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Paper Title :

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Chapter 10
A Deep Learning Approach for Detection of Application Layer Attacks in Internet

V. Punitha
National Institute of Technology, Tiruchirappalli, India

C. Mala
National Institute of Technology, Tiruchirappalli, India

ABSTRACT

The recent technological transformation in application deployment, with the enriched availability of applications, induces the attackers to shift the target of the attack to the services provided by the application layer. Application layer DoS or DDoS attacks are launched only after establishing the connection to the server. They are stealthier than network or transport layer attacks. The existing defence mechanisms are unproductive in detecting application layer DoS or DDoS attacks. Hence, this chapter proposes a novel deep learning classification model using an autoencoder to detect application layer DDoS attacks by measuring the deviations in the incoming network traffic. The experimental results show that the proposed deep autoencoder model detects application layer attacks in HTTP traffic more proficiently than existing machine learning models.

INTRODUCTION

The technological advancements bring out new dimensions in application development. The availability of the applications and services are intentionally blocked by Denial of Service/Distributed Denial of Service (DoS/DDoS) attacks. DoS attack is the one of the powerful threats in internet. In this attack, the malicious user makes the server and other network resources unavailable to legitimate users by interrupting the server's regular activities. Malicious user launches this attack by sending overwhelming requests to targeted server continuously, until legitimate access are unable to be processed by the server, and thereby blocking the availability of the server to legitimate users. Malicious user uses single com-

DOI: 10.4018/978-1-7998-2491-6.ch010

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Detection of Packet Dropping Nodes in Wireless Mesh Networks

International Conference on Advanced Communication and Networking

ACN 2019: Applied Soft Computing and Communication Networks pp 27-41 | Cite as

- R. Thillaikarasi (1) Email author (thillai-cse@saranathan.ac.in)
- S. Mary Saira Bhanu (1)

1. National Institute of Technology Tiruchirappalli, , Tiruchirappalli, India

Chapter
First Online: 01 May 2020

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Part of the Lecture Notes in Networks and Systems book series (LNNS, volume 125)

Abstract

Wireless mesh network (WMN) is a wireless ad hoc network which uses mesh topology to connect the radio nodes together and it is prone to vulnerabilities due to its open architecture. Packet loss is the major issue due to its open wireless physical media, frequent topological changes, scalability and power constraints. In general, packet drops in WMN during transmission may happen due to mobility or buffer overflow or power depletion or malicious behavior of the intermediate nodes which degrades the performance of WMN. This paper proposes an adaptive dynamic source routing protocol (ADSR) to detect the misbehaving node using the cross-layer approach that performs packet dropping and reroute the packets using the alternate paths. These packet drops are identified precisely in this work, which significantly reduces false positive rate of detection of malicious nodes. The performance of ADSR is analyzed using a mathematical model by considering the characteristics of a node's behavior. Using extensive simulations, the performances are thoroughly analyzed and evaluated and compared with traditional dynamic source routing (DSR), Watchdog (WD), Bait-DSR (BDSR) protocols. Simulation results show that with negligible increase in overhead, this protocol provides secured routes with an increased packet delivery ratio (PDR) and throughput.

Keywords

Cross-layer design Dynamic source routing Packet drops Packet salvaging Wireless mesh network

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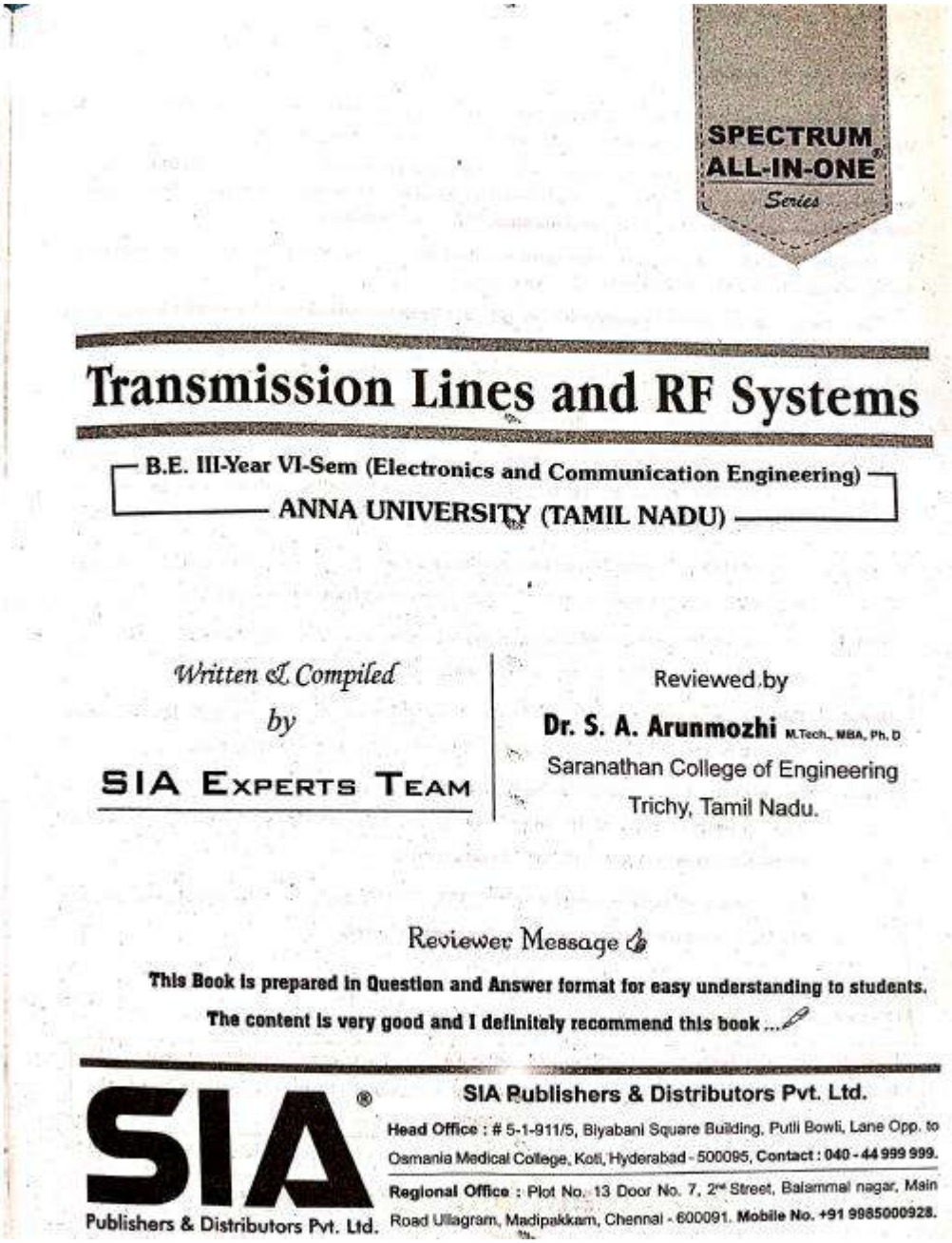

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Dr. S. A. Arunmozhi M.Tech., MBA, Ph. D
Saranathan College of Engineering
Trichy, Tamil Nadu.

Reviewer Message

This Book is prepared in Question and Answer format for easy understanding to students. The content is very good and I definitely recommend this book ...

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A 2.5-V 8-Bit Low power SAR ADC using POLC and SMTCMOS D-FF for IoT Applications

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Abstract - **A 2.5-V 8-bit low force and efficient Successive-Approximation Register Analog-to-Digital converter (SAR-ADC) utilizing a Principled Open Loop Comparator (POLC) and Switched Multi-Threshold Complementary Metal Oxide Semiconductor (SMTCMOS) D-FF shift Register. In light of high proficiency and low force applications SAR-ADC is increasingly well known, yet it experience the ill effects of resolution and speed confinements. To defeat the above issue proposed a systematic methodology uses low force POLC based SAR-ADC is structured. Considering about the resolution, speed and compact design of 8-bit SAR-ADC, the proposed POLC strategy reasonably diminishes the propagation delay by 37% and decreases the force utilization by 62% appeared differently in relation to the standard system. A D-flip flop is planned to employ SMTCMOS procedure which has low force utilization and productively decline the leakage power. All the above circuits are simulated by using TANNER-EDA tool in 0.25µm CMOS technology produces 97% Efficiency.**

Keywords –Leakage Power, Successive Approximation Register (SAR), Principled Open Loop Comparator (POLC) and Switched Multi-Threshold Complementary Metal Oxide Semiconductor (SMTCMOS).

I.INTRODUCTION

Internet-of-Thing (IoT) is a system of shrewd gadgets for real time requirements extending from keen matrices, virtual force foundry, insightful residence and smart urban communities. The financial advantages of an IoT has a potential function for a long way past versatile device, therapeutic gadgets and self-governing remote sensor hubs with cutting edge server farms. The time-space setting rather than details of pervasive detecting circuits gives the proficient and complete elements of an IoT. In this manner, just kilohertz inspecting rates and around 8-bit of resolution is frequently necessitated for each standby-circuit, including an ADC. Nonetheless, with thickly actual detecting hubs of an IoT network, continuous and standard substitution of charge is inescapable if the force utilization problem is no more fittingly tended to. From the above explanation, IoT devices with a viable as well as minimum-force ADC is a crucial square are exceptionally enchanting. From the innovative elaboration, force utilization of ADCs has diminished drastically. However, the force utilization of comparators and D-FF in ADCs has expanded based on huge resolution because of the diminished V_{LSB} and distortion. The most requesting plan issues of squat-force, excessive-resolution ADC produce noise repression, decreased force utilization of comparators, Shift Register and SAR logic. SAR - ADC has a high proficient system is called POLC comparator and SMTCMOS D-FF used to decrease of the transistor switching energy and noise.

The Principled open loop comparator (POLC) and SMTCMOS D-FF techniques are implemented by 0.25µm CMOS innovation. The planned POLC pattern consumes a minimum number of transistors consequently the circuit area is compact and SMTCMOS D-FF shifter register achieves a faster operating speed. So as to actualize a high gain, Principled Open Loop Comparator, the two- organize op-amp is an attractive implementation without compensation. The resting of this proposal is formulated as follows. Part II explores about previous work. Division III investigates SAR ADC architecture with proposed POLC comparator. Segment IV illustrates the schematic SMTCMOS D-FF. The experimental results and conclusion are detailed in Portion V and VI respectively.

II. PREVIOUS WORK

The successive-approximation (SA) algorithm [1-4] is the most favoured ADC type algorithm in real time data conversion applications. Sample-and-Hold fiction switch remuneration strategy [5] was utilized in SAR design, latched comparator is realized with the help of current-mode method, control logic circuit uses the different sources of information and the DAC involves binary weighted capacitor clusters. Two Stage CMOS OP-AMP with Cascode technique is involved in a High Swing-UPF [6] increases the DC gain for the supply 1.5v. The pseudo-cascode technique uses for the process current scalable design provide minimum power dissipation [7].

The structure [8] consists of coarse and fine SAR-ADC is used to deal with binary ones, which has 3.5 bit and 6 bit respectively. The results INL and DNL are obtained with a

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Research Paper Titled

"An IOT Based Staple Food Endowment and Waste Management System for Foster Care using Arduino and Blockchain"

Presented by

Mr. V. Dinesh, Assistant Professor, Dept. of ECE, Saranthan College of Engineering, Trichy

in a two days online International Conference on **"Recent Trends in Computer Science and Information Technology" (ICRCSIT–20)** organized by the Departments of Computer Science and Engineering & Information Technology, St. Martin's Engineering College in Association with Computer Society of India, Hyderabad & Global Cyber Security Forum, India on 17th & 18th June, 2020.

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Assistant Professor, Department of EEE
Saranathan College of Engineering
Trichy, Tamil Nadu, India

for presenting the research paper entitled "**An Improved Fuzzy Logic Based Power Quality Index for Sinusoidal and Nonsinusoidal Situations**" in the AICTE Sponsored First International Conference on Challenges and Opportunities for Development of Smart Cities 2020 (ICCODS 2020) held at the Department of Electronics and Communications Engineering, PSR Engineering College, Sivakasi, Tamil Nadu, India during 23 - 25, January 2020.

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Saranathan College of Engineering, Trichy
participated/presented/co-authored a paper on An Energy-Efficient Clustering Protocol for IoT wireless Sensor Network based on Cluster Supervisor Management in the International Conference on Computer, Communication and Power Engineering (I3CPE'19).

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Department of Instrumentation and Control Engineering

Two Tank Conical Interacting (TTCIS) is a non-linear MIMO system (i.e. level process). The process industries require liquids to be pumped as well as stored in tanks and then pumped to another tank. Most of the time the liquid will be processed by chemical or mixing treatment in the tanks, but the level of the liquid in the tank to be controlled at some desired value and the flow between tanks must be regulated. The interactions existing between loops make the process more difficult to design PI/PID controllers for MIMO processes than that for single input single output (SISO). Two input two output, TTCIS is described in the work. Here, a method for controlling multivariable processes is presented. The controller design is divided into two parts: firstly, a decoupling matrix is designed in order to minimize the interaction effects. Then, the controller design is obtained for the process + decoupler block. The aim is to meet the design specifications for each loop independently. A conventional PI controller is to keep the liquid levels in the tanks at the desired value.

FOR AUTHOR USE ONLY

Aravind Pitchai Venkataraman

Decoupler Design: Interacting Non-Linear System

Modeling, Analysis and Matlab Simulation

Aravind is an Assistant Professor in the Department of Instrumentation and Control Engineering at Saranathan College of Engineering, India. He submitted his Ph.D. thesis in Electrical Engineering at Anna University, India, has nine years of experience with 55 research articles and 3 research book publications on control system and related topics.

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ICIRSEM 2020

09th MARCH 2020

Keywords: IoT, Sensors, Pic Microcontroller, NodeMCU, Servo Motor.

Air quality monitoring system by using myRIO LabVIEW

Bharath prabu.R, Divakaran.V, Nagaraj.S, Rajesh kumar.S and Seetharaman.R

Department of Instrumentation and Control Engineering,

Saranathan College of Engineering, Trichy.

Abstract:

Air quality sensors are devices that detect and monitor the presence of hazardous substances like butane, smoke in the surrounding area. This paper covers an experimental analysis of a air quality monitoring system which is used to monitor the temperature, butane and smoke levels in the surroundings .National instruments labVIEW is used as work platform and sensors are interfaced with myRIO**.**

Keywords: NI LabVIEW, myRIO, LM35 sensor, MQ-2 sensor, MQ-135 air quality sensor.

Speed Control in Automobile's Using LabVIEW

Aakash.R , Abbas Abdul Salam.S, Krishna Kumar.M, Raviendren.P.K &

Ms Ezhiliarasi.K

Department of Instrumentation and Control Engineering,

Saranathan College of Engineering, Trichy.

Abstract:

The speed control is the major technique used to reduce accidents. This paper represents control strategy for controlling the vehicles maximum speed in traffic lanes by calculating the traffic density in that particular area by using google maps. The traffic density is taken through Image processing. In google maps, density is shown on the basis of color. Based upon that traffic density, the maximum speed of the vehicle will be limited and the message will be shown in the display connected in the vehicle. This helps to reduce accidents due to rash driving in medium traffic lanes. By implementing this system in real time speed of the automobiles can be regulated in the defined range.

Keywords: Google Maps, Traffic Density, Image processing, Speed control.

Territory Monitering Robot Using Raspberry Pi 3

Dr.S.M. Girirajkumar, A.Yaamini, R.S. Sanchhali and G.Nivashni Devi

Department of Instrumentation and Control Engineering,

Saranathan College of Engineering, Trichy.

Abstract:

Remote surveillance and monitoring of our frontier has seen a growing need in emerging times. Currently the surveillance of International border areas is a strenuous task for soldiers. As every field is opting for robotics in order to improve the existing systems, our aim is to implement the robotics in military security systems for the at most security. By this paper, we put forward a surveillance robot which is capable of surveilling and detecting for intruders in region of international borders. Therefore the surveillance robot is designed in such as way that it would automatically detect the invader in the borders and alert the nearby security personnel as a helping hand by alerting him through video streaming over Internet of Things. The heart of the robot is a powerful Raspberry Pi 3 Model B which is used as the ultimate controller for the entire operation of the robot. For capturing and streaming the video the raspberry pi camera is attached to the micro controller which actively monitors the area and send a notification when any obtrusion is detected. The transmission part of the surveillance robot is carried out using Internet of Things by enabling WiFi. The live streaming ability of the raspberry Pi allows the camera feed to be analyzed from any location using internet. The IOT module eliminates the need of transmitter and receiver module thus it makes the node compact, cost effective and ease of using. Thus the Raspbian operating system based surveillance robot is designed to achieve the objective of this paper.

Keywords: Surveillance robot, IOT, Video streaming, Raspberry Pi.

Blood Flow Analysis in Aorta during Atherosclerosis

Akshaya B, Atchaya G, Barakath Nisha A, Hemalatha K,

Mr. T.Tamilarasan and Dr.M.Shanmugavalli

Department of Instrumentation and Control Engineering,

Saranathan College of Engineering, Trichy

Abstract:

Blood flow measurement plays a vital role to identify and diagnosis of various diseases in different organs of the body. Depending on the change in geometry of aorta, blood flow rate will change based on non Newtonian fluid characteristics. Hence in this paper simulation of the aorta is designed and modulated using ANSYS 18.1 to calculate the viscosity of the aorta to identify atherosclerosis (thickening of aorta) which is major cause for coronary artery disease.

Key words: ANSYS, Blood flow, aorta, atherosclerosis, viscosity

Railway Crack Detection System Using Raspberry Pi 3

M.Vigneshwaran, N.Rukmani, E.dhivya and KA.srividhya

Department of Instrumentation and Control Engineering,

Saranathan College of Engineering, Trichy.

Abstract:

Most convenient mode of passenger transport provided by railway. Still accidents are major concern in terms of undefined crack in rail tracks. Due to the crack in railway track results in loss of human life and economy. Therefore we need to bring a new technology which can reduce the loss of major lives. This paper provides railway track crack detection system using raspberry pi, EM card module, webcam and Internet of Things. Raspberry pi plays vital role to coordinate the devices used in the system. The location information stored in Radio Frequency Identification tag by python programming in raspberry pi. The frequency from the Radio frequency Identification tag read by the reader module which is EM-18 reader module. RFID module emit low frequency (125KHz) which is harmless and enough to access the RFID tag. This way of finding the location provides better speed and accuracy irrespective of any signal problem.

IoT Based Smart Health Monitoring System

Alan Roddick.S, Manoj Kumar.G, Karthik.M, Ragul.R and Mr. P. Aravind

Department of Instrumentation and Control Engineering,

Saranathan College of Engineering, Trichy.

Abstract:

Health management is one of the major concern when considering a mass population among the earth irrespective of various nations. Our paper focuses on the development and implementation of an effective healthcare monitoring system through IoT by acquiring the vital health parameters and transmitting the data by wireless communication to a personal cloud storage. Method of acquiring and monitoring data in system is implemented using LabVIEW interconnected with myRio. The data can be accessed any time of the current status of the patient. In case any abnormal behavior in the signals is detected, the caretaker and doctors are notified immediately through a message service (SMS) via GSM module. Cloud computing and password protected account provides privacy and security of patient details by allowing restricted access to the database thus providing quality healthcare to all.

Keywords: IoT, LabVIEW, Healthcare, LM-35, MAX-30100.

Design and Implementation of Ball and Beam System Using PID Controller and Development of Graphical User Interface Using LABVIEW

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Dr.S.M Girirajkumar

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Abstract:

The ball and beam system is widely used as a tool for learning traditional as well as advanced control techniques. The system with highly nonlinear characteristics is an excellent tool to represent unstable systems. This paper represents an optimal control strategy for controlling the position of ball on the beam by comparing the various optimization algorithms like Zeigler-Nichols, Cohen-Coon and Genetic Algorithm. This system is an open loop non-linear system. The whole system could be implemented by employing a servo motor, an Infrared distance sensor, a processor and a support assembly. The system is designed with two Degrees-of Freedom. The nonlinear characteristic of the higher order system is regulated by using PID controller. The control problem is a challenging one as the ball position continuously varies with the beam angle. The control strategy includes PID control for both ball position (beam angle) and servo position control. The control parameters are tuned using optimal method. Then the results are verified experimentally using real time ball and beam system.

Keywords: Optimization algorithms, higher order system, PID controller, ball and beam.

solar PV panels or electricity grid based on energy storage consumption. The main idea of the topology is to utilize single conversion which improves the efficiency, feasibility and reducing loss.

Automatic fruit detection system using image processing

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Abstract :

Now-a-days in agriculture industry we have good reference in fruit field. Effective growth and improved field is necessary and important in agricultural field. In this field farmers need manual monitoring system. This system will help humans until the fruit is improved. But in manual monitoring system will not always give the exact results , and this one is time taking process too, so for that we need one smart operating system to detect the fruit and there disease also. For this needs we are proposed one new technology to satisfy the process. Here we are using some of the image processing technologies and algorithms. We will implement the system like it will detect the fruit wellness and unwellness.The specified algorithms we are using to detect these things. Those we are used IMAQ toolkit in LabVIEW software. Here we use vision development module helps you program and configure vision algorithms and image processing in LabVIEW.

IoT based Asset Tracking for Freight Movement

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Abstract :

Currently, one of the most notable aspects of freight managementis the tracking of mobile assets. Mobile assets generally refer to assets in motion. Internet of things (IoT) solutions offer a cost effective and comprehensive method to track the assets. This paper primarily aims to develop asset tracking controller device to collect a variety of information like vehicle location, temperature of the surrounding environment that areconstantly streamed to the NI data dashboard in real time. In this paper, we present a portable battery-operated robotic car that acts a mobile asset. It has been developed to sense environmental parameters like temperature using Pmodand also detect the obstacle distance using ultrasonic. The system is controlled by NI (National Instruments) myRIO controller and the geolocational data is acquired by ubloxgps receiver by the LabVIEW software.

Design of Cardiac Activity Monitoring Using Arduino

R.Seetharaman[1], K.Aishwarya[2], S.Gayathridevi[3], K.Raashmi[4], R.Reshma[4]
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Abstract :

Recent technologies are mainly concentrating on life saving innovations and in disease prevention. In this paper, we have developed a device for monitoring the cardiac activities of a patient who has been affected by heart diseases. The measurement of biological parameters is very essential for maintaining the cardiac patients health. Heartbeat sensor was used for sensing heart rate (pulse rate) of a person. ECG sensor was used to measure the electrical activity of heart. Thus we measure the body parameters like heart beat and ECG. The expansion and contraction of the heart forces the blood to flow through the arteries. From this, the pulse rate can be detected by sensing the areas where the artery is close to the skin. The signals from the sensors are send to arduino with the help of serial communication ports. The arduino processes the digital signals from the sensors and performs the heart beat and ECG monitoring. The data has been send to the doctors mobile with the help of bluetooth module. This device is cost effective and it can easily used by the patient who has the risk of cardiac attack.

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Experimentation of Coriolis flow meter using self sensing Electronics

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Abstract :

In Coriolis mass flow meter, the fluid is allowed to flow through the pipe. When the fluid flows through the pipe, it actuates through a piezo actuating sensor using self sensing electronics and its vibration is sensed by a piezo electric sensor and the output is given to the Digital Storage Oscilloscope (DSO).The input from the Audio Frequency Oscillator (AFO) is given to the piezo actuation system. The output of the piezo actuating system is given to the piezo actuating sensor to provide vibration and it is sensed by piezo electric sensor which is then given to the piezo sensing unit. Then it is filtered by using a band pass filter. The output is viewed using DSO.

Design and simulation of coriolis flow meter

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Abstract:

This paper reports the design and simulation of U-shape and straight tube Coriolis flow meter in ANSYS software. The meter is designed in Fluid Flow (Fluent); analyzed the velocity contour and pressure contour profiles, and is also designed for analyzed Water and air is used as the input fluid flowing through the straight and U-shape meter for analyzing the velocity and pressure profiles.

MEMS based Pressure Sensor to Measure Blood Pressure

[1]Saikamala. C.M, [2]Santhoshini. R, [3]Swetha. S, [4]Christy Arockia Rani. A, [5]Shanmugavalli. M

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Abstract:

Piezoresistive pressure sensor is designed and simulated for the measurement of blood pressure. The piezoresistive pressure sensor consists of a metal diaphragm, piezoresistors and connector wires. When pressure is applied on the top membrane, a corresponding change in resistance produces an output voltage. This voltage corresponds to the pressure applied. In this paper the piezoresistive pressure sensor design is simulated using IntelliSuitesoftware.

Decision making for critical run outs in cricket using LabVIEW

[1]Ajay G, [2]Azhagu vignarajan M, [3]Jagadeesan R, [4]Mohamedpharsath M, [5]Gopi Krishnan.A

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Abstract:

This work describes the implementation of monitoring critical run out using LABVIEW.Thus the game of cricket currently needs the help of umpire for providing decision to stumping, no ball and run out,by reviewing various angular video footage thoroughly to give correct decision. According to the laws of cricket the third umpire

is expected to give decision in 30 seconds, but the actual fact was it take more than 30 seconds to give accurate decision. Thus there are lot of technology has been developed for monitoring various parameter like run out, no ball and so on, but still it is difficult to identify accurate decision. To overcome the above issues we make a simple process by using a sensor whose output is monitored on LabVIEW. The system design is portable, cost wise it is low and it has no complications. This system gives a clear information about the decision in cricket for various parameter and produce a fairness between the players. This work is useful for monitoring accurate run out.

