule. An individual waiting on bus needs to know the present seats accessibility of the following readily available bus as well as the offered ability to take a trip. It is worthless to await a bus without expertise of existing readily available capability of bus. The suggested system will certainly give the offered seats when it gets to the individual's terminal. This system could inspire travelers to take a trip in bus instead of investing for cars or taxis. By making use of WIFI component for information interaction objective. That information, openings information will be upgraded. This android system would certainly aid the guests to have a sufficient traveling by capturing the best bus at the correct time with much less initiative.*

***Keywords:*** *Face detection, Haar-like features, Morphological image processing, Contrast limited adaptive histogram equalization*

## INTRODUCTION

By comprehending the future extent of modern technologies offered today we will certainly have a numerous kinds of application and also enhancement of bus stand tracking and also control. Previous deal with bus radar there is an as well substantial. Yet could " To do numerous applications at the very same time in previous job. In bus stand tracking as well as control carries out complete bus stand task on basis of 2 components

In bus component " as well as „ bus stand component ". Supply accessibility to live info pertaining to bus timetables, Expected Time of Arrival (ETA), Estimated Time of Departure (ETD), and so on, with Display at Bus stands, Self-service Short Messaging Service (SMS) along with the Internet. Showing uninhabited seats and also uninhabited systems for buses in bus stops. Counting of the individuals existing in the bus in bus side as well as counting the uninhabited placements of the system on system side.

Nowadays, most people use public vehicle instead of personal car due to the rising of fuel price and traffic jams. Public company has been developing the system for displaying the position of the passenger vehicle for convenience of customers. However, those systems only indicate the position of the vehicle but not show the availability of seats in the vehicle. Customers will waste a time for waiting the next passenger vehicle and cannot manage the time travel or activities correctly. If customers know both of the position of the passenger vehicle and vacancy of seats, customers can use the time to other activities before the passenger vehicle arrives. Customers can plan their travel better.

In this research, the seat vacancy identification system is designed by using image processing technique. Webcam is connected with Raspberry Pi 2 in the electric vehicle for detecting the object on vehicle and sending the data to the server via 3G communication.This system use Open Source Computer Vision (OpenCV) to analyze and process the data then calculated the vacancy of the electric vehicle by using the maximum face detection data.

## LITERATURE REVIEW AND RELATED THEORY

"Real-Time Integrated CCTV using Face and Pedestrian Detection Image Processing Algorithm for Automatic Traffic Light Transitions", this research deals with the traffic light for pedestrian who wants to cross the road. If the pedestrian cross the road they press the button and wait for traffic light. This system use CCTV instead the button and use image processing for detecting the face of pedestrian. If CCTV detects the face of pedestrian, the system will set the red light to show for 45 second. On the other hand if CCTV does not detect the face, the red light will show for only 30 second. [1] "To Analyze the

# OBSERVING OPERATING ACTIVITIES OF WORK VEHICLES BY USING ZIGBEE NETWORK SYSTEM

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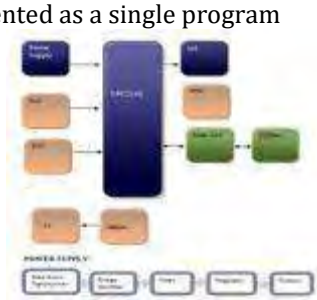
***ABSTRACT:*** *Observing activities of working vehicles on a work site, such as a factory, is important in regard to managing the lifetime of vehicles and achieving high operational availability. However, it is a problem that an administrator cannot completely grasp the activities of a working vehicle. Existing systems cannot cover a large area, particularly in an indoor environment. A system is proposed for monitoring operating activities of working vehicles, regardless of whether they are operating indoors or outdoors. The system calculates the activity rate of a vehicle by analyzing the topology of a network configured by the wireless technology ZigBee. In addition, it was experimentally verified that network topology and RSSI can be used to estimate activities of working vehicles.*

***Keywords:*** *ZigBee; Sensor Network; Activity; Status;*

## 1.INTRODUCTION

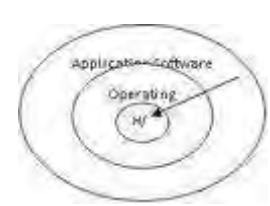
**EMBEDDED SYSTEMS:** Each day, our lives become more dependent on 'embedded systems', digital information technology that is embedded in our environment. More than 98% of processors applied today are in embedded systems, and are no longer visible to the customer as 'computers' in the ordinary sense. An Embedded System is a special-purpose system in which the computer is completely encapsulated by or dedicated to the device or system it controls. Unlike a general-purpose computer, such as a personal computer, an embedded system performs one or a few pre-defined tasks, usually with very specific requirements. Since the system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product. Embedded systems are often mass-produced, benefiting from economies of scale. The increasing use of PC hardware is one of the most important developments in high-end embedded systems in recent years. Hardware costs of high-end systems have dropped dramatically as a result of this trend, making feasible some projects which previously would not have been done because of the high cost of non-PC-based embedded hardware. But software choices for the embedded PC platform are not nearly as attractive as the hardware.

Typically, an embedded system is housed on a single microprocessor board with the programs stored in ROM. Virtually all appliances that have a digital interface -- watches, microwaves, VCRs, cars -- utilize embedded systems. Some embedded systems include an operating system, but many are so specialized that the entire logic can be implemented as a single program



### 1.Overview of an Embedded System Architecture

Every Embedded system consists of a custom-built hardware built around a central processing unit. This hardware also contains memory chips onto which the software is loaded.




The operating system runs above the hardware and the application software runs above the operating system. The same architecture is applicable to any computer including desktop

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# VLSI DESIGN OF N x N BIT HIGH PERFORMANCE MULTIPLIER WITH REDUNDANT BINARY ENCODING

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***ABSTRACT:*** *Due to its high modularity and carry-free addition, a redundant binary (RB) representation can be used when designing high performance multipliers. The conventional RB multiplier requires an additional RB partial product (RBPP) row, because an error-correcting word (ECW) is generated by both the radix-4 Modified Booth encoding (MBE) and the RB encoding. This incurs in an additional RBPP accumulation stage for the MBE multiplier. In this paper, a new RB modified partial product generator (RBMPPG) is proposed; it removes the extra ECW and hence, it saves one RBPP accumulation stage. Therefore, the proposed RBMPPG generates fewer partial product rows than a conventional RB MBE multiplier. Simulation results show that the proposed RBMPPG based designs significantly improve the area and power consumption when the word length of each operand in the multiplier is at least 32 bits; these reductions over previous NB multiplier designs incur in a modest delay increase (approximately 5%). The power-delay product can be reduced by up to 59% using the proposed RB multipliers when compared with existing RB multipliers.*

***Keywords:*** *Redundant binary, Modified Booth encoding, Redundant binary encoding, Redundant binary Modified partial product generator (RBMPPG), Redundant binary to normal binary converter*

## I.INTRODUCTION

DIGITAL multipliers are widely used in arithmetic units of microprocessors, digital signal processors and multimedia. Many algorithms and architectures have been proposed to design high-speed and low-power multipliers [1], [2]. A normal binary (NB) multiplication by digital circuits includes three steps. In the first step, partial products are generated; in the second step, all partial products are added by a partial product reduction tree until two partial product rows remain. In the third step, the two partial product rows are added by a fast carry propagation adder. Two methods have been used to perform the second step for the partial product reduction. A first method uses four-two compressors, while a second method uses redundant binary (RB) numbers [5], [6]. Both methods allow the partial product reduction tree to be reduced at a rate of 2:1.

This paper focuses on the RBPP generator for designing a 2n-bit RB multiplier with fewer partial product rows by eliminating the extra ECW. A new RB modified partial product generator based on MBE (RBMPPG -2) is proposed. In the proposed RBMPPG-2, the ECW of each row is moved to its next neighbour row. Furthermore, the extra ECW generated by the last partial product row is combined with both the two most significant bits (MSBs) of the first partial product row and the two least significant bits (LSBs) of the last partial product row by logic simplification. Therefore, the proposed method reduces the number of RBPP rows from N=4 þ 1 to N=4, i.e., a RBPP accumulation stage is saved. The proposed method is applied to 8x8-, 16x16-, 32x32-, and 64x64-bit RB multiplier designs; the designs are synthesized using the Nan- Gate 45 nm Open Cell Library. The proposed designs achieve significant reductions in area and power consumption compared with existing multipliers when the word length of each of the operands is at least 32 bits. While a modest increase in delay is encountered (approximately 5 percent), the power-delay product (PDP) at word lengths of at least 32 bits confirms that the proposed designs are the best also by this figure of merit.

This paper is organized as follows. Section 2 introduces radix-4 Booth encoding. The design of the conventional RBPP generator is also reviewed. Section 3 presents the proposed RBMPPG. This section also demonstrates the adoption of the proposed RBMPPG into various word-length RB multipliers. Section 4 provides the evaluation results of the new RB multipliers using the proposed RBMPPG for different word lengths

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# Design of Nano-Calculator Using Quantum Dot Cellular Automata (QCA)

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***ABSTRACT:*** *CMOS technology over junction transistor is a very important contribution in terribly massive Scale Integrated technique for the last 20 years.Quantum Dot Cellular Automata (QCA) brings as a replacement answer to the elemental limits of CMOS technology.This paper could be a proposal of creating Quantum dot cellular automata (QCA) based mostly Nano-calculator.In this Calculator we've simulated four basic operations: addition, subtraction, multiplication and division.QCA is associate degree advance technology that overcomes some limitations of CMOS like change speed. QCA generated circuits operates within the order of THz frequency vary wherever circuits doesn't need any additional power provide for operation.*

***Keywords:*** *Clocksignal; Adder; Subtractor; Multiplier; Demultiplexer; nano Calculator.*

## I. INTRODUCTION

Quantum Dot Cellular Automata (QCA) is enforced by quadratic cells within which four potential wells reside in four corners of the cell connected by electron tunnel junctions. within the QCA

cells specifically 2 electrons will reside within the potential wells. because of repulsion of their columbic forces, they occupy 2 opposite corners. so there will be 2 configurations, one for binary zero and another one for binary one. elementary analysis on Quantum dot cellular automata was planned by the authors in [1].

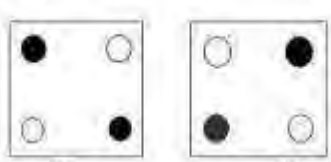


Fig 1. QCA cells with four quantum dots (a) cell with polarization p= -1(Logic '0') (b) cell with polarization p = 1 (Logic '1')

## II. CLOCKING

The Quantum Dot Cellular Automata based circuits operate in four clock phases such as Switch, Hold, Release and Relax.

In **Switch** phase, extra electrons within a cell are polarized under the influence of neighboring cells. In this phase, a cell attains a definite binary value. Tunnel wants to get closed and potential barrier keeps on rising. In **Hold** phase, the potential barrier is maximum and tunnel gets closed so that electrons do not switch and retain their polarity.

In **Release** phase, the potential barrier keeps on lowering and tunnel tends to get opened. As a result cells lose their polarity. In **Relax** phase, the potential barrier is minimum and tunnel stays open. As a result a cell has no influence on its neighbors. In QCA cells having different colors means that they are under different clocks and having same color means they are under same clock. In QCA, Green refers to clock 0, Violet refers to clock 1, Blue refers to clock 2 and White refers to clock 3. The clocking of is proposed in [1-2].

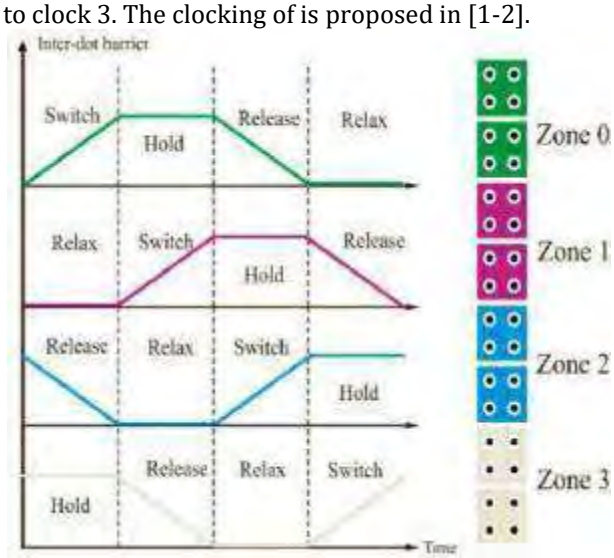


Fig.2 Clocking in QCA

## III. NANO CALCULATOR

The calculator has completely been simulated using QCA technology. As compared to CMOS, QCA has taken miniaturization of hardware devices on a whole new level.

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# THE DEVELOPMENT OF A REMOTELY CONTROLLED HOME AUTOMATION SYSTEM FOR ENERGY SAVING

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***ABSTRACT:*** *The purpose of this study is to showcase the design and development of a web-enabled home automation system prototype. The unit was developed using low- cost components such as the ubiquitous Arduino microcontroller. One of the features of the developed unit is the ability to monitor the power consumed by electrical loads. The unit also has the ability to control the status of individual loads through the internet using a web-enabled mobile application. This feature enables load management that could contribute to energy saving.*

***Keywords:***

## 1. INTRODUCTION

The aim of this project is focused on the development of a prototype for an internet based home automation system. The focus is to establish a platform that allows communication between the web-enabled mobile application and the microcontroller situated at a remote location anywhere in the world.

### 1.1 BACKGROUND

Over the year's humans have learned to rely on technology, the use of technology has thus developed tremendously over the years. This is evident in the telecommunication stream, previously communication was done face to face or through the postcard or letter. In some cultures, it was tradition to play the drum as a form of communication to warn, invite or express a celebration in the neighboring villages. However, today communication takes place relatively fast, easier and without a lot of hassles through the usage of cell phones. A cell phone's function is not limited to calling and texting; it can be used for various functions. Cell phones have become a necessity in people lives, communication and entertainment are all possible with the smartphones. Automation is the backbone of modern industries, it is the key to global economic growth as it allows for increasing productivity and accuracy by cutting out the human intervention while reducing costs. Home automation is the extension of industrial process automation to households' appliances. Among others home automation may include the remote control of lights (Centralized or individual), air conditioning, security system (remote power monitoring) and other systems such as those used for entertainment. Home automation provides improved comfort and security, increases energy efficiency and convenience for users. Today automation is introduced in homes through the connectivity of house appliances and smartphones, tablets, and PCs.

### 1.2 PROBLEM STATEMENT

Energy consumption can be measured through its environmental impact and usage; the measure of the amount of power consumed by the load side of an electrical circuit is termed energy consumption. The maximum power that a load can consume is equal to the total power generated by the source minus the power lost in the transmission line. When the load requires more energy than what the source can provide, this becomes a major issue, which results in load shedding and blackouts. Energy consumption is a major issue in the modern world. Inefficient power monitoring and controlling techniques in the households, businesses, and institutions are the main cause of power consumption.

### 1.3 LITERATURE REVIEW

A home automation system is a channel by which homeowners and occupants have remote control over different types of electrical and electronics appliances in their home.

The home automation system is the use of robotics and computer technologies to household appliances by defining the home automation as domestics. Energy saving is the advantage that a home automation system gives to all its clients and especially forgetful ones, in that they can

# IOT BASED CHILD SAFETY WEARABLE DEVICE

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***ABSTRACT:*** *This paper discusses the concept of a smart wearable device for little children. The major advantage of this wearable over other wearable is that it can be used in any cellphone and doesn't necessarily require an expensive smartphone and not a very tech savvy individual to operate. The purpose of this device is to help parents locate their children with ease. At the moment there are many wearables in the market which help track the daily activity of children and also help find the child using Wi-Fi and Bluetooth services present on the device. But Wi-Fi and Bluetooth appear to be an unreliable medium of communication between the parent and child. Therefore, the focus of this paper is to have an SMS text enabled communication medium between the child's wearable and the parent as the environment for GSM mobile communication is almost present everywhere. The parent can send a text with specific keywords such as "LOCATION" "TEMPERA TURE" "UV" "SOS" "BUZZ", etc., the wearable device will reply back with a text containing the real time accurate location of the child which upon tapping will provide directions to the child's location on google maps app and will also provide the surrounding temperature, UV radiation index so that the parents can keep track if the temperature or UV radiation is not suitable for the child. The prime motivation behind this paper is that we know how important technology is in our lives but it can sometimes can't be trusted, and we always need to have a secondary measure at hand. The secondary measure used in this project is the people present in the surrounding of the child who could instantly react for the child's safety till the parents arrive or they could contact the parents and help locate them. The secondary measure implemented was using a bright SOS Light and distress alarm buzzer present on the wearable device which when activated by the parents via SMS text should display the SOS signal brightly and sound an alarm which a bystander can easily spot as a sign of distress. Hence this paper aims at providing parents with a sense of security for their child in today's time.*

***Keywords:*** *Children, Arduino, Safety, Wearable.*

## 1.INTRODUCTION

The Internet of Things System (loT) [1] refers to the set of devices and systems that stay interconnected with real- world sensors and actuators to the Internet. loT includes many different systems like smart cars, wearable devices [2] and even human implanted devices, home automation systems [3] and lighting controls; smart phones which are increasingly being used to measure the world around them. Similarly, wireless sensor networks [4] that measure weather, flood defenses, tides and more. There are two key aspects to the loT: the devices themselves and the server-side architecture that supports them The motivation for this wearable comes from the increasing need for safety for little children in current times as there could be scenarios of the child getting lost in the major crowded areas. This paper focusses on the key aspect that lost child can be helped by the people around the child and can play a significant role in the child's safety until reunited with the parents.

Most of the wearables available today are focused on providing the location, activity, etc. of the child to the parents via Wi-Fi [8] and Bluetooth [9]. But Wi- Fi and Bluetooth seem a very unreliable source to transfer information. Therefore it is intended to use SMS as the mode of communication between the parent and child's wearable device, as this has fewer chances of failing compared to Wi-Fi and Bluetooth. The platform on which this project will be running on is the Arduino [10] Uno microcontroller board based on the ATmega328P, and the functions of sending and receiving SMS, calls and connecting to the internet which is provided by the Arduino GSM shield using the GSM network [11]. Also, additional modules employed which will provide the current location of the child to the parents via SMS. The second measure added is SOS Light indicator that will be programmed with Arduino UNO board to display the SOS signal using Morse code. The different modules stay enclosed in a custom designed 3D printed case [12]. In the

# *BOOKING SYSTEM OF A VEHICHLE PARK USING IOT TECHNOLOGY*

**M.Prudhvi Raj & N.Naresh & Vijayalakshmi Ch**
Department of ECE, Mallareddy College Of Engineering, maisammaguda, India.

***ABSTRACT:*** *we provide a system for parking reservations and security, maintenance during a exceedingly in a very non-public automobile parking field in an urban metropolis. Our system style is employed to eliminate surplus time conception to search out Associate in nursing empty extract a automobile parking field. By identical sheath, we will conjointly save over seventy five to eighty five % of fuel wastage in an exceedingly automobile lot to check the empty parking slot. The reservation processes square measure happening solely by the user. Therefore the user visit lot exploitation Associate in Nursing humanoid application through an online access and notice the empty parking slot and a reserve parking slot as per their preference. Here we tend to gift the main response to user's reservation action and therefore the driving force will put aside his own seemingly parking slot supported the time and price perform. We've projected a system with multi-processing queuing mechanism (MPQM) to avoid multi-user approach downside (MUAP) throughout the reservation procedure in our perceptive automobile parking booking arrangement supported IOT technology.*

***Keywords:*** *android Application, android Studio, Arduino UNO, internet of Things, Multi-User Approach process (MUAP), QR Code, un hearable sensing element.*

## I. INTRODUCTION

Now a day's congestion of traffic will increase chop-chop with the increasing growth of population. With relevance the amount of population the usage of cars conjointly exaggerated. Thanks to a lot of usage of automobile the tie up occurred on the road. as a result of the finding of free parking slot takes longer. Hence, we tend to lose a particular amount of your time and created over seventy five to eighty five % of fuel wastage to search out the empty parking extract lot. to resolve this downside, we want a special system within the lot to live empty area and show the knowledge to the folks that searching for the empty area. However, many systems designed antecedently to avoid time wastage in automobile lot.

In the sensible parking allocation and reservation system, a system itself allocates the automobile parking space for each user [1][2].

In this, the system observes the gap between the user and parking areas with the assistance of world positioning system [1]. With this distance mensuration the system calculates the typical time conception for the user getting into the automobile parking space [1]. Then the system allocates the suitable parking slot for the user [1] [3]. Therefore the user could or might not be accepted the allotted automobile parking space

If once the user accepts allotted slot, then the user will able to modification his parking slot [1]

In our system all the user will able to reserve own seemingly parking spot. therefore there's no restriction between the slot reservation, and user request. Here the user reserves his spot with respect the system framework represented. Here every step of the reservation method is differentiated by DLSM. MUAP is avoided by special queuing method (MPQM) with the embedded method management unit (EPCU) in our sensible automobile parking system [1].

## LITERATURE SURVEY

**V. Venkateswaran, N. Prakash, and IJRET [1]:** during this paper, they introduce a special system for sensible parking reservations Associate in Nursingd security maintenance in an exceedingly industrial automobile lot in urban surroundings. Here they furnish the main response to user's reservation action and therefore the driving force will reserve his own seemingly parking slot supported the price perform. rather than economical automobile parking we want a special security choices to create our vehicle terribly safe. By this case they need provided a higher security steerage of barrier gate management security system; with the assistance of embedded method management unit (EPCU). There square measure several steps taken to create a reservation with completely different lighting theme mechanism (DLSM).

**Amir O. Kotb, Yao-Chun Shen, Xu Zhu, Senior Member, IEEE, and Yi Huang, Senior**

# An Energy-Efficient Cooperative Spectrum Sensing for Cognitive Radio: A Review

**P.Venkatapathi[1] , R Krishna Chaitany[2] , Dr.Habibulla Khan[3] , Dr.S.Srinivasa Rao [4]**
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***ABSTRACT:*** *Cognitive radio (CR) is a promising solution for improving spectral utilization. Those bands of frequencies which are allocated to primary users (PU) or licensed users, can be used by secondary users (SU) or cognitive users, when PU are not present. Hence, spectrum sensing is necessary to identify the available spectrum and to prevent harmful interference with licensed users. Cooperative spectrum sensing (CSS) is used commonly because spectrum sensing of individual nodes cannot achieve high detection accuracy. The drawback of CSS scheme is that there exists a tradeoff between energy consumption and sensing performance. A more accurate sensing procedure requires minimizing energy consumption without degrading detection performance. In this paper, a survey of various works which aims to maximize the energy efficiency without degrading sensing performance is done.*

***Keywords:*** *primary users; secondary users; cooperative spectrum sensing; energy efficiency; detection performance.*

## I. INTRODUCTION

Spectrum resources are required for the purpose of communication. The frequency spectrum has been divided into different parts and each part is assigned for specific use. The electromagnetic radio spectrum is a natural resource, the use of which by transmitters and receivers is licensed by governments [1]. The following observations can be made about the spectrum:-

Some frequency bands in the spectrum are sparsely occupied.
Some other frequency bands are partially used
The remaining frequency bands are heavily occupied.

This underutilization of the electromagnetic spectrum leads to spectrum holes or white spaces. A spectrum hole is a band of frequencies assigned to PU, but the band is not being utilized by that user. CR has been proposed to promote the efficient use of spectrum by exploiting the existence of spectrum holes. CR is an intelligent wireless communication system that senses its operational electromagnetic environment and adjusts its radio operating parameters like modulation type, power output, frequency etc to modify system operations such as maximizing throughput, mitigating interference, etc. SUs are the CR entities that uses spectrum hole. These SUs should not cause any interference to the PU. Hence, it is important to detect the PU correctly.

Spectrum sensing is the key function of CR. It is the process of monitoring the spectrum to detect the presence of PU on a specific channel. If the PU is absent (not utilizing spectrum) then, SU can utilize spectrum. Otherwise, SU cannot use the spectrum. Spectrum sensing techniques include energy detection, matched filter detection, cyclostationary feature detection, waveform detection etc [2]. A matched filter is a linear filter designed to maximize the output signal tonoise ratio (SNR) for a given input signal. In matched filter detection technique, an unknown signal is correlated with a time shifted version of impulse response of the matched filter. Cyclostationary feature detection technique is the best method for detecting modulated signal with high levels of noise. PU signal is periodic in nature and hence they will exhibit periodic statistical properties which will not be present in noise and interference. In energy detection technique, sum of square of received signals amplitude is taken. The energy detection method is also called as blind detector because it ignores the structure of the signal. Energy detection is commonly used because it is easy to implement and is less complex. Moreover, prior information about PU is not required as in case of matched filters.

# Resource Allocation Strategies in Cognitive Radio Systems:A Survey

**P.Rajeshwari[1] , P.Venkatapathi[2] , , Dr.Habibulla Khan[3] , Dr.S.Srinivasa Rao [4]**
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***ABSTRACT:*** *In this paper, resource allocation and multiple access in cognitive radio (CR) and compressed sensing (CS)-based wireless networks are studied. Energy-efficiency oriented design becomes more and more important in wireless systems, which motivates us to propose a location-aware power strategy for single user and multiple users in CR systems and a CS-based processing in wireless sensor networks (WSNs) which reduces the number of data transmissions and energy consumption by utilizing sparsity of the transmitted data due to spatial correlation and temporal correlation. In particular, the work on location-aware power allocation in CR system gives a brief overview of the existing power allocation design in the literature and unifies them into a general power allocation framework.*

***Keywords:*** *Cognitive radio, energy efficiency, resource allocation, location-aware strategy, OFDM*

## INTRODUCTION

In recent years, the design concept of wireless communications is shifting towards energy-efficiency besides capacity and rates, primarily aiming to resolve the escalating overall energy consumption foreseen in the near future. Such a concept is the core component of green communications. Cognitive Radio (CR), thanks to its sensors, is an enabling technology for green communications which enhances the spectrum efficiency and reduces the electromagnetic radiation levels. Compressed sensing (CS), a novel mathematical theory, can also be applied in wireless communication systems to implement green communications. CS acquires a signal of interest indirectly by collecting a relatively small number of observations rather than evenly sampling it at the Nyquist rate which fundamentally changes the traditional digital signal processing in wireless communications and enhances the energy efficiency. Motivated by the benefits of these mentioned technologies, my research work is focused on the sensing and power allocation strategy of CR systems and CS-based wireless sensor networks (WSNs) to hold the promise of green communications.

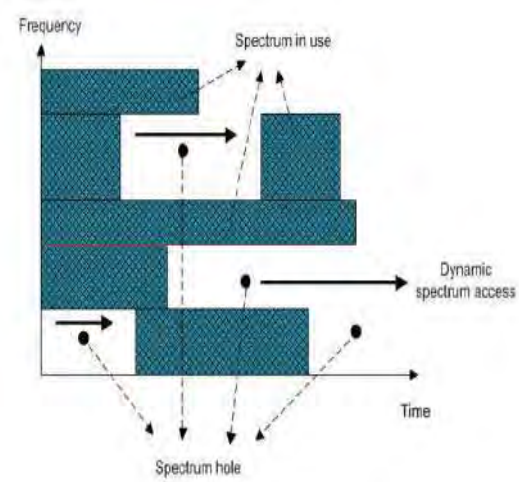


Figure 1.1: Spectrum hole and dynamic spectrum access.

### 1.1 Cognitive Radio

In November 2002, the Federal Communications Commission (FCC) published a report [1] and it shows that spectrum access is a more significant problem than the physical scarcity of spectrum due to the inflexible spectrum regulation policy. In fact, most of the allocated frequency bands are under-utilized: some frequency bands in the spectrum are largely unoccupied most of the time, and some other frequency bands are only partially occupied [2, 3]. This motivates the rise of CR, which is an intelligent wireless communication system that makes use of spectrum according to its surrounding environment to improve spectrum utilization significantly. In a CR system, it is

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# SUPER ACTIVE MATRIX OLED

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***ABSTRACT:*** *In modern technology, typically use active matrix which contain thin film transistor (TFT's) display. In this TFT's transistor include capacitors that enable individual pixel to active. By using TFT's the active matrix is more efficient then OLED. These active matrices mainly used in mobiles phones i.e., in touch screen for high resolution. But newly Samsung introduced super AMOLED with better brighter screen, low power consumption less sunlight reflection, high resolution and very high-speed refresh rate i.e., speed up the response time. Super AMOLED also called as SAM AMOLED. Samsung adopted diamond PenTile technology for high resolution in mobiles.*

***Keywords:*** *electro luminescence, pixel, pixel per inch, self-emission, thin film transistor.*

## I.INTRODUCTION

ACTIVE Matrix Light Emitting diode is a display technology used in mobile as screen. AMOLED describes a specific type of display i.e., thin-film display technology in which organic compounds form the electroluminescent material, and active matrix refers to the technology behind the addressing of pixels. The basic principle behind the working of AMOLED is Electroluminescence. Electroluminescence (EL) is an optical phenomenon and electrical phenomenon in which a material emits light in response to the passage the electric current or by a strong electric field [1]. Electroluminescence is the result of excitation of electrons which releases their energy as photons which produce light [2]. For recombination, electrons and holes may be separated by doping the material to form a p-n junction (in semiconductor electroluminescent devices such as light-emitting diodes) or through excitation by impact of high-energy electrons accelerated by a strong electric field (as with the phosphors in electroluminescent displays) [3]. AMOLED has expresses pure colours when electric current stimulates the relevant pixels. The primary colour matrix is arranged in red, green and blue pixels which are mounted directly to print on board. By using specific colours can improves overall colour contrast. Active-matrix OLEDs (AMOLED) require a thin -film transistor as backplane to switch each and every individual pixel on or off. This layer of organic semiconductor material is situated between two electrodes. Generally, at least one of these electrodes is transparent. AMOLED used in mobiles phones, media players and digital cameras [5]. OLEDs are light weight, durable, power efficient and ideal for portable applications. According to Samsung, Super AMOLED reflects one-fifth as much sunlight as the first-generation AMOLED. Super AMOLED is part of the Pen tile matrix family, sometimes abbreviated as SAMOLED [6][7].