Design of PID controller Simulation for MULTI INPUT multi output System using Control Techniques

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Abstract:

The following paper presents the use of different tuning methods that are the auto tuning, Cohen Coon and Zeigler Nicholas for obtaining the response of Multi Input Multi Output system. After obtaining the transfer function for the tanks the tuning methods are used for obtaining the PID (Proportional-Integral- Derivative) gain values of the system. These gain values are required for the control of the process using PID Controller. The system response can be obtained after the system has been controlled. The response of the system obtained using the different tuning methods can be compared in the form of graphs or by tabulating the values or the transient time response of the system.

Level and Pneumatic Process Monitoring and Controlling using LabVIEW

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Abstract:

This paper represents the National Instruments LabVIEW based simulation design of Proportional-Integral-Derivative (PID) for Level and Pneumatic pressure control. The level tank and pressure tank is SISO (Single Input Single Output) system. This project aims at designing and simulating a conventional PID controller for level and pressure process at two different process stations. Level control of a liquid and pressure control of a gas or air in a process tank is achieved by a PID controller through a actuator. The PID controller gives response outputs which have minimum steady state error and minimum overshoot. The process block diagram is formulated using LabVIEW icons, indicators and controls. This LabVIEW program saves the user time to identify and understand the operations of the process very easily by viewing and highlighting the process flow.

Distance measurement and obstacle avoiding using ultrasonic sensor and ARDUINO

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ABSTRACT:

In recent days, accidents are happen often it is difficult to drive the vehicles in visibility zero condition. Some safety measures has to be taken such an accidents. This can be done by monitoring the distance between the two objects. When the objects are come closer with in certain range, The ultrasonic sensor will detect the distance and displayed in LCD screen and correspondingly speed will be reduced.

Privy pristine and salvage

[1]Guru VenkateshK, [2]Shanawaz SN, [3]SriramS, [4]Thayuman R, [5]Sathishkumar M
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Abstract:
The purpose of this project is to provide hygienic environment near the urinals at the public restrooms by making it to get flushed automatically. To use less amount of water for flushing purpose and to prevent the unnecessary wastage of water and save the water forthe future generation.Whereas this project also provide cheapest urinal flushing and recycle system prevailing of bad odor and unhygienic environment in public rest rooms.

Vocal cranium casing using Microcontroller

[1]V.Mohan,[2]B.SuryaKumar,[3]S.Riyazdeen, [4]M.Sathis Kumar
[1,2,3]Final year ICE, Saranathan College of Engineering, Trichy -12
[4]Asst. Prof/ICE, Saranathan College of Engineering, Trichy-12

Abstract :
The idea of developing this proposed model arise from social welfare using instrumentation technologies. Statistics says that nearly 43 accidents occur per day in 2016. To reduce these tragic happenings wearing of helmet is made compulsory but the following of this rule is being ignored day by day. so the bike instrumentation features like indications of fuel, speed etc. are being just only displayed on the dial but in this model it has been determined with the help of vocal indications like speed and fuel programmed in the helmet. This idea will attract many customers knowing a new functional implementations are given to improve the safety of the rider and craze of wearing helmets will improve.

Processing and Evaluation of Polymer Matrix Composites – Review

[1]S.Mukundh, [2]D.Saravana kumar, [3]A.Prabhakaran, [4]P.V.Rajesh, [5]M. Rayees ahmed
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Abstract:
Composite materials are those materials which are made from two or more materials with different physical and chemical properties, when combined produce a material which is having different properties from the unit materials. In a composite typically, there are two constituents, One constituent act as a matrix and other constituent acts as reinforcement. The composite materials are heterogeneous at microscale but homogeneous at macroscale. These materials are combined in such a way that they can use of their virtues while minimizing the some effects of their deficiencies. Frequently composites are selected to give unusual combinations of stiffness, strength, weight, high temperature performance, hardness, corrosion and wear resistance. Generally polymer is of two types: Thermoplastics do not undergo any chemical change in their composition when heated and can be molded many times. Thermosetting plastics can be shaped once; after that its shape cannot be changed. In the thermosetting process, a chemical reaction occurs that is irreversible. Mostly the thermoplastics are recyclable, while thermosetting plastics cannot be recycled. The properties of this plastics affects the environment. They are widely used in applications such as aircraft wings, aircraft outer bodies, automobile inner linings, cabins, bumper, TV antennas, decorative tabletops.

energy is obtained using Dual Axes Solar Power Tracking System with LDRs. The maximum power point tracking (MPPT) Solar Charge controller is used to ensure that the maximum amount of generating power is transferred to the load and can also be stored in the batteries for future use. As an application in *Home Energy Management System*, PassiveInfra Red (PIR) sensor automatically controls room lights and fan base on the presence of humans. Based on the solar light intensity, automatic room light and fan are controlled using LDR .This method overcomes the conversion of AC-DC and DC -AC which reduces the cost of power production per unit watt power.

Analysis of SEPIC converter for renewable energy application using proteus and MatLAB

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ABSTRACT:

Design of the power electronics circuitry are now -a-days reducing the size, space and weight of the converter/ inverters circuits. This is possible because of the availability of new high switching frequency devices. This paper represents the analysis performance of SEPIC converter for renewable energy applications. This converter is used in buck as well as in boost mode. The SEPIC converter is designed, analyzed and simulated. The proposed model of the SEPIC converter consist of two parts: (i) main converter components like switch, Inductors, Diodes, Capacitors, and a Load.,(ii) a control circuit for controlling the duty cycle using ARDIUNO .to verify the proposed model, the circuit is prepared and their experimental results were compared with the results obtained by simulation of the circuit in PROTEUS and MatLAB.

Third Eye-Low Cost Smart Cane for Visually Impaired person

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[1,2,3]Final year EEE, Saranathan College of Engineering, Trichy - 12

ABSTRACT

To enlighten the darkened life of visually impaired people we proudly introduce our innovation-THIRD EYE, smart cane which is to support the life of visually challenged people. Our proposed third eye project is to convert an alternate for a conventional blind stick for visually impaired persons to detect and navigate from place to place without relying on others. We use Microcontroller ARDUINO UNO +Bluetooth module for data collection and to communicate with the user. To detect obstacles of different sizes, we plan to place 3 pairs of ultrasonic sensors at different places in the cane for object recognition. An adjustable mechanism is included to vary the height of the smart cane so that it can be used for all age groups of different heights. The sensor unit and controller unit are placed inside the smart cane. For powering controller and sensor 6F229 volt battery is used.

Optical character recognition based text to braille Converter

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Abstract:

This paper is based on a project which facilitates the education of visually impaired people through a device that helps to read text from books by them. Nowadays, visually impaired people uses Braille coded books for reading which are not easily affordable and voluminous in their size.This project is about a compact device which converts normal texts from a book to Braille coded tactile display. The conversion process is performed by Optical Character

Department of Information Technology

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Coordinator

Princ

I-BOT : CUSTOMER SERVICE CHATBOT FOR LARGE RETAIL STORE

R.Rengaraj[1],K.Kishore[2],N.Saran[3],L.Vinod singh[4]

1.Assistant Professor, Information Technology, SaranathanCollege of Engineering

2,3,4Information Technology, SaranathanCollege of Engineering

ABSTRACT-Nowadays, it is an era of intelligent machines. With the advancement of Artificial Intelligent, Machine Learning and Deep Learning, machines have started to impersonate as human. Conversational agents activated by Natural Language Processing(NLP) is known as chatbot, which are an excellent example of such machine. Customer service is one of the field, where chatbots are emerging. In order to make these Chatbots more effective, we have proposed an efficient Chatbot using NLP, which helps people to know about the product and its location in a large retail shop. It has all information about the products and their location that are present in the retail shop. If a customer wishes to buy a set of products and don't have any specific information about the products and its location. Then the Chatbot takes a set of product name as an input and then provide information about that product and its location. It also saves time of the customer by suggesting an optimized route to reach all products location that the customer wishes to purchase. I-Bot is a closed domain Conversational agent which uses a retrieval based model that identifies the intent of the input user query and maps it to a retail database to return appropriate results.

I.INTRODUCTION

Today in the world of Artificial Intelligence, machines are incorporated with human-like intelligence to make lives easier. One such example is an automated conversational agent or simply a 'chatbot'. A conversational agent (CA) or a dialog system is a computer system intended to converse with a human, with a coherent structure. Over the years these systems have employed speech, graphics, gestures and other modes of communication; however, text remains primary mode for interaction. Now-a-days there is an increasing use of these conversational systems because of the wide range of application domain. Conversational

classification of query intent. Our system uses multi-layered Artificial Neural Network (ANN) because of the higher accuracy over the traditional machine learning algorithm.Artificial neural networks have multi-layered architecture having an input, output and multiple hidden layers. ANNs are powerful tools, because they can perform arbitrary parallel computation in a modest number of steps. They are commonly used as classifiers. Despite their flexibility and power, these neural networks can only be applied to problems whose inputs and targets can be sensibly encoded with vectors of fixed dimensions. Thus every input sentence is translated to a fixed size vector, called as vector embedding. Human chats are

INTELLIGENT POTHOLE DETECTION

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2,3,4. Information Technology Saranathan College of Engineering Trichy.

ABSTRACT

In this project we have proposed a systematic way of determining the potholes in the road using mobile phone.Here we make use of Accelerometer sensor to collect data.Using this data, we can find the severity condition of the pothole.We are creating an application to sense the presence of potholes on the road through a Gyroscope sensor installed on the mobile phone. This sensor detects a shake in mobile and records a threshold value by sensing the potholes on the road.If many vehicles are installed with this sensor, we may be able to collect data about holes present on road and store it on the cloud for future reference. By using machine learning technique, we may be able to alert the users about the presence of holes on road.Therefore, by this method we can avoid the maximum number of accidents and alerting the concerned officials to take some precautionary actions.

I.INTRODUCTION

Poor road conditions play vital role in

way to detect or report them at scale. To Overcome this issue, we have developed a system to detect potholes and assess road conditions in real-time. Our solution is a mobile application that records data on a vehicle's movement from gyroscope and accelerometer sensors in the phone. As the user logins, the models use the sensor data to classify whether the road is good or bad, and whether it contains potholes. Then, the classification results are used to identify severity of potholesthat illustrate road conditions across the city. Our system will alertconcerned officials to identify and repair damaged roads which inconvenience passengers and cause accidents. This paper tells our data science process for collecting training data on real roads, evaluating machine learning models, and deploying information about the potholes through a real-time Android app.

OBJECTIVE

One of the major problems in our day-to-day life is Traffic. Most of the people get affected due to the traffic problem. The

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PRODUCT RECOMMENDATION USING TOP-K APPROACH

SANGEETHAPRIYA[1] J, AKILA[2] KM, HARIENI[2] G, ABINAYA[2] M, KALYANI[2] CT

1. Assistant Professor Information Technology, Saranathan College of Engineering, Trichy.

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ABSTRACT

Now a day's online shopping has achieved a tremendous popularity within very less amount of time. Recently few e-commerce websites has been developed their functionalities to an extent. Such that they recommend the product for their users referring to the connectivity of the users to the social media and provide direct login from social media such as facebook, Twitter, whatsapp, etc.. Recommending the users that are totally new to the website, a novel solution is developed for cold-start product recommendation that aims for recommending products from e-commerce websites. In specific both users and products extracted feature their representations from data collected from e-commerce websites using recurrent Top-K to transform user's social networking features into user embedding. This paper refers a Top-k approach which can manipulate the user implementing for cold-start product recommendation.

Keywords: *Data mining, E-Commerce, Social Media, Top-K approach, Product Recommendation.*

1 INTRODUCTION

Data mining is a method of extracting appealing information or patterns from huge databases. At present numerous techniques have been used to find out such sort of information, the majority of them result in machine learning and statistics. The superior fraction of these approaches hub on the detection of correct knowledge. Although this information might be performed in the data mining depend on what variety of information someone needs to mine in databases.

The precincts between E-commerce and social networking site have become increasingly blurred. E-commerce websites such as eBay features many of the characteristics of social networks, including real-time status updates and interactions between its buyers and sellers. Several commercial sites as well hold up the device of social login, which allows new users to sign in with their obtainable login information as of social networking sites such as Facebook, Twitter or Google+. Mutually Facebook and Twitter contain a new characteristic, last year they permit users to buy products straight from their websites by clicking a "buy" button to purchase items in advertisements or other posts. Product recommendation is a key area to focus for increased sales for any e-commerce website[6]. There are many algorithms which focus on connecting the social media to e-commerce but none are focused on product recommendation by leveraging the social media information like demographic, micro-blogs, location etc.

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This is to certify that Mr./Ms./Dr. SENTHIL BALAJI *of* SARANATHAN COLLEGE OF ENGINEERING *department of* IT *presented a paper entitled* FACIAL EXPRESSION RECOGNITION BASED ON DEEP LEARNING ALGORITHM FOR ANNOTATE THE MUSIC IN PLAYERS *in the National Conference on "Cutting Edge Technologies on Communication, Signal Processing and Networking (NCCSN'19)" held at Saranathan College of Engineering, Trichy on 15th and 16th March 2019.*

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This is to certify that Mr./Ms./Dr. MANOJ KUMAR.Y - o

COLLEGE OF ENGINEERING de

presented a paper entitled AUTONATED ATTENDANCE ENTRY & RECOGNITION OF THE FACE USING OPENCV *in the National Conferenc*

Technologies on Communication, Signal Processing and Network

Saranathan College of Engineering, Trichy on 15th and 16th March 2019

Dr. C.VENNILA

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Usage Of Ceramic Matrix Composites In Bio Medical Applications

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Abstract:

In this work, Powder metallurgy is an important composite forming technique in which a metal and a non metal, both in powdered form are joined together in specific proportion to enhance the mechanical properties so that the properties of the fabricated composite specimens are superior when compared to the individual metal. Metal matrix composites which are fabricated using powder forming process are found to have increased applications in automobile, shipping and aircraft industries. Powder metallurgy process is one of the types of fabrication of StrombusGigas (Conch)-Silica composites in which both matrix as well as reinforcement exist as solid powders. Optimizing the process parameters of powder metallurgy in the fabrication of composite used in the bone marrow implants has been done for the desirable physical properties. In this research paper, process parameters such as composite ball milling hours, composition of Conch and compaction pressure were evaluated using RSM. The properties such as particle density and porosity are studied and tabulated for the proposed composite and the influence of different process parameters over these properties were studied by framing 13 experimental runs using Box-Behnken method. Tests were done by considering three factors and two levels. The parameters which significantly affect the properties were identified using ANOVA.

Design ,fabrication and automation of Wheelchair for quadriplegic patients using MEMS sensor:Review article

[1]K. Amarnath, [2]Ashwin R, [3]Avinesh Balaji K, [4]Harish S, [5]Eddie Lucas S
[1,2,3,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy -12

Abstract :

The current advancements in the field of rehabilitation engineering has led to many inventions which aid people with disabilities to rid their air of malaise with ease. One of such inventions is electronically controlled wheelchairs which aid people who have difficulties in walking , which might have been caused due to a trauma or paralysis . Even a slight trauma to the spinal cord might lead to a condition known as quadriplegia (or) tetraplegia , resulting in paralysis and ultimately leads to partial or total loss of use of all four limbs and torso. In such cases , a wheelchair which can be controlled by head motion , eye motion or even brain signals might be an optimal solution. This paper highlights the intricacies involved in designing and automating a wheel chair which can be controlled by head motion , powered by microelectromechanical sensors via PIC microcontroller.

A security model for electronic health records in healthcare cloud using fog computing

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[2]Assistant Professor/CSE, JJ College of Engineering and Technology, Trichy.

Abstract :

Recently, there has been an increased interest inside the transmission of virtual medical images for e-health services. However, current implementations of this provider do no longer pay a whole lot attention to the confidentiality and protection of patients' data. The need of rapid and secure transmission is essential within the medical world. Nowadays, the transmission of images is a everyday routine and its miles vital to discover an efficient way to transmit them over the internet. In this paper proposed a approach to encrypt an medical images for safe and denoised transmission. This undertaking offers with image cryptography, information hiding and steganography. In this undertaking, we provide a new medical image steganography technique for protective patients' exclusive facts through the embedding of this statistics within the picture itself even as maintaining excessive quality of the picture in addition to high embedding capacity. This project implement LSB substitution based nine pixel differencing. To improve higher embedding capabilitywhile not sacrificing the physical property, a uniquesteganographic methodologybased totally on 9-pixel differencing with modified least vital Bit (LSB)

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Biocompatible materials and processing techniques for developing artificial bone scaffolds - review

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Abstract:
In this modern world, Bone Tissue Engineering is an emerging technique in the field of Bio fabrication. Bone grafting is a conventional technique with high risk and complexity. Engineered bone tissue is a potential alternative for conventional bone graft. This paper focuses on different biomaterials with various characteristics such as biocompatibility, biodegradability, bionert, sterilization, bioresorbable, non-toxicity, osteoconductive and mechanical properties which are used for artificial bone replacement in bone tissue engineering. We have evaluated articles concerning additive manufacturing process like Rapid prototyping, Fused deposition modelling, Stereolithography, Selective laser sintering for biofabrication of artificial bone scaffolds. This overview of the characteristics, advantages and limitations of various biomaterials and their processing techniques which are used for artificial bone scaffolds in Bone tissue engineering, helps to understand the researches already done in the same field to choose better material and better processing technique.

Experimentalevaluation ofhybrid polymer matrix composites- a review

K. Jaya kumar[1], S. Saravana mani[2], S. Sheik aasif[3], A. Vignesh[4], P.V. Rajesh[5].
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ABSTRACT :
Composite materials are those materials which are made from two or more materials with different physical and chemical properties, when combined produce a material which is having different properties from the unit materials. In a composite typically, there are two constituents. One constituent act as a matrix and other constituent acts as reinforcement. The composite materials are heterogeneous at microscale but homogeneous at macroscale. These materials are combined in such a way that they can use of their virtues while minimizing the some effects of their deficiencies. Frequently composites are selected to give unusual combinations of stiffness, strength, weight, high temperature performance, hardness, corrosion and wear resistance.Generally polymer is of two types: Thermoplastics do not undergo any chemical change in their composition when heated and can be molded many times. Thermosetting plastics can be shaped once; after that its shape cannot be changed. In the thermosetting process, a chemical reaction occurs that is irreversible. Mostly the thermoplastics are recyclable, while thermosetting plastics cannot be recycled. The properties of this plastics affects the environment. They are widely used in applications such as aircraft wings, aircraft outer bodies, automobile inner linings, cabins,bumper, TV antennas, decorativetable tops.

CFD analyze of fluid dynamic in cyclone separator

A. Mercy Vasan[1], P.Amirthakumar[2], S.Ayyappan[3], B.Gokul[4], M.Kannadasan[5]
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ABSTRACT :
Cyclone models have been used without relevant modifications for more than a century. Most attentionhas been focused on finding new methods to improve performance parameters. Recent studies concentrateon evaluating geometric effects in improving equipment performance .This work aims at optimizing thevortex finder configuration to reduce the pressure drop and denudation rate, for a given collectionefficiency of the cyclone separator. Literature findings suggest the dependence of pressure drop on thedimensions of the vortex finder. Our model suggests the introduction of hole in the vortex finder, as ameans of reducing pressure drop. Six existing cyclone separator designs were chosen and the moreefficient Coker model was used to find pressure drop in each

International Conference on Current Research in Engineering Science and Technology (ICCREST-2019)

Short Review on Recent Trends in Solar Drying Systems

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***Abstract*— Energy obtained from the sun is known as solar energy. Various applications of solar energy include electricity production, water heating, distillation, drying of foods, cooking, etc. In this study we focused on solar drying process and its performance enhancement. With an aim of improving performance further, numerous research works are conducted by solar dryer based researchers. Such highlighted works are consolidated in terms of drying rate, mass of moisture removed, drying efficiency, etc. In addition, this paper also highlights results of various machine learning based papers in the field of solar energy and drying.**

Keywords— Solar; dryer; performance; enhancement; machine; learning.

I. INTRODUCTION

Drying of food products involves removal or reduction of moisture content. Drying decreases the weight and volume of the products which reduces their packing, storage and transportation costs. The life of the food products can also be increased by drying process and make the product available during off season. Thermal energy is a key factor in dryers for which electric heaters or petroleum products are often used. Solar driers are widely helpful in industrial applications. So the reduction of fossil fuels utilization is possible. Now a days design of solar drier are much more concentrated, such that the obtaining the higher efficiency within the minimum surface area. The main boon of solar drier started when the results of many experiments has good efficiency. The one of the methods of drying the product with simple design consideration has become necessity. This can be achieved in solar heatrier system

II.LITERATURE SURVEY

Shobana Singh et.al [1] has undergone review on variety of solar driers designed for drying the food products. To reduce the complexity in various components of dryer system, there is a need to develop simple and effective theoretical model with suitable boundary conditions that can satisfactorily describe the drying process in all test conditions. They made an experimental setup for drying the food product. They investigated efficiency by varying the size of food product. It is found that dryer with sample thickness of 8mm and loading density of 4.33 kg/m^2 can operate optimally for absorbed energy of $450W/m^2$ and air mass flow rate of 0.017 kg/s.

Ashish Agrawal et.al [2] described that a solar dryer without heat storage provides air with large variations in temperature to the dryer, and drying of food is not possible during partial clouds and late evening hours. They described various reviews of researchers, to store the heat in dryer. Paraffin wax was used as a heat storage material in most of the previous research works because of its low cost and easy availability, but the major drawback of paraffin is low thermal conductivity.

M. Chandrasekar et.al [3] conducted an experimental investigation using the outlet of A/C as an inlet air into the dryer. In this work of sending the hot air inside the dryer, helps a lot in drying the sultana grapes (seedless) at a faster rate than normal mode. A possibility of 13% increase in solar dryer efficiency was demonstrated due to the utilization of solar dryer with A/C condenser unit compared to the conventional indirect solar dryer.

C.O.C. Oko et.al [4] presented the analysis of a coupled heat and mass transfer process in a fixed-bed solar grain dryer. and Humidity of air, moisture concentration, temperature were measured in a solar grain dryer in Nigeria, at the latitude of 4.858°N and longitude of 8.372°E. The process was also modeled, mathematically, by a set of partial differential equations that were coupled within the grain and through the grain boundary with the hot drying air. There was good agreement between the theoretical and experimental results at specified Biot and Posnov numbers, and varying Fourier number. The results of this work will be useful for specifying the design parameters of solar grain dryers.

N. A. Vlachos et.al [5] designed a prototype tray dryer equipped with a solar air collector, a heat storage cabinet and a solar chimney. The dryer is straightforward to construct and operate and may be enforced at low value. Considering the various climatic conditions tested (sunny, cloudy or rainy), the drying method reached full completion altogether tests at an inexpensive rate of dehydration. Experimentation over the night, while not the employment of the centrifugal fan, confirmed the system's smart performance relating to the utility of the warmth storage cupboard since the products' water content continued to decrease though at a lower rate.

Sujata Nayak et.al [6] tested the mint and comparison was made to fresh samples. The results are recorded for eight different samples in fresh and dried conditions. it has seen that

EXHAUST FLOW ANALYSIS AND EXPERIMENTAL INVESTIGATION OF CATALYTIC CONVERTER USING CFD AND ANN

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***Abstract*—A catalytic converter is a device which is used for reducing the emissions toxicity from the exhaust systems of an internal combustion engines. This catalytic converter is fitted in series with the exhaust pipe of gasoline fueled vehicles which converts over the 90 percent of hydrocarbons (HC), carbon monoxide (CO) and Oxides of Nitrogen (NO_x) from the engine into less harmful nitrogen (N_2), carbon-dioxide (CO_2) and water vapor (H_2O). This work reports the design of novel diffuser for improving the performance of the catalytic converter. In order to increase the residual time of the exhaust gas flow, the novel diffuser is designed. The novelty of our work is to reduce the velocity of the exhaust gas in the catalytic systems by changing design of diffuser section. The diffuser system is modeled for various dimensions. The upstream flow characteristics of the diffuser system are analyzed using computational fluid dynamics. The results are obtained for comparing the better model with the conventional one. The better design model is fabricated for investigating the experimental analysis. The experimental values are analyzed in artificial neural network (ANN) software. The values obtained from computational fluid dynamics and ANN are compared for getting better results**

Keywords* — *catalytic converter, residual time, diffuser, upstream, cone angle.

I. INTRODUCTION

In automobile industries, various techniques are employed for reducing the emissions from the exhaust system of the internal combustion engines. A controlled combustion reaction needs to be occurred inside the vehicle s engines for operating the internal combustion engines. But this controlled combustion reaction also produces harmful burnt gases that contribute significantly to air pollution.

In order to reduce air pollution, modern automobiles are equipped with a device called a catalytic converter that reduces emissions of three harmful compounds found in the exhaust system of the internal combustion engines which are Carbon monoxide (a poisonous gas), Nitrogen oxides (a cause of smog and acid rain), Hydrocarbons (a cause of smog). These harmful gases are converted into less harmful gases before leaving the exhaust system. This is achieved by using a catalyst that is why device name is called as catalytic converter. The combination of Platinum (Pt), Palladium (Pd) and Platinum (Pt), Rhodium (Rh) is used as a catalyst in the catalytic converter.