## II.EXISTING METHOD

Super-AMOLED (Active-Matrix Organic Light-Emitting Diode) displays are AMOLED displays for mobile devices (such as smartphones, wearables) with an integrated touch function.Samsung's latest Super AMOLED displays adopt a new sub pixel arrangement called Diamond shaped Pixel by replacing the previous PenTile scheme.Modern PenTile OLED displays reach very high pixel densities Samsung are using PenTile for high-resolution (over 230 pixels per inch) OLED.In 2012, AMOLED technology used in mobiles, tv screen display and digital display cameras with low power. AMOLED display contains OLED pixel to generate light by integrated on a thin film transistor (TFT)array which controls electric flowing to each individual pixel. These TFT black plane technologies are polycrystalline silicon and andamorphase silicon are used in AMOLED's. The first EL introduced by pope and coworker in 1963 from an organic molecule, anthracene and its thickness 10μm - 5mm when a bias of several hundred volts was applied across it.P. S. Vincent achieved bright blue EL from vacuum which was deposited by 0.6μm thickness and its anthracene crystal films applied with bias of less than 100V.The breakthrough was achieved by Tang and VanSlykein1987, he made a

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# THE FinFET TECHNOLOGY

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***ABSTRACT:*** *The Integrated Circuit(IC) is become an integral part in all aspects of Industrial growth and modifying Its Characteristics as per updated technology. The semiconductor industries are emerging with new ideas which goes beyond the Moore's law predictions which predicted that "The number of transistor per chip would quadruple for every three years". But this "Physical law" does not hold forever and gave a final conclusion that "another metric will be needed to chosen to allow the future trend to be mapped and predicted". Even the Moore's law was very old Prediction, Most of the industries comparing the its standards with it .Now a days ,Transistor Technology is going towards the low technology node the reason is there is shrinking the transistor size, automatically its driving performance will be improved. So, this paper is discussing on the new proposed technology architectures of Dual gate and tri gate MOSFET.*

***Keywords:*** *Transistors, Bulk MOSFET,FD- Silicon On Insulator(SOI),3DLithiography, High dielectric spacer material/Metal . Gate*

## I.INTRODUCTION

### 1. History of Transistor

In view of difficulty in Planar CMOS Technology scaling to preserve an acceptable Gate to Channel control Fin FET Multi gate Devices have been proposed as a Technology option For replacing existing Technology. As devices shrink further, the problems with conventional (planar) MOSFETs are on rise. The electronic industries are designing the chip with a perfect logic and finishing up with fabrication verification tests. But

the major concerns lies in the patterning the wafer(Substrate) as per the requirement that The research in technology of Field Effect Transistor has began several centuries ago[1],[2]. Even the name is given as Transistor, several war time efforts was made for the device to show its originality at the times of "developing age" of Technology. Transistor was named as Surface states Triode, Semiconductor Triode, Crystal Triode, Solid Triode and Iotatron prior to the name given as Transistor by John r Pierce. At present , the designing the circuit was made easy by utilizing the resources available to us. So one couldimagine ,how old the roots of transistor Technology is and how many inventions and efforts made by the scientists at those times had still stood behind the Ancient Techniques.

Prior to the invention of Transistors, there are Devices existed which are 30-40 years ago before the Transistor was invented.

The research in technology of Field Effect Transistor has began several centuries ago.

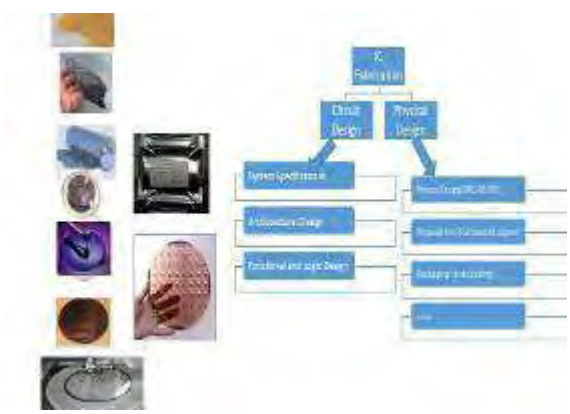

Fig.1. Evolution of Transistor Technologies

At present ,the designing the circuit was made easy by utilizing the resources available to us. So one could imagine how old the roots of transistor Technology is and how many inventions and efforts made by the scientists at those times.

**Methods of designing a chip:**

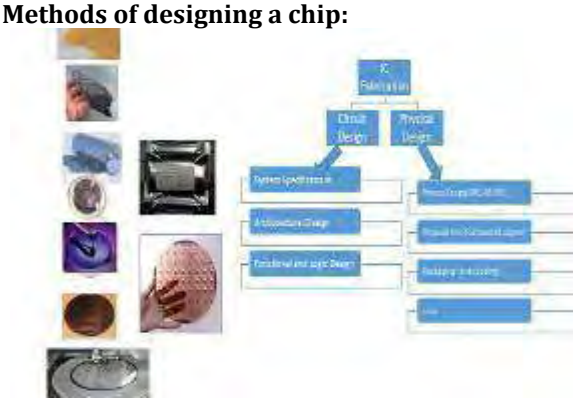

Fig.2. IC Chip Fabrication

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# DESIGN OF BUS TRACKING AND FUEL MONITORING SYSTEM

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***ABSTRACT:*** *In today's world, actual record of fuel filled and fuel consumption in vehicles is not maintained. It results in a financial loss. To avoid this we are implementing a microcontroller based fuel monitoring and vehicle tracking system. In this paper, the implementation of embedded control system based on the microcontroller is presented. The embedded control system can achieve many tasks of the effective fleet management, such as fuel monitoring, vehicle tracking. Using GPS vehicle tracking technology Fuel monitoring have been the major problem that most of bus companies looking to solve. This paper developed a bus tracking and monitoring the fuel and speed system to provide a facility for the management requirements by the administrator using GPS and GSM Technology.*

***Keywords:*** *microcontroller, GPS, GSM, fuel level indicator.*

## I. INTRODUCTION

The challenges of successful fuel monitoring involve efficient and specific design, and a commitment to implementation of the monitoring project, from data collection to reporting and using results. Tracking is the use of GPS technology to identify, locate and maintain contact reports with one or more fleet vehicles. Implementing real-time vehicle tracking as part of a commercial company's mobile resource management policy is essential for comprehensive operational control driver security and fuel savings. Rising fuel costs constantly challenge fleet operators to maintain movement of vehicles and monitor driver behavior to avoid delaying traffic conditions by either, combining deliveries, reconfiguring routes or rescheduling timetables. This aims to maximize the number of deliveries while minimizing time and distance Fuel monitoring system help the administrator to know the exact amount of fuel content of the bus, so fuel theft could be avoided and administrator could maintain the fuel more efficiently. In addition to that alcohol breath of the driver to sense whether he has drunken or not.


Vehicle tracking system

The design and development of a vehicle tracking and fuel monitoring system especially useful for mining in real-time has been reported in this paper. The system principally monitors vehicle moving and tracking such as position, and speed and subsequently identifies alcohol detection. A lot of vehicle theft occur and accident due to over speed, alcohol drunken by driver .GPS is increasingly being used in vehicle tracking and monitoring services. To resolve the problems like avoid speed and collision, traffic jams ARM processor based vehicle monitoring is implemented as well providing information for the vehicle owner. The system has been designed for ARM processor vehicle tracking and

# IMPLEMENTATION OF AUTOMATIC DRIVER DROWSINESS ALERT SYSTEM BY USING IOT

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***ABSTRACT:*** *Drowsiness isthereason for many of the road accidents. Manually tracing the drowsy driver isn't an easy task, as a result daily thousands of vehicles are running on the roads therefore we'd like a system that has to come back with each automotive and if it detects the sleepy headed driver it should stop the vehicle now. Additionally to the present if the driving force is slept the vehicle is stopped, and it monitors the heart-beat, Respiration rate and temperature of the driving force and displays it within the digital display. These 3 parameters are terribly important as a result of it shows the body standing of the driving force. These parameters are monitored manually and just in case of emergency the in-charge of the ward calls the doctor.*

***Keywords:*** *LCD display, Temperature sensor, IR Sensor, Pulse Rate Sensor, ARM7 Microcontroller, and IOT (WIFI Module).*

## INTRODUCTION

Driver sleepiness detection may bean automotives safety technology that helps fore stall accidents caused by the driver obtaining drowsy. Varied studieshave reco mmended that around 20% of all road accidents are fatigue- related,up to 50% on bound roads. Some of this systems learn driver patterns and might find once a driver is becoming drowsy. The development of technologies for detecting or preventing sleepiness at the wheel may be a major challenge within the field of accident shunning systems. Due to the hazard that sleepiness presents on the road, ways must be developed for counteracting its affects [4].

The aim of this project is to develop an epitome drowsiness detection system. The main target is going to be placed on coming up system which will accurately monitor the eye flicker rate, heart-beat breath rate and temperature of the driving force .In this project we tend to use sensors to live all these factors. The values measured are going to be sent to the microcontroller wherever the measured values are going to be compared with the reference values. If the values measured don't match with the reference values then the microcontroller can senda signal within the LCD show thereby preventing accidents.

## II. PROPOSED DROWSINESS ALERT UNIT

This is a little system; therefore we will simply plant it on any vehicle. The attention blink detectoris fastened to the driving force.The eye blink detector senses the movement of the eyeball.

The detector output is connected to a microcontroller.The automotive engine beginning system is directly controlled by the microcontroller. If the detector detects no output from the detector, as a resultthere is no movement within the eyeball; it sends the signal to the microcontroller.

The microcontroller straightaway stops the engine or locks it from beginning conjointly offer warning signal and show the rationale in an exceedingly digital display [1].

The system is developed by interfacing a heartbeat sensor, IR sensor and temperature sensorwithan ADC that converts the associate degree along readings to digital, thus extracted digital knowledge is processed employing a microcontroller [1]. The reference values of those 3 parameters and therefore the telephone numbers are kept within the microcontroller memory [2].

If anyone of those 3 parameter exceeds thereference price themicrocontroller mechanicall y callsthe keep variety.The microcontroller used here is arm7 lpc2148,it has an inbuilt ADC and counters, and therefore the counter is employed to count heartbeat, respirator rate and ADC for changing analog temperature to digital.

# OPTIMIZING THE CONVOLUTION OPERATION TO ACCELERATE DEEP NEURAL NETWORKS ON FPGA

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***ABSTRACT:*** *As convolution contributes most operations in convolutional neural network (CNN), the convolution acceleration scheme significantly affects the efficiency and performance of a hardware CNN accelerator. Convolution involves multiply and accumulate operations with four levels of loops, which results in a large design space. Prior works either employ limited loop optimization techniques, e.g., loop unrolling, tiling, and interchange, or only tune some of the design variables after the accelerator architecture and dataflow are already fixed. Without fully studying the convolution loop optimization before the hardware design phase, the resulting accelerator can hardly exploit the data reuse and manage data movement efficiently. This paper overcomes these barriers by quantitatively analyzing and optimizing the design objectives (e.g., memory access) of the CNN accelerator based on multiple design variables. Then, we propose a specific dataflow of hardware CNN acceleration to minimize the data communication while maximizing the resource utilization to achieve high performance. The proposed CNN acceleration scheme and architecture are demonstrated by implementing endto-end CNNs including NiN, VGG-16, and ResNet-50/ResNet152 for inference. For VGG-16 CNN, the overall throughputs achieve 348 GOPS and 715 GOPS on Intel Stratix V and Arria 10 FPGAs, respectively.*

***Keywords:*** *Accelerator architectures, convolutional neural networks (CNNs), field-programmable gate array (FPGA), neural network hardware.*

## I.INTRODUCTION

The field-programmable gate arrays (FPGA) are fast becoming the platform of choice for accelerating the inference phase of deep convolutional neural networks (CNNs). In addition to their conventional advantages of reconfigurability and shorter design time over application-specific integrated circuits (ASICs) [20], [21] to catch up with the rapid evolving of CNNs, FPGA can realize low latency inference with competitive energy efficiency (~10–50 GOP/s/W) when compared to software implementations on multicore processors with GPUs [10], [12], [13],

This is due to the fact that modern FPGAs allow customization of the architecture and can exploit the availability of hundreds to thousands of on-chip DSP blocks. However, significant challenges remain in mapping CNNs onto FPGAs. The stateof-the-art CNNs require a large number (>1 billion) of computationally intensive task (e.g., matrix multiplications on large numbers), involving a very large number of weights (>50 million) [4], [5]. Deep CNN algorithms have tens to hundreds of layers, with significant differences between layers in terms of sizes and configurations.

More than 90% of the operations in a CNN involve convolutions [2]–[4]. Therefore, it stands to reason that acceleration schemes should focus on the management of parallel computations and the organization of data storage and access across multiple levels of memories, e.g., off-chip dynamic random access memory (DRAM), on-chip memory, and local registers. In CNNs, convolutions are performed by four levels of loops that slide along both kernel and feature maps as shown in Fig. 1. This gives rise to a large design space consisting of various choices for implementing parallelism, sequencing of computations, and partitioning the large data set into smaller chunks to fit into on-chip memory. These problems can be handled by the existing loop optimization techniques [6], [9], such as loop unrolling, tiling, and interchange. Although some CNN accelerators have adopted these techniques [9], [11], [13], [19], the impact of these techniques on design efficiency and performance has not been systematically and sufficiently studied. Without fully studying the loop operations of convolutions, it is difficult to efficiently customize the dataflow and architecture for highthroughput CNN implementations.

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# An Approach to reduce Self Transitions with Quadro Coding Technique in Very Large Scale Integration

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***ABSTRACT:*** *A large number of logic gates are interconnected with each other which together perform a logical operation with given input signal. When an input signal changes from 0 1 or vice- versa, this change results in Power dissipation. Power dissipation is majorly due to dynamic power dissipation in charging and discharging of the capacitive load of CMOS circuits. Power is very important constraints with digital circuits by reducing power dissipation in CMOS VLSI circuits. The proposed coding technique reduces the transition activity in the input signals and will consequently result in the reduction of power consumption. A new bus coding technique has been proposed to achieve less power reduction in transmission. In this paper, the main target of VLSI designers is to minimize the switching activity of self transitions on the on-chip bus lines which is called as Quadro coding. In this process, the applied input data is coded in four different ways and the coding resulting in maximum reduction in transition activity is selected. By this coding scheme the average transition activity is reduced by approximately 36% for 8-bit wide data bus, 23% for 16-bit wide data bus, 15% for 32-bit wide data bus. The coding technique gives better results for shorter bus width.*

***Keywords:*** *— transition activity; dynamic power dissipation; self transitions; Interconnect; on-chip bus.*

## INTRODUCTION

As nanometer scale is the trending technology, the wires are packed closer and the inter-wire coupling capacitance dominates the total capacitance. Interconnects plays an important role in overall performance of the chip Digital circuits consists of a number of interconnected logic gates which together perform a logic operation with more input signals. Crosstalk and Power consumption is a major concern in design of VLSI circuits as the technology is moving towards reduced chip size. A very popular method among them is the Bus Invert method, which does a conditional inversion of the bus lines to reduce the self transitions and thereby reducing the self energy. Crosstalk is mastering the nanometer technology which causes changes on interconnects. Crosstalk is an important design factor on total power consumption and delay of on-chip data buses. Transition activity on bus can be reduced by employing various bus encoding techniques.

new coding technique 'Quadro coding' which minimizes both coupling and self transition activities in the bus lines have been evolved which focuses on reducing transition activities on bus which minimizes crosstalk and power consumption on on-chip data bus but with some increase in area overhead. The main focus of this technique is reduction in dynamic power dissipation. The capacitance of interconnect can be classified as coupling capacitance and self capacitance. The coupling capacitance is the capacitance between the adjacent data lines while the self capacitance refers to the capacitance between the substrate and the wire itself [6].The dynamic power in VLSI chip decides the behavior of chip and is highly dependent on the load capacitance and the coupling capacitance i.e. bus line signal transitions [7]. Dynamic power dissipation on a coded bus in a CMOS VLSI circuit is given by

$$P_{dynamic} = \text{Į}*VDD^2*CL*f \quad ...(1)$$

Where
VDD is the supply voltage, CL is the load capacitance, f is the clock frequency,
= Įs*Cs + Įc*CC.
Įs is the self transition activity factor and Įc is the coupling transition factor.
Here, RHS of (1) is to be reduced for reducing dynamic power dissipation. In this paper, the main objective is to reduce dynamic power dissipation by reducing transition activity on the bus. The rest of the paper is organized as follows: Definitions of some of the important terms are given in section II, Literature survey and Bus model is explained in section III, proposed bus coding is explained in section IV,

# DESIGN OF POWER AND AREA EFFICIENT APPROXIMATE MULTIPLIERS

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***ABSTRACT:*** *Inferred preparing can decrease the arrangement multifaceted nature with an extension in execution and power profitability for screw up adaptable applications The proposed gauge is utilized in two varieties of 16-bit multipliers. Mix results reveal that two proposed multipliers achieve control save assets of 72% and 38%, separately, appeared differently in relation to a right multiplier. They have better precision when diverged from existing estimated multipliers. Mean relative botch figures are as low as 7.6% and 0.02% for the proposed assessed multipliers, which are better than the past works. Execution of the proposed multipliers is surveyed with a photo planning application, where one of the proposed models achieves the most astonishing zenith banner to clatter extent.*

***Keywords:*** *Approximate computing, error analysis, low error, low power, multipliers.*

## 1.INTRODUCTION:

In applications like multimedia signal processing and data miningwhich can tolerate error, exact computing units are not alwaysnecessary. Research on approximate computing for error tolerant applications is on the rise. Adders and multipliers form the key componentsin these applications. In [1], approximate full adders are proposedat transistor level and they are utilized in digital signal processing applications. Their proposed full adders are used in accumulation ofpartial products in multipliers.To reduce hardware complexity of multipliers, truncation is widelyemployed in fixed-width multiplier designs. Then a constant or variablecorrection term is added to compensate for the quantization errorintroduced by the truncated part [2], [3]. Approximation techniquesin multipliers focus on accumulation of partial products, which iscrucial in terms of power consumption. Broken array multiplieris implemented in [4], where the least significant bits of inputsare truncated, while forming partial products to reduce hardwarecomplexity. The proposed multiplier in

saves few adder circuitsin partial product accumulation.In [5], two designs of approximate 4-2 compressors are presentedand used in partial product reduction tree of four variants of 8 × 8 added multiplier. The major drawback of the proposedcompressors
in [5] is that they give nonzero output for zero valued inputs,
which largely affects the mean relative error (MRE) as discussedlater. f overcomes theexisting drawback. This leads to better precision. In , inaccurate counter design has been proposedfor use in power efficient Wallace tree multiplier. A new approximate adder is presented in [10] which is utilized for partial productaccumulation of the multiplier. For 16-bit approximate multiplierin [10], 26% of reduction in power is accomplished compared toexact multiplier. Approximation of 8-bit Wallace tree multiplier voltage over-scaling (VOS) is discussed in [11]. Lowering supplyvoltage creates paths failing to meet delay constraints leading to error.Previous works on logic complexity reduction focus on straightforwardapplication of approximate adders and compressors to thepartial products. In this brief, the partial products are altered tointroduce terms with different probabilities. Probability statistics ofthe altered partial products are analyzed, which is followed systematic approximation. Simplified arithmetic units (half-adder,full-adder, and 4-2 compressor) are proposed for approximation.The arithmetic units are not only reduced in complexity, but careis also taken that error value is maintained low. While systemicapproximation helps in achieving better accuracy, reduced logiccomplexity of approximate arithmetic units consumes less power andarea. The proposed multipliers outperforms the existing multiplierdesigns in terms of area, power, and error, and achieves better peaksignal to noise ratio (PSNR) values in image processing application.Error distance (ED) can be defined as the arithmetic distancebetween a correct output and approximate output for a given input.In [12], approximate adders are evaluated and normalized ED (NED)is proposed as nearly invariant metric

# EFFECT OF DIFFERENT PROCESS PARAMETERS ON THE SYNTHESIS AND CHARACTERIZATION OF CARBON NANOTUBES

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***ABSTRACT:*** *Carbon Nanotubes (CNTs) have been of great interest, since their discovery, both from a fundamental point of view and for the future applications. The present work includes the synthesis of Carbon Nanotubes by Arc Discharge Method and the effect of various process parameters during the synthesis. Optimization of the process parameters is necessary for the high yield and good quality of the CNTs with low carbon subsidiary impurities. In the case of synthesis of Multi walled carbon Nanotubes, the study pertains to analysis of the effect of the buffer gas used; the effect of the partial pressure of the buffer gas and effect of shape of cathode on the synthesis of MWCNTs. From the experimental trials, synthesis of MWCNTs seemed to be favorable in Hydrogen atmosphere as the synthesis time of 80 mins in Helium isreduced to 8 mins in Hydrogen. There also appears to be no effect of variation of partial pressure of buffer gas Helium between 300 Torr& 440 Torr on the co- synthesis of SWCNTs & MWCNTs.*

***Keywords:*** *Carbon nanotubes, MWCNTsAmorphous carbon,Graphite nanoparticles,Arc Discharge.*

## INTRODUCTION:

### 1.1CARBON

[1]Carbon is the lightest member of the IVA family of the periodic table with atomic number 6 and electronic configuration 1s22s22p2. Its first ionization potential is 11.26V. The atomic weight of C12 = 12.0000 was established by the IUPAC in 1961 as the standard of atomic weights. . It is a non-metallic solid which comes under p- block elements of the periodic table. It is a tetravalent compound having four valence electrons to form covalent chemicalbonds

### 1.2ALLOTROPES OFCARBON

The three relatively well-known allotropes of carbon are amorphous carbon, graphite, and diamond. Once considered exotic, fullerenes are nowadays commonly synthesized and used in research; they include buckyballs (C60), carbon nanotubes,carbon nanobuds (C60 attached to Carbon nanotube wall) and nanofibers. Several other exotic allotropes have also been discovered, such as lonsdaleite, glassy carbon,carbon nanofoamand linear acetyleniccarbon.

### 1.3CARBONNANOTUBES

Carbon nanotubes are extraordinary macromolecules containing only carbon. They are formed by rolling up graphene sheets. Nanotubes are members of the fullerene structural family, which also includes the spherical buckyballs. The ends of a nanotube might be capped with a hemisphere of the buckyballstructure.

Carbon nanotubes (CNTs) are one of the most commonly mentioned building blocks of nanotechnology. With one hundred times the tensile strength of steel, thermal conductivity better than all but the purest diamond, and electrical conductivity similar to copper, but with the ability to carry much higher currents, they seem to be a wonder material.

### 1.3.1TYPES OF CARBON NANOTUBES AND RELATED STRUCTURES

Carbon Nanotubes are categorized as Single-walled carbon nanotubes (SWCNTs) and Multi-walled carbon nanotubes(MWCNTs).A Single walled carbon nanotube is a rolled up sheet of graphene, whichis a planar- hexagonal arrangement of carbon atoms distributed in a honeycomb lattice. Nano tubescan have a single wall (SWNTs) or multiple walls (MWNTs), which consist of several concentric single-wallednanotubes.

### 1.3.2 SYNTHESIS OF CARBONNANOTUBES

There are several techniques for producing single and Multi walled nanotubes.And, all of them have advantages as well as disadvantages. The most established methods are the high temperature techniques, namely arc discharge and laser ablation, as well as chemical vapordeposition.

### THE ARC DISCHARGE METHOD

The carbon arc discharge method, initially used for producing C60 fullerenes, is the most common and perhaps easiest way to produce carbon nanotubes as it is rather simple to undertake. However, it is a technique that produces a mixture of components and requires separating nanotubes from the soot and the catalytic metals present in the crudeproduct. This method creates nanotubes through arc-vaporisation of two carbon rods

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# PERFORMANCE ANALYSIS OF BOILER IN THERMAL POWER PLANT

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***ABSTRACT:*** *In India, coal is the dominant source of energy generation. Efficiency of any conventional coal fired unit ranges from 34-38%. This paper presents the efficiency calculation of boiler, turbine and condenser of a 210 MW unit. The study focuses on evaluation of various parameters like dry flue gas loss, wet flue gas loss, moisture in fuel and hydrogen, condenser back pressure, turbine cylinder efficiency, soot formation, etc. and some optimization techniques are mentioned to minimize the same. The benefits of these techniques are considerable fuel saving, emission reduction, heat rate improvement, cost minimization, increased equipment life cycle, etc. Cost analysis through heat rate deviation has been done to determine annual fuel savings. Lastly various critical parameters are mentioned for further improvement of plant performance*

***Keywords:*** *Coal fired power plant, rankine cycle, boiler efficiency, turbine efficiency, condenser efficiency, heat rate*

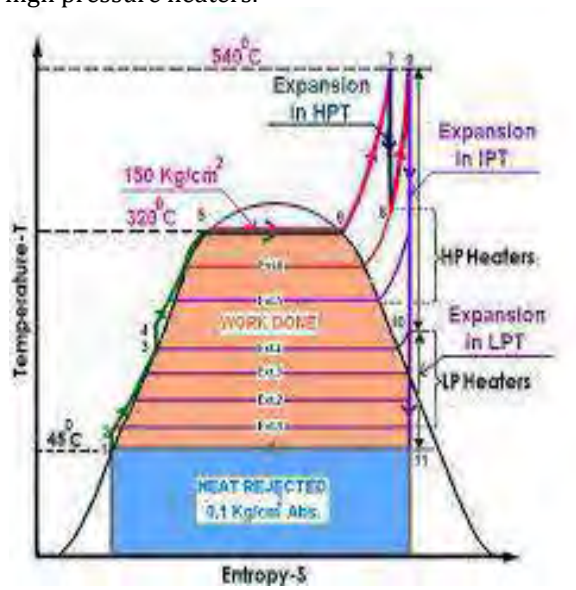
## I. INTRODUCTION

A boiler is an enclosed vessel that provides a means forCombustion heat to be transferred into water until it becomes heated water or steam. The hot water or steam under pressure is then usable for transferring the heat to a process. Water is a useful and cheap medium for transferring heat to a process. When water is boiled into steam its volume increases about 1,600 times, producing a force that is almost as explosive as gunpowder. This causes the boiler to be extremely dangerous equipment that must be treated with utmost care. The process of heating a liquid until it reaches its gaseous state is called evaporation. Heat is transferred from one body to another by means of radiation, which is the transfer of heatfrom a hot body to a cold body without a conveying medium, convection, the transfer of heat by a conveying medium, such as air or water and conduction, transfer of heat by actual physical contact, molecule to molecule.

Boiler Specification: The heating surface is any part of the boiler metal that has hot gases of combustion on one side and water on the other. Any part of the boiler metal that actually contributes to making steam is heating surface. The amount of heating surface of a boiler is expressed in square meters. The larger the heating surface a boiler has, the more efficient it becomes. The quantity of the steam produced is indicated in tons of water evaporated to steam per hour. Maximum continuous rating is the hourly evaporation that can be maintained for 24 hours.

F & A means the amount of steamGenerated from water at 100 0C to saturated steam at 100

This condensate is then sent back to boiler through boiler feed pump via low pressure and high pressure heaters.




It works on the principle of modified rankinecycle. The function of thermal power plant is to generate steam in boiler which is used to drive turbine and generator mounted on the same shaft to produce electricity. The exhaust from low pressure turbine is condensed in condenser and the resultant condensate is extracted through condensate extraction pump.

The CEA in India uses power station heat rate as a proxy for calculating plant efficiency. The heat

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# DESIGN OF ABSORPTION REFRIGERATION SYSTEM DRIVEN BY ENGINE EXHAUST GAS FOR VEHICLES

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***ABSTRACT:*** *As we tend to all recognize that absorption refrigeration has no moving elements,Air conditioning is that the method of sterilisation the properties of air (primarily temperature and humidity) to additional favorableonditions. additional usually, air con will talk to any style of technological cooling, heating, ventilation, or medical care that modifies the condition of air. it's a widely known indisputable fact that an outsized quantity of warmth energy related to the exhaust gases from Associate in Nursing engine is wasted.*

*In this thesis, energy from the exhaust gas of an internal combustion engine is used to power an absorption refrigeration system to air-condition an ordinary passenger car. All the required parts for the absorption refrigeration system is designed and modeled in 3D modeling software CREO parametric software. Thermal analysis is done on the main parts of the refrigeration system to determine the thermal behavior of the system.*

***Keywords:*** *refrigeration,vapour, absorption, refigerent,CAD,CREO*

## I. INTRODUCTION

Refrigeration is the process of casting off warmness from an enclosed or controlled space, or from a substance, and transferring it to an area in which it's miles unobjectionable. The number one cause of refrigeration is lowering the temperature of the enclosed area or substance after which keeping that decrease temperature as evaluate to surroundings. Cold is the absence of heat, therefore on the way to lower a temperature, one "removes warmness", rather than "including cold." The basic objective of growing a vapour absorption refrigerant system for vehicles is to cool the distance inside the automobile through making use of waste heat and exhaust gases from engine. The air con gadget of motors in these days's world makes use of "Vapour Compression Refrigerant System" (VCRS) which absorbs and gets rid of heat from the interior of the car that's the space to be cooled and in addition rejects the heat to be somewhere else. Now to increase an performance of vehicle past a sure restriction vapour compression refrigerant device resists it because it can't employ the exhaust gases from the engine. The heat required for running the Vapour Absorption Refrigeration System can be obtained from that which is wasted into the atmosphere from an IC engine. G. Vicatos[4] observed that in the exhaust gases of motor vehicles, there is enough heat energy that can be utilized to power an airconditioning system. Once a secondary fluid such as water or glycol is used, the aqua ammonia combination appears to be a good candidate as a working fluid for an absorption car air conditioning system. In the paper, the waste heat from gas engine turbine can be used as the heat source for the absorption refrigeration system. The experimental analysis showed that performance of the integrated refrigerating system was greatly improved by using the waste heat of gas engine. Colbourne [5] summarized a study analyzing over 50 published technical documents comparing the performance of fluorinated refrigerants and HCs. A significantly higher number of tests showed an increase in performance when using HCs as compared to using fluorinated refrigerants (Colbourne and Suen,)[6].Similarly, Colbourne and Ritter[7] investigated the compatibility of non-metallic materials with HC refrigerant and lubricant mixtures. They performed experiments compliance with European standards for the testing of elastomeric materials and ASHRAE material compatibility test standards. Setaro et al.

tested and compared the heat transfer and pressure drop through a brazed plate heat exchanger and a tube-andfin coil for two different refrigerants, R22 and R290 in an air-to water heat pump system. Qin et al. [9] developed an exhaust gasdriven automotive air conditioning working on a new hydride pair. The results showed that cooling power and system coefficient of performance increase while the minimum refrigeration temperature decreases with growth of the heat source temperature. System heat transfer properties still needed to be improved for better performance. Koehler et al. [10] designed, built and tested a prototype of an absorption

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# Improvement of an Automobile Radiator using Thermal Analysis

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***ABSTRACT:*** *Radiators are used to transfer thermal energy from one medium to another for the purpose of cooling. Radiators are used for cooling internal combustion engines, mainly in automobiles but also in pistonengine aircraft, railway locomotives, motorcycles, stationary generating plant. The radiator transfers the heat from the fluid inside to the air outside, thereby cooling the fluid, which in turn cools the engine. Research is being carried out for several decades now, in improving the performance of the heat exchangers, having high degree of surface compactness and higher heat transfer abilities in automotive industry. These compact heat exchangers have fins, louvers and tubes. In this project we are designing a radiator without louver fins and with louver fins. The original radiator has no louver fins, we are modifying that by giving louver fins. 3D model is done in Pro/Engineer.*

***Keywords:*** *Ansys Milling, Taguchi, H13 Steel.*

## INTRODUCTION

### Introduction to Automobile Radiator

Radiators are heat exchangers used to transfer thermal energy from one medium to another for the purpose of cooling and heating. The majority of radiators are constructed to function in automobiles, buildings, and electronics. The radiator is always a source of heat to its environment, although this may be for either the purpose of heating this environment, or for cooling the fluid or coolant supplied to it, as for engine cooling. Despite the name, radiators generally transfer the bulk of their heat via convection, not by thermal radiation, though the term "convector" is used more narrowly; see radiation and convection, below. The Roman hypocaust, a type of radiator for building space heating, was described in 15 AD. The heating radiator was invented by Franz San Galli, a Polish-born Russian businessman living in St. Petersburg, between 1855 and 1857. **B. Radiation and Convection**

One might expect the term "radiator" to apply to devices that transfer heat primarily by thermal radiation (see: infrared heating), while a device which relied primarily on natural or forced convection would be called a "convector". In practice, the term "radiator" refers to any of a number of devices in which a liquid circulates through exposed pipes (often with fins or other means of increasing surface area),

Not withstanding that such devices tend to transfer heat mainly by convection and might logically be called convectors. The term "convector" refers to a class of devices in which the source of heat is not directly exposed.

**Fig.1. Water-air convective cooling radiator.**

### Introduction To Pro/Engineer

Pro/ENGINEER, PTC's parametric, **integrated** 3D CAD/ CAM/CAE solution, is used by discrete manufacturers for mechanical engineering, design and manufacturing. Created by Dr. Samuel P. Geisberg in the mid-1980s, Pro/ENGINEER was the industry's first successful parametric, 3D CAD modeling system as shown in Fig.1. The parametric modeling approach uses parameters, dimensions, features, and relationships to capture intended product behavior and create a recipe which enables design automation and the optimization of design and product development processes. This powerful and rich design approach

# IMPROVING THE HEAT TRANSFER RATE OF AC CONDENSER BY OPTIMISING THE MATERIAL

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***ABSTRACT:*** *Air conditioning systems have condenser that removes unwanted heat from the refrigerant and transfers that heat outdoors. The primary component of a condenser is typically the condenser coil, through which the refrigerant flows. Since, the AC condenser coil contains refrigerant that absorbs heat from the surrounding air, the refrigerant temperature must be higher than the air. In this thesis heat transfer by convection in AC by varying the refrigerants are determined by CFD and thermal analysis. The assessment is out on an air-cooled tube condenser of a vapour compression cycle for air conditioning system. The materials considered for tubes are Copper and Aluminium alloys 6061 and 7075. The refrigerants varied will be R 22, R 134 and R407C. CFD analysis is done to determine temperature distribution and heat transfer rates by varying the refrigerants. Heat transfer analysis is done on the condenser to evaluate the better material. 3D modeling is done in CREO and analysis is done in ANSYS*

***Keywords:***

## INTRODUCTION

In systems involving heat transfer, a condenser is a device or unit used to condense a substance from its gaseous to its liquid state, by cooling it. In so doing, the latent heat is given up by the substance, and will transfer to the condenser coolant. Condensers are typically heat exchangers which have various designs and come in many sizes ranging from rather small (hand-held) to very large industrial-scale units used in plant processes. For example, a refrigerator uses a condenser to get rid of heat extracted from the interior of the unit to the outside air. Condensers are used in air conditioning, industrial chemical processes such as distillation, steam power plants and other heat-exchange systems. Use of cooling water or surrounding air as the coolant is common in many condensers.

**Examples of condensers Applications:**

**Air cooled** – If the condenser is located on the outside of the unit, the air cooled condenser can provide the easiest arrangement. These types of condensers eject heat to the outdoors and are simple to install.

Most common uses for this condenser are domestic refrigerators, upright freezers and in residential packaged air conditioning units. A great feature of the air cooled condenser is they are very easy to clean. Since dirt can cause serious issues with the condensers performance, it is highly recommended that these be kept clear of dirt.

**Water cooled** – Although a little more pricey to install, these condensers are the more efficient type. Commonly used for swimming pools and condensers piped for city water flow, these condensers require regular service and maintenance.

They also require a cooling tower to conserve water. To prevent corrosion and the forming of algae, water cooled condensers require a constant supply of makeup water along with water treatment.

Depending on the application you can choose from tube in tube, shell and coil or shell and tube condensers. All are essentially made to produce the same outcome, but each in a different way.

**Evaporative** – While these remain the least popular choice, evaporative condensers can

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# Thermal performance and analysis of a solar water heating system with heat pipe evacuated tube collector

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***ABSTRACT:*** *Heat Transfer enhancement used to enhance the heat transfer rate. It is categorized into passive and active methods. Active methods require external power while passive methods do not require any external power to improve the thermohydraulic performance of the system. Passive methods are widely used in both experimental and numerical applications. Passive methods include various components which are located in the fluid flow path such as twisted tapes, coiled wires.*

***Keywords:*** *heat transfer enhancement, coiled wire, thermohydraulic, heat transfer, twisted tape.*

## Introduction

Heat transfer enhancement is a process of increasing heat transfer rate and thermohydraulic performance of the system using various methods. Heat transfer enhancement technique are commonly used in areas such as process industries, heating and cooling in evaporators, refrigerators, radiators, automobiles etc.

Heat transfer enhancement methods are classified into three categories which include active method, passive method, and compound method. Active method require external power to input the process while passive method don't require any external power. Two or more active and passive method can be compound together that is called compound method which is used to produce a higher enhancement.

## Active Techniques

Active technique is used to enhance the heat transfer transfer rate by using an external power source to adjust the flow field so as to obtain an improvement in thermal efficiency. Providing an external power in most application is not easy for this reason use of active techniques is limited.

## Passive techniques

Passive techniques does not require any external power; rather geometry or surface of the flow channel is modified to increase the thermohydraulic performance of the systems. The inserts, ribs, and rough surface are utilized to promote fluid mixing and turbulence flow, which results in an increment of the overall heat transfer rate.

## Compound technique

A compound technique consist of the combination of more than one heat transfer enhancement method to increase the thermohydraulic performance of heat exchangers. It can be employed simultaneously to generate an augmentation that promotes the performance of the system either of the techniques operating independently.

## Passive technique

### Rough surface

They may be either integral to the base surface or made by placing a roughness adjacent to the surface.

Integral roughness is formed by machining or restructuring the surface. For single phase flow the configuration is generally chosen to promote mixing in the boundary layer near the surface, rather than to increase the heat transfer surface area.

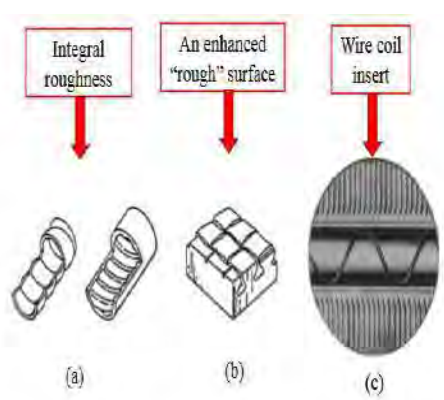


Fig. 1.2 (a) Tube-side roughness for single-phase or two-phase flow, (b) "rough" surface for nucleate boiling, (c) wire-coil insert.

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# ANALYSIS OF HEAT TRANSFER RATE BY VARYING COOLING FLUID FOR ENGINE CYLINDER FINS

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***ABSTRACT:*** *The Engine cylinder is one of the major automobile components, which is subjected to high temperature variations and thermal stresses. In order to cool the cylinder, fins are provided on the cylinder to increase the rate of heat transfer. By doing thermal analysis on the engine cylinder fins, it is helpful to know the heat dissipation inside the cylinder.*

*The principle implemented in this project is to increase the heat dissipation rate by using the invisible working fluid, nothing but air. We know that, by increasing the surface area we can increase the heat dissipation rate, so designing such a large complex engine is very difficult. The main purpose of using these cooling fins is to cool the engine cylinder by air.*

*The main aim of the project is to analyze the thermal properties by varying cooling fluid, material and thickness of cylinder fins.*

*Parametric models of cylinder with fins have been developed to predict the thermal behavior. The models are created by the geometry, rectangular and also by varying thickness of the fins for both geometries. Cooling fluids used in this thesis is air, oil. The 3D modeling software used is Pro/Engineer.*

*Thermal analysis is done on the cylinder fins to determine variation in temperature distribution. The analysis is done using ANSYS. Transient thermal analysis determines temperatures and other thermal quantities that vary over time.*

***Keywords:*** *FINS, CYINDER, AIR, LIQUID-OIL, TEMPARATURE, CFD MODELINS,ANSYS*

## Introduction:

Internal combustion engine cooling uses either air or a liquid to remove the waste heat from an internal combustion engine. For small or special purpose engines, air cooling makes for a lightweight and relatively simple system. The more complex circulating liquid-cooled engines also ultimately reject waste heat to the air, but circulating liquid improves heat transfer from internal parts of the engine. Engines for watercraft may use open-loop cooling, but air and surface vehicles must recirculate a fixed volume of liquid. The main aim of the project is to design cylinder with fins for a 150cc engine, by changing the thickness of the fins, changing the cooling fluid and to analyze the transient thermal properties of the fins. Analyzation is also done by varying the materials of fins. Present used material for cylinder fin body is Aluminum alloy 204 which has thermal conductivity of 110 – 150 w/mk.

Our aim is to change the material for fin body by analyzing the fin body with other materials and also by changing the thickness.

Geometry of fins – Rectangular Thickness of fin – 3mm ,2.5mm

Materials – Aluminum Alloy A204,Al- 6061

Cooling Fluid – Air, Oil

STEPS INVOLVED IN THE PROJECT:

MODELING
THEORETICAL CALCULATIONS
TRANSIENT THERMAL ANALYSIS

## BASIC PRICIPLE:

Most internal combustion engines are fluid cooled using either air (a gaseous fluid) or a liquid coolant run through a heat exchanger (radiator) cooled by air. Marine engines and some stationary engines have ready access to a large volume of water at a suitable temperature. The water may be used directly to cool the engine, but often has sediment, which can clog coolant passages, or chemicals, such as salt, that can chemically damage the engine. Thus, engine coolant may be run through a heat exchanger that is cooled by the body of water.

Most liquid-cooled engines use a mixture of water and chemicals such as antifreeze and rust inhibitors. The industry term for the antifreeze mixture is *engine coolant*. Some antifreezes use no water at all, instead using a liquid with different properties, such as propylene glycol or a combination of propylene glycol and ethylene glycol. Most "air-cooled" engines use some liquid oil cooling, to maintain acceptable temperatures

# DESIGN AND ANALYSIS OF PRESSURE VESSEL WITH FRP MATERIAL

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***ABSTRACT:*** *Long life of component is paramount. Today's lot of money is wasted to prevent the component from corrosion. The present project work is aimed at designing pressure vessel using composite material by which it is protected from corrosion and to increase life time.*

*The present project work aimed at establishing design, analysis and manufacturing process for making pressure vessel with FIBER RENIFORCED PLASTIC. Design process consists of implementing FEM for the selection design. Analyzing design is done using CATIA-V5 software.*

*As the pre component design and development requires use investments in the design of die and break ever number of components to be manufactured is very high. To come out of this problems as to reduce the project cost the advanced FRP based manufacturing technique were adopted to reduce the break ever batch number of components a thorough investigation in the form of pilot project report for the product development.*

*Present project work is aimed at advanced composite material for the component manufacturing so as to exploit the advantage of failure behavior of FRP for Presents Design and Establishing a Design and Manufacturing Process for the Created Component.*

***Keywords:*** *Pressure vessel, FRP material.*

## 1. INTRODUCTION

Composites are able to meet diverse design requirements with significant weight savings as well as "high strength –to-weight ratio" as compared to conventional materials.

Composite material is a material system composed of two or more dissimilar materials, differing in forms and insoluble in each other, physically distinct and chemically inhomogeneous. The resulting product properties are much different from the properties of constituent materials.

Composite are combination of two materials in which one of the materials, called reinforce, is in the form of fiber sheets, or particles, and is embedded in the other materials called matrix. There in forcing material and matrix material ceramic or polymer. Composites are used because overall properties of the composite are superior are used because overall properties of the composite are superior to those of the individual components. For example: polymer ceramic composite have a great modulus than the polymer component, but are not as ceramics.

## 2. LITERATURE REVIEW

### 2.1 MOISTURE ABSORPTION BEHAVIOR FOR GLASS-FIBER COMPOSITES

Weitzman recently gave a comprehensive review on this subject. In general, the moisture absorption behavior of composite materials can be categorized into several types. Glass fiber reinforced plastic (gfrp) exhibit such behavior under specified conditions. For instance, e-glass/vinyl ester with acryl-silent or epoxy Silone surface treatment follows linear fickianbehavior for water absorption up to 80 c .in fact periodic change in the aforementioned environments will results in many such jumps. For example fiber/matrix debones and matrix cracking which is often irreversible? Also an irreversible process causes of leaching out of the material from the bulk following chemical or physical breakdown. Sorption process involving severe circumstances such as elevated temperatures external load and high solvent concentration will often results in behavior. In general the moisture absorption behavior depends on temperature, applied load type of media time and material system and is inseparable from other performance aspects concerning durability.

Moisture absorption will results in development of residual stress plasticizing the resin and accelerate time-dependent behavior .data on visco elastic behavior for pultruded gfrp under the influence of fluid absorption are rare, although there are data on creep-rupture of the material in fluids (i.e., stress corrosion ). As pointed out by some investigators that moisture absorption level in history –dependent, and therefore sorption

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# DESIGN AND CFD ANALYSIS OF HAIR PIN HEAT EXCHANGER AT DIFFERENT NANO FLUIDS

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***ABSTRACT:*** *Heat exchanger is a device used to transfer heat between one or more fluids. The fluids may be separated by a solid wall to prevent mixing or they may be in direct contact.*
*In this work, glycerin 40%) fluid is mixed with base fluid water(60%) are calculated for their combination properties. The nano fluid is titanium carbide, magnesium Oxide and silver nano particle for weight percentage0.2%, 0.5%, 0.7% 1.0%. Theoretical calculations are done determine the properties for nano fluids and those properties are used as inputs for analysis. Hairpin Exchangers are available in single tube (Double Pipe) or multiple tubes within a hairpin shell (Multitude), bare tubes, finned tubes, U-tubes, straight tubes (with rod-thru capability), fixed tube sheets and removable bundle.*
*3D model of the hair pin heat exchanger is done in CREO parametric software. CFD analysis is done on the hair pin heat exchanger with TiC, MgO & silver nano particle at different weight percentage 0.2%, 0.5%, 0.7% & 1.0%.*

***Keywords:*** *Heat Exchangers , Nano Fluids , CFD , Baffles.*

## INTRODUCTION

Heat exchangers are one of the mostly used equipment in the process industries. Heat Exchangers are used to transfer heat between two process streams. One can realize their usage that any process which involve cooling, heating, condensation, boiling or evaporation will require a heat exchanger for these purpose. Process fluids, usually are heated or cooled before the process or undergo a phase change. Different heat exchangers are named according to their application. For example, heat exchangers being used to condense are known as condensers, similarly heat exchanger for boiling purposes are called boilers. Performance and efficiency of heat exchangers are measured through the amount of heat transfer using least area of heat transfer and pressure drop. A better presentation of its efficiency is done by calculating over all heat transfer coefficient. Pressure drop and area required for a certain amount of heat transfer, provides an insight about the capital cost and power requirements (Running cost) of a heat exchanger.

## TUBULAR HEAT EXCHANGERS

A tubular heat exchanger can either consist of a smaller-diameter tube mounted inside a larger diameter tube ("double-pipe exchanger", see Figure 1) or, more commonly, a tube bundle inside shell ("shell-and-tube exchanger", see Figure 1.1). Thus, heat transfer surfaces are plain or enhanced tubes. Additionally, shell-and-tube heat exchangers can contain multiple pass tube bundles, i.e., for double-pass we have a bundle of U-tubes, for triple-pass the tubes in the bundle bend twice, etc. Multiple-pass shells are common as well. Baffles, either segmental or doughnut and disc ones, present in the shell direct fluid flow in shell-side, support the tubes, and limit possible tube vibrations.

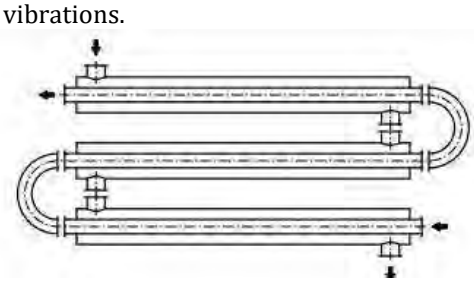

Figure 1: Countercurrent double-pipe heat exchanger

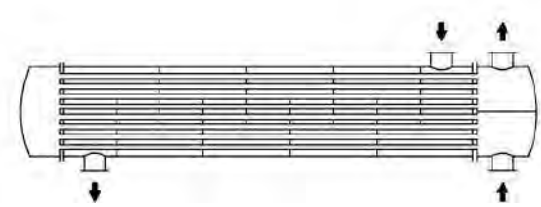

Figure 1.1: Segmentally baffled one-pass shell and two-pass tube shell-and-tube heat exchanger

Flow in shell-side can be improved by suitable adjustments of baffle design as is done in helixchangers (Král et al., 1996) – see Figure 1.2.

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# DESIGN AND HEAT TRANSFER ANALYSIS OF A PARABOLIC SHAPED DISH COLLECTOR

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***ABSTRACT:*** *Parabolic dish is a point focusing collector; it is used for the applications, where temperature requirements are very high like in steam generation. The heat gained produces a temperature of between 125 ºC to 250 ºC and this is used to drive a micro-Steam Turbine or small Stirling Engine that generates electricity A parabolic dish concentrates only the direct radiation that enters the system parallel to its optical axis*

*In this thesis, focuses on solar parabolic dish collector with truncated cone shaped helical coiled receiver made up of copper and coated with nickel chrome at focal point, which is designed and modeled using 3D modeling software Pro/Engineer. The present model has 15 coils for solar receiver. To investigate the performance of the collector, a 20 coiled receiver is also studied. Heat transfer analysis is done on the dish collector by applying different temperatures affecting in a particular day. Comparison is done between the two models.*

*In this thesis, the CFD analysis is to determine the heat transfer rate, pressure drop, velocity, mass flow rate and heat transfer coefficient for the fluids R134A and R-22 with different tube and coil diameters. Thermal analysis is to determine the temperature distribution and heat flux for copper and aluminum as tube materials.*

*3D modeling is done pro-engineer and analysis is done in ANSYS software.*

***Keywords:*** *Types of convection, Natural convection, inclined plates, copper material.*

## I. INTRODUCTION

A **s**olar dish collector collects heat by absorbing sunlight. A collector is a device for capturing solar radiation. Solar radiation is energy in the form of electromagnetic radiation from the infrared (long) to the ultraviolet (short) wavelengths. The quantity of solar energy striking the Earth's surface (solar constant) averages about 1,000 watts per square meter under clear skies, depending upon weather conditions, location and orientation.

### Flat Plate Thermals

Flat Plate Thermal System for water heating deployed on flat roof Flat-plate Collectors, developed by hottel and whillers in 1950s, are most common type.

They consist(1) a dark flat-plate absorber., (2) a transparent cover that reduces heats losses,(3)a heat-transport fluid (air, antifreeze or water) to remove heat from the absorber, and(4)a heat insulating backing. The absorber consists of a thin absorber sheet (of thermally stable polymers,aluminum, steel or copper, to which a matte black or selective coating is applied) often backed by a grid or coil of fluid tubing placed in an insulated casing with a glass or polycarbonate cover. In water heat panels, fluid is usually circulated through tubing to transfer heat from the absorber to an insulated water tank. This may be achieved directly or through a heat exchanger Absorber piping configurations include:

harp – traditional design with bottom pipe risers and top collection pipe, used in low pressure thermosyphon and pumped systems;

serpentine – one continuous S that maximizes temperature but not total energy yield in variable flow systems, used in compact solar domestic hot water only systems (no space heating role)

# NATURAL CONVECTIVE HEAT TRANSFER FROM INCLINED NARROW PLATES

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***ABSTRACT:*** *Natural Convection flow in a vertical channel with internal objects is encountered in several technological applications of particular interest of heat dissipation from electronic circuits, refrigerators, heat exchangers, nuclear reactors fuel elements, dry cooling towers, and home ventilation etc.*
*In this thesis the air flow through vertical narrow plates is modeled using CREO design software. The thesis will focus on thermal and CFD analysis with different Reynolds number ($2\times10^6$ & $4\times10^6$) and different angles ($0^0$,$30^0$,$45^0$&$60^0$) of the vertical narrow plates. Thermal analysis done for the vertical narrow plates by steel, aluminum & copper at different heat transfer coefficient values. These values are taken from CFD analysis at different Reynolds numbers.*
*In this thesis the CFD analysis to determine the heat transfer coefficient, heat transfer rate, mass flow rate, pressure drop and thermal analysis to determine the temperature distribution, heat flux with different materials.*
*3D modeled in parametric software Pro-Engineer and analysis done in ANSYS.*

***Keywords:*** *Types of convection, Natural convection, inclined plates, copper material.*

## INTRODUCTION

### Natural Convection

In natural convection, the fluid motion occurs by n atural means such as buoyancy. Since the fluid vel ocity associated with natural convection is relative ly low, the heat transfer coefficient encountered in natural convection is also low.

### Mechanisms of Natural Convection

Consider a hot object exposed to cold air. The temperature of the outside of the object will drop (as a result of heat transfer with cold air), and the temperature of adjacent air to the object will rise. Cons equently, the object is surrounded with a thin layer of warmer air and heat will be transferred from this layer to the outer layers of air.The temperature of the air adjacent to the hot object is higher, thus its density is lower. As a resut, the heated air rises. This movement is called the natural convection current. Note that in the absence of this movement, heat transfer would be by conduction only and its rate would be much lower.In a gravitational field, there is a net force that pushes a light fluid placed in a heavier fluid upwards. This force is called the buoyancy force.

Natural convection is a mechanism, or type of heat transport, in which the fluid motion is not generated by any external source (like a pump, fan, suction device, etc.) but only by density differences in the fluid occurring due to temperature gradients. In natural convection, fluid surrounding a heat source receives heat, becomes less dense and rises. The surrounding, cooler fluid then moves to replace it. This cooler fluid is then heated and the process continues, forming convection current; this process transfers heat energy from the bottom of the convection cell to top. The driving force for natural convection is buoyancy, a result of differences in fluid density. Because of this, the presence of a proper acceleration such as arises from resistance to gravity, or an equivalent force (arising from acceleration, centrifugal force or Coriolis effect), is essential for natural convection. For example, natural convection essentially does not operate in free-fall (inertial) environments, such as that of the orbiting International Space Station, where other heat transfer mechanisms are required to prevent electronic components from overheating.

### Natural Convection from a Vertical Plate

In this system heat is transferred from a vertical plate to a fluid moving parallel to it by natural convection. This will occur in any system wherein the density of the moving fluid varies with position.

$Nu_m = 0.478(Gr^{0.25})$

Mean Nusselt Number = $Nu_m = h_mL/k$

Where

$h_m$ = mean coefficient applicable between the lower edge of the plate and any point in a distance L ($W/m_2$. K)

L = height of the vertical surface (m)

# HEAT TRANSFER ALONG VERTICAL CHIMNEY

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***ABSTRACT:*** *Chimney, which form the last component of a system using a flue gas such as boiler, play a vital role in maintaining efficiency, draft, etc, of a system and also in minimizing the atmospheric pollution. Steel chimneys are also known as steel stacks. The steel chimneys are made of steel plates and supported on foundation. The steel chimneys are used to escape and disperse the flue gases to such a height that the gases do not contaminate surrounding atmosphere. The hot gases occupy. For the purpose of the structural design of steel the chimney, the height and diameter of chimney. Chimneys are required larger volume than before. The weight of gases per cubic meter becomes less to carry vertically and discharge, gaseous products of combustion, chemical waste gases, and exhaust air from an industry to the atmosphere. In this thesis, chimney materials (concrete used for the design of the chimney. The chimney was considered as a cantilever beam with annular will be designed considering with insulation and without insulation. The Bureau of Indian Standards (BIS) design codes procedures will be the chimney is done in CREO Parametric software and fluid- structural and thermal analysis is done on the chimney in ANSYS software. A simplified model of chimneys with various insulation cross section. 3Dmodel of and carbon epoxy). Static analysis is to determine the deformation, stress and strain for chimney with insulation and without insulation. Thermal analysis to determine the heat flux of the chimney with different materials to different models. CFD analysis to determine the pressure drop, velocity, heat transfer coefficient, mass flow rate and heat transfer rate.*

***Keywords:***

## INTRODUCTION

A chimney is a structure that provides ventilation for hot flue gases or smoke from a boiler, stove, furnace or fireplace to the outside atmosphere. Chimneys are typically vertical, or as near as possible to vertical, to ensure that the gases flow smoothly, drawing air into the combustion in what is known as the stack, or chimney effect. The space inside a chimney is called a flue. Chimneys may be found in buildings, steam locomotives and ships. In the United States, the term smokestack (colloquially, stack) is also used when referring to locomotive chimneys or ship chimneys, and the term funnel can also be used. The height of a chimney influences its ability to transfer flue gases to the external environment via stack effect. Additionally, the dispersion of pollutants at higher altitudes can reduce their impact
on the immediate surroundings. In the case of chemically aggressive output, a sufficiently tall chimney can allow for partial or complete self-neutralization of airborne chemicals before they reach ground level. The dispersion of pollutants over a greater area can reduce their concentrations and facilitate compliance with regulatory limits.

**RESIDENTIAL FLUE LINERS:** A flue liner is a secondary barrier in a chimney that protects the masonry from the acidic products of combustion, helps prevent flue gas from entering the house, and reduces the size of an oversized flue. Newly built chimneys have been required by building codes to have a flue liner in many locations since the 1950s. Chimneys built without a liner can usually have a liner added, but the type of liner needs to match the type of appliance it is servicing. Flue liners may be clay tile, metal, concrete tiles, or poured in place concrete. Clay tile flue liners are very common in the United States. However, this is the only liner which does not meet Underwriters Laboratories 1777 approval and frequently have problems such as cracked tiles and improper installation. Clay tiles are usually about 2 feet (0.61 m) long, various sizes and shapes, and are installed in new construction as the chimney is built. A refractory cement is used between each tile.Metal liners may be stainless steel, aluminum, or galvanized iron and may be flexible or rigid pipes. Stainless steel is made in several types and thicknesses. Type 304 is used with firewood, wood pellet fuel, and non-condensing oil appliances, types 316 and 321 with coal, and type AL 29-4C is used with non-condensing gas appliances. Stainless steel liners

# Application of Optimization Algorithm for Composite Laminate Optimization

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***ABSTRACT:*** *In this project composite laminate optimization code was developed using genetic algorithm in ANSYS APDL code. Now a day's composite material widely used in many industries like aerospace, automobile, marine, structural industries and many more, due to high strength to weight ratio. The main objective of this research is economically use the composite material by optimization techniques. The strength of the Laminated structures is depends upon the fiber angle, thickness, material, sequence of layer and no of layer. To find the optimized combination of above parameter is very difficult by traditional methods, it may struck in to local optimum. To avoid the above difficulties global searching algorithm like genetic algorithm were used.*

***Keywords:*** *Laminate optimization, Genetic algorithm, Structural optimization.*

## INTRODUCTION

Composite materials have received substantial attention as manufacturing materials. Although the high stiffness-to-weight and strength-to-weight properties of composite materials are attractive, their greatest advantage is their ability to be designed to satisfy directional strength and stiff nesses for any particular loading, or multi-loading, of the structure. In laminated composite structures, each ply has its greatest stiffness and strength properties, along the direction, through which the fibers are oriented in. By orienting each layer at different angles, the structure can be designed for a specific loading environment. Along with structural performance and weight, cost is an area of great interest when considering optimization studies in structural design. Obviously, reducing the amount of material required for the structure, minimizes the cost of a laminate composite. However, another method for cost reduction is to allow more than one material in the stacking sequence. Thus, it is possible to use layers of low cost material at locations, in the structure, where performance is less important. In general, the problem of composite laminate stacking sequence optimization has been formulated as a continuous design problem, and solved using gradient based techniques. These methods of solution present several disadvantages: [2]Stacking sequence design often involves design variables, which are limited to small discrete sets of values of ply thickness, orientation angle or material type, due to manufacturing or cost limitations, therefore, these methods require the transformation of these variables into continuous variables, in order that a solution might be obtained,[3]Converting the continuous solutions back to discrete feasible values, often produces sub-optimal, or even infeasible designs,[4]Composite laminate design problems often have discontinuous objective functions, exhibiting multiple designs with similar performances, involving many local optimum designs. Genetic Algorithms are suitable optimization algorithms for problems with discrete design variables. Its implementation does not require any evaluation of gradients which, together with its easiness of implementation, make it worthwhile investigating. [5]Although, Genetic Algorithms require many function evaluations, which reflect in large computational costs, there are many reported applications of Genetic Algorithms to the design of composite structures. Genetic algorithms have been applied to stacking sequence optimization of composite plates, (Callahan and Weeks, 1992), to stiffened composite panel design (Nagendra et al., 1996), design of laminated composite panels (Hajela,1990) (Leung and Nevill, 1994) (Fernandes et al., 1998)(Haftka, 1998**).**

The design of optimal composite laminates has been shown to be well suited to the defining characteristics of genetic algorithms. Techniques for improving the efficiency of this methodology

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# Traveling Salesman Problem for Visiting 10 Tamil Nadu Cities Using Genetic Algorithm

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***ABSTRACT:*** *The main objective of this paper is to find the shortest path for visiting 10 cities in Tamil Nadu using genetic algorithm. Genetic algorithms are an evolutionary technique that use crossover and mutation operators to solve optimization problems using a survival of the fittest idea. They have been used successfully in a variety of different problems, including the traveling salesman problem. In the traveling salesman problem we wish to find a tour of all nodes in a weighted graph so that the total weight is minimized. The traveling salesman problem is NP-hard but has many real world applications so a good solution would be useful.*

***Keywords:*** *Traveling Salesman problem, Genetic algorithm, cites.*

## INTRODUCTION

The origins of the Traveling salesman problem are unclear. A handbook for Traveling salesmen from 1832 mentions the problem and includes example tours through Germany and Switzerland, but contains no mathematical treatment. Mathematical problems related to the Traveling salesman problem were treated in the 1800s by the Irish mathematician W. R. Hamilton and by the British mathematician Thomas Kirkman. Hamilton's Icosian Game was a recreational puzzle based on finding a Hamiltonian cycle. The general form of the TSP appears to have been first studied by mathematicians during the 1930s in Vienna and at Harvard, notably by Karl Menger, who defines the problem, considers the obvious brute-force algorithm, and observes the non-optimality of the nearest neighbor heuristic. Richard M. Karp showed in 1972 that the Hamiltonian cycle problem was NP-complete, which implies the NP-hardness of TSP. This supplied a scientific explanation for the apparent computational difficulty of finding optimal tours. Great progress was made in the late 1970s and 1980, when Grötschel, Padberg, Rinaldi and other managed to exactly solve instances with up to 2392 cities, using cutting planes and branch-and-bound. In the 1990s, Applegate, Bixby, Chvátal, and Cook developed the program Concorde that has been used in many recent record solutions. Gerhard Reinelt published the TSPLIB in 1991, a collection of benchmark instances of varying difficulty, which has been used by many research groups for comparing results. In 2005, Cook and others computed an optimal tour through a 33,810-city instance given by a microchip layout problem, currently the largest solved TSPLIB instance. For many other instances with millions of cities, solutions can be found that are provably within 1% of optimal tour.