Catalysts are the compounds that can rate a chemical reaction without being affected themselves. For reducing the emissions of harmful compounds from the automobiles the catalysts are also used. Inside the catalytic converter both oxidation and reduction reactions takes place. Hence Platinum and Palladium is called as Oxidation catalyst whereas Platinum and Rhodium is called as Reduction catalyst.

As a result of chemical reaction, Carbon monoxide (CO) is converted into carbon dioxide (CO_2) and Oxides of Nitrogen (NO_x) is broken down into Nitrogen (N_2) and Oxygen (O_2) and the hydrocarbons (HC) are converted into carbon dioxide (CO_2) and water vapour. Initially the catalytic converter uses a reduction catalyst which composed of platinum and rhodium for reducing the nitrous oxides. When the molecules of nitrous oxides (NO and NO_2) passes through the device , the nitrogen atoms are removed with the help of catalyst, which allows the free oxygen to form oxygen gas (O_2). The formation of nitrogen gas (N_2) also takes place when the nitrogen atom reacts with another nitrogen atom which are attached to the catalyst for happening chemical reaction.

This work identifies the problems in the design of catalytic converter. First, the gases coming out from the exhaust manifold enter into the catalytic converter for reducing the toxic components. The efficiency of the Catalytic converter mainly depends on temperature, velocity and flow distribution of the exhaust gases. The velocity of the exhaust gas from upstream section to the exit section of the catalytic converter is very high. Due to high velocity the residual time decreases which results in incomplete conversion of harmful gases. This problem is overcome by providing diffuser at inlet of the catalytic converter. The purpose of diffuser is to reduce the velocity with increase in pressure. By designing the novel diffuser the velocity can be reduced and hence the residual time can be increased. So the inlet section is designed as diffuser for decreasing the velocity of the exhaust gas. In order to improve the performance, uniform flow distribution is achieved by varying the

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A Short Review on Double Pipe Heat Exchanger

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Abstract

Heat exchanger is a thermal device that transfers heat from high temperature fluid to low temperature fluid. Heat exchangers-based researchers proposed various classification of heat exchangers. Among which double pipe heat exchangers (DPHE) are commercially used in many industrial applications. Various classification of DPHE includes parallel, counter and cross flow. Numerous research works have been conducted with DPHE in terms of stand-alone parallel, counter and cross flow system. In addition, research works were also conducted to improve the performance of DPHE by using inserts, plenum at both ends, turbulators, varying geometry of the flow channels etc. In this study, we presented a short review on various DPHE research works in a manner to identify the right performance deciding parameters. In addition, the art of introducing artificial intelligence in the field of heat exchangers are also highlighted.

Keywords - heat exchanger; performance; parameter; DPHE

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A Short Review on Solar Photovoltaic / Thermal Water Collectors

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Saranathan College of Engineering
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Abstract

Solar energy is one among wide available renewable energy source. Among various solar energy conversion devices, solar photovoltaic thermal water collector is a device which converts solar energy into electrical and thermal power simultaneously. Numerous research works are conducted during the last two decades by solar PV/T water collector-based researchers. In this study, a short review on performance influencing parameters of various solar PV/T water collectors are discussed. In addition, role of artificial intelligence along with its advantages and future properties were also highlighted.

Keywords - solar; PV/T; water; collectors; performance; parameters; artificial and intelligence

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Privy pristine and salvage

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Abstract:
The purpose of this project is to provide hygienic environment near the urinals at the public restrooms by making it to get flushed automatically. To use less amount of water for flushing purpose and to prevent the unnecessary wastage of water and save the water forthe future generation.Whereas this project also provide cheapest urinal flushing and recycle system prevailing of bad odor and unhygienic environment in public rest rooms.

Vocal cranium casing using Microcontroller

[1]V.Mohan,[2]B.SuryaKumar,[3]S.Riyazdeen, [4]M.Sathis Kumar
[1,2,3]Final year ICE, Saranathan College of Engineering, Trichy -12
[4]Asst. Prof/ICE, Saranathan College of Engineering, Trichy-12

Abstract :
The idea of developing this proposed model arise from social welfare using instrumentation technologies. Statistics says that nearly 43 accidents occur per day in 2016. To reduce these tragic happenings wearing of helmet is made compulsory but the following of this rule is being ignored day by day. so the bike instrumentation features like indications of fuel, speed etc. are being just only displayed on the dial but in this model it has been determined with the help of vocal indications like speed and fuel programmed in the helmet. This idea will attract many customers knowing a new functional implementations are given to improve the safety of the rider and craze of wearing helmets will improve.

Processing and Evaluation of Polymer Matrix Composites – Review

[1]S.Mukundh, [2]D.Saravana kumar, [3]A.Prabhakaran, [4]P.V.Rajesh,
[5]M. Rayees ahmed
[1,2,3,4,5] Final year Mech, Saranathan college of Engineering, Trichy – 12

Abstract:
Composite materials are those materials which are made from two or more materials with different physical and chemical properties, when combined produce a material which is having different properties from the unit materials. In a composite typically, there are two constituents, One constituent act as a matrix and other constituent acts as reinforcement. The composite materials are heterogeneous at microscale but homogeneous at macroscale. These materials are combined in such a way that they can use of their virtues while minimizing the some effects of their deficiencies. Frequently composites are selected to give unusual combinations of stiffness, strength, weight, high temperature performance, hardness, corrosion and wear resistance. Generally polymer is of two types: Thermoplastics do not undergo any chemical change in their composition when heated and can be molded many times. Thermosetting plastics can be shaped once; after that its shape cannot be changed. In the thermosetting process, a chemical reaction occurs that is irreversible. Mostly the thermoplastics are recyclable, while thermosetting plastics cannot be recycled. The properties of this plastics affects the environment. They are widely used in applications such as aircraft wings, aircraft outer bodies, automobile inner linings, cabins, bumper, TV antennas, decorative tabletops.

properties such as tensile strength, compressive strength, flexural strength, impact energy absorption, interlaminar shear strength (ILSS) and water absorption tests.

Optimization of process parameters in friction stir welding of two dissimilar grades of aluminium matrix composites

M.Muralidharan[1], S.R.Shubathradhevi[2], K.Prakash[3], M.Ajithkumar[4]
[5]P.V.Rajesh, [6]M.Ganesan, [7]N.Baskar
[1,2,3,4]Final year Mechanical, Saranathan College of Engineering, Trichy– 12
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Abstract :
Friction Stir Welding (FSW) is a solid-state joining process which is very efficient and versatile green manufacturing technique. FSW was first developed for aluminium alloys, but now it has been used for a variety of metals and metal-matrix composites (MMC's). This environment-friendly process causes strong plastic deformation, material mixing and thermal exposure which results in significant micro structural refinement, densification and homogeneity of the processed zone. FSW has been employed in various high technology applications such as aerospace, automotive industry, high precision welding etc., for its novel technique. The important process parameters considered generally are the Tool rotation speed, Traverse speed, Force, and the Tool geometry. The output responses typically analysed are the Mechanical properties like tensile strength, hardness, Tool wear, etc., and Microstructure of the welded specimen. The objective of this review paper is to analyse the collection of literature on Friction Stir Welding process and Optimisation. Recently a lot of researchers have shown interest in Friction stir welding and its various applications. Now a days, Friction Stir Welding is employed in order to achieve reduced time and cost of the product and the strength of the weld can be increased.

Smart Accident Avoidance system based on Alcohol and Heart Beat Detection

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Abstract:
In our project, we are introducing a new smart system that will detect drunken persons and abnormal condition persons by alcohol sensor and heartbeat sensor. GSM system is used to send a message to the police station and relevant numbers for immediate action. GPS based system is used here to track those cars. Alcohol sensor detects the drunken persons before the ignition of the car, the car's ignition will immediately turn-off. Eye Blink sensor is used to identify the driver sleeping condition to avoid major accidents on roads. The heart pulse sensor is to notify the normal or abnormal condition of the driver if it notifies the speed of the vehicle is reduced below the average range.

Aluminum and water as a fuel cell based Electric Vehicle

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[1] Prof/EEE, V.S.B. Engineering College, Karur
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Abstract:
The world aims for clean power sources to run the different vehicles pavement on regular basis. As their main contribution is toxic emissions releases from internal combustion engine (ICE) to the environment. These toxic emissions affect the climate change and produce air pollution. This causes negative impacts on people's health. To overcome this problem we are moving for fuel cell based electric vehicle. In fuel cell technology there is no need of internal combustion engine. Its efficiency is 2-3 times higher than ICE. The input for fuel cell is hydrogen which is produced by chemical reaction between aluminium and water. Where aluminium is the most

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Biocompatible materials and processing techniques for developing artificial bone scaffolds - review

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Abstract:
In this modern world, Bone Tissue Engineering is an emerging technique in the field of Bio fabrication. Bone grafting is a conventional technique with high risk and complexity. Engineered bone tissue is a potential alternative for conventional bone graft. This paper focuses on different biomaterials with various characteristics such as biocompatibility, biodegradability, bionert, sterilization, bioresorbable, non-toxicity, osteoconductive and mechanical properties which are used for artificial bone replacement in bone tissue engineering. We have evaluated articles concerning additive manufacturing process like Rapid prototyping, Fused deposition modelling, Stereolithography, Selective laser sintering for biofabrication of artificial bone scaffolds. This overview of the characteristics, advantages and limitations of various biomaterials and their processing techniques which are used for artificial bone scaffolds in Bone tissue engineering, helps to understand the researches already done in the same field to choose better material and better processing technique.

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CFD analyze of fluid dynamic in cyclone separator

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Cyclone models have been used without relevant modifications for more than a century. Most attentionhas been focused on finding new methods to improve performance parameters. Recent studies concentrateon evaluating geometric effects in improving equipment performance .This work aims at optimizing thevortex finder configuration to reduce the pressure drop and denudation rate, for a given collectionefficiency of the cyclone separator. Literature findings suggest the dependence of pressure drop on thedimensions of the vortex finder. Our model suggests the introduction of hole in the vortex finder, as ameans of reducing pressure drop. Six existing cyclone separator designs were chosen and the moreefficient Coker model was used to find pressure drop in each

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IoT based remote monitoring of filament flow and temperature in a 3D printer by retrofitting

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Abstract :

In this work, we present a method to enhance a 3D printer with online access and remote monitoring by using internet enabled devices. The remote monitoring includes temperature, level of filament and the filament flow. Using microcontroller (like RASPBERRY PI-a mini–computer) which has a wireless module, the data are extracted from 3D printer by sensors and stored in cloud which is nothing but the concept *INTERNET OF THINGS*(IoT).

Review on ceramic composite material

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Abstract :

Recent days, the usage of composite materials has been increased in various fields of applications. Composites have a major purpose of usage in medical field. Composites are formed by two or more materials having different chemical and mechanical properties combined at equal or different composition in order to increase the efficiency and performance of those individual materials. In this study, a composite material has been used as an alternative, especially for biological applications. Various compositions are made using those materials, tested to analyze the physical, chemical and mechanical properties and optimized results are obtained.

Design and optimisation of flow analysis on catalytic converter by using cfd software

[1]A.Santhana bharathi, [2]V.Muralitharan, [3]A.Balakrishnan
[4]R.Ramankanth,[5]K.Praveen, [6]S.Sathyanarayanan
[1,2,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy -12
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ABSTRACT :

The need for catalytic converter modeling in the design of demanding exhaust systems for low-emitting vehicles has been widely recognized. Although a number of related models have been presented in the literature, the efficient performance in actual applications enquires further development and validation. The major difficulties posed in such modeling efforts arise
from the complexities in the reaction schemes and the respective rate expressions for the multitude of currently used catalytic formulations. This paper presents a two-dimensional catalytic converter model, featuring a number of innovations regarding the catalyst transient behavior, the reaction kinetics and the solution procedure.

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Usage Of Ceramic Matrix Composites In Bio Medical Applications

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[2.3.4]Final year Mechanical, Saranathan College of Engineering, Trichy – 12

Abstract:

In this work, Powder metallurgy is an important composite forming technique in which a metal and a non metal, both in powdered form are joined together in specific proportion to enhance the mechanical properties so that the properties of the fabricated composite specimens are superior when compared to the individual metal. Metal matrix composites which are fabricated using powder forming process are found to have increased applications in automobile, shipping and aircraft industries. Powder metallurgy process is one of the types of fabrication of StrombusGigas (Conch)-Silica composites in which both matrix as well as reinforcement exist as solid powders. Optimizing the process parameters of powder metallurgy in the fabrication of composite used in the bone marrow implants has been done for the desirable physical properties. In this research paper, process parameters such as composite ball milling hours, composition of Conch and compaction pressure were evaluated using RSM. The properties such as particle density and porosity are studied and tabulated for the proposed composite and the influence of different process parameters over these properties were studied by framing 13 experimental runs using Box-Behnken method. Tests were done by considering three factors and two levels. The parameters which significantly affect the properties were identified using ANOVA.

Design ,fabrication and automation of Wheelchair for quadriplegic patients using MEMS sensor:Review article

[1]K. Amarnath, [2]Ashwin R, [3]Avinesh Balaji K, [4]Harish S, [5]Eddie Lucas S
[1,2,3,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy -12

Abstract :

The current advancements in the field of rehabilitation engineering has led to many inventions which aid people with disabilities to rid their air of malaise with ease. One of such inventions is electronically controlled wheelchairs which aid people who have difficulties in walking , which might have been caused due to a trauma or paralysis . Even a slight trauma to the spinal cord might lead to a condition known as quadriplegia (or) tetraplegia , resulting in paralysis and ultimately leads to partial or total loss of use of all four limbs and torso. In such cases , a wheelchair which can be controlled by head motion , eye motion or even brain signals might be an optimal solution. This paper highlights the intricacies involved in designing and automating a wheel chair which can be controlled by head motion , powered by microelectromechanical sensors via PIC microcontroller.

A security model for electronic health records in healthcare cloud using fog computing

[1]R.Roshan Joshua, [2]G.Raja,
[1]M.E.Student/CSE, JJ College of Engineering and Technology, Trichy.
[2]Assistant Professor/CSE, JJ College of Engineering and Technology, Trichy.

Abstract :

Recently, there has been an increased interest inside the transmission of virtual medical images for e-health services. However, current implementations of this provider do no longer pay a whole lot attention to the confidentiality and protection of patients' data. The need of rapid and secure transmission is essential within the medical world. Nowadays, the transmission of images is a everyday routine and its miles vital to discover an efficient way to transmit them over the internet. In this paper proposed a approach to encrypt an medical images for safe and denoised transmission. This undertaking offers with image cryptography, information hiding and steganography. In this undertaking, we provide a new medical image steganography technique for protective patients' exclusive facts through the embedding of this statistics within the picture itself even as maintaining excessive quality of the picture in addition to high embedding capacity. This project implement LSB substitution based nine pixel differencing. To improve higher embedding capabilitywhile not sacrificing the physical property, a uniquesteganographic methodologybased totally on 9-pixel differencing with modified least vital Bit (LSB)

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Biocompatible materials and processing techniques for developing artificial bone scaffolds - review

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[1,2,3] Final year Mech, Saranathan College of Engineering, Trichy - 12
[4]Asst. Prof/Mech, Saranathan College of Engineering, Trichy - 12

Abstract:
In this modern world, Bone Tissue Engineering is an emerging technique in the field of Bio fabrication. Bone grafting is a conventional technique with high risk and complexity. Engineered bone tissue is a potential alternative for conventional bone graft. This paper focuses on different biomaterials with various characteristics such as biocompatibility, biodegradability, bionert, sterilization, bioresorbable, non-toxicity, osteoconductive and mechanical properties which are used for artificial bone replacement in bone tissue engineering. We have evaluated articles concerning additive manufacturing process like Rapid prototyping, Fused deposition modelling, Stereolithography, Selective laser sintering for biofabrication of artificial bone scaffolds. This overview of the characteristics, advantages and limitations of various biomaterials and their processing techniques which are used for artificial bone scaffolds in Bone tissue engineering, helps to understand the researches already done in the same field to choose better material and better processing technique.

Experimentalevaluation ofhybrid polymer matrix composites- a review

K. Jaya kumar[1], S. Saravana mani[2], S. Sheik aasif[3], A. Vignesh[4], P.V. Rajesh[5].
[1,2,3,4] Final year Mechanical Engineering, Saranathan College of Engineering, Trichy-12
[5]Asst. Prof/Mechanical Engineering, Saranathan College of Engineering, Trichy-12

ABSTRACT :
Composite materials are those materials which are made from two or more materials with different physical and chemical properties, when combined produce a material which is having different properties from the unit materials. In a composite typically, there are two constituents. One constituent act as a matrix and other constituent acts as reinforcement. The composite materials are heterogeneous at microscale but homogeneous at macroscale. These materials are combined in such a way that they can use of their virtues while minimizing the some effects of their deficiencies. Frequently composites are selected to give unusual combinations of stiffness, strength, weight, high temperature performance, hardness, corrosion and wear resistance.Generally polymer is of two types: Thermoplastics do not undergo any chemical change in their composition when heated and can be molded many times. Thermosetting plastics can be shaped once; after that its shape cannot be changed. In the thermosetting process, a chemical reaction occurs that is irreversible. Mostly the thermoplastics are recyclable, while thermosetting plastics cannot be recycled. The properties of this plastics affects the environment. They are widely used in applications such as aircraft wings, aircraft outer bodies, automobile inner linings, cabins,bumper, TV antennas, decorativetable tops.

CFD analyze of fluid dynamic in cyclone separator

A. Mercy Vasan[1], P.Amirthakumar[2], S.Ayyappan[3], B.Gokul[4], M.Kannadasan[5]
[1]Asst. Prof/Mech, Saranathan College of Engineering.Trichy - 12
[2,3,4,5] Final year Mech, Saranathan College of Engineering.Trichy -12

ABSTRACT :
Cyclone models have been used without relevant modifications for more than a century. Most attentionhas been focused on finding new methods to improve performance parameters. Recent studies concentrateon evaluating geometric effects in improving equipment performance .This work aims at optimizing thevortex finder configuration to reduce the pressure drop and denudation rate, for a given collectionefficiency of the cyclone separator. Literature findings suggest the dependence of pressure drop on thedimensions of the vortex finder. Our model suggests the introduction of hole in the vortex finder, as ameans of reducing pressure drop. Six existing cyclone separator designs were chosen and the moreefficient Coker model was used to find pressure drop in each

case. CFD analysis of the existing designswith and without the hole in vortex finder were done. A mass flow rate of 500 m 3/hr, an inlet flowvelocity of 15 m/s and the k-Ɛ turbulence model were chosen for flow simulation. By fixing constraintsfor pressure drop, denudation rate and collection efficiency and the model was analyzed by CFD.

A Research Review in Friction WeldingProcess

[1]Karthikeyan Sambantham, [2]Naveen Christopher, [3]Rakesh Angaraj, [4]Baskar Neelakandan,[5]Ganesan Manickam, [6]Robinson Wilson
[1,2,3,6]Final year Mechanical, Saronathan college of Engineering, Trichy -12
[4,5] Professor/ Mechanical, Saronathan college of Engineering, Trichy -12

Abstract :

Producing a component plays a very crucial role in the field of manufacturing industries. Joining two components are done in many ways like welding, riveted joints, bolts and nuts, clips, adhesives etc. Among them welding has a greater bonding strength between the materials. Welding is a process of combining like or unlike materials by the use or without the use of heat and pressure. Friction welding is a solid state joining process which uses the frictional heat generated during the bonding of two metals. Friction Welding is the one of the manufacturing technique used to join related or unrelated combining of materials inclusive or exclusive of filler rod.In friction welding process, heat is developed at the junction of joining the specimen under plastic deformation by converting the rotational energy into heat energy by means of pressure. It has been extensively used in industries because of the increased mechanical properties such as hardness, tensile strength. They are one among the safety type of welding to the workers. This welding process is preferred in many industries to reduce the time and cost and increase the quality of the welded specimen. For obtaining good joint efficiency various input process parameters such as upset pressure, upset time, heating pressure, heating time, rotational speed, burn off length and chemical composition of the test specimen were considered. The output responses are axial shortening, hardness, tensile strength, impact strength and microstructure.The main purpose of this paper is to review the collection of literature available on the friction welding process and optimization techniques by various research works. The authors initiate that input process factors plays an important role in the quality and efficiency of the welded joint.

Strain analysis of crank shaft withInternet of things(IoT)

[1]A.SARAVANAN, [2]S.ARAVINTHAN, [3]L.ALLAN LALWLEY, [4]S.JAYAKUMAR, [5]N.ARAVINDAN
[1] Asst. Pro/Mechanical Engineering,*Saranathan College of Engineering* Trichy -12
[2,3,4,5] Asst. Pro/Mechanical Engineering, *Saranathan College of Engineering* Trichy -12

Abstract :

Crank shaft is one of the serious mechanism of vehicle which associations piston and connecting rod to the engine. It undergoes changeable loads subjected to dissimilar conditions, and variable change in load condition due to over pressurized, fatigue load. This project focuses on analysis of crank shaft targeting to monitors the deflection of the automobile and indicates the deformation in the crank shaft.

Effect of process parameters in CNC Turning Operation: A Review

[1]U.Mohamed Faizal, [2]X.Stephen Raja, [3]S.Naveen Kumar, [4]R.Kumar, [5]R.Ruban
[1,2,3,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy -12

Abstract:

CNC turning operation plays a major role in manufacturing sectors. Selection of Cutting parameters, work piece material and cutting tool all have an essential influence on the achievement on the best quality, high metal removal rate and desired surface roughness. It is very important to provide best quality at less cost to the customers. Prediction of surface roughness and machining time are always important in manufacturing field. To improve production rate in mass production industry by reducing the machining time and effective use of CNC machine. By changing the process parameters such as speed, feed and depth of cut, several surface roughness was obtained.

Recognition (OCR) and it is displayed with the help of servo motors or push pull solenoids. This reduces the printing cost of Braille coded books as well as the space of storage.

Autonomous bio-bot for green house cultivation

[1]Raghavan.S.S,[2]Vishal.N,[3]Swaminathan.S
[1,2,3]Final year EEE, Saranathan College of Engineering,Trichy-12

ABSTRACT:

A global competition is pressing farmers on many fronts, mechanized agriculture has become one of the important modern agricultural methods .With the global population is expected to reach more than 8 billion by 2050, the need for agricultural production to be increased double to meet out the demand. With the limited space, the agriculture production has to be increased. This gives pressure to the Government, Private sectors and Farmers to improve the production in a positive manner. Hence all the developed countries come forth to implement robotic platform for agricultural applications such as monitoring, weed removal and pesticide spraying. Introducing robots in agriculture has been started since 1985.In recent decades, technology as a result of latest scientific research have been widely applied in agriculture to improve quality and productivityThough the latest technologies are accepted and implemented, it is noticeable that agriculture is still labor intensive. Present day solutions densely depend upon heavy application of chemicals that are sprayed at defined time intervals making the environment toxic. Studies confirm that spraying shows harmful effect on human labours and consumers. Hence in order to limit application towards site specific, automation has to be implemented for agriculture operations like monitoring, control environment and inspection.

Strain Analysis of Knuckle Joint Using Internet of Things: Review

[1]A.Saravanan, [2]A.Vembarasan, [3]S.Pasupathi, [4]M.Vinoth, [5]S.Suryajothi
[1] Asst. Prof/Mechanical, Saranathan College of Engineering, Trichy - 12
[2,3,4,5]Final yearMechanical, Saranathan College of Engineering, Trichy -12

Abstract:

It consists of a system which is comprised of several units that monitors the health of the automobile in a dynamic state as well as static state. The parts of vehicle monitoring system has stolen vehicle recovery Asset tracking, Field service management, Field sales, Trailer tracking, surveillance, Transit tracking, Fuel Monitoring, Distance Calculation. From the above system, we are concentrating in a particular unit which monitors the deflection of the automobile and indicates the suspension or knuckle to be changed according to servicing the automobile.

Experimental Analysis of using Various Steel Grades of a Ball Pin of an Automobile Ball Joint Assembly

[1]S. Pradeesh, [2]K.B. Vijayendra, [3]D. Thamotaran, [4]J. Sivasubramanian
[5]K. Thiyagarajan
[1,2,3,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy -12

Abstract:

This study describes the design and analysis of a steering system ball joint using finite element analysis and experimental method. The main load carrying component of a ball joint is ball pin. Thus the manufacturing and designing of ball pins are crucial. The extruded steel rods are forged to the required shape for the ball pin. These ball pins are turned and thread rolled. Raw ball pins have lower yield strength. Ball pins experience two major loads mainly, axial load and radial load. In order to make the ball pin durable, induction hardening is done. The induction hardening hardens the surface of the ball pin and the core remains soft. This is the favourable condition for a ball pin. The induction hardening is a tedious process that is it must be done for an accurate period of time. The main scope of our project to analyse the usage of alternate steel grades in a ball joint so as to make it more reliable, risk free component. We have also trying to eliminate some major manufacturing processes which is difficult and expensive. A comparative study of using afew other steel grades instead of using the existing one will be done.

case. CFD analysis of the existing designswith and without the hole in vortex finder were done. A mass flow rate of 500 m 3/hr, an inlet flowvelocity of 15 m/s and the k-Ɛ turbulence model were chosen for flow simulation. By fixing constraintsfor pressure drop, denudation rate and collection efficiency and the model was analyzed by CFD.