The Traveling Salesman Problem is well-known among NP-hard combinatorial optimization problems[1]. It represents a class of problems which are analogous to finding the least-cost sequence for visiting a set of cities, starting and ending at the same city in such a way that each city is visited exactly once. The desire of economy, in which least time span or least distance are also significant for a decision maker, ultimately poses TSP as a multi-objective problem. In TSP as a Multi-Objective Combinatorial Optimization Problem, each objective function is represented in a distinct dimension. Of this form, to decide the multi objective TSP in the optimality means to determine the k-dimensional points that pertaining to the space of feasible solutions of the problem and that possess the minimum possible values according to all dimension. The permissible deviation from a specified value of a structural dimension is also considerable because Amna Rehmat, Hina Saeed, Muhammad Shahzad Cheema Pak.j.stat.oper.res. Vol.88 l.III No.2 2007 pp87-98 traveling sales man can face a situation in which he is not able to achieve his objectives completely. There must be a set of alternatives from which he can select one that best meets his aspiration level. Conventional programming approaches does not

# Investigation of Design, Analysis and Manufacturing of GFRP composite leaf spring by VARTM process

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***ABSTRACT:*** *Even though many destructive methods are available to identify the quality of the material specimen but the same quality may not reflect in real time product. Analyses of specimen are cost effective compare to destruction testing method. In this paper, strength of the composite structure is analysed and the product is manufactured by advance VARTM method compare to traditional hand layup method. As the result Vacuum-Assisted Resin Transfer Moulding (VARTM) gives low void and high material bonding property compare to other composite specimen's mainly due to 52% of fibre volume fraction which is suitable for automobile structural application.*

***Keywords:***

## Introduction

Mild steel (MS) is the widely used material for past years due to very low cost but weight of the material is very high so that fuel economy also gradually increased, even though aluminium are used in higher end car for light weighting but the cost become higher. Current day's carbon fibre reinforced composite widely used in automobile leaf spring due to their high stiffness and high strength compare to their weight ratio. Baker and Rials [1] reported that even though carbon fibre shows twice the strength of steel compare to their weight but the cost is five time the cost of steel so that product cost also increased tremendously. Current researchers highly focusing on new type of FRP reinforced material such as E- Glass fibre for composite material which are already using in boat, transport and aerospace industry.

Developing technology results in different manufacturing technique for composite manufacturing. In this paper Vacuum-Assisted Resin Transfer Moulding (VARTM) is used instead of traditional hand layup process. HyunKim et al. [3] investigated that vacuum process of manufacturing shoes high mechanical property compare to traditional method of manufacturing. In addition to that VARTM method is cost effective and low investment cost compare to other manufacturing methods [4,5]. In this study, hand layup and VARTM method of manufactured FRP composites are compared with existing MS and AL metals for replacing option. Most of the paper are highly focusing on the optimization and design of the material but very few papers are focusing on the manufacturing method replacement technique [6- 8]. In this paper, GFRP are manufactured by hand layup and VARTM processed specimens are compares and analysed and better product are manufactured.

## 3. Manufacturing process of fibre reinforced composites

Composite material quality not only depends on materials but also depends on manufacturing technique by varying fibre volume fraction $V_f$. In this paper, simple traditional hand lay-up composite products are at room temperature shown in Fig.1 but recent researchers are focusing on Vacuum assist resin transfer moulding (VARTM) are widely used to achieve high $V_f$. For this manufacturing process primarily starts with applying PVA (Poly Vinyl Alcohol) the release agent on the surfaces of the mould. Then the fabrics were pre- impregnated with the matrix material and by hand layup method resin is applied manually. For VARTM method, polyester resin is injected inside the vacuum bag by using vacuum pump at 25Psi pressure as shown in Fig.2. In this paper Isothalic polyester resin, accelerator and catalyst are mixed at the ratio of 1:0.025:0.015 and are injected inside the product. After 1 to 2h, laminate are remove from the mould and cured at room temperature for 24 h. in this paper, All the fibre laminates were made with 10-28 plies by varying position of glass fiber static sequence. The fibre volume fraction are calculated by equation1 and 2 and are tabulated in table1.

# Intelligent Risk Analysis Model for Mining Adaptable Reusable Component

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**Abstract**: *Every elucidation for today's quandary has been achieved in an easier prospect, with due respect to the experience gained by a normal man. The engineers too look out for the better way in the development cycle of software apart from its traditional approach. Software being implemented in almost every machine, is in the urge of being developed with many improvisation techniques but obeying the time and cost constrains. Adding to the available simplifications methodologies in the development phases, the proposed Intelligent Risk Analysis Model (IRAM) would abridge the limitations of an Object Oriented Program (OOP) developed for a new software product showing betterments in time and budget needed. An OOP would comprise of individual and exclusive objects with indicated functionalities. Recognizing the usage of the objects in the existing programs would eliminate the necessity of a new coding, thus the component could be reused if it cannot be designated any better. This methodology does a primary verification whether there are any components which match with the stated requirements in the database of programs (e.g., C++, Java, Perl and Python). Based on the analysis of the matched component, it is categorized into Exact Match (EM), Partial Match (PM) or the Rejected Match (RM) which denotes its chances of applicability into the new product. This analysis of the correspondence in the reused object depends on the defined four parameters tuple namely Expected Language (EL), Module Description (MD), Argument Description (AD) and the Usage Threshold (UT). The component that matches exactly EM can be directly incorporated into the new software product whereas if the component falls into the other category PM then it is subjected to additional tests, Rank (R) is allotted, Intelligent Report (IR) is prepared and measures for its updating as an EM are taken. The RM component is eliminated from the list of possible outcomes at once.*

**Keywords**: *Software engineering, software reusability, OOP, IR, cohesion and coupling, regression test.*

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## 1. Introduction

The software has been devised with the intention of reducing the workload, time and cost metrics. But the manpower and the resources required for the software development itself had to involve the mightier and expertise, obey the strict principles and the top of all to satisfy the end user. Despite many simplifications, the development phases need proper follow-up and alternative plans for maintaining the product on the right track. Any minor change/mistake in the proposed plan would cost the developer his entire effort to a waste [14].

The software development phases (analysis, design, coding, testing and implementation) include dedicated functionalities of each phase, organized at the last would yield the desired software product. The Analysis phase observes the requirements of the user/customer and the design phase is for the developer's team to design the best plan to carry out. The coding phase is for the switching into machine level code [14]. The testing is to obtain the conditions in which the product works and fails (under predicted conditions) [12]. Testing is secondly to ensure the reliability of the software in feasible extremes. Implementation is to establish the developed product in the original environment it is supposed to be [1].

## 2. Testing Object Oriented Programs

The Object Oriented Programming (OOP) has introduced new innovative and much easier attitudes to design the software product, diverse from that of the traditional programming disciplines. Adding to the advantages, reduced time to be designed and ease of structure, promotes its practice among the recent programmers [6, 12]. The OOP introduces out of the ordinary concepts such as encapsulation, inheritance, polymorphism and data abstraction. Inheritance helps to promote the reusability factor, in turn helping for the development of the software more rapidly [4, 8].

Reusability factor includes along with its merits, the risk of unstable conditions in the new environment [17]. The existing environment may be the best platform and the new platform requires some reformation to the coding in order to make it adapt with the new environment [1, 8]. Hence, a risk analysis model is obliged to eradicate the limitations and promise the compatibility of the reusable component [3, 4].

## 3. Proposed: Intelligent Risk Analysis Model (IRAM)

The urge of a suitable Risk analysis model among the numerous models [2, 10, 11], motivates the design of

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# Video Coding Technique with Multi Objective Particle Swarm Optimization and EZW

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**Abstract** – Video coding plays an important role in video transmission and storage applications. Today's increasing order of multimedia applications led to a lot of research works in video coding in such a way that high compression ratio is achieved with the available bandwidth. Wavelet based image compression has witnessed great success in the past decade. Wavelet transform based motion compensated video codec performs better compression in order to meet the rate and distortion constraint in video transmission than the block based techniques. However, it is well known that the 2D DWT does not represent directional features of images efficiently. Lots of efforts have been put into multiscale directional representation. In this paper, video coding using directional transform DDWT is considered and its expansive nature is reduced by noise shaping algorithm. High compression ratio is achieved through the selection of optimal coefficients of DDWT using Multi Objective Particle Swarm Optimization (MOPSO) method. In this video coding technique, the objective functions of Entropy, Computation Time and Mean Square Error are considered for optimization with the constraints of bits per pixel and frame rate. The selected optimum coefficients are encoded using EZW method. The performance of the proposed method is compared with the standard 3D SPIHT coding.

**Keywords**: Dual tree discrete wavelet transform, Video coding, Multi objective optimization, Particle swarm optimization

## 1. Introduction

The storage and transmission of the video signals are not possible without compression, since video information of one second requires several megabytes of memory. Also transmission of video signals, need the use of compression techniques to reduce the transmission bandwidth. A lot of research works on compression algorithms have been carried out for video coding. At high compression ratios, block based coders introduce artifact and ringing effects. While considering the wavelet based motion compensated 2D+t transform for video coding, the complex motion estimation and compensation is a tedious process. So 3D-Wavelet based coders are proposed. Wavelet based motion compensated video coders are recently developed. 3D temporal wavelet transforms for video compression is reported [1, 2] and is shown that 3D wavelet transforms without motion compensation provides better compression performance than the motion compensated predictive methods. The popular encoding techniques such as EZW [3] and SPIHT [4] combined with 3D wavelet results, good quality of compression. These coders provide both temporal and spatial scalability [5]. Continuous rate scalable applications can prove valuable in scenarios where the channel is unable to provide a constant bandwidth. Rather than terminating the session, a decoder can adjust the bit rate to use the limited resources, yet produce video of acceptable quality. Such decoders are particularly attractive because of their flexibility. Scalable video coding has the capability of reconstructing lower resolution signals from partial bit streams. Motion compensated temporal wavelet coding eliminates the encoder drift in scalable video coding [6]. The limitations of discrete wavelet transform for multi dimensional signals such as aliasing, oscillatory nature of coefficients and lack of directionality are reported [7]. Dual Tree Discrete wavelet (DDWT) Transform is more suitable for video coding with the kernel functions having the capability of directional property, eliminating motion estimation and compensation process. The suitability of Dual tree Discrete Wavelet Transform for video coding is already discussed [8-9]. The DDWT filter bank design and its application for denoising is also discussed [10].

Dual tree discrete wavelet transform is an expansive type transform, since it converts M number of samples into N number of coefficients (M<N).The number of coefficients is reduced using Noise Shaping algorithm [11]. The significant coefficients are selected using Multi objective optimization algorithm using PSO. In [12], the usage of 3-D dual tree wavelet transform with PSO in video coding with single objective function (Maximizing PSNR) is

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# VIDEO CODING TECHNIQUE USING 3D DUALTREE DISCRETE WAVELET TRANSFORM WITH MULTI OBJECTIVE PARTICLE SWARM OPTIMIZATION APPROACHES

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## ABSTRACT

Wavelet-based image compression with Wavelet transform based motion compensated video codec performs better compression to meet the rate and distortion constraints in video transmission with the available bandwidth than the block based techniques. However, it is well known that the 2D DWT does not represent directional features of images efficiently. Lots of efforts have been contributed to multiscale directional representation. In this study Video coding using Dualtree Discrete Wavelet Transform is considered and its expansive nature is reduced by noise shaping algorithm and high compression ratio is achieved by means of the selection of optimal coefficients using MOPSO method. In Multiobjective Optimization (MO) problems, more than one objective functions have to be minimized simultaneously. In the proposed method, Entropy of the sub bands and Mean square error are considered for optimization with the constraints of frame rate. The two different types of MOPSO approaches such as weighted aggregation approach and Vector Evaluated PSO are used to select the optimum subbands. The two techniques outputs are compared with the standard 3D SPIHT coding.

**Keywords:** Dual Tree Discrete Wavelet Transform, Noise Shaping Algorithm, Multi Objective Particle Swarm Optimization, Multiobjective Optimization, Mean Square Error, Vector Evaluated PSO

## 1. INTRODUCTION

The storage and transmission of the video signals are not possible without compression, since video information of one second duration takes several megabytes of memory. The available bandwidth is insufficient for multimedia applications. Research works on compression algorithms have been carried out for video coding. At high compression ratios block based coders introduce artifact and ringing effects. While considering the wavelet based motion compensated 2D+t transform, the complex motion estimation and compensation is a tedious process. So we go for 3D-Wavelet based coders. Discrete Wavelet Transform is commonly used Wavelet Transform (DWT), but having limitations such as aliasing, oscillatory nature of coefficients and lack of directionality as discussed in Thamarai and Shanmugalakshmi (2011). Dual Tree Complex Wavelet (DTCWT) Transform is more suitable for video coding with the kernel functions having the capability of directional property, eliminating motion estimation and compensation process. Yang *et al*. (2007) reported the suitability of dual tree discrete wavelet transform for video coding.

Dual tree discrete wavelet transform is an expansive type transform; It converts M number of samples into N number of coefficients (N>M). The number of coefficients N is reduced using noise shaping algorithm. The significant coefficients are selected using MOPSO algorithm. Thamarai and Shanmugalakshmi (2010)

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# Sketching-Din Elimination of Web Page

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**Abstract: Problem statement:** The web content mining used to access lot of web pages, mining of web contents aims to extort positive information or awareness. **Approach:** There are several type of Web contents which can suggest valuable information to users are accessible in the Web, for instance graphical data, Extensible Markup Language documents, Hyper Text Markup Language documents and simple text. Here, only element of the information is useful for a testing purpose and the remaining information are noises. **Results:** In this research study, we propose an approach for removing the noises from a given web page which will get better the presentation of web content mining. At first, the web page information is divided into various blocks. **Conclusion:** From which, the duplicate blocks are removed using sketching. The performance of the proposed approach and results ensure the effectiveness of the proposed approach in classify the main blocks.

**Key words:** Web mining, web content mining, web cleaning, duplicate blocks, web page information, graphical data, world wide web, Web Structural Mining (WSM), Web Usage Mining (WUM)

## INTRODUCTION

The World Wide Web is quickly promising as a significant standard for transacting trade as well as for the distribution of information allied to a large collection of topics for example industry, administration, Games. According to mainly prediction, the mass of person information will be accessible on the Web in ten years. These vast amounts of data raise a grand challenge, namely, how to turn the Web into a more useful information utility. Web content mining face huge problems due to the duplicate and near duplicate web pages. These pages either increase the index storage space or slow down or increase the serving costs thereby irritating the users. Thus the algorithms for detecting such pages are inevitable for effective web content mining.

Analysis and discovery of useful information from World Wide Web poses a phenomenal challenge to the researchers in this area. Such a phenomena of retrieving valuable information by adopting data mining techniques is called Web mining. Web mining is classified into following five sub tasks: (1) Resource finding, (2) Information selection and pre-processing, (3) Generalization, (4) Analysis and (5) Visualization (6).

Web mining is separated into three category: Web Content Mining (WCM), Web Usage Mining (WUM) and Web Structural Mining (WSM). Web content mining is the method of identify user definite data from text, image, audio or video data already available on the web. This process is alternatively called as web text mining, since text content is the most widely researched subject on the World Wide Web.

This is so due to the following characteristics of the Web: (1) the amount of data/information on the Web is huge and still growing rapidly. (AlMurtadha *et al*., 2011; Al Shalabi, 2009)Web data is also easily accessible, (2) the coverage of Web information is wide and diverse. One can find information about almost anything on the Web, (3) Information on the Web is heterogeneous, (4) Much of the Web information is semi-structured due to the nested structure of HTML code and the need of Web page designers to present information in a simple and regular fashion to facilitate human viewing and browsing, (5) Much of the Web information is linked. There are links among pages within a site and across different sites. These links serve as an information organization tool and also as indications of trust/authority in the linked pages and sites, (6) much of the Web information is redundant. The same piece of information or its variations may appear

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# Secure Authentication Technique for Data Aggregation in Wireless Sensor Networks

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**Abstract: Problem statement:** In Wireless Sensor Networks (WSN), serious security threat is caused by node capture attacks where an adversary gains full control over a sensor node through direct physical access. **Approach:** This creates a high risk of data confidentiality. **Results:** We propose a secure authentication technique for data aggregation in WSN. During first round of data aggregation, the aggregator upon identifying the detecting nodes selects a set of nodes randomly and broadcast a unique value which contains their authentication keys, to the selected set of nodes. When any node within the set wants to send the data, it sends slices of data to other nodes in that set, encrypted with their respective authentication keys. Each receiving node decrypts, sums up the slices and sends the encrypted data to the aggregator. **Conclusion/Recommendations:** The aggregator aggregates and encrypts the data with the shared secret key of the sink and forwards it to the sink. In the second round of aggregation, the set of nodes is reselected with new set of authentication keys. By simulation results, we show that the proposed approach rectifies the security threat of node capture attacks.

**Key words:** Wireless Sensor Networks (WSN), group based key management protocol (DGKE), Robust Authentication Scheme (RAS), Cooperative Distributed Detection (CDD), Simple Distributed Detection (SDD), Distributed Coordination Function (DCF)

## INTRODUCTION

**Wireless sensor networks:** Wireless sensor networks comprises of the upcoming technology that has attained noteworthy consideration from the research community. Sensor networks comprise of many small, low cost devices and are naturally self organizing ad hoc systems. The function of the sensor network is monitoring the physical environment, collect and transmit the information to other sink nodes. In general the range of the radio transmission for the sensor networks are in the orders of the magnitude which is smaller than the geographical extent of the intact network. Hence, the data has to be transmitted hop-by-hop towards the sink in a multi-hop manner. The consumption of energy in the network can be reduced if the amount of data to be relayed is reduced (Vass and Vidacs, 2007).

Wireless sensor network comprises of a great number of minute electromechanical sensor devices which posses the sensing, computing and communication abilities. These devices can be utilized for gathering sensory information, like measurement of temperature from an extended geographical area (Kohonen, 2004).

Many of the features of the wireless sensor networks give rise to challenging problems (Hartl and Li, 2004). The most important three characteristics are:

- Sensor nodes are the ones which are prone to maximum failures
- Sensor nodes make use of the broadcast communication pattern and have severe bandwidth restraint
- Sensor nodes have limited amount of resources

**Data aggregation:** Data aggregation is considered as one of the fundamental distributed data processing procedures for saving the energy and minimizing the medium access layer contention in wireless sensor networks (Zhenzhen *et al*., 2007). Data aggregation is presented as an important pattern for routing in the wireless sensor networks. The basic idea is to merge the data from various sources, reroute it with the elimination of the redundancy and thus reducing the number of transmissions and saving the energy (Krishnamachari *et al*., 2002). The inbuilt redundancy

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# Data Relay Clustering Algorithm for Wireless Sensor Networks: A Data Mining Approach

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**Abstract: Problem statement:** Nowadays sensors are very essential for today life to monitor environment where human cannot get involved very often. Wireless Sensor Networks (WSN) are used in many real world applications like environmental monitoring, traffic control, trajectory monitoring. It is more challenging for sensor network to sense and collect a large amount of data which are continuous over time, which in turn need to be forwarded to sink for further decision making process. Clustering of sensory data act as a nucleus job of data mining. A clustering in WSN involves selecting cluster heads and assigning cluster members(sensors) to it for efficient data relay. The contraints in power supply, limited communication, bandwidh, storage resoures are the major challenges in WSN facing today. **Conclusion:** Proposed study presents K-Means Data Relay (K-MDR) clustering algorithm for grouping sensor nodes there by reducing number of nodes transmitting data to sink node, it reduces the communication overhead and in this manner increase the network performance. Furthermore Conserve and Observe Modes (COM) algorithm reduces the number of nodes within the cluster there by without compromising the coverage face major challenges such as limited communication bandwidth, constraints in power supply and storage resources region of it. The contribution of K-MDR is to reduce power consumption finally the simulation experimental results show that the time efficiency of the algorithm is achieved.

**Key words:** WSN, clustering, COM, data mining

## INTRODUCTION

Advances in wireless communications made to cultivate tiny hardware components as multifunctional and intelligent sensor nodes with major advantage of low-Power and low-cost.Usually it communicate in short range distances over a radio frequency channel and these devices are small in size.the componenets of these tiny nodes are sensing, processing and communicating data, realize the objectives of wireless sensor networks (Taherkordi *et al*., 2008).

Comparing with the tradition sensors,Wireless sensor networks promise significant improvements. A large number of integrated sensor nodes from the Wireless Sensor Network which are densely deployed either inside the observable fact or very close to it . It cooperate with each other through a wireless network in gatheringing the environmental information or reacting to particular events. Classical applications of sensor networks are monitoring of medical data, weather monitoring, object tracking, vehicle monitoring and combat field survey (Ilyas and Mahgoub, 2005). The majority of sensor networks applications fall into the querying class of applications and for future analysis and mining it required to continuously collect and integrate data. The WSN's extraordinary characteristics direct us to innovative research challenges in several data mining process. WSN face rigorous resource constraints in communication bandwidth, power supply, storage and processor capacity (Ma *et al*., 2005) normally the traditional mining techniques is centralized, computationally expensive and focuses on disk stored data. In data mining grouping a simliar data is known as clustering which is a preparatory step for future data analysis. In this study a new algorithm called distributed K-means clustering algprithm is proposed for clustering sensor's node in WSN. The nodes within the clusters will forward the data to sink through cluster head where aggregation of data takes place.

**Cluster analysis in data mining**: The process of clustering the data objects into cluster is depended on the similarities and their functionalities is data clustering. This process is much easier to collect and

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# Energy Efficient Data Aggregation using Voronoi based Genetic Clustering Algorithm in WSN

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## ABSTRACT
Wireless Sensor Network is an major emerging technique in wireless communication technology for application across a wide array of domains such as the military surveillance, medical diagnosis, weather forecasting, fire detection alarming systems, etc. One of the main challenges of wireless sensor network (WSN) is how to improve its time of livelihood due to the restricted energy of sensor nodes. Data must be aggregated in order to avoid amounts of traffic in the network, limit the recourses and energy. To solve the above dilemmas , data mining process such as clustering and data aggregation is used .clustering is used to group the nodes where as data aggregation function like MIN,MAX,AVG is used for swabbing redundant data transmission and improves the life span of energy in wireless sensor network. In this paper a new approach related to Voronoi based Genetic clustering (VBGC) Algorithm is proposed for energy efficient data aggregation. Our algorithm achieves energy efficiency by reducing the number of data transmission in each round to cluster head and from it to Base station (BS) .The Base Station periodically executes the proposed algorithm to select new Cluster-Heads after a certain period of time. Simulation results reveal that our algorithm outperforms basic GA.

## Keywords
Wireless Sensor Networks, Voronoi Diagram, Genetic Algorithm, clustering, data aggregation

## 1. INTRODUCTION
Wireless Sensor Networks (WSNs) is essential ingredient of many application environments that are used in military and civilians. A sensor network is composed of a large number of sensor nodes, which are densely deployed either inside the phenomenon or very close to it [1]. One of the most important features in WSNs belongs to the limited battery of sensor nodes. When battery-powered wireless sensor nodes are placed in a specific field, it is complex to replace their batteries or provide additional energy. Furthermore, if one sensor node consumes completely its energy, part of the network may disconnect [2].

Data gathering is a common but it is significant operation in many applications of WSNs, while data aggregation and hierarchical mechanism are widely used techniques. Data aggregation can eliminate data redundancy and reduce communication load. Data mining technique like clustering mechanisms is an effective means for running such high population of nodes and can help reduce the nodes' energy consumption [3]. Some efforts in energy-efficient clustering are as follows. [2] have proposed a so-called Low Energy Adaptive Clustering Hierarchy (LEACH) as the first clustering protocol. In this protocol, a data collection area is randomly divided into several clusters while each cluster has a cluster-head and some cluster members. Cluster members transmit data to their own cluster-heads, which aggregate and transmit data to the base station. Later, [4] extended their work and represented a LEACH-C protocol. In this clustering method, the base station makes sure that only nodes with enough energy are participating in.

A protocol named HEED has been proposed by [5]. The protocol selects cluster-heads through O(1) time iteration according to some metrics and adopts the multi-hop communication to reduce energy consumption. The transmission cost in WSNs is regarded as the energy consumption of the nodes and when we can minimize this value, energy is saved. Fig. 1 shows a data delivery example in a cluster based network [1]. As shown, the calculation of transmission cost can be divided into two parts. The first part is the cluster members that transmit data to their cluster-heads. The second part, however, is the cluster-heads that transmit aggregated data to a sink node.

The Genetic Algorithm (GA) is a technique for randomized search and optimization and has been applied to a wide range of studies [6,7]. A basic operation flow of GA includes creating initial population, evaluating fitness, selection, crossover, mutation, updating optimal chromosome, and checking termination condition.

Searching for optimal clusters can be done using GA. Following, are the energy-efficient clustering technique using GA that has been developed previously. Electing a cluster-head that can minimize the maximum intra-cluster distance between itself and its cluster members by optimize energy consumption of the network have been proposed in [8]

The researcher in [9] have developed a GA that creates energy efficient clusters for routing in wireless sensor networks. For evaluate the energy consumption of the network, they used a radio model. Besides, they assumed a fitness function with some fitness parameters such as direct distance to sink, cluster distance, transfer energy, and number of transmissions. The proposed algorithm maximizes the fitness function which is more energy efficient than a few existing cluster-based routing protocols in this work.

The problem of energy-efficient clustering in WSNs has been addressed by [10]. They proposed a novel clustering algorithm which improves the rate of data aggregation in the network. By ensuring that only nodes with a sufficient energy are selected as cluster-heads, they greatly decreased the consumed energy.[11]consider the distance for data transmission between sensor nodes that evaluates the fitness of a network. In their study, the actual energy consumption of the sensor nodes was varied depending on defining cluster-heads and battery status of sensor nodes.

# A Comprehensive review on Density-Based clustering algorithm in data mining

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***ABSTRACT:*** *The problem of detecting clusters of points in data is challenging when the clusters are of different size, density and shape. Many of these issues become even more significant when the data is of very high dimensionality and when it includes noise and outliers. Clusters are identified by looking at the density of points. This paper gives an overview on various density based cluster algorithms –DBSCAN, OPTICS, and DENCLUE. These algorithms are particularly suited to deal with large datasets, with noise, and are able to identify clusters with different sizes and shapes. In machine learning and data analytics clustering methods are useful tools that help us visualize and understand data better.*

***Keywords:*** *Density,Clustering,Minpoints,DBSCAN,OPTICS,DENCLUE*

## 1. Introduction

DBSCAN is a density based clustering algorithm, it is focused on finding neighbors by density (MinPts) on an 'n-dimensional sphere' with radius

A cluster can be defined as the maximal set of 'density connected points' in the feature space.[1] DBSCAN algorithm is that, for each point of a cluster, the neighborhood of a given radius has to contain at least a minimum number of points, that is, the density in the neighborhood has to exceed some predefined threshold.[2] This algorithm needs three input parameters:

- k, the neighbour list size
- Eps, the radius that delimitate the neighborhood area of a point (Epsneighbourhood)
- MinPts, the minimum number of points that must exist in the Eps-neighbourhood.

### 1.1 Parameter estimation

The parameter estimation is a problem for every data mining task. To choose good parameters we need to understand how they are used and have at least a basic previous knowledge about the data set that will be used.[3]

**eps**: if the eps value chosen is too small, a large part of the data will not be clustered. It will be considered outliers because don't satisfy the number of points to create a dense region. The eps should be chosen based on the distance of the dataset (we can use a k-distance graph to find it), but in general small eps values are preferable.

**minPoints**: As a general rule, a minimum minPoints can be derived from a number of dimensions (D) in the data set, as minPoints ≥ D + 1. Larger values are usually better for data sets with noise and will form more significant clusters. The minimum value for the minPoints must be 3, but the larger the data set, the larger the minPoints value that should be chosen.

To clusters a dataset, our DBSCAN implementation starts by identifying the k nearest neighbors of each point and identify the farthest k nearest neighbor (in terms of Euclidean distance) . [4] The average of all this distance is then calculated. After that, for each point of the dataset the algorithm identifies the directly density-reachable points and classifies the points into core or border points.

The clustering process is based on the classification of the points in the dataset as core points, border points and noise points, and on the use of density relations between points to form the clusters.[5]

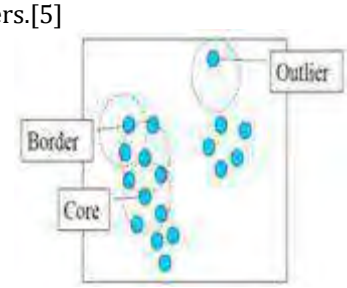


*Fig.1 Diagram Representation of classification points*

A point is a core point show in figure.1 if it has more than a specified number of points (MinPts) within Eps—these are points that are at the interior of a cluster.

A border point has fewer than MinPts within Eps, but is in the neighborhood of a core point.

A noise point is any point that is neither a core point nor a border point

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# Improving segmentation accuracy for detecting deforestation using texture feature derived from Landsat 8 OLI multispectral imagery

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*Research Article*

# Hybrid RGSA and Support Vector Machine Framework for Three-Dimensional Magnetic Resonance Brain Tumor Classification

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A novel hybrid approach for the identification of brain regions using magnetic resonance images accountable for brain tumor is presented in this paper. Classification of medical images is substantial in both clinical and research areas. Magnetic resonance imaging (MRI) modality outperforms towards diagnosing brain abnormalities like brain tumor, multiple sclerosis, hemorrhage, and many more. The primary objective of this work is to propose a three-dimensional (3D) novel brain tumor classification model using MRI images with both micro- and macroscale textures designed to differentiate the MRI of brain under two classes of lesion, benign and malignant. The design approach was initially preprocessed using 3D Gaussian filter. Based on VOI (volume of interest) of the image, features were extracted using 3D volumetric Square Centroid Lines Gray Level Distribution Method (SCLGM) along with 3D run length and cooccurrence matrix. The optimal features are selected using the proposed refined gravitational search algorithm (RGSA). Support vector machines, over backpropagation network, and $k$-nearest neighbor are used to evaluate the goodness of classifier approach. The preliminary evaluation of the system is performed using 320 real-time brain MRI images. The system is trained and tested by using a leave-one-case-out method. The performance of the classifier is tested using the receiver operating characteristic curve of 0.986 (±002). The experimental results demonstrate the systematic and efficient feature extraction and feature selection algorithm to the performance of state-of-the-art feature classification methods.

## 1. Introduction

Cancers that are most common in children aged 0–14 are brain and central nervous system (CNS) tumors (21%) [1]. A brain tumor is a mass of tissue formed by accumulation of abnormal cells in brain and central nervous system. It is caused by improper metabolic cycle. The cells in human body die over age and are replaced by new cells. But tumor cells grow even though the body does not need them and will not die. The abnormal mass of tissue cells grows uncontrollably intruding normal brain activity. Tumors are categorized as benign (well-defined mass with no cancer cells) and malignant (spreading rapidly to other body parts). Recognition of these tumors from brain, overlapped with dense brain tissues, is very challenging. Any anomalous detection of abnormal tissues results in misdiagnosis of both locus and dimension. Magnetic resonance imaging (MRI) modality is found to best assist tissue contrast for anatomical details and also investigate the mechanisms of the brain by functional imaging towards tumor predictions.

Representation of a 3D data in the form of 2D projected slices results in loss of information and may lead to erroneous interpretation of results [2]. In general, the 2D images cannot precisely convey the complexities of human anatomy and hence interpretation of complex anatomy in 2D images requires special training. Therefore, automatic brain tumor recognition in MRI images is very essential towards diagnostic and therapeutic applications. Hence this paper presents an

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# Low Area Wallace Multiplier Using Energy Efficient CMOS Adder Circuit Analysis In Instrumentation

**G. Sridhar*** **and T. Reenaraj****

***Abstract:*** In most digital and high performance systems such as Microprocessor,FIR filter and Digital Signal Processor,Multiplier plays an important role.In this paper,the multiplier offers less area and power consumption is reduced. To reduce the hardware component, Energy efficient CMOS full adder plays an important role in Wallace tree multiplier.Modified Wallace multiplier have minimum adders than Standard Wallace Multiplier.In this paper,the energy efficient CMOS full adder is used in the modified Wallace multiplier at the place of full adder in the standard Wallace multiplier in order to reduce area and power consumption.

***Keywords:*** Energy efficient full adder, CMOS full adder, Wallace multiplier.

## 1. INTRODUCTION

VLSI stands for "Very Large Scale Integration". This is the field which involves packing more and more logic devices into small areas. Alongside, obeying Moore's law, the capability of an IC has increased exponentially over the years, in terms of computation of power, utilization of available area, yield. The combined effect of these two advances is that people can now put diverse functionality into the IC's, opening up new frontiers. Examples are embedded systems, where intelligent devices are put inside everyday objects, and ubiquitous computing where small computing devices proliferate to such an extent that even the shoes you wear may actually do something useful like monitoring your heartbeats.

The increasing prominence of portable systems and the need to limit power consumption (and hence, heat dissipation) in very-high density VLSI chips have led to rapid and innovative developments in low-power design during the recent years. The ever increasing demand for portable computing devices and wireless communication systems require low power VLSI circuits. Minimizing power dissipation during the VLSI design flow increases life time and reliability of the circuit. Numerous techniques for the design of low power VLSI circuits are reported where the dominant factor of power dissipation is caused by switching activity. While these techniques have reduced the circuit power dissipation during functional operation, testing of such low power VLSI circuits has recently become an area of concern. Therefore addressing the problems associated with testing low power VLSI circuits have become an important issue.

### Challenges

As microprocessors become more complex due to technology scaling, microprocessor designers have encountered several challenges which force them to think beyond the design plane, and look ahead to post-silicon:

- **Process variation** – As photolithography techniques tend closer to the fundamental laws of optics, achieving high accuracy in doping concentrations and etched wires is becoming more difficult and

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# AN EFFICIENT LIFTING SCHEME ARCHITECTURE FOR 2D DISCRETE WAVELET TRANSFORM

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**ABSTRACT**

A high-speed and reduced-area lifting architecture for 2D Discrete Wavelet Transform computation and the 2-D DWT Image Decomposition is proposed in this work. Lift scheme is one of the wavelet computation techniques. Prior DWT architectures are mostly constructed on the basic lifting scheme or the flipping structure. In order to attain a critical path with only one multiplier, at least four pipelining stages are mandatory for one lifting step, or a large temporal buffer is required. In this work, modifications are made in the lifting scheme as the Radix-8 booth multiplier is used and the intermediate values are recombined and stored to reduce the number of pipelining stages and the registers. The two-input/two-output parallel scanning architecture is adopted in the design. The detailed analysis is performed to compare the proposed architecture with the modified architecture in terms of hardware complexity computation time and Power consumption. In the proposed architecture, the number of LUTs reduced to 50%, power consumption is reduced to 89mw, and computation time delay is reduced to 36.6% when compared to the conventional Lifting Scheme.

**Keywords:** discrete wavelet transforms (DWT), flipping structure, lifting scheme, pipeline, VLSI architecture.

## 1. INTRODUCTION

The Discrete Wavelet Transform (DWT) has become a very versatile signal processing tool over the last decade. It has been effectively used in signal and image processing applications. The advantage of DWT over other traditional transformations is that it performs multire solution analysis of signals with localization both in time and frequency. The DWT is being increasingly used for image compression today since it supports features like progressive image transmission, image manipulation, region of interest coding, etc. The coding efficiency and the quality of image restoration with the DWT are higher than those with the traditional discrete cosine transform. Furthermore, it is easy to attain a high compression ratio. So the DWT is widely used in signal processing and image compression, such as MPEG-4, JPEG 2000, and so on [1], [2]. Traditional DWT architectures [3], [4] are based on convolutions. Then, the second-generation DWTs, are based on lifting algorithms are proposed [5], [6]. Compared with convolution-based, lifting-based architectures require lesser computation complexity and also require less memory. Directly mapping these algorithms to hardware [7] leads to relatively long data path and low efficiency.

Several different architectures based on the lifting scheme have been proposed. An efficient folded architecture (EFA) with low hardware complexity is discussed by G. Shi; W. Liu *et al* [8]. However, computation time of EFA is quite long. A pipelined architecture is discussed by B. F. Wu and C. F. Lin [9], to reduce the critical path to one multiplier and limit the size of the temporal buffer to 4N, high processing speed cannot be achieved because it has one input and one output. The parallel 2-D DWT is discussed by Y. K. Lai, L. F. Chen, and Y. C. Shih [10], the design is a pipelined two-input/two output architecture, and a 2 × 2 transposing module with four registers, the critical path delay is one Tm. But it needs eight pipelining stages to complete the 1-D DWT and it requires 22 registers for computation. The flipping structure is discussed by C.-T. Huang, P.-C. Tseng and L.-G. Chen [11]. But, the flipping structure has a large temporal buffer, and lead to longer critical path delay due to fewer pipelining stages, various efficient lifting architectures are discussed in [12], [13], [14] and [15]. High speed VLSI implementation of 2D DWT is discussed in [16]. Different pipelined architectures are discussed in [17], [18] and [19]. An efficient multiplier less design is discussed in [20] and Lifting structure with Booth multiplier is discussed in [21].

Further optimization on the lifting scheme is proposed to overcome drawbacks in former works and reduce sizes of the logic units and the memory without loss of the throughput. The number of pipelining stages and registers is reduced, by recombining the intermediate values of the row and column transforms and keeping the critical path delay as Tm. In addition, a novel architecture is established to implement the 2-D DWT based on the above modified scheme. To reduce the size of the transposing buffer the parallel scanning method is employed. As a result, the design achieves higher efficiency.

## 2. PROPOSED ALGORITHM

The existing architectures for implementing the DWT are mainly classified into two categories: convolution based and lifting based approach. The lifting-based architectures have advantages over the convolution-based in computational complexity and memory requirement. The lifting scheme was first proposed by Daubechies and Sweldens in 1996 [5], [6]. It illustrates that every finite-impulse response wavelet or filter bank can be factored into a cascade of lifting steps. The polyphase matrices for the wavelet filters can be decomposed into a sequence of alternating upper and lower triangular matrices multiplied by a diagonal

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# VORONOI FUZZY CLUSTERING APPROACH FOR DATA PROCESSING IN WSN

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**Abstract**

Clustering for data aggregation is essential nowadays for increasing the wireless sensor network (WSN) lifetime, by collecting the monitored information within a cluster at a cluster head. The clustering algorithm reduces overall transmission of data from each sensor to the sink node thus energy spent by individual sensor node is minimized .The cluster heads collect all sensed information from their respective cluster members and performs data aggregation to transmit the data to the sink node. In this paper novel Voronoi Fuzzy multi hop clustering (V-FCM) algorithm is proposed for grouping the sensor node. This algorithm is a mixture of Voronoi diagram and modified Fuzzy C- Means clustering algorithm. In addition to clustering, data aggregation technique such as MAX, MIN and AVG is computed in each cluster head for further reduction of the number of data transmissions. Finally, the simulations are performed and the results are analyzed within the simulation set up to determine the performance of the proposed algorithm in Weather forecasting sensor network. Our proposed approach has achieved higher energy efficiency when compared with the Fuzzy C-Means algorithm.

*Keywords:* Clustering, data aggregation, Voronoi fuzzy clustering algorithm, energy, QoS, Delaunay triangulation, EMST.

## 1. Introduction

Cluster aggregation is an essential technique that naturally reduces energy costs in wireless sensor networks without compromising the quality of data delivery. The process of separating the sensor nodes into groups is called clustering. There are a number of challenges involved in clustering. Firstly, the clusters themselves have to be identified. Secondly, cluster heads have to be chosen. Thirdly, routes have to be discovered from every node to their cluster head, and finally, the cluster heads have to proficiently relay the data to the sink node. This paper focuses all the later four problems. The foremost problem is defined by the application domain.

Data aggregation is another vital function in WSN to reduce the consumption of energy. The key idea of this process is to eliminate redundancy in data, minimizing the number of transmissions via integrated all the incoming data in the cluster head from diverse sources and enroute it to the sink. This focuses on data-centric approach. Aggregation algorithms are limited to the application requirement that is either in time or energy performance.

A wireless sensor network consists of tiny sensing devices, which normally run on battery power. Sensor nodes are densely deployed in the region of interest. Each device is sensing and wireless communication capabilities, which enable it to sense and gather information from the environment and then send the data and messages to other nodes in the sensor network or to the remote base station [4]. Wireless sensor networks have been envisioned to have a wide range of application in both military and civilian domains [1]. Due to the less power of sensor node energy, researchers have designed a lot of energy-efficient routing protocols prolong the lifetime of sensor networks [2]. The energy source of sensor nodes in wireless sensor networks is usually bored by battery, which is undesirable, even impossible to be recharged or replaced. Therefore, improving the energy efficiency and maximizing the networking lifetime are the major challenges in sensor networks [3]. Considering the limited energy capabilities of an individual sensor, a sensor node can sense only up to a very limited area, so a wireless sensor network has a large number of sensor nodes deployed in very high density (up to 20nodes/m) [5, 6, 7], which causes

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# ENHANCEMENT IN WORKING PERFORMANCE OF CUSTOM POWER DEVICE USING DIFFERENT CONTROLLING METHODS

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**ABSTRACT**

With increasing applications of nonlinear and electronically switched devices in distribution systems and industries, Power-Quality (PQ) problems, like harmonics, neutral current elimination, reactive power has become an unavoidable issue. The Unified Power Quality Conditioner (UPQC) of shunt and series inverter having a common Direct Current (DC) link. The UPQC in distribution has made it possible to mitigate the following problems effectively. The UPQC has been realized by Voltage Source Inverter (VSI). The controlling algorithm determines the production of controlling signals which is used by the VSIs for the generation of their gating signals. The variation of performance of the device occurs with the different controlling algorithms .This paper proposes the comparison of performance of two mainly used algorithms namely Particle Swarm Optimization (PSO) and Genetic Algorithm (GA). The two controlling algorithms are used in a Fuzzy Controller (FC). In addition to this Synchronous Reference Frame (SRF) theory with modified Phase Locked Loop (PLL) is used in both cases for better performance. The main PQ issues concentrated in this paper relates to reactive power compensation, harmonics elimination and neutral current elimination. The performance is being investigated in an IEEE 118 bus system. Simulation outputs have been obtained through MATLAB/SIMULINK.

**Keywords:** *Power Quality, Unified Power Quality Conditioner, Particle Swarm Optimization, Synchronous Reference Frame, Genetic Algorithm.*

## 1. INTRODUCTION

Electric power systems are real-time energy delivery systems. An electric power system is a network of electrical components used to supply, transmit and use electric power. This can be broadly divided into the generators that supply the power, the transmission system that carries the power from the generating centers to the load centers and the distribution system that feeds the power to nearby homes and industries.

Electric PQ is a term which has captured increasing attention in distribution system. The measure of PQ depends upon the needs of the equipment that is being supplied. Usually the term PQ refers to maintaining a sinusoidal waveform of bus voltages at rated voltage and frequency. There are two approaches to the mitigation of PQ problems [1]. The first approach is called load conditioning, which ensures that the equipment is less sensitive to power disturbances, allowing the operation even under significant voltage distortion. The other solution is to install line conditioning systems that suppress or counteracts the power system disturbances.

A flexible and versatile solution to voltage quality problems is offered by Active Power Filters (APF). Currently they are based on Pulse Width Modulation (PWM) converters and connect to low and medium voltage distribution system in shunt or in series [2]-[5]. The Power Angle Control (PAC) concept is suggests that with proper control of shunt and series inverter. Just as facts improve the reliability and quality of power transmission system, the custom power enhances the quality and reliability of power that is delivered to customers.

The application of power electronics to power distribution system for the benefit of a customer or group of customers is called custom power devices. Like Flexible AC Transmission System (FACTS), the term custom power use for distribution system. The UPQC is one of the key custom power device,

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# VORONOI FUZZY CLUSTERING APPROACH FOR DATA PROCESSING IN WSN

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Clustering for data aggregation is essential nowadays for increasing the wireless sensor network (WSN) lifetime, by collecting the monitored information within a cluster at a cluster head. The clustering algorithm reduces overall transmission of data from each sensor to the sink node thus energy spent by individual sensor node is minimized .The cluster heads collect all sensed information from their respective cluster members and performs data aggregation to transmit the data to the sink node. In this paper novel Voronoi Fuzzy multi hop clustering (V-FCM) algorithm is proposed for grouping the sensor node. This algorithm is a mixture of Voronoi diagram and modified Fuzzy C- Means clustering algorithm. In addition to clustering, data aggregation technique such as MAX, MIN and AVG is computed in each cluster head for further reduction of the number of data transmissions. Finally, the simulations are performed and the results are analyzed within the simulation set up to determine the performance of the proposed algorithm in Weather forecasting sensor network. Our proposed approach has achieved higher energy efficiency when compared with the Fuzzy C-Means algorithm.

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Data aggregation is another vital function in WSN to reduce the consumption of energy. The key idea of this process is to eliminate redundancy in data, minimizing the number of transmissions via integrated all the incoming data in the cluster head from diverse sources and enroute it to the sink. This focuses on data-centric approach. Aggregation algorithms are limited to the application requirement that is either in time or energy performance.

A wireless sensor network consists of tiny sensing devices, which normally run on battery power. Sensor nodes are densely deployed in the region of interest. Each device is sensing and wireless communication capabilities, which enable it to sense and gather information from the environment and then send the data and messages to other nodes in the sensor network or to the remote base station [4]. Wireless sensor networks have been envisioned to have a wide range of application in both military and civilian domains [1]. Due to the less power of sensor node energy, researchers have designed a lot of energy-efficient routing protocols prolong the lifetime of sensor networks [2]. The energy source of sensor nodes in wireless sensor networks is usually bored by battery, which is undesirable, even impossible to be recharged or replaced. Therefore, improving the energy efficiency and maximizing the networking lifetime are the major challenges in sensor networks [3]. Considering the limited energy capabilities of an individual sensor, a sensor node can sense only up to a very limited area, so a wireless sensor network has a large number of sensor nodes deployed in very high density (up to 20nodes/m) [5, 6, 7], which causes

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# THE EFFECT OF SLS TREATMENT ON TENSILE PROPERTY OF COCONUT FIBER REINFORCED EPOXY COMPOSITES*

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**Abstract–** A study on the effect of fiber length and fiber surface modification on tensile property of alkaline treated coir fiber reinforced epoxy composites is presented in this paper. The fiber surface treatment was carried out using Sodium Lauryl Sulfate (SLS) solution at five different concentrations, 2%, 4%, 6%, 8% and 10% respectively. Each group of the coir fiber was treated for 10 days. For each group the coir fibers experiments were conducted for different fiber lengths namely 10, 20, and 30mm. The SLS treated coir fiber was used as a reinforcement and epoxy was used as a matrix to fabricate the composites. The tensile strength of different samples of composites was measured. Increased SLS concentration in fiber treatment was found to increase the tensile strength up to 4% and further increase in SLS concentration reduced the tensile strength, also, experimental results showed that an increase in fiber length increased tensile strength. The maximum tensile strength of the composite was found to be uniformly occurring for 4% SLS with 30mm fiber length composite samples. Based on the nonlinear regression analysis the tensile strength equation was proposed for coir fiber reinforced epoxy composites**.**

**Keywords–** Coir fiber, epoxy matrix, fiber length, sodium lauryl sulfate, regression analysis

## 1. INTRODUCTION

Nowadays, there is an increasing environmental consciousness and awareness of the need for sustainable development, which has raised interest in using natural fibers as reinforcements in polymer composites to replace synthetic fibers. The advantages of natural fibers includes low cost, low density, unlimited and sustainable availability, and low abrasive wear of processing machinery [1]. The performance of a polymer composite depends not only on the selection of their components, but also on the interface between them. In order to meet the specific needs, sometimes it is necessary to modify the matrix, and the reinforcement. Natural fibers play an important role in developing high performing fully biodegradable 'green' composites which will be a key material to solve the environmental problem. Natural fibers are largely divided into two categories depending on their origin: plant based and animal based. In general plant based fibers are lingo-cellulose in nature composed of cellulose, hemi cellulose and lignin, for example, jute, coir, sisal, cotton, etc. [2-6]. Whereas animal based fibers are composed of proteins, for example, silk and wool [7]. Natural fiber reinforced composites also have several drawbacks such as poor wettability, incompatibility with some polymeric matrices and high moisture absorption by the fibers. The main problem often encountered in its use is the fiber matrix adhesion problem due to the incompatibility between the hydrophilic natural fibers and the hydrophobic polymer matrix. This problem may be improved by chemical treating in the fiber surface. Alkali treatment is a common method to clean and

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# Performance Analysis of Three-sides Concave Dimple Shape Roughened Solar Air Heater

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## ABSTRACT

Three-sides artificially roughened solar air heaters perform better than one-side roughened ones under identical operating conditions. The present paper is an outcome of the experimental investigations conducted upon three- and one-side concave dimple roughened ducts. The present investigation is carried out under the mass flow rate range (0.0060-0.0250) kg/s, relative roughness pitch (p/e) 8-16 and relative roughness height ($e/D_h$) 0.018-0.045. Thermal performance characteristics of three-sides and one-side roughened duct has been analyzed, compared and validated. The variation in plate temperature along the test length of the roughened duct has an appreciable impact on the heat transfer from the plate to the underside flowing air. The collector's surface temperature is found to be 21% lower in the three-sides than the one-side roughened duct. Plate temperature excess for both three-sides and one-side roughened duct has been analyzed and compared. The plate temperature excess range for three-sides roughened duct is significantly lower (12.5-28.5 °C) compared to one-side roughened duct (17.5-35.5 °C). The augmentation in fluid (air) temperature flowing under three-sides concave dimple roughened duct is found to be 34.87% more than one-side roughened duct. The augmentation in thermal performance due to the provision of roughness geometry in the form of concave dimple shape on the three-sides over one-side roughened duct is found to be 39-56% for varying p/e and 44-51% for varying $e/D_h$ depending upon the operational mass flow rate of air and roughness geometry. The maximum thermal efficiency is obtained at relative roughness pitch of 12 and relative roughness height of 0.036. The results for efficiency ratio along with parametric variation influence on performance of the roughened ducts have also been discussed in detail.

## KEYWORDS

*Three-side roughened duct, One-side roughened duct, Relative roughness pitch, Relative roughness height, Thermal performance, Plate temperature excess.*

## INTRODUCTION

The thermal efficiency of non-roughened flat plate solar collector is low compared to solar water heater due to the fact that convective heat transfer coefficient and thermal

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# Performance prediction of three sides hemispherical dimple roughened solar duct

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**Abstract:**

The present paper deals with the results of experimental investigation conducted upon one and three sides concave dimple roughened solar air heater ducts and examine the effects of roughness and flow parameters on thermal

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# Augmentation in thermal efficiency of three sides over one side concave dimple roughened ducts

**Vikash Kumar and Laljee Prasad**

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**Abstract:** We present experimental investigations and comparison on thermal efficiency of solar thermal air heater (SAH) with 1-side and 3-side concave dimple roughened ducts; under the Reynold's number (Re) range of 2500 - 12500; relative roughness pitch (p/e) of 8 – 15; and relative roughness height ($e/D_h$) of 18 - 0.045. Maximum thermal efficiency was observed at p/e = 12 and $e/D_h$ = 0.036. The increase in thermal efficiency of 3-sides over that of 1-side roughened duct is found to be about 44 - 56 % for varying p/e and 39-51 % for varying $e/D_h$. Present results and understanding is useful in practically designing an efficient solar thermal air heater.

**Keywords:** Solar air heater, Concave dimple, roughened duct

**1 Introduction:** The thermal efficiency of non-roughened flat-plate solar air heater (SAH) is less than solar water heater (SWH) due to the fact that heat transfer co-efficient (h) and thermal capacity ($C_p$) of air is lower than water. As a result of poor transfer of heat from the collector to air, heating of the collector happens leading to higher temperature. This results in higher heat loss to the surrounding atmosphere. Research efforts by different groups in the past have been focused on developing methods that would results in augmenting heat transfer rate from the absorber to air. One of the method by which this is achieved is via increasing collector's surface area or by providing roughness on air flowing side of the collector. For circular cross-section ribs or rectangular wire of small diameter aligned parallel to the flow direction, it has been observed that air flow get separated near the ribs and re-adheres in the vicinity of inner rib space at a p/e value of 7 or more **[1-2]** and extends up to the beginning of next re-attachment point **[3]**. Reattachment effect in the case of chamfered ribs is seen at relative roughness pitch (p/e) as low as 5 thereby reducing the recirculating flow region and laminar sub-layer thickness **[4]**. Published literature suggest that heat transfer augmentation is more when the roughness element are aligned at inclination or is v-shaped roughened instead of transverse roughness pattern **[5]**. When the ribs are in v-pattern or inclined to the flow, secondary flow (flow of heated secondary air in contact with roughness element) is induced due to the inclination of ribs. The heated air (secondary flow) tends to move towards the side walls in case of inclined ribs. In case of v-up or v-down pattern the heated air move towards the side walls and center of ribs respectively. Thus the entire absorber plate is exposed to the primary air (axially flowing air) which is at comparatively lower temperature with respect to the secondary air, resulting in more heat transfer **[6-8]**. The temperature along the central axis of the flowing air is higher for v-down roughened collector than v-up rib arrangement. This is due to secondary air flow moving towards the central axis gets intermingled with the axial flow (primary flow) causing additional turbulence resulting in higher heat transfer **[9]**.

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# Multi Slot TMI Measure based Machine Scheduling for CNC Applications with Improved Data Security

**P. Velmurugan, A. Kannagi, P. John Paul**

***Abstract*— The modern manufacturing process has been adapted with computer numerical control machines. Number of protocols has been discussed earlier for the improvement of production yield with secure access. However, the performance of scheduling and data security in CNC applications is still challenging due to the security issues. To overcome the deficiency, an multi slot TMI (Throughput-Makespan-Idle Time) based scheduling algorithm is presented. The proposed work performs scheduling of CNC machines and their operations to improve the scheduling performance. The presence of multi slot in CNC machines enables the processing of more than one operation in the batch process. By identifying a sequence which is efficient in terms of throughput, makespan and idle time makes the CNC machine to produce higher outcome. The data security has been enabled with attribute based encoding to improve the security of data in CNC applications. The method produces efficient results on scheduling as well as data security.**

***Index Terms*— CNC, Machine Scheduling, Data Security, Multi Slot Machines, TMI.**

## I. INTRODUCTION

The computer numerically control machines are the most important invention in this decade which supports higher production in manufacturing industries. The manufacturing industries involve in the production of various products which includes number of operations on the job given. For example, consider a production of pet bottle cap which has number of operations like threading, shaping, and drilling. The operations are performed in a sequence where the CNC machine has comes with number of heads to hold the job piece where the number of operations to be performed. The CNC machines perform the jobs based on the instructions given.

The CNC machines have been designed to understand number of instructions given in form of codes. The codes are dedicated for an operation with set of values. For example, for a drilling operation, the CNC code is G83 being used which has to specify the radius and spot of the hole. Similarly, any operation has been specified with the machines have number of slots and spindles enabled, the scheduling of the tools and operations can be performed efficiently.

Machine scheduling is the process of allocating the machines and performing operations of various jobs based on certain criteria. Consider, there exist the machines driller, shaper, planner with the CNC machine. Given a job set J, which consist of 100 jobs where each has number of operations involved. With the available machines and their instances, the scheduling of the operations on the jobs has been completed in a sequence. Finding such order of execution operations is named as scheduling. In general, the scheduling is performed based on the completion time of the job and process. The job with the less completion time has been completed in this case. Similarly, there are number of scheduling cases has been available for the problem of machine scheduling.

The data and the codes submitted to the CNC machines are subject to be hacked and modified by some malicious users in the network. As the codes are transferred through network communication, they would be hacked in some point and the malicious user would change the codes and their values which would affect the entire production of the unit. It is most important to safeguard the data given to the CNC machines. The CNC machine is capable of decrypting the encoded information and based on the original information obtained from the cipher text, the machine can invoke the operation. To improve the performance of data security an optimal algorithm is presented in this paper.

To improve the scheduling performance, a novel algorithm is presented in this article. The method would find the number of machines handle and number of jobs to be executed. By estimating TMI measures for different sequence of operations, the method schedules the jobs to increase the production rate and data security. The detailed approach is discussed in the next sections.

# Performance Enhancement of V - trough solar concentrator with peripherally oblique-cut twist inserts

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***Abstract*—Heat transfer and pressure drop characteristics of a thermosyphon V-trough solar concentrator equipped with Peripherally Oblique-cut twisted tape (PT-O) has been investigated experimentally. The experimental trials were made by placing the three different PT-O tapes (angle of oblique cut θ=60º, 45º and 30º) in forward arrangements (PT-O, FW) and backward arrangements (PT-O, BW) under same operating condition. Besides, for comparison one Typical Twist (TT) tape was also tested. The experimental results obtained from the plain tube V-trough (V plain) solar concentrator was evaluated with standard equations and found the deviations within ±10.96% for Nusselt number and ±4.24% for friction factor. The experimental results confirmed that the use of PT-O tapes leads to greater heat transfer rate and friction factor over the V plain and TT tape. The results also revealed that the heat transfer of PT-O tapes increases with increase in inclined angles. When compared to forward arrangements, backward arrangements of PT-O tape offer better thermal performance for the same inclined angles. In addition, empirical correlations of the Nusselt number and the friction factor for PT-O tape were determined. Compared to the experimental data, the deviation of predicted Nusselt number and friction factor falls within ±10.86% and ±8.88% respectively.**

***Keywords*—V trough; peripherally oblique-cut; forward arrangement; backward arrangement; typical twist**

## I. INTRODUCTION

The insertion of twisted tape for augmenting the heat transfer in fire tubes of the boiler was reported in early stage by Whitham [1]. Sivashanmugam and Sundaram [2] analyzed experimentally about heat transfer improvement in double pipe heat exchanger. The results indicated that the minimum twist ratio provided maximum percentage of energy transfer rate and the value was 44.7%. Liao and Xin [3] conducted an experiment in heat exchangers with twisted tapes of twist ratio 5, 10 and 15 using water, ethylene glycol and ISO VG46 turbine oil as working fluids. A full-length helical screw of different twist ratios was introduced by Sivashanmugam and Suresh [4]. They concluded that the friction factor was decreased two times at low Reynolds number and four times at high Reynolds number for all twist ratios. Smith Eiamsa-ard et al. [5] used regularly spaced twisted tape with two different twist ratios and three space ratios in a double pipe heat exchanger. They found that the heat transfer coefficient was increased when both twist ratio and space ratio increased.