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Exhaust flow analysis and experimental investigation of catalytic converter using CFD and ANN

[1]S.Sathya narayanan, [2]A.Manavalan, [3]J.Manirathinam, [4]P.Naveen, [5]S.Manivel
[1]Asst. Prof/Mechanical, Saranathan College of Engineering, Trichy-12
[2,3,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy-12

Abstract:
A catalytic converter is a device which is used for reducing the emissions toxicity from the exhaust systems of an internal combustion engines. This catalytic converter is fitted in series with the exhaust pipe of gasoline fueled vehicles which converts over the 90 percent of hydrocarbons (HC), carbon monoxide (CO) and Oxides of Nitrogen (NO_x) from the engine into less harmful nitrogen (N_2), carbon-dioxide (CO_2) and water vapour (H_2O). This work reports the design of novel diffuser for improving the performance of the catalytic converter. In order to increase the residual time of the exhaust gas flow, the novel diffuser is designed. The novelty of our work is to reduce the velocity of the exhaust gas in the catalytic systems by changing design of diffuser section. The diffuser system is modeled for various dimensions. The upstream flow characteristics of the diffuser system is analyzed using computational fluid dynamics. The results are obtained for comparing the better model with the conventional one. The better design model is fabricated for investigating the experimental analysis. The experimental values are analysed in artificial neural network (ANN) software. The values obtained from computational fluid dynamics and ANN are compared for getting better results.

Design and analysis of engine cylinder fin

[1]Paramaguru, [2]S.Mathu Deepan, [3]A. Roy GnanaDhanaraj, [4]A. Vigneshwaran,[5]R.Vijai
[1]Asst. Professor/Mechanical, Saranathan College of Engineering, Trichy – 12
[2,3,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy – 12.

Abstract :
The Engine cylinder is one of the major automobile components, which undergoes high temperature variations and thermal stresses. In order to cool the engine cylinder, fins are provided on the cylinder to increase the heat transfer rate. By doing thermal analysis on the engine cylinder fins, it is helpful to know the heat dissipation rate inside the cylinder. The main 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 engine is complex and very difficult. The main purpose of using fins is to cool the engine cylinder by air. A parametric model is created in 3D modeling software Creo parametric. Thermal analysis is done on the fins to determine variation in temperature distribution with respect to time. The analysis is done using Ansys. Analysis is conducted by varying material and geometry of the fin. Presently Material used for manufacturing fin is Cast Iron. In this project, it is replaced by the different materials and measures the output. Then finally compare the existing fin parameters with the newly modified fin and then concluded with the better performance material design.

Application of Jute Fibre & ZrO_2 reinforcement with Epoxy Resin in Helmet

T.Allwin Sam[1], G.Deva Viswa[2], R.Hariprasath[3], R.K.Madhumithran[4] P.Vigneshwar[5]
[1,2,3,4]Final year Mechanical, Saranathan College of Engineering, Trichy -12
[5]Asst. Prof/ Mechanical, Saranathan College of Engineering, Trichy -12

Abstract:
The degradation behaviour of synthetic fibre composite is a major issue in developed as well as developing countries Researchers are trying to replace many parts and components made of synthetic fibre with natural fibre composites. In this context, a helmet material, replaced by the jute/epoxy fibre composite with different thickness and impact of nanofiller material made of ZrO_2 of 2% is characterized by their mechanical

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IoT based remote monitoring of filament flow and temperature in a 3D printer by retrofitting

[1]P.V.Rajesh, [2]J.Mohamed Azarudeen, [3].Yathinder Krishna, [4]M.Thirunavukkarasu, [5]S.Senthilkumar
[1]Asst. Prof/Mechanical, Saranathan College of Engineering, Trichy -12
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Abstract :
In this work, we present a method to enhance a 3D printer with online access and remote monitoring by using internet enabled devices. The remote monitoring includes temperature, level of filament and the filament flow. Using microcontroller (like RASPBERRY PI-a mini–computer) which has a wireless module, the data are extracted from 3D printer by sensors and stored in cloud which is nothing but the concept *INTERNET OF THINGS*(IoT).

Review on ceramic composite material

[1]P.JOTHI PALAVESAM, [2]R.MOHANA PRIYA, [3]M.SHANMATHI, [4]S.SHARAN
[1] Asst. Prof/Mechanical, Saranathan College of Engineering, Trichy - 12
[2,3,4]Final year Mechanical, Saranathan College of Engineering, Trichy - 12

Abstract :
Recent days, the usage of composite materials has been increased in various fields of applications. Composites have a major purpose of usage in medical field. Composites are formed by two or more materials having different chemical and mechanical properties combined at equal or different composition in order to increase the efficiency and performance of those individual materials. In this study, a composite material has been used as an alternative, especially for biological applications. Various compositions are made using those materials, tested to analyze the physical, chemical and mechanical properties and optimized results are obtained.

Design and optimisation of flow analysis on catalytic converter by using cfd software

[1]A.Santhana bharathi, [2]V.Muralitharan, [3]A.Balakrishnan [4]R.Ramankanth,[5]K.Praveen, [6]S.Sathyanarayanan
[1,2,4,5]Final year Mechanical, Saranathan College of Engineering, Trichy -12
[3,6]Asst. Prof/Mechanical, Saranathan College of Engineering, Trichy -12

ABSTRACT :
The need for catalytic converter modeling in the design of demanding exhaust systems for low-emitting vehicles has been widely recognized. Although a number of related models have been presented in the literature, the efficient performance in actual applications enquires further development and validation. The major difficulties posed in such modeling efforts arise
from the complexities in the reaction schemes and the respective rate expressions for the multitude of currently used catalytic formulations. This paper presents a two-dimensional catalytic converter model, featuring a number of innovations regarding the catalyst transient behavior, the reaction kinetics and the solution procedure.

conjunction with assessment posting styles. User will login to the device using his consumer identification and password and could view various merchandise and will give assessment approximately the product. To discover the evaluation is fake or authentic, system will find out the MAC address of the consumer if the machine observes fake assessment send by way of the identical MAC Address many a times it'll inform the admin to do away with that overview from the device. This gadget uses information mining technique. This machine allows the user to find out accurate overview of the product.

Sewage and drainage inspection using integrated technologies

K.Nandhitha[1],V.Gayathri[2], A.Abinaya[2], R.Dhayabarani[1]
[1] Assistant Professor/ECE, V.S.B. Engineering College, Karur
[2] Final year ECE, ECE, V.S.B. Engineering College, Karur

ABSTRACT:

In this modern era, there are many techniques used for the management of solid waste and drainage fills. A combination of MSP430, Arduino and Global system is the modern trends used in this paper. To explain briefly, we have kept the ultrasonic sensors in the trash cans kept at the public places. When the trash can reach the particular level, the sensor will give indication to the MSP430 Controller. As soon as the garbage is completely filled, by using GSM technology, the controller indicates by sending SMS to the driver of the truck, as it needs to be cleaned and the message will send to the central base station. Likewise, the drainage overflow can also be monitored periodically.

Recent Advances in Turning Operation : Review

[1]N. Sathiya Narayanan,[2]M.Ganesan, [3]S. Nanthakumaran, [4]N. Baskar, [5]S.Nagaraj, [6]G. Nagababu,[7]A.L. Vaithilingam
[1,2,3]Prof/Mechanical, Saranathan College of Engineering, Trichy -12
[4,5,6,7]Final year Mechanical, Saranathan College of Engineering, Trichy -12

Abstract :

The main objective of the manufacturing industries is to increase the production rate as well as reducing the cost by selecting recent advancements in the manufacturing process. A common method to manufacture parts to a specific dimension involves the removal of excess material by machining operation with the help of cutting tool. Turning process is the one of the methods to remove excess material from cylindrical and non-cylindrical parts. The important machining parameters in turning process are normally considered as spindle speed, feed rate and depth of cut affect the metal removal rate and surface roughness of the finished component. Normally, the forces acting on the workpiece during turning process such as tangential force, axial force and radial force that affect the tool life.During the turning process, rake angle, side rake angle, cutting edge angle, relief angle and nose radius are also affect the performance of the turning. The cutting tool performance is improved by enhancing coolant flow availability at the contact point, reducing the tool-chip contact area and trapping wear debris. This paper is to study the importance of process parameters on surface roughness and Material Removal Rate (MRR) in turning process.

Experimental Investigation and Comparative Analysis of Al-6061 Using L9 Orthogonal Array

[1]S.Bilal Ahamed, [2]N.Baskar, [3]R.Lavanyan, [4]M. Ganesan,[5]T.Ranjith
[1,3,4] Final year Mechanical, Saranathan College of Engineering, Trichy -12
[2,5]Prof/Mechanical, Saranathan College of Engineering, Trichy-12

Abstract:

Modern industry mainly concentrates on the quality by choosing the material and method. Machining is one of the important manufacturing methods to produce the product. Turning process is most wanted operation in manufacturing industries and it is carried out in lathe. The main objective of the industries is to produce the component at affordable price. This mainly depends on the selection of machining parameters. The machining parameters are spindle speed, feed rate and depth of cut and the output responses are MT, material removal rate and

conjunction with assessment posting styles. User will login to the device using his consumer identification and password and could view various merchandise and will give assessment approximately the product. To discover the evaluation is fake or authentic, system will find out the MAC address of the consumer if the machine observes fake assessment send by way of the identical MAC Address many a times it'll inform the admin to do away with that overview from the device. This gadget uses information mining technique. This machine allows the user to find out accurate overview of the product.

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surface roughness. In this work, experimental investigation conducted on Al-6061 based on Design of Experiments (DOE) and empirical equations are formulated from the experimental results. The effect of process parameters of Aluminium-6061 (Al-6061) is analyzed and the experimental results are validated by using empirical equation.

AGRIBOT- Farmer's friend

Pradeep Raaj.K[1], Prasanth.P[2], Soorya.B[3], Hari Prakash.R[4]
[1,2,3,4]Final year EEE, Saranathan College of Engineering, Trichy – 12

ABSTRACT:

To reduce the farmers struggle in the field with the help of a robot, by helping the farmer by performing various activities like ploughing, watering, seeding and a physical assistant in the field. To reduce the usage of non-renewable resources, like petrol and diesel for the tractor by using renewable resources, like solar power. Today, it is not an efficient way to use agricultural machines that run by petrol or diesel, so in order to stay in safe-zone and provide some fairness to environment. It would be helpful with the help of a rover. The designed robot can perform various jobs. The agribot is designed to be versatile such that the tools can be easily changed. The cost of ploughing a land with robot would be less than that of tractor. It is incorporated with GPS system, so that we can track the movement of the robot from anywhere.

Performance Evaluation of Asymmetric Multi-level Inverter Setup for Remote Area Power applications

[1]U.Aravindhan, [2]R.Dhineshkumar, [3]M.S.Ajay
[1,2,3]Final year EEE, Saranathan College of Engineering, Trichy -12

Abstract—It is very challenging to find a direct application for low voltage Renewable Energy systems. This paper proposes a solution for the effective utilization of low power Renewable Energy sources. It also proposes the possibilities of using high voltage and high power loads using low voltage or low power renewable energy systems. The performance of the system has been analyzed using MATLAB/Simulink and the results were verified and compared with Hardware output. This work also concentrates on the utilization of Modified Cascaded Multilevel inverter with reduced switches with an increase in multilevel outputs which inherently reduces the cost and Total Harmonic Distortion.

Effect of Process Parameters in Drilling : A Review

[1]Abdul Sathar Khan. A, [2]Manimaran. S, [3]Gangeshwari. S, [4]Baskar. N, [5]Harish. R, [6]Ganesan. M
[1,2,3,5]Final year Mechanical, Saranathan College of Engineering, Trichy – 12
[4,6]Prof/Mechanical, Saranathan College of Engineering, Trichy - 12

Abstract :

Drilling is a hole making process which removes excess material from the workpiece in the form of chips. Drilling tool is a multi-point cutting tool which creates holes in the work piece.During the drilling process, heat is generated at the contact between drilling tool and workpiece. This heat energy affect the life of the drill bit and quality of the drilled hole as well as surface finish. The most important drilling process parameters normally considered are Spindle speed, depth of cut, feed rate, chip morphology, thrust force and burr height. The effective drilling is achieved with the optimisation of process parameters.Since, many researchers appraised the effect of input process parameters on the output responses in drilling process but some more investigations is essential to overcome the existing difficulties and to improve the quality of the hole. The main objective of this work is to review the literatures on the drilling process as well as techniques discussed to optimise the process impact on optimization techniques used in the process.

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IoT based remote monitoring of filament flow and temperature in a 3D printer by retrofitting

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[1]Asst. Prof/Mechanical, Saranathan College of Engineering, Trichy -12
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Abstract :
In this work, we present a method to enhance a 3D printer with online access and remote monitoring by using internet enabled devices. The remote monitoring includes temperature, level of filament and the filament flow. Using microcontroller (like RASPBERRY PI-a mini–computer) which has a wireless module, the data are extracted from 3D printer by sensors and stored in cloud which is nothing but the concept *INTERNET OF THINGS*(IoT).

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from the complexities in the reaction schemes and the respective rate expressions for the multitude of currently used catalytic formulations. This paper presents a two-dimensional catalytic converter model, featuring a number of innovations regarding the catalyst transient behavior, the reaction kinetics and the solution procedure.

Department of Humanities and Science

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ICCER 2020
5th International Conference on
Chemical and Environmental Research (ICCER-2020)
(Under UGC Autonomous Grant)
Certificate
This is to certify that Mr./Ms./Dr. A.LAKSHMANAN, Assistant Professor of Chemistry, Saranathan College of Engineering, Tiruchirappalli-620 012, has presented a paper entitled Synthesis, Characterization, Anticancer Studies, Energy and Environmental Applications of a New Mannich Base Ligand and Some of its Inner Transition Metal Complexes in the 5th International Conference on Chemical and Environmental Research (ICCER-2020), organized by PG and Research Department of Chemistry, Jamal Mohamed College (Autonomous), Tiruchirappalli - 620 020, Tamilnadu, India, on 8th January 2020.
Dr. B. Arifa Farzana
Co-Convener
Dr. A. Asrar Ahamed
Co-Convener
Dr. M. Anwar Sathiq
Convener
Dr. M. Mohamed Sihabudeen
Coordinator & HOD of Chemistry
Dr. S. Ismail Mohideen
Principal

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Certificate

This is to certify that Mr./Ms./Dr. **Dr. V. BALAMURUGAN,** *Assistant Professor of Chemistry, Saranathan College of Engineering, Tiruchirapalli* has presented a paper entitled "**Synthesis, Characterisation and Antioxidant Activity of Novel Complexes of Schiff Base Derived from (E)-2-((2-hydroxy-1,2-diphenylethylidene)amino)phenol**" in the **5th International Conference on Chemical and Environmental Research (ICCER-2020)**, organized by PG and Research Department of Chemistry, Jamal Mohamed College (Autonomous), Tiruchirappalli - 620 020, Tamilnadu, India, on 8th January 2020.

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Co-Convener	Co-Convener	Convener	Coordinator & HOD of Chemistry	Principal

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ABS 28

BIO SENSING ACTIVITY OF SILVER NANOPARTICLES BY GREEN SYNTHESIS METHOD USING CISSUS QUADRANGULARIS EXTRACT

J. Violet Mary[1] C.Pragathiswaran[2] N.Anusuya[3]
C.Smitha[4] G.Thulasi[5] and D.Balakrishnan[6]
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Abstract

The green synthesis of nanoparticles is a convenient ,inexpensive,rapid and eco friendly method compared to traditional synthesis methods. The Silver nanoparticles were synthesized by using plant extract of cissus quadrangularis .It has been used Bio-sensing activity.The present work is synthesized Ag nanoparticles were characterized by UV,XRD, SEM,EDAX. The green synthesized Ag-NPs proposed in the present study is sensing the Cd^{2+}in aqueous solution.

Key words: Ag-NPs, UV,XRD, SEM,EDAX,Bio sensor

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ABS 70

GREEN SYNTHESIS OF CHITOSAN CAPPED SILVER NANO PARTICLESFOR BIOSENSOR APPLICATION

N.Anusuya[1] C.Pragathiswaran[2]J.Violet mary[3]
D.Balakrishnan[4]C.Smitha[5]andG.Thulasi[6]
[1]Department of Chemistry, Cauvery College for Women, Trichy-620 018
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Abstract

Chitosan-silver Nano composite is one such system which possesses eco- friendly,biodegradable, and biocompatible nanocomposites with good sensing capability having gained importance for use as biosensors.Chitosan silver nano composites was prepared by the chemical reduction method. The prepared nanocomposite was characterised using XRD and UV analysis. The UV analysis has been used for thestructural elucidation of the sample. The application of this composite as sensor for sensing cadmiumwas performed using UV spectrometer.

Keyword; Biopolymer, Silver.

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IEEE Conference Record # 42487; IEEE Xplore ISBN:978-1-5386-0965-1

COMPARATIVE STUDY OF SUPERVISED AND SEMI-SUPERVISED LEARNING FOR ENHANCED DRUG PREDICTION

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Abstract— **Several precautions should be taken in using pharmaceutical drugs, for both healthcare professionals, who prescribe and administer drugs, and for drug consumers. Factors such as interactions among the prescribed drugs, interactions with the patient's current medication, side effects to be avoided, and contraindications, need to be carefully considered. Additionally, the presence of some drug properties, such as side effects and effectiveness, depends on characteristics of patients, such as age, gender, lifestyles, and genetic profiles. Our goal is to provide a system to assist medical professionals and drug consumers in choosing and finding drugs that suit their needs. We develop an approach that allows querying for drugs that satisfy a set of conditions. The approach allows users to specify side effects and tailors the answers based on user specification. We utilize drug data from multiple data sources. However, drug data are usually noisy and incomplete as they are either manually curated or automatically extracted from text resources such as drug labels. To cope with incomplete and noisy data, we can implement data mining techniques which include clustering and classification algorithms. We represent the system with comparative analysis of supervised and semi-supervised learning in terms of performance metrics**

Index Terms— Drug query system, Data mining, Clustering, Classification, Semi-supervised learning

I. INTRODUCTION

Predictive analytics is a branch of data mining concerned with the analysis of data to identify underlying trends, patterns, or relationships to predict future probabilities and trends. It encompasses statistics, data mining and game theory that analyze current and historical facts to make predictions about future events of interest. In predictive modeling, data is collected, a statistical model is formulated, predictions are made and the model is validated or revised as additional data becomes available. Clinical data mining is based on strategic research to retrieve, analyze and interpret both qualitative and quantitative information available from medical datasets or records. Predictive data mining automatically creates classification model from the training dataset, and apply such model to automatically predict other classes of unclassified datasets. Predictive data mining deals with learning models to support clinicians in diagnostics, therapeutic, or monitoring tasks. It learns from past experience and applies knowledge gained to future situations, by applying machines learning methods to build multivariate models from clinical data and subsequently make inferences on unknown data. Machine learning model is related to the exploitation of supervised classification approaches. Prior to applying the learning model, the data is pre-processed to remove noise and ensure data mining principle is applied to real data. Predictive data mining is the most common type of data mining that has the most application in business and real life that is centered on data pre-processing, data mining and data post-processing collectively referred to as Knowledge Discovery in Databases. Machine learning is closely related to (and often overlaps with) computational statistics, which also focuses on prediction-making through the use of computers. It has strong ties to mathematical optimization, which

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A Searching technique in intranet-based massive content repository system

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Abstract— **The continuous evolution of data have made it difficult to retrieve valuable information. So the need for an efficient approach to retrieve content quicker is increased. The content repository system of an organization has documents of all departments. In order to retrieve content quicker, we propose a system that uses an amalgamation of B-tree data structure and Boyer Moore algorithm. B-tree is used for categorizing huge volumes of documents which reduces the search time logarithmically. Boyer Moore algorithm is applied to check for specific sub-topics present inside documents. The performance can be improved by ignoring irrelevant information and the search can be done with minimum disk reads.**

Keywords— Text retrieval ; B-tree ; Boyer Moore ; Searching

I. INTRODUCTION

Content retrieval is the primary task of an organization's repository. An organization can possess different departments with each department holding information which is of value to other departments. So they have to be posted in the knowledge repository of the organization which any member of the organization can access. Size of the repository grows proportionately with the volume of documents being posted by various departments. This gives rise to a problem in the amount of time taken to search for a specific document.

Most of the techniques are based on table for listing documents. This may take a long time for searching the document in the repository.

B-tree is a self-balancing tree data structure that keeps data sorted and allows searches in logarithmic time[5]. A node in a B-tree can more than two children. Unlike self-balancing binary search trees, the B-tree is optimized for systems that reads large volumes of data[2].

Storing the humungous volume of documents in a B-Tree helps them to remain sorted alphabetically. This narrows down the search time for a document[7].

B-tree is used when records are stored in disk (large and slow). So, use of B-tree instead of Binary tree significantly reduces access time because of high branching factor and reduced height of the tree[8]. With regard to B-tree structure, documents can be sorted alphabetically and kept in separate disks so that only a particular disk is searched for a document. This reduces the number of disk reads.

Sometimes the topic entered by the user may not be explicitly categorized under B-tree. It may act as a sub-topic which is written inside any document . i.e. it may remain as a part of a document . In order to find information of such type, Boyer Moore algorithm is used so that most of irrelevant information is avoided while searching. It skips many number of comparisons and moves the pattern faster among documents.

The Boyer Moore algorithm is an efficient string searching algorithm that is a standard in many practical systems[4]. The algorithm preprocesses the string being searched for (topic of interest),but not the string being searched in(documents). It is thus well-suited for applications in which the text to be searched is much shorter than the document or where it persists across multiple searches[3]. The algorithm uses information gathered during the preprocess step to skip sections of the text, resulting in a lower constant factor than many other search algorithms.

Also titles which are searched newly are added to the existing B-tree. So that if next time another user searches for the same sub-topic the retrieval would happen at B-tree itself rather than searching through Boyer Moore algorithm.

As a result, the information can be retrieved in sub-linear time.

II. RELATED WORK

B.Ganga[1] proposes an approach which retrieves similar documents by combining two existing algorithms suffix tree(trie) ,index data structure and Boyer-Moore Algorithm faster string searching algorithm. The system proposed provides similar documents in different formats like Portable Document Format, MS Format files or Text files.

This approach does not reduce the number of disk reads or document reads as it searches the vast document base available.

Moon Soo Cha, et al.[2] proposes a system that retrieves the information from the content of a document. The proposed method is based on a topic model that is used to extract major keywords for a given document.

But the search time may be high as the content is searched through a large number of documents. The

Article No. 07

- Dynamic Analysis of Android Apps written with PhoneGap Cross-Platform Framework

  Jaewoo Shim[1], Minjae Park[1], Seong-je Cho[1], Minkyu Park[2], and Sangchul Han[2]

  [1]Dankook University, Republic of Korea

  [2]Konkuk University, Republic of Korea

Article No. 08

- Privacy fatigue in the internet of things(IoT) environment

  Junhyoung Oh, Ukjin Lee, and Kyungho Lee

  Korea University, Republic of Korea

Article No. 09

- Securely Controllable and Trustworthy Remote Erasure on Embedded Computing System for Unmanned Aerial Vehicle

  Sieun Kim[1], Taek-Young Youn[2], Daesun Choi[3], and Ki-Woong Park[4]

  [1]Sejong University, Republic of Korea

  [2]Electronics and Telecommunications Research Institute, Republic of Korea

  [3]Kongju National University, Republic of Korea

  [4]Sejong University, Republic of Korea

Article No. 10

- Authorized Wireless Charging System based on Double-Frequency-Hopping for Mobile Devices

  Yangjae Lee[1], Dongmin Yang[2], Taek-Young Youn[3], Ki-Woong Park[1]

  [1]Sejong University, Republic of Korea

  [2]Chonbuk University, Republic of Korea

  [3]Electronics and Telecommunications Research Institute, Republic of Korea

Article No. 11

- SVM based Traffic Classification for Mitigating HTTP Attack

  V. Punitha and C. Mala

  National Institute of Technology, Tiruchirappalli, India

Article No. 12

- Detection of Coercive Parsing Attack in XML Requests using Machine Learning Techniques

  V. Punitha and C. Mala

  National Institute of Technology, Tiruchirappalli, India

Article No. 13

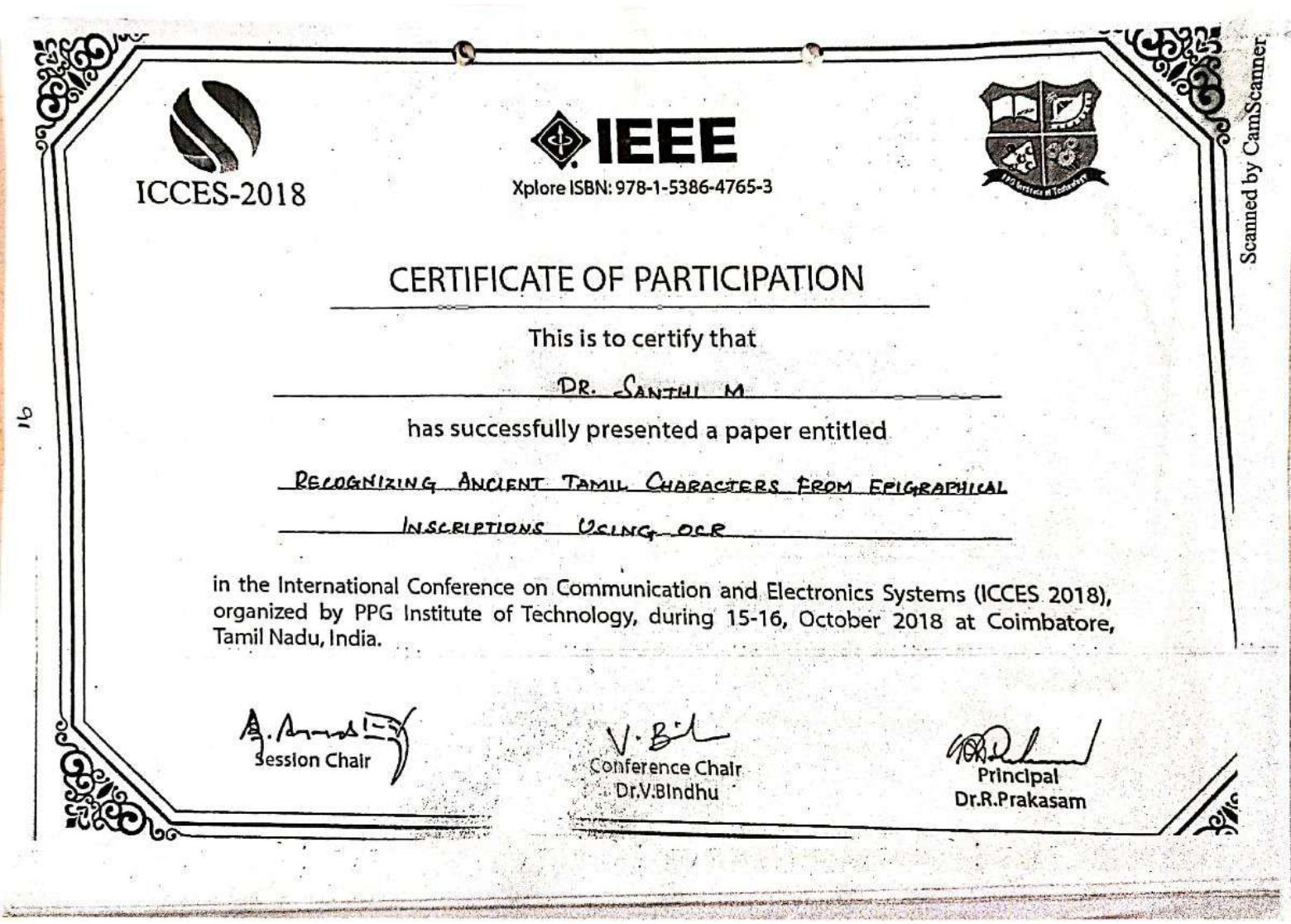
- Situational Awareness Framework for Threat Intelligence Measurement of Android Malware

  Mookyu Park[1], Junwoo Seo[1], Jaehyeok Han[1], Haengrok Oh[2], and Kyungho Lee[1]

  [1]Korea University, Republic of Korea

  [2]Agency for Defense Development, Republic of Korea

Article No. 14



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This is to certify that

DR. SANTHI M

has successfully presented a paper entitled

RECOGNIZING ANCIENT TAMIL CHARACTERS FROM EPIGRAPHICAL INSCRIPTIONS USING OCR

in the International Conference on Communication and Electronics Systems (ICCES 2018), organized by PPG Institute of Technology, during 15-16, October 2018 at Coimbatore, Tamil Nadu, India.

Session Chair

Conference Chair
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2nd International Conference on Innovations in Electrical, Information and Communication Engineering

(ICIEICE'19)

23rd March 2019

Best Paper Award

Is here by granted to Dr. / ~~Mr.~~ / ~~Ms.~~ SANTHI. M

of SARANATHAN COLLEGE OF ENGINEERING

for the paper

ANCIENT TAMIL CHARACTER RECOGNITION USING ENSEMBLE CLASSIFIER

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Dr. / ~~Mr.~~ / ~~Ms.~~ M. SANTHI of SARANATHAN COLLEGE OF ENGINEERING, TRICHY has participated in the 2nd International Conference on Innovations in Electrical, Information and Communication Engineering (ICIEICE'19) held on 23rd March 2019 at Kongunadu College of Engineering and Technology, Trichy, Tamilnadu, India.

He / She also presented a paper entitled ANCIENT TAMIL CHARACTER RECOGNITION USING ENSEMBLE CLASSIFIER

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This is to certify that Dr./Mr./Ms.....DR. M. SANTHI.....

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has attended/presented a paper entitled "..DETECTION OF ACUTE LYMPHOCYTIC LEUKEMIA USING STATISTICAL FEATURES.....

....." in the

4th International Conference on Current Research in Engineering Science and Technology (ICCREST-2019) on 08th March 2019.

KonGunadu

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Department of CSE, ECE, EEE & IT

2nd International Conference on Innovations in Electrical, Information and Communication Engineering

(ICIEICE'19)

Certificate

Mr / Ms. M.SANTHI of

NATHAN COLLEGE OF ENGINEERING, TRICHY has participated in the

2nd International Conference on Innovations in Electrical, Information and Communication Engineering (ICIEICE'19)

held on 7th March 2019 at Kongunadu College of Engineering and Technology, Trichy, Tamilnadu, India.

She also presented a paper entitled DETECTION OF ACUTE LYMPHOCYTIC LEUKEMIA USING BLAST CELL MORPHOLOGICAL FEATURES

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japriya
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ICNTET-2018-0865

International Conference on New Trends in Engineering & Technology (ICNTET) – 2018

Certificate

This is to certify that Dr./Mr./Mrs./Miss **M.Santhi** *has published a paper entitled:* **An Efficient Threshold Transposed Approximation (TTA) Architecture of Flash ADC in VLSI** *in International Conference on New Trends in Engineering & Technology (ICNTET) - 2018 with Catalog "CFP18P34-PRT: 978-1-5386-5629-7", Organized by GRT Institute of Engineering & Technology, Tiruttani, Chennai, Tamil Nadu, India during 7th & 8th September 2018.*

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Fifth International Conference on

Green Technologies for Power Generation, Communication & Instrumentation (ICGPC' 19)

April 03rd & 04th , 2019

Certificate

This is to certify that Prof./Dr./Mr./Ms. C. VENNILA *of* Saranathan College of Engg *has Participated/Presented a paper titled* Guiding Assistance for Blind using DOT *with Paper ID no* ..... *in Fifth International Conference on Green Technologies for Power Generation,Communication & Instrumentation (ICGPC '19) on 03rd & 04th April 2019 organized by Department of* ECE & EEE *at SPIHER, Chennai, India.*

R. Rani Hemamal

Dr.R.Rani Hemamalini
Co-Convener,ICGPC' 19

Dr.G.P.Ramesh
Convener, ICGPC' 19

Dr.L.Mahesh Kumar
Director Academic, SPIHER

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Avadi, Chennai - 600 054, India

Fifth International Conference on
Green Technologies for Power Generation, Communication & Instrumentation (ICGPC' 19)

April 03rd & 04th , 2019

Certificate

This is to certify that Prof./Dr./Mr./Ms. Dr. C. Vennila of Saranathan College of Engineering, Trichy has Participated/Presented a paper titled Performance improvement of Satellite image classification Using Versatile Supervised Multi-Spectral approach with Paper ID no 042 in Fifth International Conference on Green Technologies for Power Generation, Communication & Instrumentation (ICGPC '19) on 03rd & 04th April 2019 organized by Department of ECE & EEE at SPIHER, Chennai, India.

R. Rani Hemamalini
Dr.R.Rani Hemamalini
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Dr.G.P.Ramesh
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Dr. / ~~Mr.~~ / ~~Ms.~~ C. VENNILA of SARANATHAN COLLEGE OF ENGINEERING, TRICHY has participated in the 2nd International Conference on Innovations in Electrical, Information and Communication Engineering (ICIEICE'19) held on 23rd March 2019 at Kongunadu College of Engineering and Technology, Trichy, Tamilnadu, India.

He / She also presented a paper entitled ACCIDENT DETECTION AND SECURITY SYSTEM WITH NFC FOR TWO WHEELERS.

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ICRTESM'18
ISBN: 978-93-87793-51-4

This certificate acknowledges and honours

Dr.C.Vennila

for participating & presenting his/her paper on

ALL IN ONE WIRELESS SPEEDOMETER WITH NFC FOR TWO WHEELERS

in

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This is to certify that Mr./Ms./Dr. PADMAA . M *of* SARANATHAN COLLEGE OF ENGINEERING *department of* ECE *presented a paper entitled* SINGLE IMAGE DEHAZING AND COLOR RESTORATION USING GMM. *in the National Conference on "Cutting Edge Technologies on Communication, Signal Processing and Networking (NCCSN'19)" held at Saranathan College of Engineering, Trichy on 15th and 16th March 2019.*

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This is to certify that Mr./Ms./Dr. M. PADMAA *of* SARANATHAN COLLEGE OF ENGINEERING *department of* ECE *presented a paper entitled* Tree Leaves and fruits disease detection using convolutional neural networks *in the National Conference on "Cutting Edge Technologies on Communication, Signal Processing and Networking (NCCSN'19)" held at Saranathan College of Engineering, Trichy on 15th and 16th March 2019.*

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International Conference on Innovative Engineering Initiatives (ICIEI - 2019)

Certificate

This is to certify that the following paper has been presented in the" International Conference on Innovative Engineering Initiatives " (ICIEI - 2019) held during 13th & 14th March 2019.

Title of the Paper : TREE LEAVES AND FRUITS DISEASE DETECTION USING IMAGE PROCESSING TECHNIQUES

Author : Dr. M. PADMAA, PROFESSOR

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Dr. / ~~Mr.~~ / ~~Ms.~~ S. A. ARUNMOZHI of SARANATHAN COLLEGE OF ENGINEERING, TRICHY has participated in the 2nd International Conference on Innovations in Electrical, Information and Communication Engineering (ICIEICE'19) held on 23rd March 2019 at Kongunadu College of Engineering and Technology, Trichy, Tamilnadu, India.

He / She also presented a paper entitled LIFETIME ENHANCEMENT IN WIRELESS SENSOR NETWORK USING DENSITY BASED CLUSTERING METHOD

Conference Chair
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This is to certify that Mr./Ms./Dr. ARUNMOZHI. S *of* SARANATHAN COLLEGE OF ENGINEERING *department of* ECE *presented a paper entitled* ENERGY AWARE ROUTING IN WIRELESS SENSOR NETWORKS USI PARTICLE SWARM OPTIMIZATION *in the National Conference on "Cutting Edg Technologies on Communication, Signal Processing and Networking (NCCSN'19)" held Saranathan College of Engineering, Trichy on 15th and 16th March 2019.*

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This is to certify that Mr./Ms./Dr. V. MOHAN *of* SARANATHAN COLLEGE OF ENGINEERING *department of* ECE *presented a paper entitled* DEVELOPMENT OF EFFECTIVE CODEBOOK USING PSO WITH VECTOR QUANTIZATION *in the National Conference on "Cutting Edge Technologies on Communication, Signal Processing and Networking (NCCSN'19)" held at Saranathan College of Engineering, Trichy on 15th and 16th March 2019.*

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Certificate

This is to certify that Mr./Ms./Dr. V.MOHAN, ASSOCIATE PROFESSOR/ECE.
of SARANATHAN COLLEGE OF ENGINEERING *has presented a paper titled*
" DESIGN OF EFFECTIVE CODEBOOK USING FUZZY RULE BASED VECTOR QUANTIZATION. "
in the 5th International Conference on Latest Trends in Science, Engineering and Technology (ICLTSET'19) during March 22 & 23, 2019.

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Vice Principal

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Dr. P.SHANMUGAPRIYA
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2nd International Conference on Innovations in Electrical, Information and Communication Engineering (ICIEICE'19)

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Dr. / ~~Mr.~~ / ~~Ms.~~ P. SHANMUGAPRIYA of SARANATHAN COLLEGE OF ENGINEERING, TRICHY has participated in the 2nd International Conference on Innovations in Electrical, Information and Communication Engineering (ICIEICE'19) held on 23rd March 2019 at Kongunadu College of Engineering and Technology, Trichy, Tamilnadu, India.

He / She also presented a paper entitled DEVELOPMENT OF INTERFACE SYSTEM FOR PERSONAL DETAILS ENROLLMENT

Conference Chair
Dr. J. Yogapriya
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General Chair
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of SARASWATHY COLLEGE OF ENGINEERING *has presented a paper titled*
" PERFORMANCE ANALYSIS OF NETWORK CODING WITH Q-LEARNING ALGORITHM USING MULTI PATH TRANSFER PROTOCAL IN WIRELESS NETWORK "
in the 5th International Conference on Latest Trends in Science, Engineering and Technology (ICLTSET'19) during March 22 & 23, 2019.

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Dr. C.VENNILA
Dr. P.SHANMUGAPRIYA
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in the 5th International Conference on Latest Trends in Science, Engineering and Technology (ICLTSET'19) during March 22 & 23, 2019.

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COMPRESSIVE DATA GATHERING FOR WIRELESS SENSOR NETWORKS

M.Baritha Begum and T.Swathi

barithabegum-ece@saranathan.ac.in and

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Saranathan College of engineering, Trichy, India

ABSTRACT

In wireless sensor network (WSN) each node forwards the collected data directly to the sink node and the amount of data transmitted is more due to high energy consumption and power consumption. This is one of the major drawbacks in WSN. In order to reduce compressed data gathering method is used. In compressed data gathering two methods are used for balanced projection node. Locations based clustering method is proposed to distribute the projection nodes evenly and balance the network energy consumption. Density based clustering method is proposed, taking into account the location and density of nodes together, balancing the network energy and reducing the power consumption of nodes. In simulation results old method is compared with the compressed data gathering method where the results show that our proposed methods have better network connectivity and from that we can acquire less energy consumption and energy transmission.

Key Words: Compressive Data Gathering, Location Based Clustering Method, Density Based Clustering Method

INTRODUCTION

Wireless sensor network (WSN) which is used for monitoring and recording the physical conditions of the environment and systematically arrange the collected data at a base station. WSNs measure environmental conditions. WSN is a wireless network that has base stations and many numbers of nodes .These networks that is wireless sensor network are used to monitor corporal or ecological conditions like sound, pressure, temperature and all the nodes which pass data through the network to a base station.

In Star topology each node connects directly to a sink node. A single sink node is that which can collect all the data at last and it can also send the data to all normal nodes. The data cannot be sent from one node to another. Due to this we can acquire minimal delay and low latency. The advantage has the ability to keep the remote nodes to maintain power consumption at minimum level and which is simply under control.

Tree topology is that which connects to the node and also to the neighbour nodes where the node act as a parent child formation and which finally connect to the sink node. By using the tree topology we can connect more nodes with it. We can get large wireless sensor network.

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Author : Ms. G. LAKSHMI, ASSISTANT PROFESSOR

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DESIGN OF PATCH ANTENNA FOR ISM BAND APPLICATIONS USING CST MICROWAVE STUDIO

C. Divya[1], V. Koushick[2], G. Lakshmi[3], S. Dinesh[4]

Assistant Professor [1, 2, 3], Research Scholar [2], Research Associate [4]
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Abstract **- In this study, a microstrip patch antenna is designed for Industrial, Scientific and Medical (ISM) band application with design frequency of 5.8 GHz. Different antennas have been designed with a FR4 Epoxy and RT duroid with a substrate thickness of 1.6mm. The antenna designed with FR4 substrate yields a VSWR of 1.33 and a gain of 8.75 dB at resonant frequency of 5.8GHz and designed with RT duroid substrate gives a VSWR of 1.56 and a gain of 8.1 dB at 5.8GHz. Both antennas are simulated using CST microwave studio. A comparative analysis of two antennas has been made with parameters like Gain, directivity, VSWR and Return loss. The proposed antenna resonates for 5.8 GHz in ISM band and is mainly focused Amateur & Amateur – Satellite services, fixed satellite, RFID and mobile applications. In real time applications, the 5.8GHz microwave ISM frequency range is mainly used for WLAN, RFID, Audio / Video signal transmission and reception.**

Keywords – RFID, ISM, VSWR, Gain, Return loss

I. INTRODUCTION

In 1888 the German physicist Heinrich Hertz invented Antenna. Antennas are used to transmit electromagnetic waves in a free space between transmitter and receiver. It plays a vital role in wireless communication technology. Different types of antennas are available but the researchers are mainly focused with planar or printed antennas because of easy fabrication, low profile comfortability and low cost. The micro strip patch antennas (MSA) are also printed antennas because it is fabricated using micro strip techniques on PCB (Printed circuit Board). In MSA, the patches are constitutive elements in an array. The features of MSA comprises,

- Patch Layer (Thin, flat metallic region)
- Substrate Layer
- Ground Layer (Comparatively larger than patch dimension)
- Excitation Layer (Antenna Feed)

In a typical RFID technique, passive tags are attached to an object such as goods, vehicles and shipments, while a vertical/circular polarization antenna is connected to the RFID reader. The RFID reader and tag can radio-communicate with each other using a number of different frequencies, and currently most RFID systems use unlicensed spectrum. The common microwave frequencies used for RFID and mobile services are (3.4 / 3.9 / 5.8 / 8.2 GHz). The frequency range of 5.1-5.3 GHz and 5.7-5.8 GHz is used for Wi-Fi services all over the world. The frequency range between 5.3-5.9 GHz can be used for 5G services. Several calculation methods are adopted to solve the Maxwell equations and to evaluate the performance of an antenna.

Among these, three of them are widely used in simulation software:

- The method of moments (MoM) is used in CADFEKO software.
- The method of finite integral (FIT) is used in the software CST Microwave Studio.
- The Finite Element Method (FEM) is used by software HFSS.

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ANCIENT TAMIL CHARACTER RECOGNITION FROM EPIGRAPHICAL INSCRIPTIONS USING IMAGE PROCESSING TECHNIQUES

Merline Magrina M,Santhi M,HOD/ECE ,Professor, ECE Department,[2] student,ECE Department, ,*Saranathan College of Engineering,Tiruchirapalli.*

***Abstract*—Recognition of ancient Tamil characters enables the archaeologists to reveal historical events in Chola period of 12th century. The research in the field of archeology will have negative impact due to inefficiency in the manual procedure. OCR methodology is used to recognize ancient Tamil characters in stones. The input image is preprocessed and segmented. In pre-processing stage the color images are converted to gray images, enhanced and noises are removed by median filter. The resultant image is applied for post processing steps through morphological operation. The characters are segmented from the dilated image by bounding box and the features like orientation points, magnitude points and region properties are detected. The characters are classified using various methods i.e. KNN & Ensemble learning classifier and the classified characters are matched using Unicode. The exact Modern Tamil Character is mapped and their Segmentation rates& Recognition rates are calculated and compared.**

An Area Effective and High Speed SAR ADC Architecture for Wireless Communication

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Abstract. An area effective, high speed and low power 8-bit Successive Approximation Register Analog to Digital converter (SAR-ADC) using 250 nm CMOS technology introduced in this paper. Among different types of ADC successive approximation is used as it is high speed architecture, suitable packed design and has good speed to power ratio. To minimize the power a Switched Inverter Quantization (SIQ) comparator and to reduce the leakage power the Multi Phase Clocking (MPC) based D-FF shift register for SAR logic are preferred for this work. The whole circuit design is bringing out with the help of Tanner EDA Tool.

Keywords: Area effective · Low power · High speed · Speed to power ratio · Tanner tool

Abbreviations

SAR	Successive Approximation Register
ADC	Analog to Digital Converter
SIQ	Switched Inverter Quantization
MPC	Multi Phase Clocking
DAC	Digital to Analog Converter

1 Introduction

In the modern fields of wireless communication, image processing and video systems, the demand on fast and less power analog to digital converters increases as the emerging of many portable applications [1]. With the design of CMOS technology, SAR-ADC is used extensively to obtain fast and accurate performance with least power consumption. Now a day's mixed signal designing data converters are important building block [2]. ADC acts as a important link between analog and digital domain. As Digital circuits has a major advantage such as accuracy, low cost, resolution, less sensitivity, excellent in signal processing, power and good simulation results over

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RELIABLE RADIO ENVIRONMENT MAPPING FOR EFFECTIVE SPECTRUM SENSING IN COGNITIVE RADIO NETWORKS

Preethi.M , Sanchana.B , Sugasini.K , Surya.H, C.Vennila
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Abstract— ***The increasing demand of wireless applications has put a lot of difficulties on the usage of available radio spectrum, a limited and precious resource. Cognitive radio is a promising technology which provides an innovative way for efficient utilization of available electromagnetic spectrum. The key function of cognitive radio is spectrum sensing which prevents the harmful interference with licensed users and it identifies the available spectrum. The Radio Environment Map (REM) can be a powerful tool for solving spectrum scarcity and spectrum access problems, making context-aware resource allocation more efficient. We can optimize the accuracy of the REM using a geostatistical tool named Kriging interpolation in cognitive radio networks.***

Keywords—cognitive radio networks, cooperative sensing, radio environment mapping, path loss component, kriging interpolation

INNOVATION IN BIKE SYSTEM OF ACCIDENT DETECTION USING PROTOCOL

S.Revathi, C.Vennila, PG Student, Dept.Of Communication System, Professor, Dept. Of Communication System, Saranathan College of Engineering, Trichy.

Abstract – Nowadays road accident is a widespread problem in all over the world. The advent of technology has also increased the road accidents take place frequently which causes huge loss of life and property because of the poor emergency facilities. To overcome these drawbacks, GPS will monitor speed of a vehicle and compare with the previous speed in every second through a microcontroller unit and protocol. Whenever the speed will be beloaaw the specified speed, it will assume that an accident has occurred. The system will send the location and message/call by utilizing the GSM network through software. A wireless monitoring system along with sensor and internet of things protocol is developed to give an immediate alert to concerned people. This will help to reach the rescue service in time and save the valuable human life. **Keywords – GPS, Sensor, GSM, Protocol, Accident detection 1.**

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Speech Based Interaction System Using DNN and i-vector

P. Shanmugapriya(✉), V. Mohan, S. Yogapriya, and Y. Venkataramani

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Abstract. In this paper, a speech based interaction system using Deep Neural Network (DNN) and i-vector based DNN approaches are proposed. In DNN based approach, Mel-frequency cepstral coefficients (MFCC) features are extracted from the speech signal and it is directly given to DNN. In i-vector based DNN approach, DNN is trained using i-vector which is formed from Gaussian Mixture Model-Universal Background Model (GMM-UBM). For both approaches, the performance of the system is obtained in the form of confusion matrix and compared. In addition to that, GMM-UBM based approach is also compared with the proposed work. MFCC is used for representing the characteristics of the speech and auto encoder is used for classification purpose. It uses stacked two auto encoder layers and one soft max layer. The proposed system achieves improvement in performance when increasing the number of hidden units and the input dimension of MFCC features. The proposed work is to develop ASR system for isolated words in Tamil language and the experiments are conducted for speaker independent case. The results demonstrated that i-vector based DNN approach provides 100% recognition rate for 17 classes with 20 hidden units in each of the 2 layers. The dimension of i-vector is 100.

Keywords: MFCC · Deep Neural Network · GMM-UBM · i-vector · Speech based interaction system

1 Introduction

The ability of the system to identify and understand words spoken out by the user is called Automatic Speech Recognition (ASR) system. The sound/speech signal uttered by the user which is obtained from either microphone or telephone conversation is converted into machine readable format i.e., textual words. The three important steps involved in speech recognition system are pre-processing, feature extraction and classification. In Pre-Processing, Pre-Emphasis of the speech signal is the first step. It is used for DC elimination or normalization of the frequency components of the signal. The second and third steps in pre-processing are Framing and windowing. Speech signal is quasi periodic in nature, so it is classified into number of frames each is of duration 20–30 ms. To maintain the continuity in the spectrum, hamming window is used.

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Design of Multi-layer Hybrid Coupler at 1.2GHZ

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***Abstract*--Multi-layer hybrid coupler with short–circuited coupled lines in the middle branch is demonstrated.The coupled lines are designed with a parallel coupled 3-line which provides tight coupling and symmetric transmission phase over the center frequency. Multi-layer method is implemented to widen the bandwidth and also to reduce the loss.This design achieves return loss of 26.08 dB and isolation of 19.859 dB.**

***Keywords*—branch line coupler ,hybrid coupler ,parallel coupled line,3-line coupled line ,multi-layer.**

I. INTRODUCTION

A directional coupler is a passive reciprocal network. It is a general purpose tool used in RF and microwave signal routing for isolating, splitting or combining signals. It is used in a variety of measurement applications such as Power monitoring, Source leveling, Isolation of signal sources, transmission and reflection measurement[1].