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# OPTIMIZATION OF DESIGN AND OPERATING PARAMETERS FOR ENHANCING THE PERFORMANCES OF PEMFC WITH SERPENTINE FLOW FIELDS

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***ABSTRACT***

***The performance of the Proton Exchange Membrane Fuel Cell (PEMFC) depends on various design and operating parameters. The present work is aimed to optimize the performance of 25cm$^2$ PEMFC, with respect to one design parameter (landing to channel width ratio- L: C) of serpentine flow field and two operating parameters (cell temperature & back pressure). Here, Taguchi technique and analysis of variance methodology have been used to obtain the optimum combination for the above three parameters. The experiments have been carried out with respect to Taguchi's orthogonal array of L9 (33), for parametric analysis of PEMFC performance. Three factors and three levels, such as various landing width to channel width ratio (1:1, 1:2 and 2:2), cell temperature (40 ºC, 50 ºC and 60ºC) and back pressure (0, 0.5 and 1 bar) have been taken for optimization studies. Based on the experimental study conducted on serpentine flow field, the maximum power density of 0.263 W/cm$^2$ has obtained at 1 bar back pressure, 60°C cell temperature and L:C- 1:2. Among all the design and operating parameters, the major parameter that contributes to the performance of PEMFC is back pressure with 69.8 %.***

***KEYWORDS: Analysis of Variance, Design and Operating Parameters, Serpentine, Taguchi Technique & Landing to Channel Width Ratio***

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Original Article

## INTRODUCTION

The growing concerns on environmental issues have been constantly demanding cleaner and more energy efficient vehicles. In order to explore environment friendly alternatives, many automobile manufactures started focusing on Fuel cell powered vehicles [1]. Hence, the rapid rate of technical advances on the fuel cells, they will sooner become a viable alternative to internal combustion engine technology [2]. Fuel cells with its combination of ultra low emission and high efficiency attracts many of the fuel cell developers for rapidly commercializing this environment friendly technology [3]. It will be certainly the technology of choice of the future hydrogen economy, when our fossil fuel runs out.

Efficiency of the PEMFC is governed by various geometrical parameters such as, flow field dimensions (like width, depth, length), landing to channel width ratios (L: C), cross-sectional structure of the flow channels, type of flow field design, number of cells and number of flow passes, and various operating parameters like cell temperature, operating pressure, back pressure, mass flow rate of species, stoichiometric ratio and humidity of reactants. Manso et al. [4] studied the performance of the PEMFC by examining various geometric parameters of the flow fields such as pins, straight and serpentine channels, integrated and interdigitated channels. Also, they have studied the influence of flow direction, channel length and number of channels, baffles usage in the flow

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# A Novel Method for Implementing Reversible Sequential Counters using Mach Zehnder Interferometer

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**Abstract:** This work presents all optical reversible implementation of sequential counters using semiconductor optical amplifier (SOA) based Mach-Zehnder interferometer (MZI) switches. The reversible computing has evolved as an alternative as it promises zero power dissipation in circuit simulation. Reversible logic has applications in the several emerging technologies like ultra-low power CMOS design, optical computing, nanotechnology and DNA Computing. The researchers are trying to combine the optical interconnects with the electronic computing devices. The implementation of reversible logic circuits with optical technology can be performed using Semiconductor Optical Amplifier based Mach-Zehnder Interferometer switches which has significant advantages of the high speed, low power, fast switching time and ease of fabrication. All the designs are implemented using minimum number of MZI switches and garbage outputs. This design ensures improved optical costs in reversible realization of all the counter circuits. The theoretical model is simulated to verify the functionality of the circuits. Design complexity of all the proposed memory elements has been analyzed.

**Keywords:** Semiconductor Optical Amplifier (SOA), Mach- Zehnder Interferometer, Optical Computing, Xilinx.

## I. INTRODUCTION

A familiar example of a device with sequential logic is a television set with "channel up" and "channel down" buttons. Pressing the "up" button gives the television an input telling it to switch to the next channel above the one it is currently receiving. If the television is on channel 5, pressing "up" switches it to receive channel 6. However if the television is on channel 8, pressing "up" switches it to channel "9". In order for the channel selection to operate correctly, the television must be aware of which channel it is currently receiving, which was determined by past channel selections.[1] The television stores the current channel as part of its state. When a "channel up" or "channel down" input is given to it, the sequential logic of the channel selection circuitry calculates the new channel from the input and the current channel. Digital sequential logic circuits are divided into synchronous and asynchronous types. In synchronous sequential circuits, the state of the device changes only at discrete times in response to a clock signal. In asynchronous circuits the state of the device can change at any time in response to changing inputs. Along with the optical sequential counters here includes the reversible logic, which is very popular because of its applications like quantam computing, DNA computing, optical computing, etc. Reversible logic also considered as an alternate low power design methodology. A reversible circuit consists of a cascade of reversible gates without any fanout or feedback connections, and the number of inputs and outputs must be equal.

There exist various ways by which reversible circuits can be implemented like NMR technology, optical technology, etc. Reversible logic is becoming a popular emerging paradigm because of its applications in various emerging technologies, like quantum computing, DNA computing, optical computing, etc. It is also considered an alternate low power design methodology. A reversible circuit consists of a cascade of reversible gates without any fanout or feedback connections, and the number of inputs and outputs must be equal. There exists various ways by which reversible circuits can be implemented like NMR technology, optical technology, etc. In the optical domain, a photon can store information in a signal having zero rest mass and provide very high speed. These properties of photon have motivated researchers to study and implement reversible circuits in optical domain. Theoretically from the decade old principles of the reversible logic is considered as a potential alternative to low power computing. Optical implementation of reversible gate can be one possible alternative to overcome the power dissipation problem in conventional computing. In recent time researchers have investigated various reversible logic gates and their all-optical implementations using micro resonator and semiconductor optical amplifier based Mach-Zehnder Interferometer switch. Also MZI-based implementation of reversible logic gates offer significant advantages like ease of fabrication, high speed, low power, and fast switching time.

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# Implementation of Energy Area Efficient Three-Input XOR/XNOR with SCD Methodology

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**Abstract:** In this brief, we propose three efficient three-input XOR/XNOR circuits as the most significant blocks of digital systems with a new systematic cell design methodology (SCDM) in hybrid-CMOS logic style. SCDM, which is an extension of CDM, plays the essential role in designing efficient circuits. At first, it is deliberately given priority to general design goals in a base structure of circuits. This structure is generated systematically by employing binary decision diagram. After that, concerning high flexibility in design targets, SCDM aims to specific ones in the remaining three steps, which are wise selections of basic cells and amend mechanisms, as well as transistor sizing. In the end, the resultant three-input XOR/XNORs enjoy full-swing and fairly balanced outputs. They perform well with supply voltage scaling, and their critical path contains only two transistors. They also outperform their counterparts exhibiting 27%–77% reduction in average energy-delay product in HSPICE simulation based on TSMC 0.13-µm technology. The symmetric schematic topologies significantly simplify and minimize the layout, as 26%–32% improvement in area is demonstrated.

**Keywords:** Binary Decision Diagram Applications, Energy Efficiency, Hybrid-CMOS Logic Style, Systematic Design Methodology, Three-Input XOR/XNOR Circuits.

## I. INTRODUCTION

The exclusive-OR (XOR) and exclusive-NOR (XNOR) gates are the essential parts of several digital systems and are highly used in very large scale integration (VLSI) systems such as parity checkers, comparators, crypto processors, arithmetic and logic circuits, test pattern generators, especially in Full adder module as Sum output that is 3-input XOR and so forth. In most of these systems, XOR and XNOR gates constitute a part of the critical path of the system, which significantly affects the worst-case delay and the overall performance of the system. An optimized design is desired to avoid any degradation on the output voltage, consume less power, and have less delay in critical path with low-supply voltage as we scale toward deep sub-micron technology. Other desired features for the design are to have a small number of transistors to implement the circuit. In particular, for XOR and XNOR circuits, the simultaneous generation of the two-non skewed outputs is highly desirable. As known, the switching speed of the balanced XOR and XNOR functions, comparing with those designs that use an inverter to generate the complement signal, is increased by eliminating the inverter from the critical path. Thus the design methodology for 3-input XOR/XNOR circuits is introduced.

## II. THREE-INPUT XORXNOR IN HYBRID-CMOS LOGIC STYLE

This methodology is based on using different basic cells and optimization mechanisms. To obtain basic cells, 3-input XOR/XNOR function is investigated. For choosing the mechanisms, we use the simulation results of in which the balanced two inputs XOR/XNOR circuits based on the Cell2 have possessed better results.

### A. The Elementary Basic Cell

In the process of designing balanced 3-input XOR– XNOR circuits, we face three independent inputs and two complementary outputs. The elementary basic cell which is extracted of minimum sum of product form of 3-input XOR–XNOR in Eq. 1 has been presented in Fig.1. This cell has eight elements, deciding two outputs. Each element is a pass transistor or transition gate and has two input controls, i.e., the gate and either the drain or the source.

$$A \oplus B \oplus C = B'.(AC' + A'C) + B.(A'C' + AC)$$
$$A \odot B \odot C = B.(AC' + A'C) + B'.(A'C' + AC)$$

The input signals (applied to the two input terminals of these transistors) and the selection of pMOS, nMOS transistors and transition gate decide various output states. As presented in Fig. 1, we refer to the pins of central section (IN1 to IN4 and G1 to G4) as A or C, or their complements respectively. We assume that pins of external section G5 to G8 can also be B or its complement. Another form of the elementary basic cell is obtained by swapping the position of B or its complement that is G5 to G8 and the outputs of central section that are the drains or the sources of external section. This form of the circuit (as the elementary basic cell) is power-less and ground-less (P-/G-).Therefore, the

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# Low voltage high performance bulk driven quasi-floating gate based self-biased cascode current mirror

Nikhil Raj [a], Ashutosh Kumar Singh [b], Anil Kumar Gupta [a]

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https://doi.org/10.1016/j.mejo.2016.04.001



## Abstract

A low voltage high performance self-biased cascode current mirror in terms of output resistance and bandwidth is proposed in this paper. The proposed current mirror enhances the output resistance in range of mega ohms and also shows a significant improvement in bandwidth compared to prior arts. The current mirror is designed using bulk-driven technique which helps it to operate at very low supply voltage of ±0.2 V. To achieve high output resistance, the proposed current mirror uses the super cascode stage at its output. Furthermore, an external capacitor is used which accounts for increasing the bandwidth. Small-signal analysis carried proves the improvement achieved by proposed architecture. The current mirror operates well for wide input current range from 0 to 200 $\mu$A with good linearity and shows the bandwidth of 415 MHz. The observed input and output resistance is 300 Ω and 212 MΩ respectively. Further,

Journal of Alloys and Compounds
Volume 729, 30 December 2017, Pages 828-842

# Effect of pin profile volume ratio on microstructure and tensile properties of friction stir processed aluminum based metal matrix composites

P. Vijayavel [a], V. Balasubramanian [b]

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https://doi.org/10.1016/j.jallcom.2017.09.117



## Highlights

- Friction stir process (FSP) were used to fabricate LM25AA-5% SiCp metal matrix composite.
- Pin volume ratio is one of vital parameter which will influence the processing efficiency predominantly.

# Experimental analysis of heat transfer and friction for three sides roughened solar air heater

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ABSTRACT. *This paper deals with the results so obtained after conducting exhaustive experimentation on 1 & 3-sides concave dimple roughened SAH in terms of Nusselt number (Nu) & friction factor (f). The geometrical & flow parameters were used as dimensionless ratio as relative dimple pitch (p/e), relative dimple height (e/Dh), relative dimple depth (e/d) and 'Re' in the range of 8-15, 0.018-0.045, 1-2 and 2500-13500 respectively. For various sets of roughness parameters, there exists an optimum roughness parameter, either side of which heat transfer rate decreased. The optimum roughness parameters found under present investigation is p/e=12, e/Dh=0.036 and e/d=1.5. The maximum rise in 'Nu' for varying 'p/e', 'e/Dh' & 'e/d' was respectively found to be of the order of 2.6 to 3.55 times, 1.91 to 3.42 times and 3.09 to 3.94 times than one side concave dimple roughened duct for the parameters range investigated. The maximum rise in friction factor of 3-sides concave dimple over those of 1-side roughened ones for varying 'p/e', 'e/Dh' & 'e/d' was respectively found to be as 1.62 to 2.79 times, 1.52 to 2.34 times and 2.21 to 2.56 times.*

RÉSUMÉ. *Cet article traite des résultats ainsi obtenus après avoir mené une expérimentation exhaustive sur des SAH dépolies concaves à 1 et 3 côtés, en termes de nombre de Nusselt (Nu) et de facteur de friction (f). Les paramètres géométriques et de débit ont été utilisés comme rapport sans dimension: pas de fossé relatif; (p / e), hauteur de la fossette relative (e / Dh), Profondeur de fossette relative (e / d) et «Re» dans la plage de 8-15, 0,018-0,045, 1-2 et 2500-13500 respectivement. Pour divers ensembles de paramètres de rugosité, il existe un paramètre de rugosité optimal, dans lequel le taux de transfert de chaleur a diminué. Les paramètres de rugosité optimaux trouvés dans les recherches actuelles sont p/e=12, e/Dh=0.036 et e/d=1.5. L'augmentation maximale dans le 'Nu' pour les variables 'p / e', 'e / Dh' et 'e / d' s'est avérée être respectivement de l'ordre de 2,6 à 3,55 fois, de 1,91 à 3,42 fois et de 3,09 à 3,94 fois supérieure à celle du canal rugueux concave d'un côté pour la plage de paramètres étudiée. L'augmentation maximale du facteur de frottement de la fossette concave à 3 côtés par rapport à ceux des côtés rugueux à 1*

Solar Energy
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# Thermal performance investigation of three sides concave dimple roughened solar air heaters

Vikash Kumar [a], Laljee Prasad [b]

Show more

https://doi.org/10.1016/j.solener.2019.06.008



## Highlights

- A novel type solar air heater with 1 & 3-sides concave dimple roughened ducts is investigated.
- Validation of the test rig is done using similar duct model adopted by Saini and Verma.

Journal
Stochastic Analysis and Applications ›
Volume 34, 2016 - Issue 1





Article

# A dexterous feature selection artificial immune system algorithm for keystroke dynamics

V. Chandrasekar & S. Suresh Kumar

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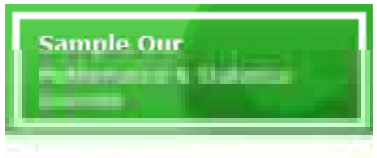
## ABSTRACT

The main problem in security protecting the computer or resources from intruders. The password and username are the most common means to provide security. But this method has many loop holes such





Thirugnanasambantham et al., *Cogent Engineering* (2018), 5: 1501864
**https://doi.org/10.1080/23311916.2018.1501864**

cogent engineering

MATERIALS ENGINEERING | RESEARCH ARTICLE

# Degradation mechanism for high-temperature sliding wear in surface-modified In718 superalloy

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Additional information is available at the end of the article

**Abstract:** This technical paper deals with high-temperature dry sliding wear behavior and its mechanism of $Al_2O_3$–50$TiO_2$ (A50T) coating on Inconel 718 alloy. The sliding wear behavior of the A50T coating on Inconel 718 alloy was investigated using a pin on disc equipment at 500°C with varying parameters like normal load and sliding velocity. Scanning Electron Microscope (SEM) features of worn samples reveal that ploughing, deep grooving and splat exfoliation are the dominant wear mechanisms of A50T coating at 10 N, while at 30 N, they are crack extension, crack deflection, crack bridging and splat exfoliation.

**Subjects: Manufacturing Technology; Corrosion-Materials Science; Materials Processing; Metals & Alloys; Surface Engineering-Materials Science**

**Keywords: superalloy; plasma spray; friction; sliding wear mechanism; A50T; SEM; 3D surface topography**

## 1. Introduction

Wear can be defined as the interaction between surfaces resulting in the removal of material.

### ABOUT THE AUTHORS

Dr K.G. Thirugnanasambantham is working as an Associate Professor in St. Peter's Engineering College, Hyderabad, Telangana, India. He is having 8 years of work experience in academic teaching including research. His research interests are tribology, surface modification/coatings and vibration. He won national award for his thesis titled Design of Rolling Type Seismic Isolation to Arrest Seismic Vibration from ISTE. He has published his work in five international journals and six international conferences.

Dr Ramesh Raju is working currently as a Professor, Department of Mechanical Engineering, Santhiram Engineering College, Nandyal, Kurnool dist., AP, India. He has 5 years of industrial experience, 8 years of teaching experience and 6 years of research experience. His areas of interest are laser material processing, surface engineering and refractory materials. He is a Fellow of Indian Institute of Production Engineers (India) and Member of Indian Society for Technical Education of India. He has published his work in 10 international journals and 20 international conferences.

### PUBLIC INTEREST STATEMENT

Regarding mechanisms with which sliding wear phenomenon happens, virtually no report is available in literature on alumina–titania ($Al_2O_3$–50$TiO_2$) on In718 superalloy at 500°C. Thus, the main objective of this technical paper is towards elucidation of different sliding wear mechanism of alumina–titania ($Al_2O_3$–50$TiO_2$) at 500°C, with varying the parameter normal load. Further, it is well known that mechanism only always determines the wear rate and vice versa is not true. Hence, this paper lays more emphasis on mechanistic aspects only which provides depth information for readers.

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International Journal of Engineering & Technology

*Website: www.sciencepubco.com/index.php/IJET*

***Research paper***

# Smart curiosity sinks node prediction mining algorithm for path optimization in wireless sensor network

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**Abstract**

As of late, data miming and handling for wireless sensor systems (WSNs) have turned into a theme of dynamic research in a few fields of software engineering, for example, the circulated frameworks, the database frameworks, and the data mining. Managing the large amounts of information and efficiently using this information in improved path optimization has become increasingly challenging. In this paper, we will demonstrate how sink node predicted and integrated for path relationships and patterns in linked data, i.e., the interdependencies between data items at the lowest elemental level. The problem of path optimization has been approached using various techniques. The path selection plays the vital role in achieving the quality of service parameter and secure communication. Considering multiple routing, the security can be enforced with various strategies. Using few parameters namely the congestion, delay and hop count would support improve the performance of the network as well as lifetime. With the motivation, an efficient smart curiosity sink node prediction mining algorithm has been presented in this paper. First, both the source and destination nodes maintain information about the routes and network conditions. Based on that a single efficient path has been selected for data transmission. On the other side, the receiver verifies the path being followed, the route available and their conditions. Using this information the delay approximation is performed to decide the legitimate of the path being selected and the traffic incur in the way. The proposed method identifies several network threats and detects the presence of the node in the route. The proposed plan improves the performance of mining data efficiency as well as increases the throughput.

***Keywords:*** *Sink node, path optimization, mining, route estimation, WSN.*

## 1. Introduction

Machine learning from sensor data has gotten a lot of consideration by the data mining group. Distinctive methodologies concentrating on path optimization, sink node recognizable proof, regular examples, following examples, and characterization have been efficiently utilized on sensor data. Be that as it may, the outline and sending of sensor networks make one of a kind research challenges because of their massive size irregular and unsafe execution, lossy imparting condition, restricted power supply, and high disappointment rate.

These troubles make ordinary mining methodologies inapplicable in light of the fact that usually mining is united and computationally costly. Wireless sensor systems have pulled in critical consideration in numerous applications areas, for example, territory observing, protest following, condition checking, military, catastrophe administration, and additionally shrewd situations. In these applications, constant and solid control is a basic prerequisite. These applications yield the enormous volume of dynamic, geologically circulated and heterogeneous data.

This crude data, if proficiently broke down and changed to usable data through data mining, can encourage computerized or human-prompted strategic/vital choice. Thusly, it is basic to create procedures to dig the sensor data for examples to settle on smart choices speedily.

Subsequently, new calculations have been made, and a portion of the data mining calculations have been altered to deal with the data produced by sensor networks. Plenty of information disclosure procedures. Since data mining is an expansive demonstrate and can be connected to any area data, more broad overviews on data mining systems, where creators analyzed the machine-learning and data mining methods for path optimization amid data move in the network.

Since the order of data mining procedures in this evaluation depends on path design mining, sink node, and it follows, there are adequate of examinations accessible on every one of these methods. The smart curiosity sink node prediction mining procedures focus on design and management of network instead of data disclosure. The sink node expectation mining systems strategies over data stream are given, where the source analyzed conventional characterization methods over data streams.

In any case, inspected data mining methods that importance on path optimization and examination from WSNs data. In correlation with the calculations supposed above and approaches uncommonly intended for WSNs, not just promoting an alternate order, assessment, and exchange on different spaces yet also exhibiting several decisions of a solution. We inspected how data mining calculations will be used to influence the sensor to network applications wise. In this work comprises of sink node forecast of data mining systems for WSNs.

## 2. Related works

A choice tree is a straightforward and intense type of data investigation which enables us to anticipate, clarify, portray, or order an objective. A choice tree comprises of two kinds of nodes; non-terminal nodes and terminal nodes [1]. A non-terminal node indicates a condition in view of an element. This condition parts data records in light of their qualities. A terminal node,

27-09-2018 | Issue 4/2018

# K-Partitioned Smallest Distance Mining Tree for Path Optimation in Wireless Sensor Network

Journal: Wireless Personal Communications > Issue 4/2018

Author: A. Kannagi



## Abstract

In wireless sensor networks (WSN), energy efficiency is an important issue, since the sensor nodes act as both data originator and data router. The sink functionality typically includes mining and sensing data from sensors in the network via multihop relays performing data processing. The nodes which are closer to the sink have to take more substantial traffic load consequently reduce their energy quickly leading to energy hole around the sink. Then the energy hole may cause failure in the sensor network and create large coverage hole. Sink repositioning can be performed using multiple sink deployment and sink mobility. Relocating or repositioning the sink is very challenging during the regular network operation. It is challenging in a multi-hop network environment to find an optimal location. Most of the existing localization solutions had low accuracy in congested situations and did not consider the resource limitations of WSN. To rectify the issues of sink repositioning, this work presents a K-partitioned smallest distance tree (k-PSDT) utilizing the ideal scan for setting an ideal number of sinks in sensor networks. At first, the quantity of sinks is resolved utilizing the ideal sink

algorithm fulfilling the h-jump requirement. k-PSDT is developed for situating numerous sink nodes and setting up the courses. In the wake of deciding the ideal number of sink positions and directing, best sink reposition is chosen by ideal pursuit technique. Sink development is finished by utilizing the canny development, and it confines the sinks developments while keeping up their bearing to the ideal positions. The performance of the new techniques is implemented using network simulator (NS2). Simulation results show that the proposed technology do the better performance as compared to the existing method regarding the metrics such as average packet delivery ratio, delay, and energy consumption.

Materials Today: Proceedings
Volume 5, Issue 2, Part 2, 2018, Pages 7207-7216

# Multi-Objective Optimization of Wear Parameters for Aluminium Matrix Composites (413/$B_4C$) using Grey Relational Analysis

J. Udaya Prakash [a], S. Ananth [b], G. Sivakumar [a], T.V. Moorthy [b]

Show more

https://doi.org/10.1016/j.matpr.2017.11.387



## Abstract

Particle reinforced AMCs are increasingly used in various automobile and aerospace applications since, they exhibit isotropic properties. AMCs containing 413 Aluminium alloy as the matrix material and 3%, 6% & 9% boron carbide of average particle size 63 μm as reinforcement were fabricated using stir casting. Optical micrographs of the composites reveal that the reinforcement particles were uniformly distributed in the matrix. Dry sliding wear tests were conducted using a pin on disc wear testing machine to study the effect of sliding speed, sliding distance, load and reinforcement on the output parameters specific wear rate (SWR) and coefficient of friction (COF). Taguchi based Grey relational analysis is used to optimize the multi response wear behavior. Analysis of Variance (ANOVA) is used to find the percentage contribution of the parameters and that of their interactions. The wear studies reveal that the SWR and COF of the AMCs

are greatly influenced by the sliding distance and sliding speed. SEM micrographs of the worn pins were analyzed to find the wear mechanisms. The present study suggests that by using correct amount of reinforcement particles, it is possible to obtain tailor made composites for a particular application. The present work provides useful insight to industrial composite manufacturers especially for automotive industries.

Previous Next

## Keywords

AMCs; Wear; Taguchi Technique; Grey Relational Analysis; ANOVA

Special issue articles Recommended articles Citing articles (3)

Publication - Article

# Effect of Tool Traverse Speed on Strength, Hardness, and Ductility of Friction-Stir-Processed LM25AA-5% SiCp Metal Matrix Composites

Metallography, Microstructure, and Analysis, 7(3), 321-333, June 2018
https://doi.org/10.1007/s13632-018-0442-5

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**Abstract**

Plates made from stir cast light metal 25 aluminum alloy–5% silicon carbide particle (SiCp) metal matrix composites (LM25AA-5% SiCp MMCs) have sub-optimum mechanical properties because of the uneven distribution of the SiC particles (SiCp) that are used as reinforcement. Currently, friction stir processing (FSP) is used as a secondary processing method to overcome the uneven distribution of particles in the aluminum matrix. The FSP method is controlled by three important parameters: tool rotational speed, tool traverse speed, and axial force. Of these three parameters, the tool traverse speed governs the mechanical properties of the MMCs. Hence, in this investigation, an attempt has been made to study the effect of tool traverse speed on the mechanical properties of friction-stir-processed material. Five different tool traverse speeds (ranging from 20 to 60 mm/min) were used to process LM25AA-5% SiCp MMC plates whose thickness was 12 mm. The tensile strength, ductility, and hardness of the friction-stir-processed

Journal
International Journal of Sustainable Energy ›
Volume 38, 2019 - Issue 2





Articles

# Influence of helix twisted tape on heat transfer and friction factor in forced circulation V-trough solar water heater

A. Saravanan, J. S. Senthilkumaar, S. Jaisankar & J. Ananth

Pages 163-176 | Received 24 Oct 2017, Accepted 03 May 2018, Published online: 19 May 2018

 https://doi.org/10.1080/14786451.2018.1476352 

# Cloud removal using efficient cloud detection and removal algorithm for high-resolution satellite imagery

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2015 Article



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International Journal of Computer Applications in Technology archive
Volume 51 Issue 1, April 2015

Original Articles

# Improving segmentation accuracy for detecting deforestation using texture feature derived from Landsat 8 OLI multispectral imagery

Menaka E & Suresh Kumar S

Pages 169-181 | Received 10 Jun 2014, Accepted 20 Mar 2015, Published online: 17 Feb 2017

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PMID: 26509188

# Hybrid RGSA and Support Vector Machine Framework for Three-Dimensional Magnetic Resonance Brain Tumor Classification

R. Rajesh Sharma [1,*] and P. Marikkannu [2]

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## Abstract

Go to:

A novel hybrid approach for the identification of brain regions using magnetic resonance images accountable for brain tumor is presented in this paper. Classification of medical images is substantial in both clinical and research areas. Magnetic resonance imaging (MRI) modality outperforms towards diagnosing brain abnormalities like brain tumor, multiple sclerosis, hemorrhage, and many more. The primary objective of this work is to propose a three-dimensional (3D) novel brain tumor classification model using MRI images with both micro- and macroscale textures designed to differentiate the MRI of brain under two classes of lesion, benign and malignant. The design approach was initially preprocessed using 3D Gaussian filter. Based on VOI (volume of interest) of the image, features were extracted using 3D volumetric Square Centroid Lines Gray Level Distribution Method (SCLGM) along with 3D run length

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# AN EFFICIENT LIVER SEGMENTATION USING KERNEL SPARSE CODING AUTOMATED (KSCA) APPROACH

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**ABSTRACT**

Computed Tomography (CT) images have been widely used for diagnosis of liver disease and volume measurement for liver surgery or transplantation. The approach is presented with respect to liver segmentation, but it can be easily extended to any other soft tissue by setting appropriately the values of the parameters for the splitting and merging algorithm and for the region growing refinement step. Sparse coding with data-adapted dictionaries has been successfully employed in several image recovery and vision problems. A novel, automated segmentation technique for detecting affected region in liver was proposed in this paper. In the new approach, we constructed ensemble kernel matrices using the pixel intensities and their spatial locations, and obtained kernel dictionaries for sparse coding pixels in a non-linear feature space. The resulting sparse codes were used to train an Extreme Learning Machine (ELM) classifier that determines if a pixel in the image belongs to an affected region. From the experimental results using ten test datasets distributed for the competition, it was confirmed that our method kernel sparse coding based liver segmentation performs better than previous methods or models.

**Keywords:** liver disease, segmentation, auto-context model (ACM), kernel sparse coding automated approach, ELM.

## INTRODUCTION

In recent years, medical image segmentation has become an active area of research and it attracts more and more researchers for novel innovations. Image segmentation automatically explores the internal structures of the patient, which may be anatomical (organs) and pathological (lesions). Automatic segmentation of lesions in a large image database has attracted the attention of several researchers as it assists in diagnosis [1], by identifying possibly forgotten lesions, and also to speed up the process of analysis. Liver is one of the most important organs of the human body. When it is affected by a tumoral pathology, it is possible to operate it by cutting the damaged portion. But the segmentation has to be done with the rules of volumetric and very specific vascularization. The medical imaging is then used to detect and visualize the internal structures. These structures do not appear in a single image, but need several acquisitions which will therefore be compared. The tumoral or hepatic volumetric is possible only after a period of segmentation of these images. Liver analysis plays a vital role in the therapeutic strategy for hepatic diseases. Therefore, the automatic segmentation of the liver has influenced a number of researchers with its importance and it assists in diagnosis of liver diseases such as steatosis, fibrosis, etc. Segmentation of a liver from a three dimensional CT volume serves as the initial process in image-based hepatic investigations [2, 3]. Even though a number of techniques have been developed and available in the literature, fully automatic liver segmentation from a 3D volume is still a challenging factor due to the large variations in liver shapes and in the intensity pattern inside and along liver boundaries.

The main aim of the present research work is to develop a novel approach for automatic liver segmentation to obtain its internal structures and tumors in a more efficient manner. Auto-Context Model (ACM) has been used in the automatic liver segmentation approach. The present research work extends the approach of HongweiJi in [14] which used the ACM model for segmentation. The present research work uses kernel Sparse Coding Automated approach for liver segmentation which overcomes the limitations in ACM approach.

## PREVIOUS WORKS

Max-Flow/Min-Cut method [4] this approach is a semi-automatic segmentation of the liver depending on graph theory and more particularly on the "Graph Cuts". In this scenario, the issue of segmentation is regarded the separation of an image into two classes "object" and "bottom". This approach for semi-automatic segmentation integrates some of the voxels of the volume to one of these two classes. This initial association acts then as base of training for the ultimate segmentation of the volume. This technique implements an energy minimization approach based on partitioning a graph into two sub-graphs by cutting minimum capacity.

Bae *et al.* [5] used simple thresholding and logic functions to attain the sketch of the liver before smoothing the boundary using B-splines. Gao *et al.* [3] extended the work through mathematical morphology on the threshold image to partition the liver from other organs, before refining the obtained contour with a Fourier-based deformable contour model. The drawback of both of these techniques is in the initial thresholding step where it is tough to set upper and lower threshold limits that separate the liver effectively, without taking into account the neighboring tissues such as the kidneys and the spleen. Thus, the initial starting point for the boundary refinement process is based on the inaccurate thresholding step.


Wireless Personal Communications
September 2015, Volume 84, Issue 1, pp 99–121 | Cite as

# Effectual Web Content Mining using Noise Removal from Web Pages

Authors | Authors and affiliations

P. Sivakumar

Article
First Online: 24 April 2015



## Abstract

Web mining is an emerging research area due to the rapid growth of websites. Web mining is classified into Web Content Mining (WCM), Web Usage Mining and Web Structure Mining. Extraction of required information from web page content available on World Wide Web (WWW) is WCM. The WCM is further classified into two categories first category is to directly mine the content on documents and second category is to mine the content using search

# Complex circuit model analysis using CDTA and SNAP

**Article** *in* International Journal of Applied Engineering Research 10(3):7937-7943 · January 2015 *with* 17 Reads
Cite this publication

**G. Sridhar**

Abstract

# Low area wallace multiplier using energy efficient CMOS adder circuit analysis in instrumentation

**Article** *in* International Journal of Control Theory and Applications 8(2):505-512 · January 2015

Cite this publication

**G. Sridhar**

**T. Reenaraj**

Abstract

In most digital and high performance systems such as Microprocessor,FIR filter and Digital Signal Processor,Multiplier plays an important role.In this paper,the multiplier offers less area and power consumption is reduced. To reduce the hardware component, Energy efficient CMOS full adder plays an important role in Wallace tree multiplier.Modified Wallace multiplier have minimum adders than Standard Wallace Multiplier.In this paper,the energy efficient CMOS full adder is used in the modified Wallace multiplier at the place of full adder in the standard Wallace multiplier in order to reduce area and power consumption.

# An efficient lifting scheme architecture for 2D discrete wavelet transform

**Article** · January 2015 *with* 10 Reads
Cite this publication

V. Vaishnavi

M. Thamarai

Abstract

Journal of Scientific & Industrial Research
Vol. 74, January 2015, pp. 38-42

# Analysis of Node Clustering Algorithms on Data Aggregation in Wireless Sensor Network

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One of the most important constraints to be studied in Wireless Sensor Networks (WSNs) is its life time. There are two typical data mining processes that support to reduce the energy consumption of WSN is clustering and data summarization. One of the primary goals of node clustering in WSN is in-network preprocessing that aims to obtain qualified information and to limit the energy consumed. A clustering algorithm is composed of three parts first electing cluster head (CH), selection of cluster membership and transferal data from members to CH.CH relays only one of the aggregated or compressed data packet to sink/ base station. In this paper a brief comparative study is made from different research proposals, which suggests different cluster head selection approaches for data aggregation. The algorithms under this study are Voronoi based K-means clustering algorithm, Voronoi Fuzzy C-means clustering algorithms and Voronoi based Genetic clustering algorithm. Significant factors for evaluating and comparing these algorithms are defined, analyzed and summarized. It has been assumed that the sensor nodes are randomly distributed and are not mobile, the coordinates of the base station (BS) and the dimensions of the sensor field are known.

**Keywords:** Wireless sensor network, Clustering algorithms, Voronoi diagram,k-means, Fuzzy, Genetic, Data aggregation.

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# AN EFFICIENT LIFTING SCHEME ARCHITECTURE FOR 2D DISCRETE WAVELET TRANSFORM

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**ABSTRACT**

A high-speed and reduced-area lifting architecture for 2D Discrete Wavelet Transform computation and the 2-D DWT Image Decomposition is proposed in this work. Lift scheme is one of the wavelet computation techniques. Prior DWT architectures are mostly constructed on the basic lifting scheme or the flipping structure. In order to attain a critical path with only one multiplier, at least four pipelining stages are mandatory for one lifting step, or a large temporal buffer is required. In this work, modifications are made in the lifting scheme as the Radix-8 booth multiplier is used and the intermediate values are recombined and stored to reduce the number of pipelining stages and the registers. The two-input/two-output parallel scanning architecture is adopted in the design. The detailed analysis is performed to compare the proposed architecture with the modified architecture in terms of hardware complexity computation time and Power consumption. In the proposed architecture, the number of LUTs reduced to 50%, power consumption is reduced to 89mw, and computation time delay is reduced to 36.6% when compared to the conventional Lifting Scheme.

**Keywords:** discrete wavelet transforms (DWT), flipping structure, lifting scheme, pipeline, VLSI architecture.

## 1. INTRODUCTION

The Discrete Wavelet Transform (DWT) has become a very versatile signal processing tool over the last decade. It has been effectively used in signal and image processing applications. The advantage of DWT over other traditional transformations is that it performs multire solution analysis of signals with localization both in time and frequency. The DWT is being increasingly used for image compression today since it supports features like progressive image transmission, image manipulation, region of interest coding, etc. The coding efficiency and the quality of image restoration with the DWT are higher than those with the traditional discrete cosine transform. Furthermore, it is easy to attain a high compression ratio. So the DWT is widely used in signal processing and image compression, such as MPEG-4, JPEG 2000, and so on [1], [2]. Traditional DWT architectures [3], [4] are based on convolutions. Then, the second-generation DWTs, are based on lifting algorithms are proposed [5], [6]. Compared with convolution-based, lifting-based architectures require lesser computation complexity and also require less memory. Directly mapping these algorithms to hardware [7] leads to relatively long data path and low efficiency.

Several different architectures based on the lifting scheme have been proposed. An efficient folded architecture (EFA) with low hardware complexity is discussed by G. Shi; W. Liu *et al* [8]. However, computation time of EFA is quite long. A pipelined architecture is discussed by B. F. Wu and C. F. Lin [9], to reduce the critical path to one multiplier and limit the size of the temporal buffer to 4N, high processing speed cannot be achieved because it has one input and one output. The parallel 2-D DWT is discussed by Y. K. Lai, L. F. Chen, and Y. C. Shih [10], the design is a pipelined two-input/two output architecture, and a 2 × 2 transposing module with four registers, the critical path delay is one Tm. But it needs eight pipelining stages to complete the 1-D DWT and it requires 22 registers for computation. The flipping structure is discussed by C.-T. Huang, P.-C. Tseng and L.-G. Chen [11]. But, the flipping structure has a large temporal buffer, and lead to longer critical path delay due to fewer pipelining stages, various efficient lifting architectures are discussed in [12], [13], [14] and [15]. High speed VLSI implementation of 2D DWT is discussed in [16]. Different pipelined architectures are discussed in [17], [18] and [19]. An efficient multiplier less design is discussed in [20] and Lifting structure with Booth multiplier is discussed in [21].

Further optimization on the lifting scheme is proposed to overcome drawbacks in former works and reduce sizes of the logic units and the memory without loss of the throughput. The number of pipelining stages and registers is reduced, by recombining the intermediate values of the row and column transforms and keeping the critical path delay as Tm. In addition, a novel architecture is established to implement the 2-D DWT based on the above modified scheme. To reduce the size of the transposing buffer the parallel scanning method is employed. As a result, the design achieves higher efficiency.

## 2. PROPOSED ALGORITHM

The existing architectures for implementing the DWT are mainly classified into two categories: convolution based and lifting based approach. The lifting-based architectures have advantages over the convolution-based in computational complexity and memory requirement. The lifting scheme was first proposed by Daubechies and Sweldens in 1996 [5], [6]. It illustrates that every finite-impulse response wavelet or filter bank can be factored into a cascade of lifting steps. The polyphase matrices for the wavelet filters can be decomposed into a sequence of alternating upper and lower triangular matrices multiplied by a diagonal

Circuits Syst Signal Process
DOI 10.1007/s00034-015-0184-4

# Low Voltage High Output Impedance Bulk-Driven Quasi-Floating Gate Self-Biased High-Swing Cascode Current Mirror

Nikhil Raj[1] · Ashutosh Kumar Singh[2] · Anil Kumar Gupta[1]

Received: 17 October 2014 / Revised: 9 October 2015 / Accepted: 10 October 2015


**Abstract** A low voltage self-biased high-swing cascode current mirror using bulk-driven quasi-floating gate MOSFET is proposed in this paper. The proposed current mirror bandwidth and especially the output impedance show a significant improvement compared to prior arts. The current mirror presented is designed using bulk-driven and bulk-driven quasi-floating gate N-channel MOS transistors, which helped it to operate at very low supply voltage of ±0.2 V. To achieve high output resistance, the current mirror uses regulated cascode stage followed by super cascode architecture. The small-signal analysis carried out proves the improvement achieved by proposed current mirror. The current mirror circuit operates well for input current ranging from 0 to 250 μA with good linearity and shows the bandwidth of 285 MHz. The input and output resistances are found as 240 Ω and 19.5 GΩ, respectively. Further, the THD

# An efficient super peer selection algorithm for peer-to-peer (P2P) live streaming network

**Article (PDF Available)** *in* Journal of Theoretical and Applied Information Technology 70(1):1-8 December 2014 *with* 192 Reads

Cite this publication

**Narayanan Madeshan**
8.28 · Malla Reddy College of Engineering, Hyderabad, ...

**Arun Chokkalingam**
15.05 · RMK College of Engineering and Technology, ...

## Abstract

Peer-to-Peer (P2P) computing is the fast emergent overlay network distribution system, the main gains of P2P is each peer in the network can act autonomous. Super peer network representation is an advancing design of centralized topology embedded in a decentralized system in the Peer-to-Peer system. Super peer overlay helps to improve the performance of P2P applications such as live streaming. To avoid the risk of super peer node failure in the network communication model, this paper proposes the gossip communication based established protocol and firefly algorithm to select the fail over super peer node from a cluster of peers in order to maintain the reliability, scalability and robustness of the network. We simulated this network model in peersim simulator to accomplish great performance.

Article

# Authentication based on keystroke dynamics using stochastic diffusion algorithm

V. Chandrasekar, S. Suresh Kumar & T. Maheswari

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# Low Power Circuit Design Techniques: A Survey

Nikhil Raj, Ashutosh Kumar Singh, and Anil Kumar Gupta

***Abstract*—This paper presents a detail on various techniques to realize low voltage low power circuit. The techniques discussed are conventional gate-driven (GD), floating gate (FG), quasi-floating gate (QFG), bulk-driven (BD), and BD-QFG. The comparative analysis results in best performance achieved by BD-QFG approach. As BD circuits are well known approach for low power design, the combined effect QFG in bulk driven circuit results in enhanced performance. The complete analysis has been carried out in industry specific node UMC 0.18 micron technology with the help of HSpice simulator.**

***Index Terms*—Quasi-floating gate, bulk-driven, bandwidth, power.**

## I. Introduction

Low power and efficient portable equipments demands are rising in day-to-day life. Moreover, a large number of research articles can be found to meet these goals specially when talking about medical equipments. The common trend for analyzing low power circuits is the lowering of supply voltage [1]. But the threshold voltage of metal-oxide-semiconductor (MOS) transistor acts as a main obstacle in lowering of voltage supply after certain limit. The supply must be at least equal to or greater than the threshold of MOS transistors used in circuit realization. The rapid scaling of CMOS processes in nanometer demand low supply which helped digital circuit realization at very low power consumption but it is not true for analog circuit realization. The associated drawback is short channel effect which results in offset, low gain stages, decreased impedance etc. Configuring, the whole system both digital and analog on single chip requires different levels of biasing currents which is fulfilled via current mirrors. To design efficient current mirror with standard gate driven MOSFET that to at low power supply is not possible. To overcome several non-conventional methods like level shifter, sub-threshold, FG, QFG, bulk has been proposed [2].

Every technique has its advantage and disadvantages. Among all, the bulk driven MOS transistors are encouraged for realizing the low power circuits. In bulk-driven MOS transistors, the gate terminal is biased by dc potential to turn on the MOSFET whereas the signal is applied between the bulk and the source of the MOS transistor and causes the drain-to-source current flow. The problems associated with bulk as processing input is its lower transconductance and moreover, requires a twin-well process for fabrication. The effect of decreased transconductance is visible by poor open-loop gain and hence the unity-gain bandwidth. In this respect, the most find suitable approach which is gaining interest nowadays is the combined effect of bulk with QFG MOS transistors. The approach is named as BD-QFG technique [3]. This approach not only work well at low supply but do not require increased the chip area as like FGMOS and QFGMOS.

The objective of this paper is on emphasizing the interest to use BD-QFG transistors which results in enhanced small signal parameter for analog circuit realization. The advantage of the technique is exploited by comparing it with different low power techniques through an example of common source amplifier. Further, a current mirror is also proposed. The HSpice results confirm the BD-QFG to be a better option for low power application. The paper is organized as follows: Section II of the paper covers the summary of low power techniques. Section III comprises the current mirror realization using techniques detailed in Section II. The simulation results in HSpice on 0.18 $\mu m$ technology are detailed in Section IV. Section V concludes the conclusion of paper.

Manuscript received March 22, 2014; revised May 13, 2014.

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## II. Low Power Techniques

### A. Floating Gate (FG) and Quasi-Floating Gate (QFG)

FGMOS and QFGMOS [4] based circuits can operate at much lower supply. The advantage of these approaches lies in terms of linearity as the input coupling capacitor divider makes input signal to attenuate and increases the linearity. The architecture of N-channel FGMOS (M1) is shown in fig. 1 (a). Under DC analysis, the gate of M1 is at floating potential. The input capacitance is formed by second layer of ploy silicon over the poly layer of gate. The input capacitor $(C)$ formed is named as poly-poly layer (PIP) capacitor. Using the law of charge conservation at floating gate $(V_{FG})$, the floating gate voltage is given as

$$V_{FG} = \frac{1}{C_T}\left(CV_{IN} + C_{GS}V_S + C_{GD}V_D + C_{GB}V_B + Q_0\right) \quad (1)$$

where $C_T = C + C_{GS} + C_{GD} + C_{GB}$ , $C_{GS}, C_{GD}, C_{GB}$ are the parasitic capacitance associated the floating gate node, and $Q_0$ is the initial charge trapped in the floating gate during fabrication. The trapped charge $Q_0$ at floating gate [5] and attenuation of effective gate input voltage due to input capacitor divider were the main obstacles with FGMOS. Many research articles came to overcome these issues at the expense of extra circuitry. Later, with introduction of QFGMOS (architecture similar to FGMOS) associated drawbacks of FGMOS were no more issues. The schematic of QFGMOS (M1) is shown in Fig. 1 (b). The only difference

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# Voronoi Fuzzy Clustering Approach for Data Processing in WSN

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# ENHANCEMENT IN WORKING PERFORMANCE OF CUSTOM POWER DEVICE USING DIFFERENT CONTROLLING METHODS

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**ABSTRACT**

With increasing applications of nonlinear and electronically switched devices in distribution systems and industries, Power-Quality (PQ) problems, like harmonics, neutral current elimination, reactive power has become an unavoidable issue. The Unified Power Quality Conditioner (UPQC) of shunt and series inverter having a common Direct Current (DC) link. The UPQC in distribution has made it possible to mitigate the following problems effectively. The UPQC has been realized by Voltage Source Inverter (VSI). The controlling algorithm determines the production of controlling signals which is used by the VSIs for the generation of their gating signals. The variation of performance of the device occurs with the different controlling algorithms .This paper proposes the comparison of performance of two mainly used algorithms namely Particle Swarm Optimization (PSO) and Genetic Algorithm (GA). The two controlling algorithms are used in a Fuzzy Controller (FC). In addition to this Synchronous Reference Frame (SRF) theory with modified Phase Locked Loop (PLL) is used in both cases for better performance. The main PQ issues concentrated in this paper relates to reactive power compensation, harmonics elimination and neutral current elimination. The performance is being investigated in an IEEE 118 bus system. Simulation outputs have been obtained through MATLAB/SIMULINK.

**Keywords:** *Power Quality, Unified Power Quality Conditioner, Particle Swarm Optimization, Synchronous Reference Frame, Genetic Algorithm.*

## 1. INTRODUCTION

Electric power systems are real-time energy delivery systems. An electric power system is a network of electrical components used to supply, transmit and use electric power. This can be broadly divided into the generators that supply the power, the transmission system that carries the power from the generating centers to the load centers and the distribution system that feeds the power to nearby homes and industries.

Electric PQ is a term which has captured increasing attention in distribution system. The measure of PQ depends upon the needs of the equipment that is being supplied. Usually the term PQ refers to maintaining a sinusoidal waveform of bus voltages at rated voltage and frequency. There are two approaches to the mitigation of PQ problems [1]. The first approach is called load conditioning, which ensures that the equipment is less sensitive to power disturbances, allowing the operation even under significant voltage distortion. The other solution is to install line conditioning systems that suppress or counteracts the power system disturbances.

A flexible and versatile solution to voltage quality problems is offered by Active Power Filters (APF). Currently they are based on Pulse Width Modulation (PWM) converters and connect to low and medium voltage distribution system in shunt or in series [2]-[5]. The Power Angle Control (PAC) concept is suggests that with proper control of shunt and series inverter. Just as facts improve the reliability and quality of power transmission system, the custom power enhances the quality and reliability of power that is delivered to customers.

The application of power electronics to power distribution system for the benefit of a customer or group of customers is called custom power devices. Like Flexible AC Transmission System (FACTS), the term custom power use for distribution system. The UPQC is one of the key custom power device,

# Analysis of deforestation using threshold based clustering algorithm

**Article** *in* International Journal of Applied Engineering Research 9(23):21031-21054 · January 2014 *with* 19 Reads



**E. Menaka**

**S. Suresh Kumar**
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Abstract

The focus of the paper is to analyze the deforestation in different levels using a threshold based clustering algorithm. It underlines the percentage of degradation; it is a prime factor to predict forest fire. The functioning of the proposed algorithm is based on the cluster defined and the threshold calculated by the algorithm. Depends on the forest type, the cluster is defined. If the cluster is 3, it gives 3 levels forest cluster, otherwise if it is 5 the resulting forest regions are like as 0%-20%, 21%-40%, 41%-60%, 61%-80% and above 80% of dense. Secondly, the threshold value is calculated based on the mean and maximum of red pixel in input image, is used to perceive the precise dry pixel in each forest region. The calculated threshold value is applied to each cluster generated by the k-means algorithm and the experimental results indicate that the proposed algorithm KAT outperforms than the K-Means algorithm, Threshold algorithm, Watershed and Watershed with a threshold to compute the deforestation in different levels in remote sensing images. It can be a highly efficient algorithm to detect the possibilities of forest fire

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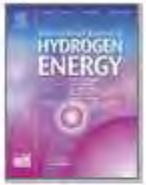


# Experimental investigation on scaling and stacking up of proton exchange membrane fuel cells

P. Karthikeyan, P. Velmurugan, Abby Joseph George, R. Ram Kumar, R.J. Vasanth

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https://doi.org/10.1016/j.ijhydene.2014.05.086

International Journal of Computational Intelligence Systems

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# Voronoi Fuzzy Clustering Approach for Data Processing in WSN

**Authors**

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Ayyavoo Karthikeyan*, Kulendran Balamurugan and Anbarasu Kalpana

# The effect of sodium hydroxide treatment and fiber length on the tensile property of coir fiber-reinforced epoxy composites

**Abstract:** The aim of this study is to investigate the effect of surface modification through sodium hydroxide (NaOH) treatment and fiber length on the tensile strength of coir fiber of reinforced epoxy composites. The coir fibers were treated with 2%, 4%, 6%, 8%, and 10% concentration of NaOH separately for 10 days. The tensile strength of untreated and alkali-treated fiber was measured. For each group of the coir fiber, experiments were conducted on different fiber lengths, namely, 10, 20, and 30 mm. The experimental results showed that increasing the NaOH concentration leads to a decrease in fiber diameter in a linear fashion. This reduction in diameter naturally ends up with reduced tensile strength. The treated coir fiber was used as a reinforcement and epoxy as a matrix to fabricate the composites. The tensile strength of different samples of composites was measured. Increased NaOH concentra-

of these materials like plastics are widely used as they have attractive mechanical properties. However, these materials have objectionable properties such as nondegradability, leading to serious environmental problems. Intensive research is going on throughout the world to replace the above materials with biodegradable substitute materials having comparable or better mechanical properties. Composites using these biodegradable materials are being tried widely for their various advantages. Some of the advantages of using biodegradable materials on composites are their availability worldwide, strength-to-weight ratio, high fatigue life, etc. [1]. Natural fibers from cultivated plants such as coconut fiber, flax, sisal, and cotton have been used in a large variety of products from clothes to house roofing. Today these fibers are appraised as environmentally correct materials owing to their bio-

# The effect of SLS treatment on tensile property of coconut fiber reinforced epoxy composites

**Article** *in* Iranian Journal of Science and Technology: Transactions of Mechanical Engineering 38(M1):157-166 · May 2014 *with* 87 Reads

Cite this publication

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# Computer Controlled Intrusion-Detector and Automatic Firing-Unit for Border Security

VENKATAPATHI PALLAM[1], P.BHEERENDRA KUMAR[2]

**Abstract:** This paper describes a novel computer-controlled intrusion-detector and automatic firing unit, which may be used for the surveillance of borders, either of a country, or of areas requiring high security, especially in regions of extreme climatic conditions, where it is difficult to deploy personnel. This system not only detects intrusion but also provides a video-coverage of the suspicious area, for remote vigilance, via a satellite based communication system. It is also provided with automatic firing mechanisms which can be used to automatically locate and fire at the target. Thus, several kilometers of the borders, which would have otherwise required several hundred personnel, can be effortlessly monitored with this system, with only a few personnel. Since, the actual firing occurs only after an authoritative personnel has doubly confirmed the presence of an intruder, chances of firing at innocent people are completely ruled out. As thermal cameras are used for imaging, this system is immune to changes in ambient conditions, and therefore, is equally suited for operation during the night. This paper also throws light on the prototype of this system, which has been successfully developed.

**Keywords:** Automatic Firing Unit, Intrusion Detection, MATLAB, AT Mega, Border Security.

## I. INTROCUTION

Reckoning the increasing security threats, it becomes very necessary to cautiously defend the borders of a country, or of any other areas demanding extreme security. However, owing to the vastness and the extreme climatic conditions which may be prevalent in these regions, it becomes practically impossible to deploy personnel throughout the borders. Hence, the need for an automated device is felt, which can render the efficient guarding of the frontiers, without any compromise on safety. This paper attempts to throw light on the design of a "Computer Controlled Intrusion Detector and Automatic Firing Unit for Border Security" and its features. This system, equipped with Thermal cameras and a Digital Signal Processing unit, can not only detect intrusion attempts, but also provide a video coverage of the suspicious area, for remote vigilance. Moreover, it is equipped with mechanisms for automatically firing at the target. This paper also discusses its prototype, which has been successfully developed, not with all the above-said features though, due to practical difficulties. The paper is organized as follows: Section II discusses the system configuration and Section III describes Components or Subsystems Description. A Wireless Camera explained in Section IV and. A Result has been illustrated in Section V and Finally conclusion of this paper in Section VI.

## II. SYSTEM CONFIGURATION

A block diagram of this system is depicted in Fig.1. This system uses surveillance camera for imaging, as they can be used regardless of the amount of ambient light, rendering its usage in the night as well. These cameras are lined up along the borders, at a certain distance apart from each other, depending on the range of the cameras. These cameras which continuously scan the corresponding areas of the border are in turn connected to a Digital Signal Processing (DSP) [2] unit, which accomplishes the task of intrusion detection by continuously comparing the images obtained, with a reference image and also with the images captured previously. Any sign of change in the successive images indicates dubious movements in that area, which would result from intrusion. This is immediately reported, by means of a wireless communication system comprising a satellite, to a centralized control room, which may be located far away from the borders, in a convenient location.

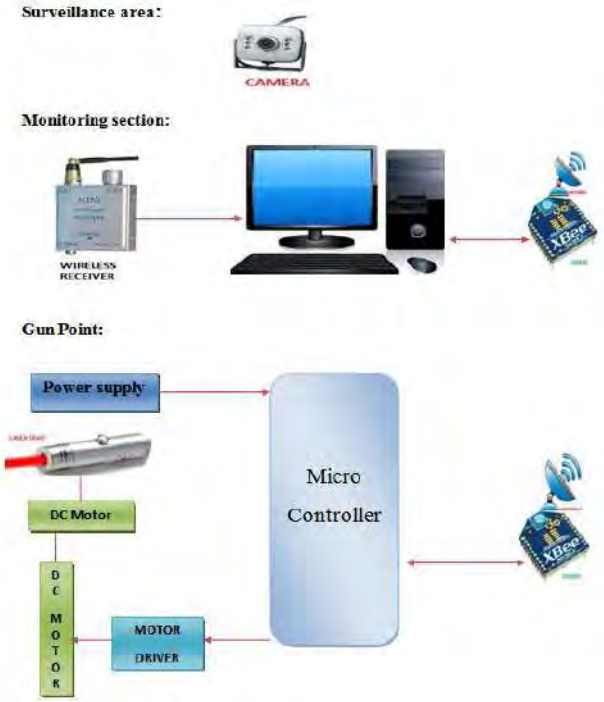


**Fig.1. The Block Diagram.**

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# Vehicle Position of Self-Recognition using Ultra High Frequency Passive RFID Tags

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[2]Assistant Professor, Malla Reddy College of Engineering, Hyderabad, India.

**Abstract:** This paper proposes a method that enables self recognition of a mobile vehicle's current position by utilizing ultrahigh frequency (UHF) passive radio-frequency identification (RFID) tags. The proposed method can be used in real industry environments such as complex storage warehouses where many different goods are dispersed throughout a wide area. In particular, the proposed method makes use of two UHF RFID readers with identical emission configuration attached to a vehicle to identify a reference RFID tag. By utilizing the received signal strength indicator obtained by the readers from the reference RFID tag, the precise position of the moving vehicle can be obtained. The experiments prove the effectiveness of the proposed method in accurately estimating the vehicle position.

**Keywords:** Localization, Radio-Frequency Identification (RFID) Passive Tags, Ultrahigh Frequency (UHF) RFID Reader.

## I. INTRODUCTION

During the past five years, the ultrahigh frequency (UHF) passive radio-frequency identification (RFID) technology has been widely adopted as a direct response to the needs of the supply chain management. When products affixed with UHF passive RFID tags ("Tag(s)") are released, they travel from manufacturing plants to warehouses to retail shops. For supply chain management operators, it would be of great interest to be able to detect the current location of such products in real time. In real-life applications, since most products are shipped on "Global Positioning System" tracked vehicles, their locations can be readily identified while they are en route. However, in order to identify the current locations of such products in an indoor environment, one needs to either manually record their exact locations or locate the indoor vehicles carrying such products. Generally, to identify momentary locations of such vehicles, odometry is widely used. Odometry enables a vehicle to estimate the total distance traveled from a starting point. However, odometry is often inaccurate since estimation errors accumulate over time without corrections by external reference signals. Thus, there has been a growing interest in supplementing odometry to improve the localization of mobile vehicles, particularly by using Tags [2]–[9].

The Tag operates by receiving power from a reader, and the responding reader can simply recognize the presence or absence of a Tag within its reading zone by receiving the received signal strength indicator (RSSI) or read rate from the Tag [10]. Therefore, it carries the inconvenience of inaccurate calculations of the distance between a reader and a target Tag [6], [12]. Also, the RSSI and read rate often become distorted due to signal fading, interference from physical obstacles, and other environmental factors. Furthermore, in situations where many identical products are to be stored in a single warehouse, they must be sufficiently placed apart from each other in order to be distinguishable, depending on the position estimation spatial error. Due to such limitations, UHF passive RFID technology lost popularity despite its low cost and ease of use. There have been many studies in which scholars have distinguished a strong signal zone from a weak signal zone of a reader so that the location of the Tag situated within a reading zone of the reader can be statistically deduced [4], [11]. However, these studies have not considered real-life interferences that can hinder or cause changes in signals, resulting in the inaccurate estimation of the actual location of the target Tag. Also, there have been studies on various statistical methods, use of multiple antennas, use of directional antennas, etc., to overcome the inaccuracies caused by interference or noise from the surrounding environment.