Directional coupler can be implemented in the context of different transmission line structures such as microstrip, strip line and waveguide. Microstrip directional coupler is widely used in microwave application because of its low cost, manufacturability, repeatability, etc. Directional coupler with parallel microstrip coupled transmission line can be easily incorporated and implemented with other circuits. It is simple in structure, easy to analyze and design and it can be implemented in many different transmission line media[1].

Directional couplers are desired to possess strong coupling and high directivity properties to strengthen the signal and to reduce the noise. In this paper parallel coupled 3-line method is employed to widen the bandwidth. Teflon and HDPE are the two substrate used here. This multi-layer method is introduced to widen the bandwidth and to reduce losses due to radiation.

II.DESIGN METHODOLOGY

Directional coupler is a four port network. For analyzing directional coupler, all the ports should be ideally matched and lossless. It comprises of two transmission lines which are called as main line and auxiliary line (secondary line).When these two transmission lines are close together, because of the interaction of electromagnetic fields of each line, power can be coupled between the lines. Maximum power can be transmitted through the main line and minimum power through secondary line.

Basic configuration of directional coupler: Directional couplers usually have four ports –input port(port1), through/direct port(port2),coupled port(port3),isolation port(port4).Ideally power entering to the port1 (input) appears at port2 (through) and port3(coupled), no power on port4(isolation),but in realization a small amount of power is leaked at port4.

The characteristics of directional coupler can be described by its coupling factor, directivity, return loss and impedance matching of ports. The design parameters of directional coupler are uniquely determined by the required coupling level. Important parameter in designing the coupler is width (w) and height (h) of the transmission line, distance between the two transmission lines(s) and the thickness of the substrate (t). These are the parameters which influence the performance of directional coupler.

The dimension of the directional coupler can be found using the below formulas ,by assuming that the port impedances are equal to Z_0 and coupling and operational frequency are known parameters at the beginning of the design.

(i)To find even and odd mode impedances :

$$Z_{0e}=Z_0\sqrt{\frac{1+C}{1+C}}$$

$$Z_{0o}=Z_0\sqrt{\frac{1-C}{1+C}}$$

where ,

C is forward coupling coefficient

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R3ToS based Partially Reconfigurable Data Flow Pipelined Network on chip

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***Abstract*— The incorporation of Data Flow Pipelining (DFP) along with the concept of Partial Reconfiguration (PR) in R3TOS based NoC is projected in this paper. Our research aims at including DFP in the router architecture to pipeline the data and reduces the latency by inserting "Slots" between the data based on the request channels. It processing a new input request at every clock cycle rather than waiting for all the data functions of input currently processing for the request to complete, resulting in increased throughput with shorter overall latency. The routing switch does so by parallel transmission of the data to the available slots before the previously allotted input completes the task. Implementation of adaptive routing in control logic after inspection of header data enhances this performance. Further, when partial reconfiguration is incorporated, the power consumption reduced up to 17% as its dynamically reconfigures the available topologies.**

***Keywords*— Pipelining, Partial Reconfiguration, NoC**

I. Introduction

In the world of growing technology scaling, Field-Programmable Gate Arrays (FPGAs) are no more to function as a simple "fixed-logic". In Von Newmann, computational elements in the lined processors are glued which needs a replacement by a flexible traditional architecture with reconfigurable computational elements and memories. FPGAs fascinate parallel computation. However, growing complexity in designing the embedded systems paved the path to Multiprocessor System-on-Chips (MPSoCs) as they provide better-customized processor designs to definite problem class. For better flexibility and performance, a combination of several types of processor and bit memory slots constitutes MPSoCs marching towards diverse designs. To overcome the scalability deficiency of bus-based communication and to increase the reliability of inter-connection communication, Networks-on-Chip (NoCs) is the alternate and affirm solution [1]. NoC has the capability to provide maximum communication bandwidth and collateral when incorporated with a variety of intellectual property cores.

As stated by Moore's law, currently multi-chip processors such as NoC accommodates many diverse components such as reconfigurable, conventional hard-coded parts and software based running on microprocessors [2]. According to [3], the system should capable of flexible with maximum bandwidth, minimal-latency, and power efficient with respect to hardware. The cores of the interconnection fabric, that communicate both intra and internally with the system access memories. To increase the performance of CPUs, we have to use parallel computing in a bigger way [4]. In order to achieve the above, many independent CPUs and memory controllers, heavy file caches have been implemented to find an application that runs on diverse processors.

It is evident that NoC used in the above processor have a better communication performance and price in connection with the target application. In order to coordinate and communicate better, NoC depends on the operating system (OS). Most of the OS handles the low bandwidth chips by type Internal Configuration Access Port (ICAP) and Programmable Configuration Access Port (PCAP) ports while R3TOS (Reliable, Reconfigurable Real-time Operating System) is specifically designed to handle high bandwidth chips such as NoC [5].

An innovative slot-less reconfigurable system, R3TOS exploits the reconfigurability of modern FPGAs. The fault tolerance and real-time performance of R3TOS improved when compared with non-reconfigurable systems. It provides application designer an OS-like development environment by filling the gap between the design of high-level reconfigurable applications and low-level hardware implementation. One of the major advantages of R3TOS is it supports multi-user, multi-tasking applications, where multiple application tasks from different users that can be customized at runtime and are executed in parallel [6].

The functionality of R3TOS tasks depends on the NoC design, as the components are crucial in allocation and execution of tasks. Many components such as First-Input-First-Output (FIFO) buffers, routing element, power controller and arbiter contributes to the NoC design [7]. The performance of the system duly depends on the changes in the NoC architecture made during designing results in throughput, latency, and bandwidth. Any alterations made during the design time with respect to an update or functionality results in performance setback or huge power dilution.

In an experiment by [8], 64% of the power leakage is due to buffers resulting from leakage power optimization, nevertheless of high loads, 85% of buffers stay idle. As stated by [9], the packet flow throughput increases as the consumption of buffers increases resulting fluctuation in dynamic power.

The above problem streamlined with parallel flow of data by means of pipelining. In this design, the data are the task

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Application Definite Fault Resistant Topology for IoT Networks

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Abstract — **Internet of Things (IoT) is an exceptional concept than the internet as they transmit the collected data through low power Local Area Network (LAN) to investigate and segregate the data. IoT is a humongous network of connected things and people as the present world is data-driven. These data plays different roles in different context. IoT establishes the connection within and between the devices through internet but tremendous advantages such as speed of transmission, energy consumption and distance traveled. Applying of IoT is crucial in communication through networking, connectivity protocol via Internet-enabled devices. Each option has its trade-offs in terms of power consumption, range and bandwidth, all are considered while choosing the connected devices and protocols for a particular IoT application. The application of IoT may fail to transmit the data due to disruption in the connectivity of interlinks. As single interlink failures lead to severe issues on the performance of network connectivity, we propose fault route resistant application definite topology in order to enhance the connectivity that dynamically permits the best shortest route. The proposed work improves throughput by a maximum of 37.7% while decreases the energy up to 12.7 % and an average distance of route until 5%.**

Keywords — **IoT, Fault Resistant, Communication Network, Topology**

I. INTRODUCTION

In today's technical scenario, data plays a major source and people are always handy with electronic goods. Networking is prime importance for Inter and Intra communication of the devices, which are connected to the mobile internet. The growth of the smart devices is exponential and in future, it may exceed the overall population of the world. The devices communicate with humans with artificial intelligence marking its way in the technology front. Kevin Ashton in 1999 [1] & [2] formulated the term "Internet of Things" (IoT) in context to the sharing of information in the field of supply chain management. Like that of biological eco-system, IoT comprises physical objects that are accessible through the internet. A network of physical devices embedded with the electronics, software, sensors, and actuators are controlled by internet to collect and exchange data. As the internet, the medium to collect the data the term 'thing' in IoT could be a person with a pacemaker or an automobile with sensors.

An IoT network not only plays a role in sensing the data but also controls remotely across the globe, creating many opportunities into the world of computer-based systems. IoT, a future of interconnectivity between broad ranges of devices through data services. In this data-driven world, IoT operates in smart environments and communicate data without physical presence but only by means of virtual identification and personalities [3] & [4]. According to [5], by 2050 internet and internet of things connect more than 50 billion devices.

WLAN or Bluetooth are the two connectivity solutions for the computer network as of now which consumes more power. Though remote sensors considered as minicomputers, the above computer solutions may be ineffective for such low-powered devices [6]. During the natural and man-made disasters, the failure in the above network makes the entire system prone to vulnerability as the sensors have to be deployed in the reachable location. In order to manage the growing traffic of the communication between the devices, IoT is required apart from the Internet, as the latter cannot perform efficiently.

The components used in the IoT will be different from the usual internet. It comprises sensors and Low PAN Gateway. The sensors sense light, heat, pressure, temperature etc., are the physical phenomenon detected to collect the data. Data collection is crucial to enhance the reliability and efficiency of infrastructure systems.

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Paper ID: 86

Process Parameter Influence Study and Investigatio on Milling of Aluminium LM 25 by using Genetic Algorithm

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Abstract — **Machining is one of the basic manufacturing processes. Nearly every man-made product contains components that necessitate machining habitually to great precision. But it is the most expensive process. These high cost put tremendous economic pressure on production managers and engineers as they struggle to find a way to increase the productivity. In production process milling operation plays a predominant role in industrial sectors. Milling is a process which is used to remove the material from the workpiece with the help of a rotary cutter. Here for optimizing the input parameters in the milling process of Aluminum LM 25, Taguchi method is chosen for Design of Experiments by which [L9] Orthogonal Array is used. The optimization is carried out in both Taguchi DOE and Genetic Algorithm for Surface Roughness, Machining Time, Temperature and Material Removal Rate (MRR) individually having feed rate, spindle speed and depth of cut as input parameters. The deviation of performance characteristics from the actual value is calculated by using Signal to noise ratio. Among the various input parameters that affecting the Output responses, the one that causing significant effect has been identified by using Analysis of Variance (ANOVA). Dynamics of natural genetics is the source for Genetic Algorithm (GA). Once the objective function is clearly defined for the optimization problem the fitness function developed by GA and evaluates the input process parameters. Upon Investigations on milling process of Aluminum LM 25, the recommendations for input process parameters are made.**

Keywords: Milling, Aluminium LM 25 material, Taguchi methodology, S/N ratio, ANOVA, Material Removal Rate, Surface Roughness, Genetic Algorithm.

I. INTRODUCTION

Higher rate of production and High quality finish products are the day to day need of Manufacturing Sectors. The execution of design requirement as per the customer need into a finished product is Manufacturing and it starts from raw material. Various steps of modification are made in every step in the conversion process. Not just with the conversion of shape and size of raw material as per design but Manufacturing also includes tests and quality checks for quality assurance of the conversion process. Milling machine is one of the most multipurpose conventional machine tools with a wide choice of metal cutting capability. Milling is one of the metal cutting technologies that involves a rotating cutter with single or multiple cutting edges to remove material from the workpiece. Good surface finish and Accuracy are the main features of milling over bo and curved surfaces. Rotary shear blades, Thread c tools, Milling cutters, Blanking and stamping dies are potential applications for Aluminium alloy LM 25. D of experiments were made with Taguchi's orthogonal (DOE) and further optimized by Genetic Algorithm (G studying the effect of milling parameters on Aluminiu 25.

II. LITERATURE SURVEY

The research works are carried out by the research different materials and their significances are disc Also it gives the research gap, motivation and objec the research work. The objective of this work carried previous researchers to improve the efficiency a improve the mechanical properties of the ma specimen, based on the literature review the foll research gap were highlighted as Poor surface Difficult to achieve close tolerance, Liquid cracking machining performance and High hardenability. The lack of efficiency and mechanical properties of the v combinations of specimen for milling process d different combination of mechanical properties. In or improve the above output responses, there is sco studying the LM 25 materials by using the Vertical M Machine.

From the literature review, the milling process is one important machining (metal removing) process optimization of milling parameters plays a vital r improve the efficiency of the machine selection development and applications of LM25 materials, e the researchers to work on the milling process. In this it is attempted to examine the effect of cutting conditi the milling process in LM25 material by using the V Milling Machine.

III. EXPERIMENTAL PROCEDURE AND BY TAGUCHI METHOD

The experimental work is carried on aluminium LM2 carbide composite tool using Bhagwan Udyog v milling machine. The main objectives of this investi are to maximize the Metal Removal Rate, to minimi Temperature and to minimize the Surface Roughness, minimize the Machining Time. The effect of r parameters like spindle speed, feed rate and depth of c used to analysis the Metal surface Roughness Tempe

Paper ID: 63

Comprehensive Analysis on Aluminum in Sand Casting by Using Intelligent Techniques

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Abstract—**Today's foundry intentions are to succeed the cost-effective casting process. As a consequence of this goal, most of the researchers were established the numerical model for effective outputs. Numerical model of casting parameters has more considerable output for the foundry planner. Generally, the sand-casting process comprises numerous parameters interdependently. If the parameters are not measured properly, the mould cavity is forced to reach the defects like porosity and blowholes. To overcome these defects, extensive study on these factors is needed. During solidification, the important parameters like furnace, sand and vent holes are affecting the material properties. The molten temperature, pouring time and holding time are most significant parameters in sand casting. Aluminum is one of the highly desirable materials in sand casting. In this work, the various furnace parameters are analyzed and compared with Artificial Neural Network (ANN) and Fuzzy logic model. The hardness and surface Roughness are analyzed and also test the work piece by using NDT techniques.**

Keywords- **Aluminum, sand casting, DOE, ANN, FUZZY, NDT.**

I. INTRODUCTION

The different manufacturing processes are involved in industry. The components are manufactured by various stages like primary and secondary. The primary processes are die casting, sand casting and investment casting etc. Sand casting is the basic manufacturing process in all industries. The component of primary process is not appropriate for the customer requirements. The secondary operation is needed for the customer satisfaction. Generally sand-casting process is forming the metal for required geometry with good mechanical properties.

An Artificial Neural Network (ANN) works similarly the human brain, where the data processing is dispersed over some interconnected processing elements, called neurons. Most of the cases the neural network could recognize the extreme solution. ANN [1] is used to signify a real-world system by alternating a set of parameters called weights, to learn the association between given input data and their related outputs. These weights are related with the relations between the neurons within the network is cal training. Most of the researchers analyzed that how the v parameters influenced with various output responses created a mathematical model with the aid of mini tab RSM and ANN.

The extreme characteristics of Mild Steel castin negligible percentage of defect have been carried out effective parameter were analyzed in sand casting [2].

Based on the Analyses of Variance (ANOVA), investigated by ANOVA for the optimum parameter level to recognize the contributions of each factor on the ca defects. Munish Chhabra [3] investigated the statistical experimental works have been conducted on non-fer material in direct metal casting process. The follow parameters like casting volume, pouring temperature and s thickness are clearly investigated by Taguchi Techniques. results were evaluated by ANOVA. The pouring temperatu only the major effect on the deviation in outer diameter and 73.06% of contribution of influence was found in direct m casting. M. Muthuswamy et al [4] analyzed the various def in pressure die casting. The DOE - Design of Experim Taguchi and RSM - Response Surface methodology was u this investigation. The regression Equation, surface and con plots are analyzed and it's identified the effective proc parameters. In this work, the most phenomenal parameter metal temperature is about 45% of contribution were fou Another important factor of degassing frequency is i identified as the highest influencing factor in pressure casting.

The mechanical properties and microstructure analysis LM25 alloy have been investigated in Low Pressure Casti (LPC) mode [5]. The pouring temperature plays a spirit role for the improvement of mechanical strength and d compared with gravity die casting. Amit Sata [6] wo studied about the various defects in continuous casting an analyzed by Multi Variate Regression (MVR) Artificial Neural Network (ANN). It is clearly found the variou defects and more than twenty-four process parameters we collected from various casting industries. All the data we analyzed by six ANN different training tools and the result were compared with Levenberg and Marquardt algorithm.

Paper ID: 31

Process Evaluation and Optimization of Fricti Welding Parameters on Aluminium Grade 60 by Direct Drive Friction Welding Method

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Abstract: The expansion of joining process is very essential in the field of manufacturing to satisfy the industrial needs and customer expectations. Friction welding process is one of the solid-state welding processes in which similar/dissimilar materials are joined without the use of filler materials. In this experimental investigation, Aluminium Grade 6061 is used as the test specimen for the welding process because of its wide variety of applications in manufacturing and automobile industries. In this research work, radial drilling machine is used for joining the similar combination materials of Aluminium Grade 6061. The input process parameters such as specimen diameter, upset time and spindle speed are used to evaluate the output response like axial shortening, hardness and impact strength. The input process parameters are selected and investigated based on the L_9 orthogonal array using the Taguchi Design of Experiments (DoE) approach and Particle Swarm Optimization (PSO) Technique. The main intention of this experimental investigation is to optimize the friction welding process parameters on the axial shortening, impact strength and hardness of the friction welded specimen.

Keywords: Friction Welding Process; Input Process Parameters; Output Responses; Optimization Techniques.

1. INTRODUCTION

Recently, welding plays major role in all the manufacturing industries to enhance the competence in the field. There are varieties of welding process available to join similar or dissimilar combination of materials with or without application of filler rod. Many researchers have investigated the different welding process to join the material with low cost. Friction welding process is one type of solid state welding process in which actual bonding takes place without the use of filler rod. During the friction welding process, frictional heat is generated at the interface of the test specimen and bonding takes place by the plastic deformation of base materials. Normally, the input process parameters selected for the friction welding process are spindle speed, heating pressure, upset pressure, heating time and upset time.

Kimmra et al. (2017) investigated the effect of friction welding condition of joining phenomena and mechanical properties of friction welded joints between 6063 aluminum alloy and AISI 304 Stainless steel. The main intention is to evaluate t of friction welding conditions on joining phenomen strength and bending ductility of friction welde between test specimen by using the weld interface te mechanical and metallurgical test method and friction method. The output responses are joint efficiency and hardness. Thus, the authors concluded that the tensile s fractured point and hardness distribution not have di between air and water cooling process. Meengam et al demonstrated the friction welding of semi solid met aluminium alloy. The main aim is to appraise the characteristic of friction welded similar joints of SS aluminium alloys by using the Microstructure test and hardness test. El-Oualid Bouarroudji, et al. (2017) inve about the Thermal analysis during a Rotational welding. The

output responses are breaking limit, Temperature, time, optimal friction time. Thus the authors concluded rupture has occurred outside of the welded joints majority of the tests conducted. Palanivel, et al. investigated the microstructure and mechanical charac of continues drive friction welded grade 2 seamless t tubes at different rotational speeds. Thus the author co that the increase in rotational speed decrease the pe equilibrium torque. Increase in rotational speed and i the weld time due to reduction in heating rate. Pandia al (2016) studied the interfacial microstructur optimization of friction welding by Taguchi method on tube to SA 387 tube plate without backing block u external tool. The experiments were conducted ba parameters such as revolution speed and heating tim authors concluded that the optimum compression stren predicted through ANOVA table is 472 MPa and metall analysis for the optimum process parameter was perfor the specimens and the interfacial microstructure was ob Shanjeevi et al (2013) analyzed the evaluation of mec and metallurgical properties of dissimilar materials by welding process using austenitic stainless steel (304 copper. This work is based on the three input parameter

Paper ID: 30

Tool Wear Investigation of Micro-textured & Non-Textured Carbide insert for Machining Industrial Component

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Abstract— **Tool wear is an important criterion which plays a significant role in the machining process. Based on the tool wear, the surface finish of the component made is determined. Poor finish is a result of tool wear, and hence the part is rejected. Rejection of the component always causes considerable losses to the manufacturer. Tool wear primarily arises due to machining being done in abnormal conditions. The flow of chip over the rake face causes wears to the insert. To curb the tool wear, newer methods are being researched. One such way is the texturing of the insert which can be done on both the rake and flank face using laser texturing machine. This research mainly focuses on the comparison of the tool wear between the micro-textured and non-textured carbide inserts. Two kinds of texture were engraved on the carbide insert, the modified CHEVRON and the novel CROSS CHEVRON patterns. The carbide inserts are subjected to SEM analysis to measure and compare the tool wear. The components manufactured by both the inserts were tested for dimensional accuracy and surface roughness to see if it falls within the specification limits.**

Keywords— **Micro-Texturing, Cross-Chevron, Tool Wear, Industrial Component.**

I. Introduction

Linear and square grooved patterns were investigated for turning AI 6063 which reduced the cutting forces 30% and 20% respectively. By increasing the depth and width of the texture and decreasing the pitch of the texture, reduces the thickness of the chip and surface roughness [1]. The patterned insert reduces the cutting force requirement by 2.7 to 10.9% comparatively non-patterned for hard turning process [2]. Laser textured carbide insert is used for turning AISI 316 austenitic stainless steel [3]. Authors studied the effect of lay directions, cutting forces; chip morphology and tool wear to compare with non-textured insert. Textured tool showed adhesion of chips on the face of race and cutting force required for turning is reduced. Cemented carbide tool with texturing on the rack face of dimple shaped pattern and machined aluminum alloy and able to obtain the tool wear reduction [4]. The aerospace alloy Al7075-T6 is machined using micro scale dimples on HSS insert. Results show that the reduction of cutting, thrust forces with the textured insert [5]. Dry turning of D2 steel is carried out with coated carbide, textured and non-textured insert and reported the improvement in Machinability due to reduction in flank wear and surface roughness [6]. Chevron proved to be better texture for reducing cutting forces, tool wear [7]. Presence of texture on the flank and rake face reduces the cutting forces friction coefficient and temperature. Cladding or deposition is used for coating the texture pattern. The coated tool gave better results than uncoated tool under dry lubrication conditions.

The horizontal, vertical and elliptical textured pattern introduced [8] in the ceramic insert and studied the tribological behavior and performance in machining with MoS2 as solid lubricant mixed with industrial coolant. Tungsten carbide tool insert with three different texture pattern namely parallel, perpendicular, and chevron performance were compared. In this research article, the authors introducing the cross-chevron texture pattern and compared its tool performance with existing non-textured and chevron texture pattern for machining industrial component

II. Materials and Methods

A. Materials and Machines.

The industrial component is of Stainless Steel Grade 304 is taken for experimentation which includes the facing operation followed by turning operation in SUPERCUT 6N Grade CNC machine. Table 1 describes the cutting parameters and operations details. Carbide inserts CNMA120404 without chip breakers is used. The laser texturing on tool face of carbide insert is made using Nd-YAG Laser texturing machine. Two kinds of patterns are made. (i) Chevron and (ii) Cross-Chevron at micro levels. The corresponding details of the texturing are listed in table 2.

B. Experimentation and measurements.

The common industrial component of adjusting screw made of SS Grade 304 is considered for machining using micro-textured and non-textured carbide insert. Facing and turning operations which is the first stage of the machining

Paper ID: 83

Digital Image Processing Approach for Assisting Weld Quality Inspection

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Abstract **– Non-Destructive Evaluation (NDE) is a technique to detect weld defects without affecting the intended application or the structure and is mainly used for damage assessment and quality control. Here we propose an efficient method to detect and classify the defects in radiographic weld images such as crack, lack of penetration, porosity, slag inclusion etc. using shape descriptors named Shape Geometric Descriptors (SGD) and Generic Fourier Descriptors (GFD) which are combined to form a new descriptor f(GFD,SGD). These descriptors form the discriminative features representing weld defect images of different classes. The given radiographic weld images are preprocessed, segmented and then discriminative features are extracted. Finally, SVM classifier is used to classify various welding defects present according to the scenario.**

Keywords **– Weld defects, Radiographic weld images, Multi-step segmentation, Shape Geometric Descriptors, Generic Fourier Descriptors, SVM Classifier**

I. INTRODUCTION

Industrial radiography is a non-destructive testing technique deployed in a wide range of industries ranging from petroleum, petrochemical, nuclear and power generation industries for the non-destructive inspection of weld pieces, conforming to the standards of these manufacturing industries. The basic principle of weld radiography is that it uses ionizing radiation which penetrates through the weld joints to detect internal defects such as lack of penetration, porosity, cracks etc,. The reliable detection of these weld defects is very much essential for the safety and integrity of manufacturing industries. An expert radiographer could manually inspect for weld defects in the captured radiographic films. Although the manual weld quality inspection has been successful over years, it is prone to errors and hence is subjective in nature. categories of welded structures. Weld defect detection in industrial radiography based on digital image processing discussed in [1], [2] and [5] clearly convey the concept of preprocessing techniques to be applied on the acquired weld image. The radiographic image processing was especially used to improve quality of image, making the analysis easier, which consists of detecting and classifying the defects on the radiographic film. In the conventional method, the analysis is done exclusively by the radiograph inspector. There are many problems during all welding processes and most of them relate to non-integrity. The knowledge about GFD and its importance to perform translational and rotational invariance

The complexity of weld inspection is attributed to the s dimension of these defects, low contrast and noisy radiographic films. Further, the reliability of this destructive inspection is affected by the lengthy working h of the expert and his knowledge about the geometry of defects.

Pattern recognition tools applied in weld defect classifica can make the process an automatic and also the most reli This is feasible due to the fact that the utilization of pa recognition makes the weld inspection no longer a subje process. This involves digital image processing techni along with machine learning approaches to be applie acquired weld radiographic images not only for visualization of weld defects but also for formalizing radiographic expertise and for enabling the weld q inspection to be robust and systematic. This is very cr because even an incorrect classification can reject a weld in good condition or accept a piece with disconti exceeding the limits set according to manufacturing stand The scope of the present work involves enhancement of contrast weld images, segmentation of region-of-interest weld portion, extraction of discriminative features fro ROI and finally classification of weld defects base extracted features.