In one such study the signals obtained from different rotating antennas were fused to create a pre-map based on the reading distances, and such values were compared with the values of the target Tag to increase the accuracy used multiple directional and steerable antennas to increase accuracy. Similarly, Kim et al. improved accuracy by using the direction of arrival of Tag signals gathered from dual-directional antennas utilized multiple antennas that were situated so that their reading zones would overlap, and whenever a Tag was simultaneously recognized by two or more antennas, such point of recognition was recorded to improve the accuracy of position estimation. However, the latter studies did not sufficiently reflect the inherent limitations of the Tag, which often suffers from interferences caused by nearby objects or Tag orientation, resulting in disturbance of the Tag detection range. According to Bekkali

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**RESEARCH ARTICLE**

# MULTI-WAVELET BASED ON NON-VISIBLE WATER MARKING

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**Abstract**

**The paper presents multi-wavelet based on non-visible water marking. In the past, DWT-DCT technique has less copyright protection and content authentication. The proposed method is solved referred problems. In this paper, firstly apply the multi wavelet to improve image resolution at LL sub band. Secondly, embedded the important data (watermark image) into host multimedia, and it can be used in digital right management, authentication and data hiding. The experimental result shows that the watermark scheme has strong robustness, and can embed much more data.**

***Index terms:*** *DWT-DCT; multi-wavelet; watermarking*

## I. INTRODUCTION

As digital technology pervades our society, a vast amount of medical images now exists in electronic format for storage [1] and transmit. Ubiquitous wired and wireless networks make it possible to access and snatch patient's data from anywhere, to promote high quality care for patients. Current, encryption and access control technologies are difficult to meet the requirements of the medical image's information security [2]. Hence, how to protect the medical image from being pirated has been an urgency problem in information security field [3]. The watermarking technology can be an effective way to solve this problem. This kind of technology put patients' information as a digital watermarking hidden in medical images. Currently the field of digital watermarking for medical research focused on the spatial domain and transform domain (DCT, DFT and DWT), which can be implemented by changing some pixel gray-scale values in the space domain or by changing the values of coefficients in the transform domain to embed watermark. Since both the new Joint Photographic Experts Group 2000 (JPEG2000) and new Moving Picture Experts Group 4 (MPEG-4) use DWT, a watermarking algorithm that uses DWT [4] is compatible with them. In order to protect the medical image's lesion zone, the general approach of the medical watermarking often embeds the watermarking into the Region of Non-Interest (RONI)[5]. The ROI of the medical image refers to the area of lesion that contains the important pathological features. If the embedded

 

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# Low power high output impedance high bandwidth QFGMOS current mirror

Nikhil Raj [a], Ashutosh Kumar Singh [b], Anil Kumar Gupta [a]

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# Low-voltage bulk-driven self-biased cascode current mirror with bandwidth enhancement

**Article** *in* Electronics Letters 50(1):23-25 · January 2014 *with* 74 Reads
DOI: 10.1049/el.2013.3600


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27.85 · National Institute of Technology, Kurukshetra

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Materials & Design

Volume 57, May 2014, Pages 1-9


Technical Report

# Effect of shoulder diameter to pin diameter ($D/d$) ratio on tensile strength and ductility of friction stir processed LM25AA-5% SiCp metal matrix composites

P. Vijayavel [a], V. Balasubramanian [a], S. Sundaram [b]

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https://doi.org/10.1016/j.matdes.2013.12.008

Ayyavoo Karthikeyan*, Kulendran Balamurugan and Anbarasu Kalpana

# The effect of sodium hydroxide treatment and fiber length on the tensile property of coir fiber-reinforced epoxy composites

**Abstract:** The aim of this study is to investigate the effect of surface modification through sodium hydroxide (NaOH) treatment and fiber length on the tensile strength of coir fiber of reinforced epoxy composites. The coir fibers were treated with 2%, 4%, 6%, 8%, and 10% concentration of NaOH separately for 10 days. The tensile strength of untreated and alkali-treated fiber was measured. For each group of the coir fiber, experiments were conducted on different fiber lengths, namely, 10, 20, and 30 mm. The experimental results showed that increasing the NaOH concentration leads to a decrease in fiber diameter in a linear fashion. This reduction in diameter naturally ends up with reduced tensile strength. The treated coir fiber was used as a reinforcement and epoxy as a matrix to fabricate the composites. The tensile strength of different samples of composites was measured. Increased NaOH concentration (up to 4%) in fiber treatment was found to increase the tensile strength, and further increase in NaOH concentration reduces the tensile strength; also, increased fiber length was found to increase in tensile strength. The maximum tensile strength of the composite was observed at 4% NaOH-treated samples. On the basis of the nonlinear regression analysis, the tensile strength equation was proposed for coir fiber-reinforced epoxy composites.

**Keywords:** coir fiber; fiber length; regression analysis; sodium hydroxide treatment; tensile strength.

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## 1 Introduction

The field of modern engineering makes use of innumerable engineering materials for different applications. Some of these materials like plastics are widely used as they have attractive mechanical properties. However, these materials have objectionable properties such as nondegradability, leading to serious environmental problems. Intensive research is going on throughout the world to replace the above materials with biodegradable substitute materials having comparable or better mechanical properties. Composites using these biodegradable materials are being tried widely for their various advantages. Some of the advantages of using biodegradable materials on composites are their availability worldwide, strength-to-weight ratio, high fatigue life, etc. [1]. Natural fibers from cultivated plants such as coconut fiber, flax, sisal, and cotton have been used in a large variety of products from clothes to house roofing. Today these fibers are appraised as environmentally correct materials owing to their biodegradability and renewable characteristics [2]. Among the numerous natural fibers, coir fiber has shown a great potential in the composite field. Coir fibers are found between the husk and the outer shell of the coconut. The individual fiber cells are narrow and hollow, with thick walls composed of cellulose. They are pale when immature but later become hardened and yellowed as a layer of lignin is deposited on their walls. There are two varieties of coir. Brown coir is harvested from fully ripened coconut. It is thick, strong, and highly resistive to abrasion. It is typically used in mats, brushes, and sacking. Mature brown fibers contain more lignin and less cellulose than fibers such as flax and cotton and so are stronger but less flexible. White coir fibers are harvested from the coconuts before they are ripe. It is a $CO_2$-neutral material. These fibers are abundant, nontoxic in nature, biodegradable, less dense, and very cheap. The coir fiber can retain water to a high degree and is also rich in micronutrients [3, 4]. Coir fibers decompose in 20–30 years in nature; they can be regarded as an environmentally friendly material. Coir fiber may be used as a reinforcement material in composite production [5–9]. Monteiro et al. [10] have proved that lignin, pectin, and other impurities within the coir fiber are considered harmful for its adhesion to the matrix during the composite fabrication. Therefore, alkali treatment of coir fiber improves the adhesion to the polyester matrix and thus

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# The new approach to improve the impact property of coconut fiber reinforced epoxy composites using sodium laulryl sulfate treatment

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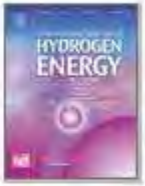


# Experimental investigation on scaling and stacking up of proton exchange membrane fuel cells

P. Karthikeyan, P. Velmurugan, Abby Joseph George, R. Ram Kumar, R.J. Vasanth

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https://doi.org/10.1016/j.ijhydene.2014.05.086

# Intelligent Risk Analysis Model for Mining Adaptable Reusable Component

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**Abstract**: *Every elucidation for today's quandary has been achieved in an easier prospect, with due respect to the experience gained by a normal man. The engineers too look out for the better way in the development cycle of software apart from its traditional approach. Software being implemented in almost every machine, is in the urge of being developed with many improvisation techniques but obeying the time and cost constrains. Adding to the available simplifications methodologies in the development phases, the proposed Intelligent Risk Analysis Model (IRAM) would abridge the limitations of an Object Oriented Program (OOP) developed for a new software product showing betterments in time and budget needed. An OOP would comprise of individual and exclusive objects with indicated functionalities. Recognizing the usage of the objects in the existing programs would eliminate the necessity of a new coding, thus the component could be reused if it cannot be designated any better. This methodology does a primary verification whether there are any components which match with the stated requirements in the database of programs (e.g., C++, Java, Perl and Python). Based on the analysis of the matched component, it is categorized into Exact Match (EM), Partial Match (PM) or the Rejected Match (RM) which denotes its chances of applicability into the new product. This analysis of the correspondence in the reused object depends on the defined four parameters tuple namely Expected Language (EL), Module Description (MD), Argument Description (AD) and the Usage Threshold (UT). The component that matches exactly EM can be directly incorporated into the new software product whereas if the component falls into the other category PM then it is subjected to additional tests, Rank (R) is allotted, Intelligent Report (IR) is prepared and measures for its updating as an EM are taken. The RM component is eliminated from the list of possible outcomes at once.*

**Keywords**: *Software engineering, software reusability, OOP, IR, cohesion and coupling, regression test.*

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## 1. Introduction

The software has been devised with the intention of reducing the workload, time and cost metrics. But the manpower and the resources required for the software development itself had to involve the mightier and expertise, obey the strict principles and the top of all to satisfy the end user. Despite many simplifications, the development phases need proper follow-up and alternative plans for maintaining the product on the right track. Any minor change/mistake in the proposed plan would cost the developer his entire effort to a waste [14].

The software development phases (analysis, design, coding, testing and implementation) include dedicated functionalities of each phase, organized at the last would yield the desired software product. The Analysis phase observes the requirements of the user/customer and the design phase is for the developer's team to design the best plan to carry out. The coding phase is for the switching into machine level code [14]. The testing is to obtain the conditions in which the product works and fails (under predicted conditions) [12]. Testing is secondly to ensure the reliability of the software in feasible extremes. Implementation is to establish the developed product in the original environment it is supposed to be [1].

## 2. Testing Object Oriented Programs

The Object Oriented Programming (OOP) has introduced new innovative and much easier attitudes to design the software product, diverse from that of the traditional programming disciplines. Adding to the advantages, reduced time to be designed and ease of structure, promotes its practice among the recent programmers [6, 12]. The OOP introduces out of the ordinary concepts such as encapsulation, inheritance, polymorphism and data abstraction. Inheritance helps to promote the reusability factor, in turn helping for the development of the software more rapidly [4, 8].

Reusability factor includes along with its merits, the risk of unstable conditions in the new environment [17]. The existing environment may be the best platform and the new platform requires some reformation to the coding in order to make it adapt with the new environment [1, 8]. Hence, a risk analysis model is obliged to eradicate the limitations and promise the compatibility of the reusable component [3, 4].

## 3. Proposed: Intelligent Risk Analysis Model (IRAM)

The urge of a suitable Risk analysis model among the numerous models [2, 10, 11], motivates the design of

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# OPTIMIZATION OF WEAR PARAMETERS OF GCI UNDER LUBRICATION AND COATING USING GRA

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***ABSTRACT***

***The tribological properties such as specific wear rate and coefficient of friction are the major concern in reciprocating engines. In this paper, sliding wear tests were conducted based on the Taguchi L27 orthogonal array (OA) under the circumstances of coated and lubrication and their results were analyzed using grey relational analysis. Load, sliding speed, sliding distance and their different environmental conditions are considered as the design parameters. The most significant parameter was found with their optimal solution using ANOVA. A confirmation test was carried out to validate the optimal results. It has been concluded that the hard coating of WC/C and 15W20 lubricant are the most significant conditions. Wear mechanisms were investigated using SEM images of the wear track.***

***KEYWORDS: Sliding Wear, Tribology, Taguchi Technique, GRA & Gravity Fed Lubrication (GFL)***

Original Article

## INTRODUCTION

Graphitic cast iron classified into three grades. Among the grade, flaky graphite shape structure of FGI has most suitable for wear resistance application [1]. GCI contains limited quantity of ferrite and graphite particles dispersed in the form of matrix of pearlite.This matrix of GCI has been used in most of the automobile parts and especially in piston rings, and cylinder liner application [2].

In literature survey many of the investigations concentrated to find the wear mechanism and the influence of the structure, hardness and the shape of graphite. Examining the destruction of GCI surfaces under dry sliding conditions, Angus and Lamb observed that the pearlitic structure provides good resistance to wear, while the presence of ferrite, which is soft and easily welded to the opposite surfaces, is undesirable. In mild wear regime at low load condition the free graphite emerges on the contact surfaces. Author finally justified the flaky graphite structure acts as a good lubricant at dry sliding condition between two contact surfaces. The same concept of pearlitic structure also accepted in an ASTM A247 type graphite flakes provides a good wear resistance in engine cylinder utility [3-5].

In lubrication experiment, a heavy duty oil is used to find the wear at different parameters and the specimen is tested by Gravity Fed Lubrication (GFL) method. Generally in hydrodynamic principal, fluid film can

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# THE DEVELOPMENT OF FIXED POINT THEORY-Review

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**Abstract:** *In this paper, we study the observations of progressive results in the fixed point theory. Given a review on some important results from start to at present scenarios.*

***Keywords:*** *Fixed Point, Metric Space, Contraction mapping*

**Subject Classification:** 54H25, 47H10

## 1. INTRODUCTION

The theory of fixed point is one of the most powerful tool of modern mathematical analysis. Theorem concerning the existence and properties of fixed points are known as fixed point theorem. Fixed point theory is a beautiful mixture of analysis, topology & geometry which has many applications in various fields such as mathematics engineering, physics, economics, game theory, biology, chemistry, optimization theory and approximation theory etc. Fixed point theory has its own importance and developed tremendously for the last one and half century. The purpose of the present paper is to study the development of fixed point theory

**Definition**: Let X be a non-empty set. A function $T : X \to X$ is called a self map on X . A point $z \in X$ is called a fixed point of a self map $T: X \to X$, if $T(z) = z$

For example the function $T : [0,1] \to [0,1]$ defined by $T(x) = x^2$ has exactly two fixed points . This function is uniformly continuous on [0, 1]
The function $S : R \to R$ defined by $S(x) = x + 1$ has no fixed point in R.

## 2. HISTORY OF FIXED POINT THEORY

In the 19th century The study of fixed point theory was initiated by Poincare and in 20th century developed by many mathematicians like Brouwer, Schauder, Kakutani, Banach, Kannan ,Tarski , and others.

**Brouwer fixed point theorem**

In 1912, Brouwer published his famous fixed point theorem. The theorem states that **Theorem 1.** If B is a closed unit ball in $R^n$ and if $T: B \to B$ is continuous then T has a fixed point in B .

**Remark:** The Brouwer's fixed point theorem guarantees the existence of fixed point. But it does not provide any information about the uniqueness and determination of the fixed point. For example, the function $T : [-1,1] \to [-1,1]$ defined by $T(x)= x^3$ is continuous and has three fixed points in [- 1,1] . Many authors have given different proofs to this theorem. Most of them are topological in nature. This theorem is not true in infinite dimensional spaces.

**Schauder's fixed point theorem**

in 1930 Schauder was given The first fixed point theorem in an infinite dimensional Banach space . The theorem is stated below:

**Theorem 2** If $T: B \to B$ is a continuous function on a compact, convex subset B of a Banach space X then f has a fixed point.

Remark: The schauder fixed point theorem is very important and has several applications in economics, game theory, approximation theory etc. In the above theorem Schauder imposed a strong condition of compactness on B. Schauder relaxed this condition and established the following classical result

# Impact of Unified Power Quality Conditioner and Distributed Generation Model for Solving the Issues on Distribution System

**Authors:** Kalyanasundaram, M[1]; Sureshkumar, S[2]

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This work is implements Unified Power Quality Conditioner (UPQC) and distributed generation (DG) unit on radial distribution system to eliminate the power quality issues. UPQC is modelled using equations and implementation is done on 33bus system. The analysis will be done using two optimization technique and the techniques will be compared to analyze the techniques giving best result. The parameters to be analyzed using optimization techniques will be losses, real and reactive power, harmonics etc. All the techniques are implemented in MATLAB.

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*Computational and Theoretical Nanoscience*
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RESEARCH ARTICLE

# Time Orient Traffic Estimation Approach to Improve Performance of Smart Grids

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The modern world has great impact of power resources and there is a huge requirement of power distribution for rapid increase in number of connection. To achieve more growth in power utilization, the customer must be educated about efficient power utilization and the problem of customer management has to be solved, where the payment of electric bills should be paid in most easy manner. To improve the customer management, we propose a customer aware power regulatory model that feeds awareness to the public about the usage of electricity and novel time orient traffic estimation based service selection approach. It improves the performance of smart grids. Consider the electric meters with wireless devices which communicate with the cloud services to generate electric bills for the customer. The model generates awareness by displaying history/notification and recommendations of power usage through the smart meters. On the other side, the users accesses cloud service to pay the electric bills and instead the service performs TTSS (Time orient Traffic Estimation Based Service Selection), to select a single optimal service for the cloud user. The method computes the traffic at each service point in each time window and based on the traffic at different services the method selects a single service based on service availability measure computed. The service availability is the measure specifies the availability of the service at any point of time. The proposed method creates awareness to the consumer for optimizing power utilization, produces efficient results in service selection and improves the CRM efficiency.

**Keywords:** Cloud Computing, Smart Grids, TTSS, Service Selection, Smart Meter, Two-Way Protocol, Secure Computing, Customer Aware Power Regulation Model.

## 1. INTRODUCTION

Cloud computing has become one of the dominating growth in information technology where the technology can be adapted to any problem. In cloud the service provider provides set of services to access certain resources and the cloud users can access the services through the services provided. The smart grids can be assumed as resources and they can be accessed through the cloud services. Similarly the development of cloud technology can be adapted to the customer relation management in any domain. In general the people pay their electric bills through online or at the counter. To overcome the difficulty in payment of electric bills the technology development can be used. By providing different cloud services at all the regions of the country, the user can pay their bills through any communication medium like internet/mobile phones.

However the people of Tamilnadu have knowledge about the power scarcity since 2011, it is necessary to educate the civilians about the necessary of power utilization. In Tamilnadu, already there is a huge requirement of power for giving continues power supply to the consumers.

Based on the requirement the government has planned regularly to install more number of the power stations thought out the India which is satisfied for the future power demand. Unfortunately, in Tamilnadu the power demand was drastically raised more than the actual planned. Hence it is not possible to construct power stations immediately. It also takes more time and cost.

As an alternative solution, by educating the people of Tamilnadu, the usage of power at the peak hours could be reduced. It indirectly reduces the maximum power demand.

Not all the time of the day requires more power to be distributed but varies according to time, where some peak time requires more power to be distributed and rest of the

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# Optimal Location and Sizing of Unified Power Flow Controller to Improve the Power System Stability Using Hybrid Method

**Authors:** Gopinath, B[1]; Kumar, Suresh[2]

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In this research paper presents a novel method, which hybridizes the Cuckoo Search (CS) algorithm with the Modified firefly Algorithm (MFA), for optimizing the location as well as the capacity of Unified Power Flow Controller (UPFC). This algorithm is proposed with an aim to enhance the power system's stability and it offers several benefits like enhanced searching capability, degradation in complexity as well as randomization and so

# Energy Aware Routing Protocol Poisson Process using Diffusion Update Algorithm in WSN

**Article** · January 2016 *with* 6 Reads
DOI: 10.5958/2249-7315.2016.00462.7
Cite this publication

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Abstract

In wireless network communication, the energy efficiency is obtained from throughput of data transmission. During the network traffic and failure of data transmission, the energy efficiency and lifetime of network can be reduced in Wireless Sensor Networks (WSN). For this problem, we propose a duty cycling preservation scheme with Enhanced Interior Gateway Routing Protocol (EIGRP). EIGRP is used to preserve energy by reducing the network traffic in which the routing decisions are managed on network automatically. It reduces the workload on amount of data needs to be transferred, so the throughput is accomplished by EIGRP for WSN. The EIGRP based on diffused update algorithm to find the shortest path to goal of network. The duty cycling is commonly used for preserving energy effectively. In this process, the cluster heads play a major function in WSN. The aim of this paper is to extend a network lifetime and to preserve the energy by using EIGRP

ELSEVIER

Applied Thermal Engineering
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Research Paper

# Performance assessment in V-trough solar water heater fitted with square and V-cut twisted tape inserts

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Show more

https://doi.org/10.1016/j.applthermaleng.2016.03.088

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# Heat transfer augmentation techniques in forced flow V-trough solar collector equipped with V-cut and square cut twisted tape

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# Three-dimensional MRI brain tumour classification using hybrid ant colony optimisation and grey Wolf optimiser with proximal support vector machine

**Article** *in* International Journal of Biomedical Engineering and Technology 29(1):34 · January 2019 *with* 4 Reads
DOI: 10.1504/IJBET.2019.096879
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**Akey Sungheetha**

Abstract

A hybrid approach employing Ant Colony Optimisation (ACO) and Grey Wolf Optimiser (GWO) is proposed in this paper along with Proximal Support Vector Machine (PSVM) classifier to carry out brain tumour classification for the given 3D MRI brain images. The proposed hybrid ACO

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# Trailing Mobile Sinks to Data Coverage Protocol for Wireless Sensor Networks

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*Abstract—Wireless Sensor Networks (WSNs), leveraging data sinks' mobility for data gathering has drawn substantial interests in recent years. Our planning is to identify a mobile sink's moving space in advance to achieve optimized network performance, or target at collecting a small portion of sensed data in the network. To perform a data reporting process we divided number clusters total sensors and which sensors to be performed we can identified the current sensors. We check the prediction automatically using our concepts prediction that has divided into two ways. One is Prediction enable, the rest is Prediction disable identified the Prediction enable and Prediction disable when Prediction Process is performed. The data Reporting investigations contain as header, Member, Prediction enable/disable. The proposed protocols feature low-complexity and reduced control overheads. Two unique aspects distinguish our approach from previous ones: 1) We allow sufficient flexibility in the movement of mobile sinks to dynamically adapt to various terrestrial changes; and 2) Without requirements of GPS devices or predefined landmarks, Sink-Trail establishes a logical coordinate system for routing and forwarding data packets, making it suitable for diverse application scenarios. We systematically analyze the impact of several design factors in the proposed algorithms. Both theoretical analysis and simulation results demonstrate that the proposed algorithms reduce control overheads and yield satisfactory performance in finding shorter routing paths.*

***Index terms: WSN, Clusters, Sink trail, Prediction enable and disable, GPS.***

## I INTRODUCTION

Networks (WSNs) have enabled a widespectrum of applications through networked low-cost low-power sensor nodes, e.g., habitat monitoring precision agriculture [and forest fire detection Inthese applications, the sensor network will operate underfew human interventions either because of the hostileenvironment or high management complexity for manualmaintenance. Since sensor nodes have limited battery life,energy saving is of paramount importance in the design ofsensor network protocols. Recent research on data collection reveals that, ratherthan reporting data through long, multi-hop, and error-prone routes to a static sink using tree or cluster networkstructure, allowing and leveraging sink mobility is morepromising for energy efficient data gathering. Mobilesinks, such as animals or vehicles equipped with radiodevices, are sent into a field and communicate directly withsensor nodes, resulting in shorter data transmission pathsand reduced energy consumption.However, data gathering using mobile sinks introducesnew challenges to sensor network applications. To betterbenefit from the sink's mobility, many research efforts havebeen focused on studying or scheduling movement patternsof a mobile sink to visit some special places in a deployedarea, in order to minimize data gathering time. In suchapproaches a mobile sink moves to predetermined sojournpoints and query each sensor node individually. Althoughseveral Mobile Elements Scheduling (MES) protocols havebeen proposed to achieve efficient data collection viacontrolled sink mobility determining anoptimal moving trajectory for a mobile sink is itself anNP-hard problem and may not be able to adapt toconstrained access areas and changing field situations. Takethe precision agriculture application as an example, asshown in Fig. 1, where mobile sinks collecting data mainlyfollow trails or field boundaries in order not to damagecrops, and change trajectories dynamically according tofarmland situations. Typically, without scheduling the trajectory for a mobile-sink in advance, a data gathering protocol using mobile-sinks suggests that a mobile sink announce its locationinformation frequently throughout the network. Many Sink-Oriented Data Dissemination (SODD) protocols use suchapproach, e.g., Directed Diffusion, Declarative RoutingProtocol (DRP) and GRAB [whereas differentaggregation methods may be adopted. This

# Implementation of Bidirectional DC-DC Converter for Aerospace Applications

**G.Sridhar, M.Muneeswaran**

***Abstract*—This project "implementation of bidirectional dc-dc converter for aerospace applications" composed of a bi directional dc to dc converter which can operate in buck and boost modes. This will be useful in regenerative applications. This project presents simulation of the proposed bidirectional dc to dc converter in both operational modes. The proposed model can be used to predict the converter efficiency at any desired operating point. The new model can serve as an important teaching cum-research tool for Dual Active Bridge hardware design (devices and passive components selection), soft-switching-operating range estimation, and performance prediction at the design stage. The operation of the DAB dc–dc converter has been verified through extensive simulations. A Dual Active Bridge converter prototype was designed on the basis of the proposed model.**

## I. INTRODUCTION

The Dual active bridge converter consist of two full bridge circuits connected through an isolation transformer and a coupling inductor L, which may be provided partly or entirely by transformer leakage inductance. The full-bridge on the left-hand-side is connected to the high voltage (HV) DC bus and the full-bridge on the right-hand-side is connected to low voltage (LV) ultra capacitors. Each bridge is controlled to generate a high-frequency square-wave voltage at its terminals. By incorporating an appropriate value of coupling inductance, the two square-waves can be suitably phase-shifted to control the power flow from one DC source to the other. An active bridge on either side of the transformer allows bidirectional power transfer. Power flows from the bridge generating the leading square-wave. The key operating waveforms of the converter during the charging mode, that is when power flows from the HV side to the LV ultra capacitor side.

In simple full bridge circuit the power flows from source to the load, but in this circuit the power flows from source to the load in forward operation this we can call as buck operation mode and in the next cycle the load can be operated as source. In this the circuit will operate as a boost converter which will improve the DC voltage by using isolation transformer and inductor which can be phase shifted. This circuit can operate in two types such as buck and boost operations. In forward operation one full bridge circuit operate as inverter to convert dc voltage into ac voltage and the other full bridge circuit operates as rectifier to convert ac voltage into dc voltage.

The bi-directional dc to dc converter means the input dc supply is converted into ac and then dc by using two full bridge circuits. In one operation one full bridge circuit operate as rectifier in other operation it will operate as inverter similarly the second full bridge circuit will operate as rectifier in one operation and in the reverse operation it will operate as inverter. Both the converters are always in operating in rectifier mode or inverter mode so we can call as dual active bridge and also the operation continues in both forward and reverse mode then we completely call as Bi-directional dual active bridge (DAB) dc-dc converter.

Bidirectional power flow capability is a key feature of DAB dc–dc converters, permitting flexible interfacing to energy storage devices. Although the DAB converter has an inherent soft-switching attribute, it is limited to a reduced operating range depending on voltage conversion ratio and output current. This is a drawback for applications that operate mainly with variable or low loads as the overall converter efficiency is reduced. Recently, a model was proposed for the DAB converter that has been validated under certain operating conditions for low load, low efficiency, and low-power operation, but the device average and rms current models and transformer/inductor RMS current models which could serve useful for hardware design were not proposed. Moreover, such current models are not available in the existing literature for either low-power or high-power converter operation. A comparative evaluation of single- and three-phase versions of the DAB converter was performed in from the perspective of operating performance and losses for bidirectional power conversion applications. The comparisons pave the way for a choice to be made between these two alternatives for any particular application. Inoue and Akagi validated DAB performance for next-generation power conversion systems using ultra capacitor-based technologies.

## II. BASIC PRINCIPLE OF OPERATION

Future aircraft are likely to employ electrically powered actuators for adjusting flight control surfaces and other high-power transient loads. To meet the peak power demands of aircraft electric loads and to absorb regenerated power, an ultra capacitor based energy storage system is examined in which a bidirectional DAB dc–dc converter is used. The DAB converter shown in Fig. 1 consists of two full-bridge circuits connected through an isolation transformer and a coupling inductor *L*, which may be provided partly or entirely by the transformer leakage inductance. The full bridge on the left hand side of Fig. 1 is connected to the HV dc bus and the full bridge on the

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# Video Coding Technique with Multi Objective Particle Swarm Optimization and EZW

**Article** *in* Journal of Electrical Engineering and Technology 11(5):1404-1411 · September 2016 *with* 13 Reads
DOI: 10.5370/JEET.2016.11.5.1404
Cite this publication

**M. Thamarai** **R. Shanmugalakshmi**

Abstract

Video coding plays an important role in video transmission and storage applications. Today's increasing order of multimedia applications led to a lot of research works in video coding in such a way that high compression ratio is achieved with the available bandwidth. Wavelet based image compression has witnessed great success in the past decade. Wavelet transform based motion compensated video codec performs better

# Overview of Energy Detection Methods for Performance Improvement in Cognitive Radio

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**Published:** 2016
**Author(s) Name:** P. Venkatapathi, S. Srinivasa Rao, M. Siva Ganga Prasad | **Author(s) Affiliation:**

**Locked** **Subscribed** **Available for All**

## Abstract

Due to the improved usage of wireless communications in commercial, governmental and personal capacities, efficient spectrum utilization has turn out to be a prime topic of interest. A potential solution to this inefficiency problem is cognitive radios (CR). The spectrum sensing is important key function of CR. It is used to detect primary user. Energy Detection(ED) is a most commonly used technique for spectrum sensing.

**Keywords:** Cognitive Radio, Energy Detection Spectrum Sensing

# High performance current mirrors using quasi-floating bulk

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## Abstract

In this paper, a modified structure of standard MOSFET is proposed which

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# EFFECT OF PIN VOLUME RATIO ON MICROSTRUCTURAL CHARACTERISTICS OF FRICTION STIR PROCESSED ALUMINIUM BASED METAL MATRIX COMPOSITE

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## ABSTRACT

FSW was invented at the welding institute (TWI) of the United Kingdom in 1991 as a solid-state joining technique and was initially applied to aluminium alloys. Friction Stir Processing (FSP) is an adaptation of friction stir welding with the following unique features. Low amount of heat generation, extensive plastic flow of material, very fine grain size in the stirred zone, healing of flaws and casting porosity, random misoientation of grain boundaries in the stirred region, mechanical mixing of the surface and subsurface layers, Therefore, the FSP can be used as a generic process to modify the microstructure and change the composition, at selective location. In FSP,the effect of pin profile on material flow, material mixing, material consolidation in predominant than other parameters.Hence, Inthis work, the effect of pin volume ratio (dynamic volume/static volume) on microstructural characteristics of aluminium based metal matrixcomposites was characterized. Microhardness of FSP region was measured and correlated with respective microstructural characteristics. From this investigation it is found that pin volume ratio of 1.15exhibited defect free stir zone with higher hardness compared to other ratios. The reasons for the above effects are discussed in detail in this paper.

**Key words:** *Friction Stir Processing; Pin Volume Ratio; Microstructure*

## 1. Introduction

Stir casted aluminum (Al) based metal matrix composites (MMCs) have the beneficial properties of both metals and ceramics like good corrosion resistance, low electrical resistance and excellent mechanical properties [1,2]. Silicon carbide particulate (SiCp) reinforced A1- alloy composites are now being exploited commercially thanks to the technological advancing in their applications such as aerospace, sports items, transportation and ship building etc [3].Despites of its beneficial properties, the quality of the composite materials was inherently affected by the fabrication process itself. The composite materials are suffered from porosity, uneven distribution of reinforcement particles etc. which have an effect on the services of the composite materials. These composites also suffered from low ductility and toughness due to incorporation of the uneven distribution of hard ceramic reinforcement.

The quality fabrication of composite materials were limited due to the difficulty in achieving a uniform distribution of the reinforcement material, mutability between the two main substance, porosities in the cast metal matrix composites, chemical reaction between reinforcement material and the matrix alloy [4,5].

Surface modification techniques can improve the grain size of the MMCs by altering the above – mentioned properties, one such technique is attempted in the present work, known as friction stir procession (FSP). FSP is an offshoot of friction stir welding (FSW) which is a solid state welding technique patented by The Welding institute of Institute of United Kingdom in 1991 [6]. FSP technique has been used to produce surface composites on aluminium substrates [7]. In this technology, a rotating tool, with specially designed tool profiles and shoulder is inserted into a substrate material tool and produces a recrystallized fine grained micro structure within the stirred zone (SZ). This process was explained in detail elsewhere [8].

Hsu et al. [10] achieved ultrafine grained A1-$Al_2$ Cu composite by FSP, which has high Young's modulus, good compressive strength and ductility.

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