II. OVERVIEW OF WELD QUALITY INSPECTION

The utilization of Radiography technique (RT) for destructive testing of weld images has increased rapidly past decades. In fact, the Radiographic technique has out to be a versatile and well-known technology in quality inspection. RT is widely used as an inspection to detecting discontinuities inside va

is utilized earlier The GFD used for analyzing the sha terms of frequency domain is explained in [6]. The idea fusion strategy is to examine the compactness an rectangularity measures in SGD and derive a cri permitting the design of new descriptor f (GFD, SGD) a better discriminate as discussed in [5].The calculati geometric parameters (area, perimeter, etc.) and s moments are elaborated for binarised weld images issued real radiographic films of welded joints as in [3] and [5]. images database has been made publicly available researchers working on automated weld quality inspectio The visual quality of acquired weld images can be impr

Paper ID: 50

Performance Analysis of Solar box Preheaters for Energy Conservation in Metal Casting

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Abstract— **In metal casting, the melting process uses around 70 % of the total energy consumed by the entire industry. If this energy consumption can be reduced, it will go a long way in addressing the energy security needs of the current society. This research work aims at reducing this energy consumption by pre-heating the raw material in a solar box set-up. Mild steel raw material in the form of scraps of various thicknesses were placed in the box and exposed to sunlight at controlled conditions to absorb the radiant heat to get preheated. The main objectives were to understand the relationship between the energy absorption by the metal scrap and the factors that influence it (such as solar flux density, scrap thickness and the duration of exposure) and to estimate the conservation potential of this method on the energy and economic fronts. The experimental results showed that the metal scrap achieved a preheat temperature of 140 °C during the peak solar irradiance. This translates to 56.50 kJ/kg of savings in melting energy. When this method is extended to the Indian foundries scenario, the energy (electricity) savings would be around 523.96 million kWh, which gives rise to economic savings to the tune of Rs.471.56 crores a year. Thus, this technique of solar thermal preheating holds promise for future energy and environment related problems and hence deserves further studies for industrial implementation.**

Keywords— **Energy conservation, solar thermal energy, metal casting, scrap pre-heating, economics.**

I. INTRODUCTION

Energy is critical in the entire process of evolution, growth and survival of all living beings and it plays a vital role in the socio-economic development and human welfare of a country. The world relies on coal, oil and gas (the fossil fuels) for over 80% of our current energy needs – a situation which shows little sign of changing over the medium-term without drastic policy changes. But there is a grim reality: the energy resources are starting to run out, with devastating consequences on the global economy and global quality of life. When it comes to India, even though India is the fifth largest producer of energy at 548 Million Tons of Oil Equivalent (MTOE) in the world, the gap between production and consumption is huge and growing. The generation pattern in India is shown in Fig.1[1]

Industrialization, urbanization, economic growth, improvement in per capita consumption of electricity, depletion of coal reserves, increasing import of coal, crude oil and other energy sources and the rising concern over climate change have put India in a critical position. It has to take a tough stand balance between economic development and environme sustainability. One of the primary challenges for India wo to alter its existing energy mix, which is dominated by co greater share of cleaner and sustainable sources of energy

It is clear that India's need for secure, affordable, environmentally sustainable energy has become one of principal economic and development challenges for country. Keeping the energy challenges that India face in the authors have come up with the idea of using the solar e in one of the most energy-intensive manufacturing sectors metal casting. In the casting process, the majority of the is taken by the melting process, which is shown in Fig.2

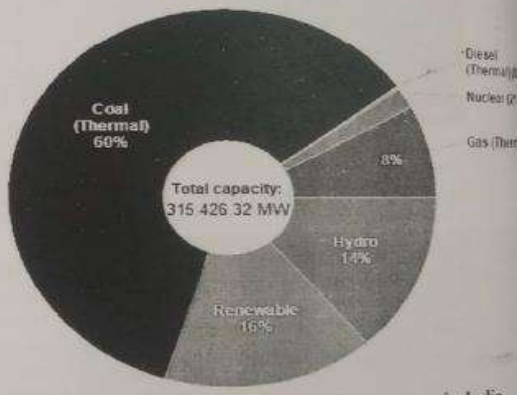

Fig. 1. Energy generation pattern in India

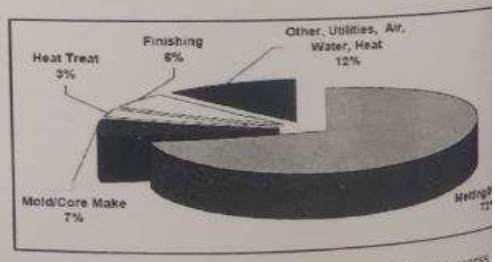

Fig. 2. Approximate share of energy consumed by different process

Paper ID: 62

Evaluation and Optimization of testing parameters in Immersion Corrosion Testing of Aluminium Matrix Composites

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Abstract

The purpose of this work is to explore the mechanical behavior, then to optimize the immersion corrosion testing parameter of aluminum Al6061 alloy composite reinforced with silicon carbide for making it suitable to be used in the structural parts of ships. Four different ratios of silicon carbide with the weight fraction of 0%, 5%, 10% and 15% are reinforced in aluminum alloy as per mass-based ratio. The composite specimens are fabricated using stir casting technique. Various mechanical tests are conducted on the composite specimen to determine the tensile strength, hardness and impact strength, then optimization is done on immersion corrosion testing parameters by the use of Response Surface Methodology (RSM) tool. The Box Behnken technique in RSM is taken to ascertain the number of test samples as experimental runs. The input parameters or factors assigned with different levels are composition of silicon carbide, testing time and face length of composite sample. The output responses which influence the input properties are acidic corrosion rate, basic corrosion rate and salt deposition rate, as die sample specimens are dipped in acid, alkali and salt solutions respectively.

Keywords:**aluminum, silicon carbide, hardness, impact strength, tensile strength, corrosion.**

1. INTRODUCTION

Extensive researches have been made and are still in the developing stage in the field of fabrication, evaluation and experimental investigation of composites. In particular metal matrix composites are giving a huge appetite to research scholars as they are evergreen in their development as well as ever increasing applications in crucial sectors.

Composites are unique materials that have enhanced mechanical, physical and technological properties when compared to single metals. They are nothing but joining of either two metals or a metal with a non metal together at different proportions.

In Metal Matrix Composite, the major constituent otherwise known as Matrix is a metal and minor constituents otherwise known as reinforcements may be either metals, polymers, ceramics or a combination of these. The reinforcements are embedded into the matrix in the form of particles / powders, fibers or whiskers.

Aluminum, the most readily available material in the crust of earth and the most preferably used material as matrix in composites. Its outstanding properties such as low weight, low cost, ductility, thermal conductivity and formability makes it one of the most sought after metal alloy for the fabrication of composites.

The composites can be fabricated by different methods of production namely stir casting (pressurized or gravity die casting), powder metallurgy, mechanical alloying, vapour deposition, etc. These composites find diverse usage in structural, engineering, research, medical, sports and automobile fields. Aircraft and marine construction industries, multipurpose products and automobile industries that require low weight, high tensile strength, good stiffness and excellent chemical retardation make use of these composites in large scale.

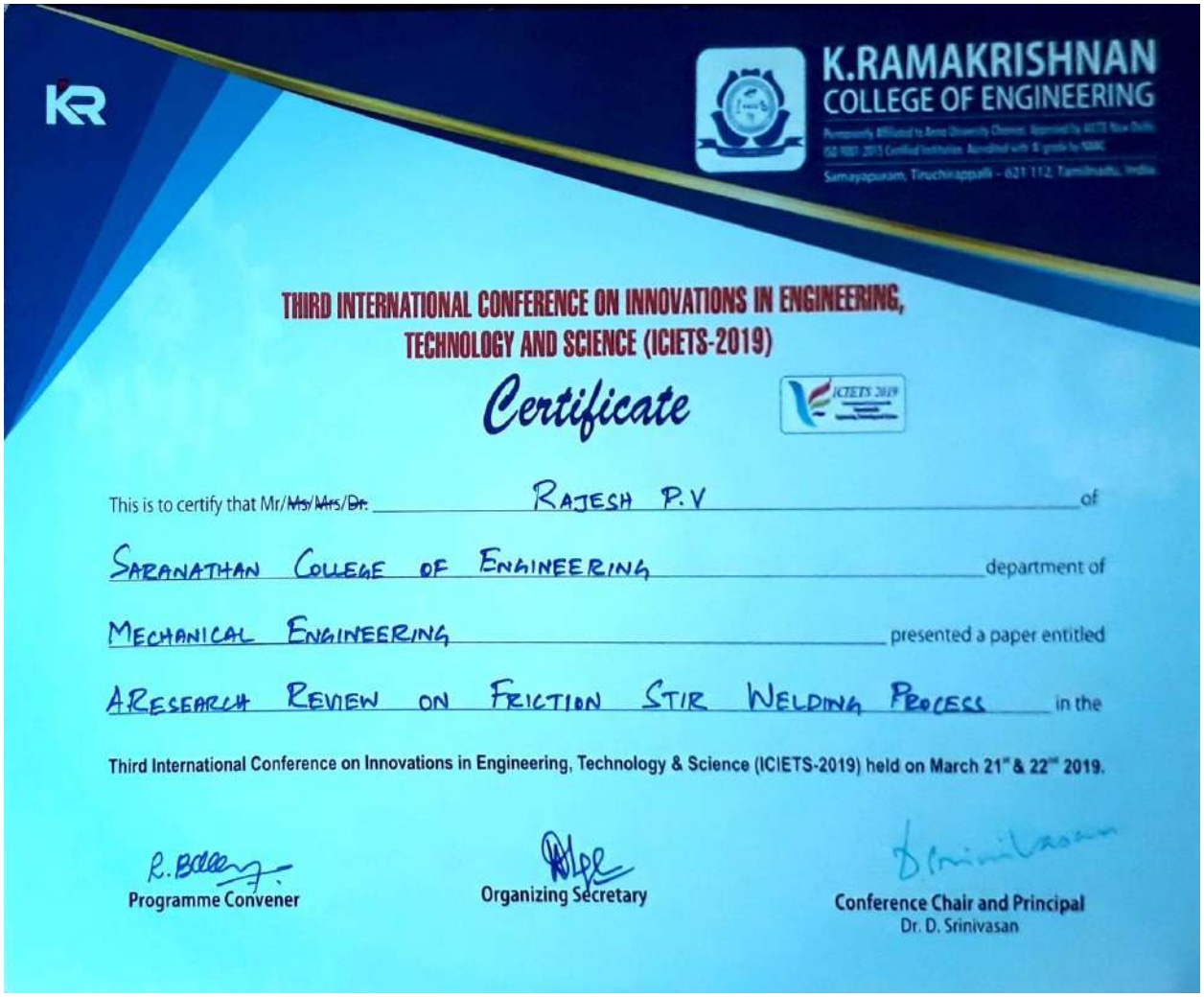
By reviewing various literatures, we found that the main objective of the study is to improve the corrosion resistance of aluminium alloys used in marine structural parts such as ship hulls, super structures, cabins, etc. Nowadays ships are using Al6061 alloy for their exterior structures. Despite its merits, it is also having some disadvantages such as low strength, low hardness and susceptibility to chemical solvents. Hence a replacement is needed for that alloy that gives

1. High strength
2. High hardness
3. Good resistance to corrosion

Hence a ceramic is reinforced as a particulate inside the alloy matrix thereby forming composites to give attractive properties.

2. EXPERIMENTAL WORK

Based on the literature review done, the specimens are determined by varying the weight percentages of matrix as well as reinforcement materials. The different compositions of composite to be fabricated using Stir Casting process are as follows:



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SATISFACTION ON NISSAN CAR SHOWROOM
in the 3rd National Conference on Applications of Management Research in Social Science, Engineering and Technology organized by M.A.M. B-School and M.A.M. College of Engineering and Technology on 25th January 2019.

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Ms Marjon Elshof
Conference Convener
Arnhem Business School
HAN University of Applied Sciences
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Dr Jyothi Kumar
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in "Synthesize: An International Interdisciplinary Conference on Business Studies and Social Sciences," on 18 and 19 December, 2018 at School of Business Studies and Social Sciences, CHRIST (Deemed to be University), Bangalore, India.

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India

5. Zn (II) COMPLEX CONTAINING A NEW MANNICH BASE LIGAND: SYNTHESIS, CHARACTERIZATION AND APPLICATIONS IN ENERGY AND ENVIRONMENT

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The preparation of simple, efficient, eco-friendly and economically viable methodologies for widely used organic compounds is in great demand. A new Mannich base ligand containing acetamide derivatives are extremely useful in engineering, energy, environment and medicinal fields because they exhibit a wide range of activities such as corrosion inhibition, metal ion removal, catalysis, biological activities and for solar energy conversion.

A new Mannich base ligand was synthesized by a three component condensation of secondary amine, aldehyde and organic compound containing at least one active hydrogen atom. And the synthesized compound was characterized by elemental analysis, IR, UV, NMR and mass spectral studies. Metal complex of Zn(II) with the above Mannich base ligand was prepared and characterized by elemental analysis, conductivity measurement, IR and NMR spectral studies. The proposed work focuses on the interaction of zinc Mannich base complex with TiO_2-NPS based on UV-Vis and fluorescence methods. The final goal is to understand the suitability of the proposed systems for DSSCs. In this regard, the advantage of the complex for its absorption in visible region along with expected higher molar extinction coefficient (€) values will be taken into account. This is a primarily important aspect for DSSC. Next is the ability of the complex to interact with TiO_2-NPS. This aspect will be studied based on the change in the visible spectra when adsorbed on to TiO_2-NPS. Using UV-Vis and fluorescence methods, it is possible to analyze the possibility and extent of such interactions by evaluating the K_b values which could be obtained through the use of Benesi-Hildebrandt equation. It is possible to prepare differently substituted complexes and obtain the K_b values and thus a comparison of these values could be made. This will enable the proper choice of the complexes for DSSCs. By using fluorescence methods, the discrimination of quenching mode as electron or energy transfer could be arrived at. This will enable

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Synthesis, characterization, antibacterial, antifungal, anticancer and anticorrosion studies of Mn^{II}, Co^{II}, Ni^{II} and Cu^{II} metal chelates of a new mannich base: *N*-[(Diphenylamino)methyl]acetamide

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The new Mannich base ligand *N*-[(Diphenylamino)methyl]acetamide was synthesized from diphenylamine, formaldehyde and acetamide by Mannich synthetic route. The complexes of Mn^{II}, Ni^{II}, Co^{II} and Cu^{II} were synthesized and characterized by various spectral techniques. The biological activities for the ligand and complexes were screened *in vitro* against six bacterial species: *E.coli, P.aeruginosa, S.typhi, B.subtilis, S.pyogenes, S.aureus* and also against two fungal species: *A.niger* and *A.flavus* by disc diffusion technique, using agar nutrient as medium and gentamycin as control. The immunomodulatory, cytotoxic and anticancer studies for the ligand and complexes were performed by employing Raji and Jukart cell lines. The order of activity was found to be cobalt(II) complex > copper(II) complex > nickel(II) complex > manganese(II) complex > ligand. Cobalt(II) nitrato complex was found to be most active among the complexes. This is because a considerable amount of cobalt is needed for dividing cancer cells rapidly. The cobalt uptake tendency by cancerous cells leads to an easy absorption of the compound. After reaching the receptor site, the labile bonds in the complex undergoes dissociation. It produces free active antimetabolite, which is active, in its own right. Inhibition of mild steel in acidic solutions can be explained on the basis of adsorption. In acidic solutions the ligand exist as protonated species and adsorb on the cathodic sites occurring through the π-electrons of aromatic ring and the lone pair of electrons of nitrogen and oxygen atoms, which decreases anodic dissolution of mild steel.

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been completely studied to understand their role in altering the optoelectronic properties of these organic systems and to be fabricated for OLED devices. All the newly studied compounds have good electron delocalization, electron transport properties than the already reported one. Over all, this work gives fine correlation between computed optoelectronic properties and HOMO-LUMO gaps which portrayed the role of hetero aromatic rings on the photo physical properties of new derivatives and throw light in designing novel candidates for OLED applications.

Key words: Pyrimidine, DFT, TDDFT, HOMO-LUMO, OLEDs

18. OXIDATION OF AROMATIC ALCOHOL BY QUINOXALINIUM DICHROMATE - MECHANISTIC APPROACH

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The kinetic of oxidation of benzyl alcohol by quinoxalinium dichromate has been studied in the presence of perchloric acid in aqueous acetic acid medium. The reaction follows first order with respect to benzyl alcohol, quinoxalinium dichromate and fractional order with respect to perchloric acid. The rate of reaction increases with increase in the percentage of acetic acid. The reaction does not follow the polymerization with acrylonitrile. The rate of reaction decreases with change in the concentration of manganous sulphate. The thermodynamic and activation parameters have been calculated using Eyring's plot. From the kinetic evidences, a probable mechanism has been proposed and suitable rate law is derived.

Key words: Oxidation, Kinetics, Mechanism, Benzyl Alcohol, Quinoxalinium dichromate.

19. ANTI CANCER STUDIES OF ACETAMIDE MANNICH BASE BY *IN SILICO* METHOD

R.Maheswari, L.Muruganandam and V.Balamurugan
Department of Chemistry, Saranathan College of Engineering, Tiruchirappalli-620 012.

Docking, a computational tool often provides comprehensive insight into molecular mechanisms of biological processes. The main objective of docking is to

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PRODUCTION OF BIOFUEL BY ANAEROBIC DIGESTION OF VEGETABLE WASTES

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Abstract

About 135.5 million tonnes per year of municipal solid waste(MSW) is generated in India and it is comprised of 20-30% of vegetable waste. The vegetable waste(VW) includes uneaten, peelings, trimmings, scrapings and left over's from agricultural fields, markets, vegetable shops, restaurants, households, canteens and cafeterias. Owing to higher percentage of organic matter and moisture content the vegetable waste is fit for generating biogas and digestate as a soil conditioner. Anaerobic digestion(AD) of high concentration organic wastes slurries is very difficult. To improve the biodegradation of vegetable waste the hemophilic AD is carried out with continuous mixing provided by agitators. This paper presents the study of AD of high concentration vegetable waste slurry in a single phase anaerobic bioreactor operated at ambient temperature.

A study of anaerobic digestion of vegetable waste(VW) was carried out in complete recycle anaerobic bioreactor under ambient temperature conditions. The reduction in chemical oxygen demand (COD) obtained at three different hydraulic retention times (HRT), 5days (d), 7d and 10d were 64%, 79% and 87% respectively. The appropriate HRT for the reactor was found to be 7d with 78% TS and 83% VS removal. The biogas production was $1m^3/m^3$ of reactor volume. The feed stock had well balanced nutrients as detected by nutrient analysis. The C/N ratio of digestate varied from 20 to 28. Seed germination of 100% and increase of 49% in plant growth were observed in plants supplied with digestate as compared to control samples. Owing to the nutrient contents, the digestate was a useful product as a soil conditioner. The technique can be recommended for anaerobic digestion of other organic substrates which would help to curtail environmental pollution while reaping the energy benefits.

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PRODUCTION OF VALUABLE RESOURCES WITH THE HELP OF EMERGING POLLUTANTS GENERATED FROM THE CITIES

M.Fahad[1], S.P.Mahalakshmi[1], L.Muruganandam[2] and R.Maheswari[2]
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Abstract

The main objective of this project is to fuel up the city with its own waste products like Water waste, Air waste and Land waste. The waste water coming out from the city is treated with the help of natural water purification system. A part of purified water is distributed to agricultural fields and remaining water is sent to Solar Ray system for production of electricity with the help of steam produced in it. The steam is condensed and sent into Di-Hydrogen-Monoxide fuel generator cell. The generator cell is used to split up the hydrogen and oxygen molecules present in water which serves as fuel for vehicles. Air waste product produced in the industries are collected and sent into a biological reservoir which contains a special kind of algae which converts CO_2 into H_2 gas which can be used for several purposes. Land waste can be divided into two waste Degradable and Non Degradable waste. Non Degradable waste like plastic is converted into Diesel with help of anaerobic Pyrolysis. The diesel from Pyrolysis is used to make some valuable products. Degradable wastes are produced in large quantities in our day to day life. These wastes are thrown into the garbage containers which are placed all over the city. These containers are interconnected through the large underground pipelines. The decomposition of waste matter takes place and there will be production of biogas. Biogas present in the pipelines is highly sealed and the gas is distributed to the residencies for cooking purpose, with the help of hub stations. Therefore with the help of the waste produced in the city, we are able to get infinite amount Electricity, Fresh Water, and Non Polluting Fuel for the livelihood of the Human Beings in our Mother Earth.

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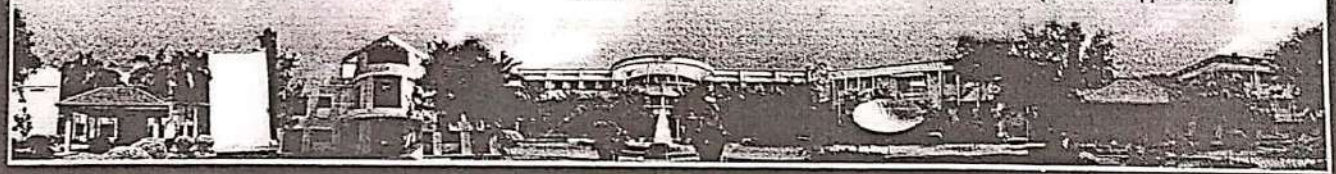

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has ~~participated~~ / presented a paper titled " N-ARYLATION OF IMIDAZOLE USING COPPER(II) COMPLEXES WITH ONS DONOR LIGAND AND TRIPHENYLPHOSPHINE CATALYSTS. AND GOT THIRD PLACE IN POSTER PRESENTATION in the

NATIONAL CONFERENCE ON ADVANCED MATERIALS IN CHEMISTRY – NCAMC '18 organized by the PG & Research Department of Chemistry, **St.Joseph's College** (Autonomous), Tiruchirappalli, Tamilnadu, India on 8th February 2018.

Dr. A.LEO STANDLY — Dr. M.AMALADASAN — Dr. K.JOSEPH SANTHANARAJ — Rev. Dr. ANDREW FRANCIS S.J.

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48. ONE STEP BIOPOLYMERSYNTHESIS, CHARACTERISATION AND ANTIBACTERIAL ACTIVITY OF SILVER NANOPARTICLES FROM CHITOSAN COMPOSITE PARTICLES

N.Anusuya[1], C.Pragathiswaran[1*], J. Violet Mary[2], G.Thulasi[3] and C.Sumitha[4]

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The Various synthesis processes have been developed by silver nanoparticles.It is used in various applications such as medicinal, polymer, corrosion inhibitors, pharmaceutical and analytical etc., In the present study a new approach for one-step synthesis of silver nanoparticles surrounded chitosan particles. The particles were confirmed by UV-Visible, FTIR and X-Ray diffraction analysis. The Silver nano particle as biologically evaluated for their anti-bacterial activity from disc diffusion method and it is compared to the standard drug.

Keywords: Chitosan, silver nitrate, FT-IR, XRD analysis.

49. GREEN SYNTHESIS AND CHARACTERIZATIONS OF SILVER NANOPARTICLES USING LEAF EXTRACT OF *CISSUS QUADRANGULARIS*

J. Violet Mary[1] C.Pragathiswaran[2] N.Anusuya[3] C.Sumitha[4] and G.Thulasi[5]

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Development of biologically inspired experimental processes for the synthesis of nanoparticles is an important branch of nanotechnology. Here we have synthesized silver nanoparticles (AgNPs) by using leaves extracts of *Cissus quadrangularis*. Surface plasmon resonancespectra for silver obtained at 451 nm with brown colour respectively. AgNPs vary in size according to different leaves extract for the synthesis. Different

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A CROSS LAYER SUPPORTED NON-RESERVATION BASED APPROACH FOR QOS PROVISIONING IN MOBILE AD HOC NETWORKS

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ABSTRACT

Mobile ad hoc networks (MANET) which was more popularly used for military application has become more popular for common use. Where ever the network can be deployed, the MANET can play a crucial role in forming a network on demand. Use of MANETs for real time application give rise to the requirement of providing quality of service(QOS). Since the topology is not fixed in MANETs, provisioning of QOS by link bandwidth reservation is difficult to achieve. In this paper, a methodology of preventing the congestion in MANET is suggested. The parameters such as link quality at the physical layer, queue length at the transport layer and detection of node which creates congestion by the Data link and transport layers and routing of data based on the above parameters at the network layer. Since this procedure do not use any hard reservations of bandwidth, it is named as lightweight QOS(LWQOS) approach. The simulation experiments have shown the approach improves the packet delivery ratio.

Keywords : Cross-Layer Design, Denial-Of-Service(DoS),Mobile Ad Hoc Networks (MANETs), Quality-Of-Service(QOS), LWQOS QoS)

I. INTRODUCTION

The Mobile Ad Hoc Networks (MANETs) are highly dynamic in nature and infrastructure free. It is consisted of a group of mobile nodes which are not surrounded by any infrastructure. Because of non-restricted mobility these nodes are liberated to move autonomously in any direction and the straightforward deployment's uniqueness of MANETs make them incredibly popular and highly appropriate for applications like emergencies, natural disasters and military operations.A mobile ad hoc network includes a group ofwireless nodes which develops a networkwithout the deployment of existing networkinfrastructure. A node an communicate withthe other nodes by multi-hop, when the nodescooperate to forward packets with each other.In MANETs, the design of a quality ofService (QoS) routing protocol is moredifficult than the conventional networksbecause the host mobility can causefrequently unpredictable topology changes[1].

Due to high raterequirements and severe delay constraints,maintaining real-time media traffics such asaudio and video in presence of dynamicnetwork topology is difficult [2]. Recently,several QoS signaling protocols for

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Dynamic Policy Access for Secure Data Sharing

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ABSTRACT: Secure data may implicitly contain confidential information. This leads to privacy concerns if the provided information is misused. The problem of simultaneously achieving fine-grainedness, scalability, and data confidentiality of access control actually still remains unresolved. This project addresses this issue by using access policies based on data attributes that allow the data owner to delegate most of the computation tasks involved in fine-grained data access control to untrusted servers without disclosing the underlying data contents. The goal is achieved by exploiting and uniquely combining techniques of attribute-based encryption (ABE) and proxy re-encryption. The proposed scheme also has salient properties of user access privilege confidentiality and user secret key accountability. The proposed scheme enables the data owner to delegate most of the computation overhead to powerful servers. Confidentiality of user access privilege and user secret key accountability is achieved.

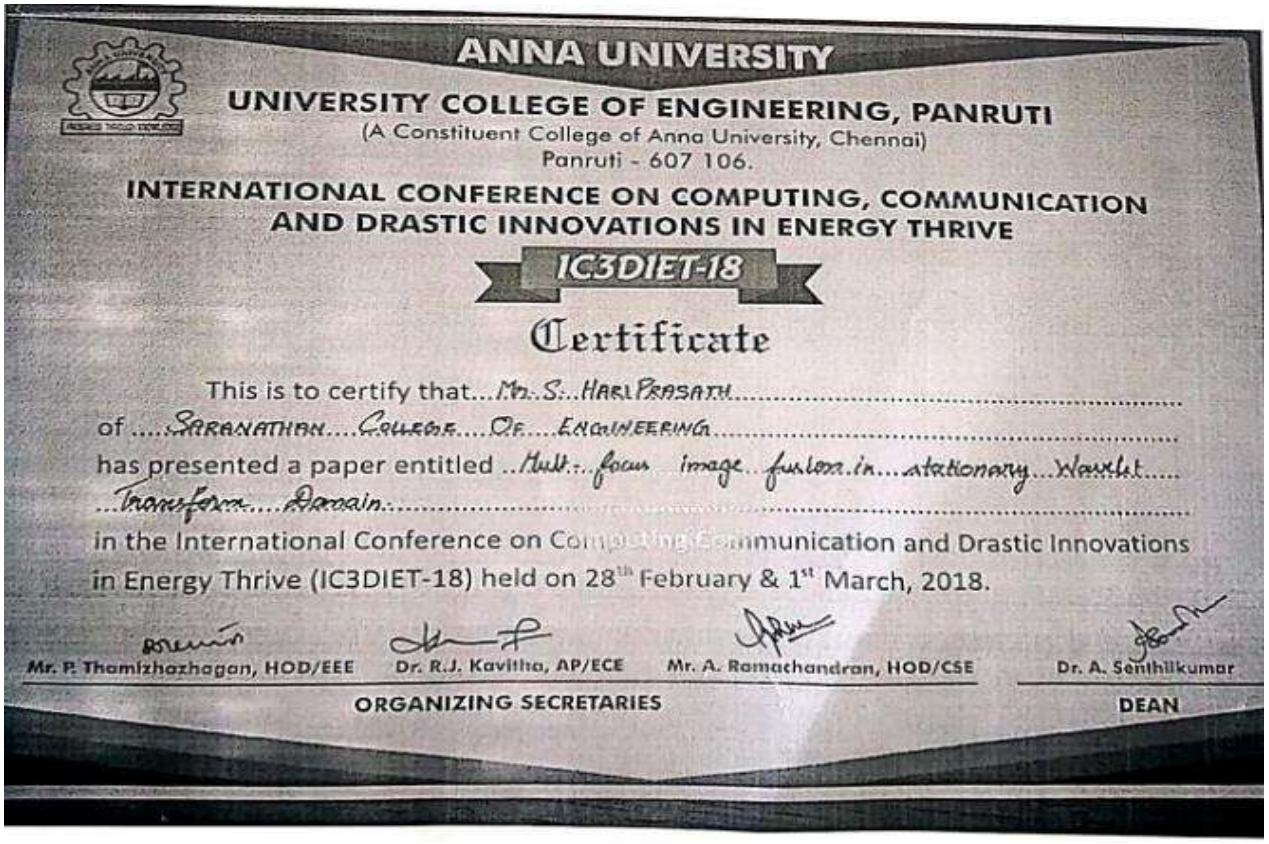
KEYWORDS: Attribute-based encryption, Proxy re-encryption, Fine-grained, Access control, secret key.

I. INTRODUCTION

A security policy specifies session participant requirements. However, existing frame works provide limited facilities for the automated reconciliation of participant policies. This paper considers the limits and methods of reconciliation in a general purpose policy model. The authors identify an algorithm for efficient two-policy reconciliation, and show that, in the worst case, reconciliation of three or more policies is intractable. Further, they suggest efficient heuristics for the detection and resolution of intractable reconciliation. Based upon the policy model, they describe the design and implementation of the policy language. The expressiveness both directly and indirectly of our model, is demonstrated through the representation and exposition of policies supported by existing policy languages. They conclude with brief notes on the integration and enforcement of privacy security policy.

II. RELATED WORK

During business collaborations, multiple participating organizations often need to share data for common interests. In such cases, it is necessary to combine local policies from different organizations into a global one in order to manage access to the shared data. However, local policies of organizations may be different or even conflicting, due to diverse rules and rule combining algorithms chosen. Few existing methods for policy combination are able to automatically combine multiple local policies into a global one. Authors proposed a bottom-up approach to address the issues of multiple policy combinations. The key idea is to first classify the rules based on attribute constraints in each policy, and then reduce the rules of the corresponding classes to one with the same attribute constraints. The reduced rules are then combined into a new global policy by choosing the appropriate rule combining algorithm in XACML. The latter ensures compliance with each of the local policies at syntax and semantic levels. To validate the approach, authors developed a proof-of-concept implementation of the automated policy combination. Experimental results demonstrate that our approach is highly scalable and supports a number of attribute constraints in each local policy.



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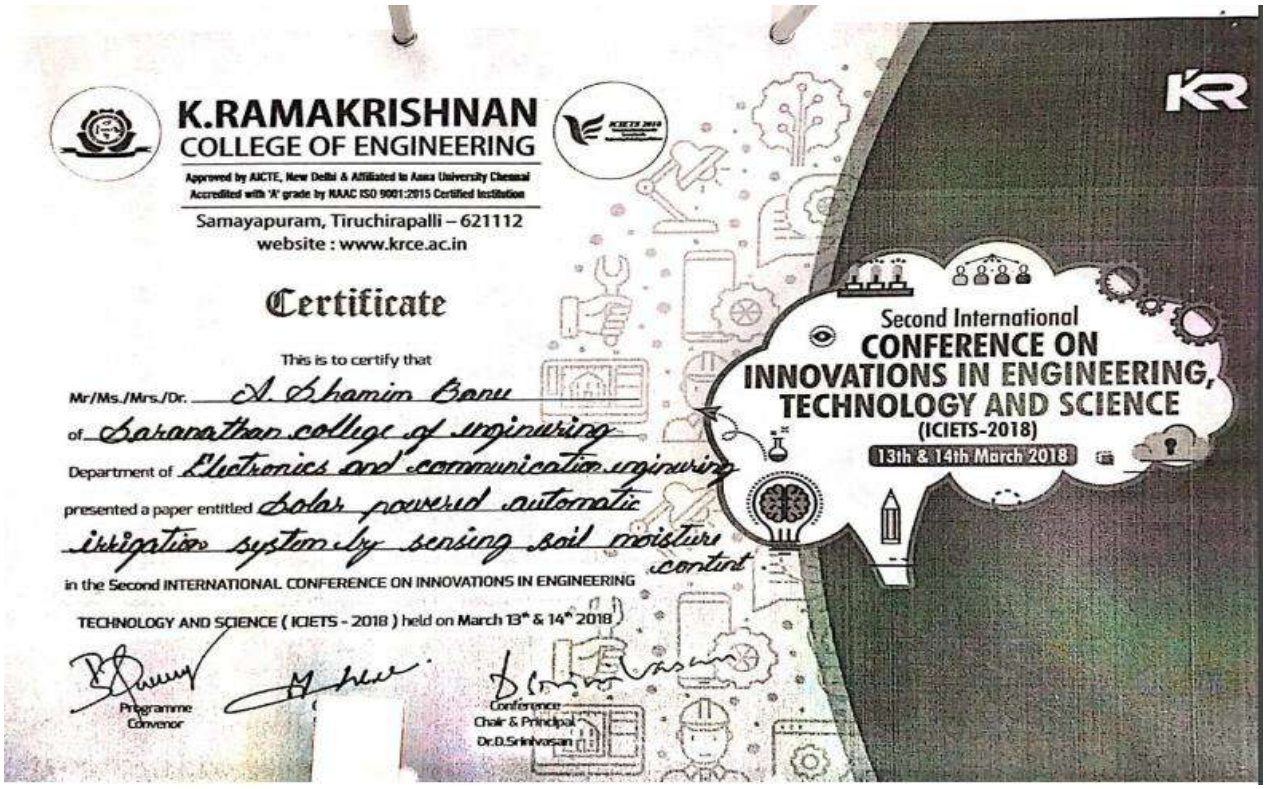

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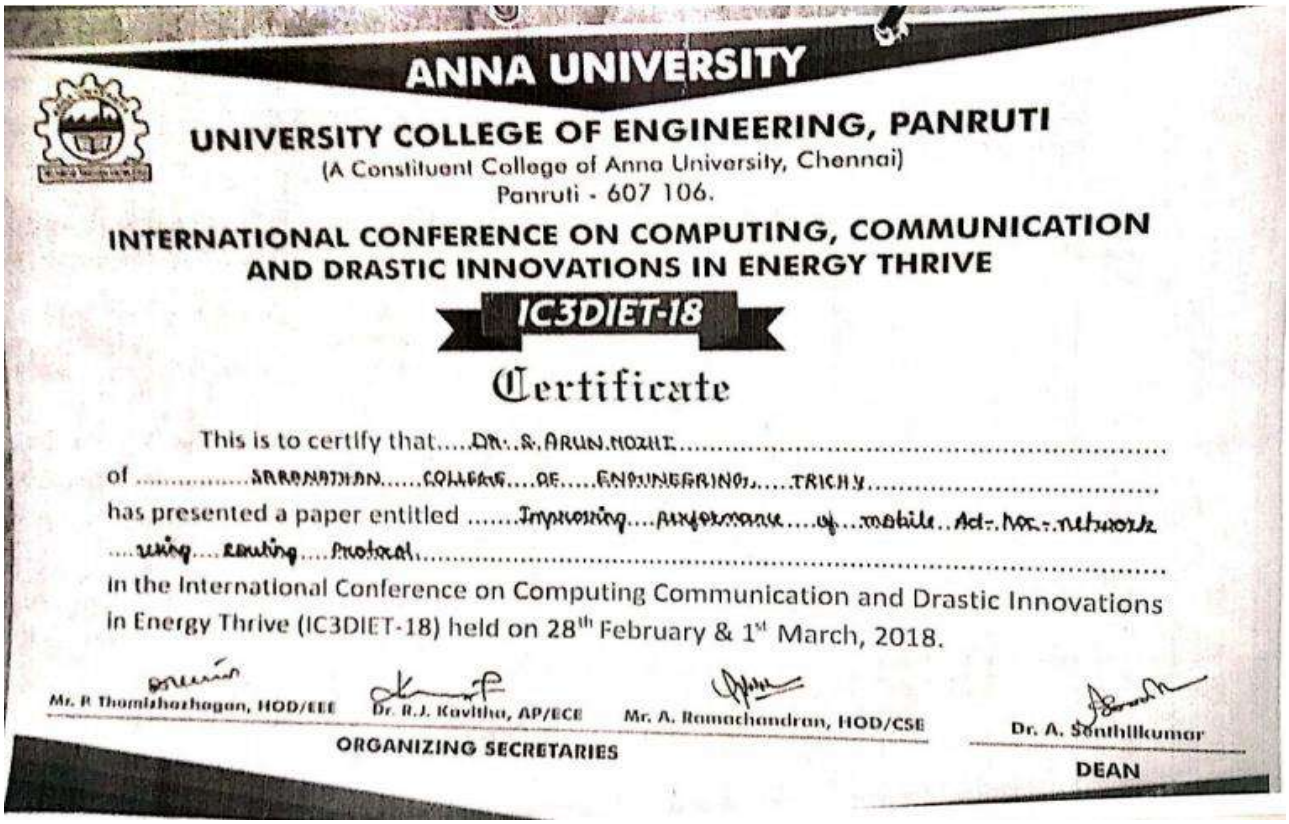

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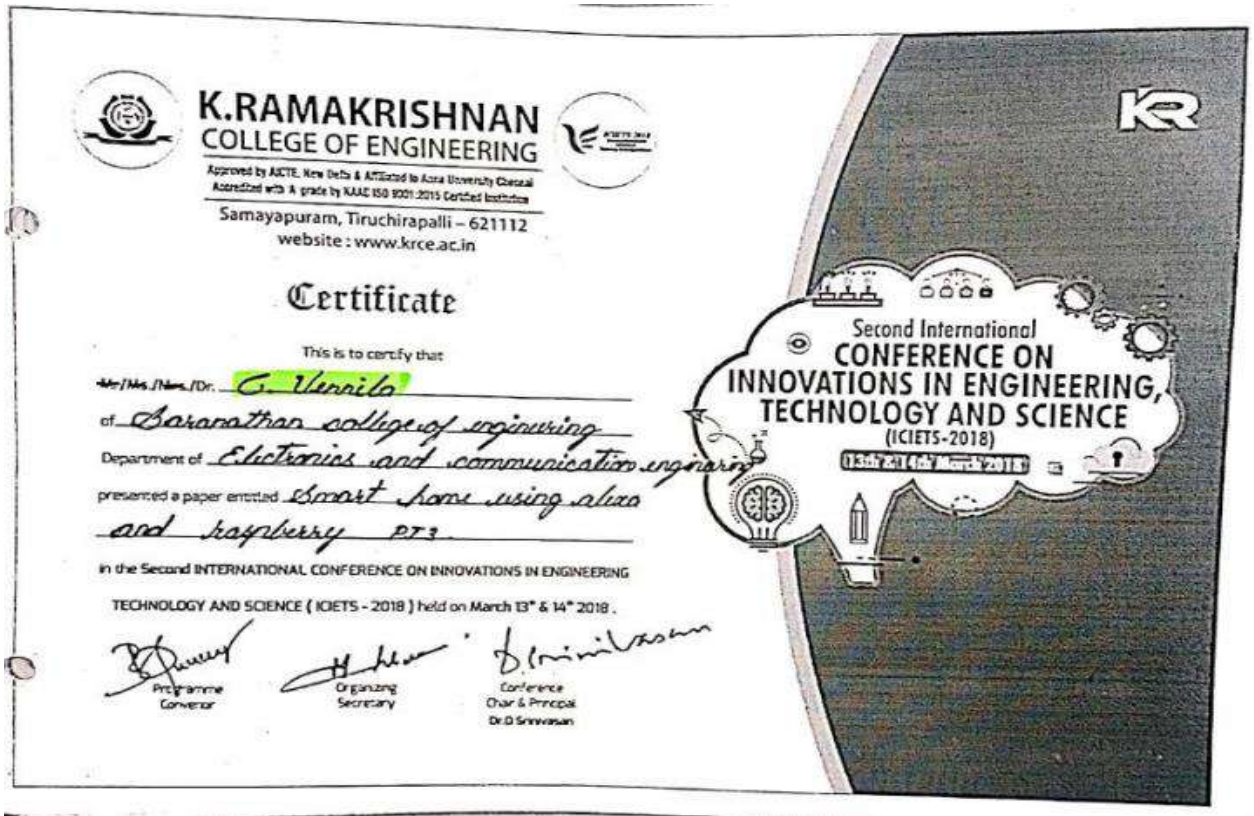

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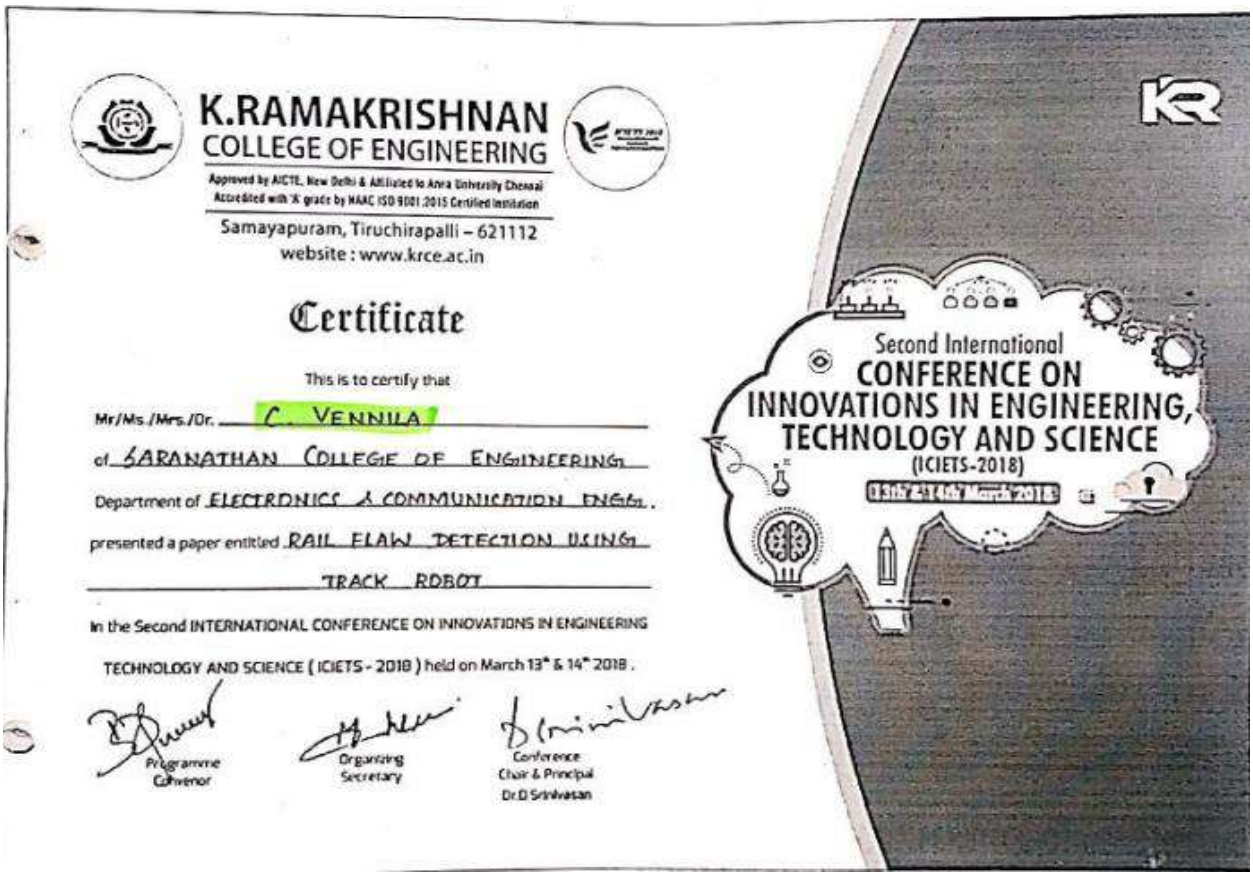

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A Meta Material Based U-Shaped Patch Antenna for Wireless Application

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I. INTRODUCTION

Designing an antenna to resonates at more than one band is very much attractive features to modify many antennas by single antenna. Different types of micro strip multi band antennas have been report freshly which can activate at desired wireless standards. Recent researches have focused on the effect of different MTM for recognizing the better antenna concept. The meta materials is defined as the synthetic material which takes μ and ε whose value is negative value. But in ordinary materials where μ and ε is in positive value. It is also called as left handed material or negative refractive index material. The property which exhibit ε is lesser than 0, μ is lesser than 0 in which defines the material is meta material which is also called as left handed material or double handed material (DNG).It propagates the waves in backward direction in the medium, consequently 'n' and phase velocity takes the negative value so that direction of demonstration of waves and flood of energy is overturn so that it provides backward wave propagation. In modern Dual band antennas play a vital role to replace two antennas by minimize area as well as cost. A compact structural slot antenna motivated for split ring resonator (SRR) with circular polarization (CP) is achieved for 2.4-5 GHz WLAN applications is used. slot antenna with here feed for excitation and a novel SRR shape was modified for achieving dual band characteristics is achieved[1] and efficiency is more than 70% is obtained.An group of electrically small meta material antenna with coplanar ground is proposed for dual band characteristics for WLAN and wimax applications. A SRR has been imprinted from rectangular patch to construct the stepped impedance of the complementary ring resonator (SICRR) and a small radiating patch is alleviated by means of CSRR. The SICRR is used as categories to reduce the high inductance of thin line of the CSRR for modification the resonance. The loading of CSRR on a rectangular patch which Resonates at 2.45 GHz, it contributes impedance bandwidth of 8.38% and 25.54% at 2.45 GHz and 3.37 GHz respectively [2].some of the recent papers of meta materials is given.

II. LITERATURE SURVEY

The monopole antenna is overlooked with an electric inductive and capacitive resonator at the base of the substrate. This resonator is dependable for providing WiMAX (2.5/5.5 GHz) and WLAN (5.2/5.8 GHz) band of applications, on the other hand 2.5 GHz band was not obtained entirely therefore a T-shaped opening with meandered lines is stamped on above the patch of monopole antenna to acquire the desired resonance around 2.5 GHz which is for wimax band. This resonance merges when the prime band of ELC is adjust to envelop the complete WiMAX band and current is enclosed in the region of the T- slot. This will provides beneficiation to opening approach for radiation [3].The antenna which exhibits of on the outside CRR and interior ELC MTM are seem to generate the dual resonance. This antenna was advanced in view of the fact that ELC MTM overreaches the constraints of SRR. MTM greater than over thickness value it decreases the resonant frequencies and increases bandwidth. The first band is recognized as on the outside CRR and second band is predictable to interior ELC ring [4]. Meta materials which having the properties, that may not obtain in nature which is existing in other materials. These novel structures has to be taken as an account much more important in recent years for the reason of huge range of valuable properties, its importance and its uses. usually, meta materials comprise DNG (double negative) and SNG (single negative).It is greatly depends on ε and μ, so materials can be categorize into four kinds they are DNG (double negative), DSP (double positive),ENG (epsilon negative) and MNG (Mu negative).The permittivity and permeability will be positive for (DPS).some examples are common dielectrics, They are called right-handed materials.

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IOT BASED DATA LOGGER WITH AUTOMATIC SPEED CONTROL AND POLLUTION CONTROL

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This project aims to control the speed of vehicles automatically in restricted areas and also provide recorded information to assist accident investigation as well as maintaining CO level in vehicles. Nowadays in a fast moving world, people do not have self-control and ride vehicles at high speed. This paper suggests a way to control the speed automatically without any harm. In this project we are using radio frequency (RF) to indicate the speed limit areas. RF receiver is placed in the vehicle. The pic microcontroller compares the vehicle speed with the limited speed of the zone. If it exceeds the limited speed, the controller alerts the driver and automatically reduces the motor RPM.This paper also provides a model for detecting the air pollution that is occurring from vehicles. For that intention there is a semi-conductor gas sensor at the exhaust of vehicles which detects the level of pollutants. When the emission level goes beyond the already set threshold level, it will alert the driver and limit the vehicle to certain speed limit. A microcontroller monitors and controls the synchronization and execution of the entire process. The prototype of IOT based Black Box can be installed to any vehicle which aids in investigation of any accident cases.

Keywords: Pic microcontroller, speed limit, Gas sensor, IOT, Black Box.

PORTABLE POCKET PRINTER

S.Meenakshi, G.Jeseeka, R.Keerthana, M.Kirubu, Dr.Baritha Begum (M.E., Ph.D,assistant professor)
Saranathan College Of Engineering

ABSTRACT: The common data printing procedure has to use notebook or desktop computer as a relay medium, first receiving the data from mobile and then sending it to printer using an appropriate printing Method. This is rather cumbersome. This paper proposes a design of a device which directly prints the data stored inside the Mobile without the assistance of a notebook or desktop computer. The design compromises Arduino controller. The configured Bluetooth dongle accept file from Mobile and gives to Arduino. The Printer driver is a program to control a printer that is connected to the system. This system also gets the information through Wi-Fi and prints the data.

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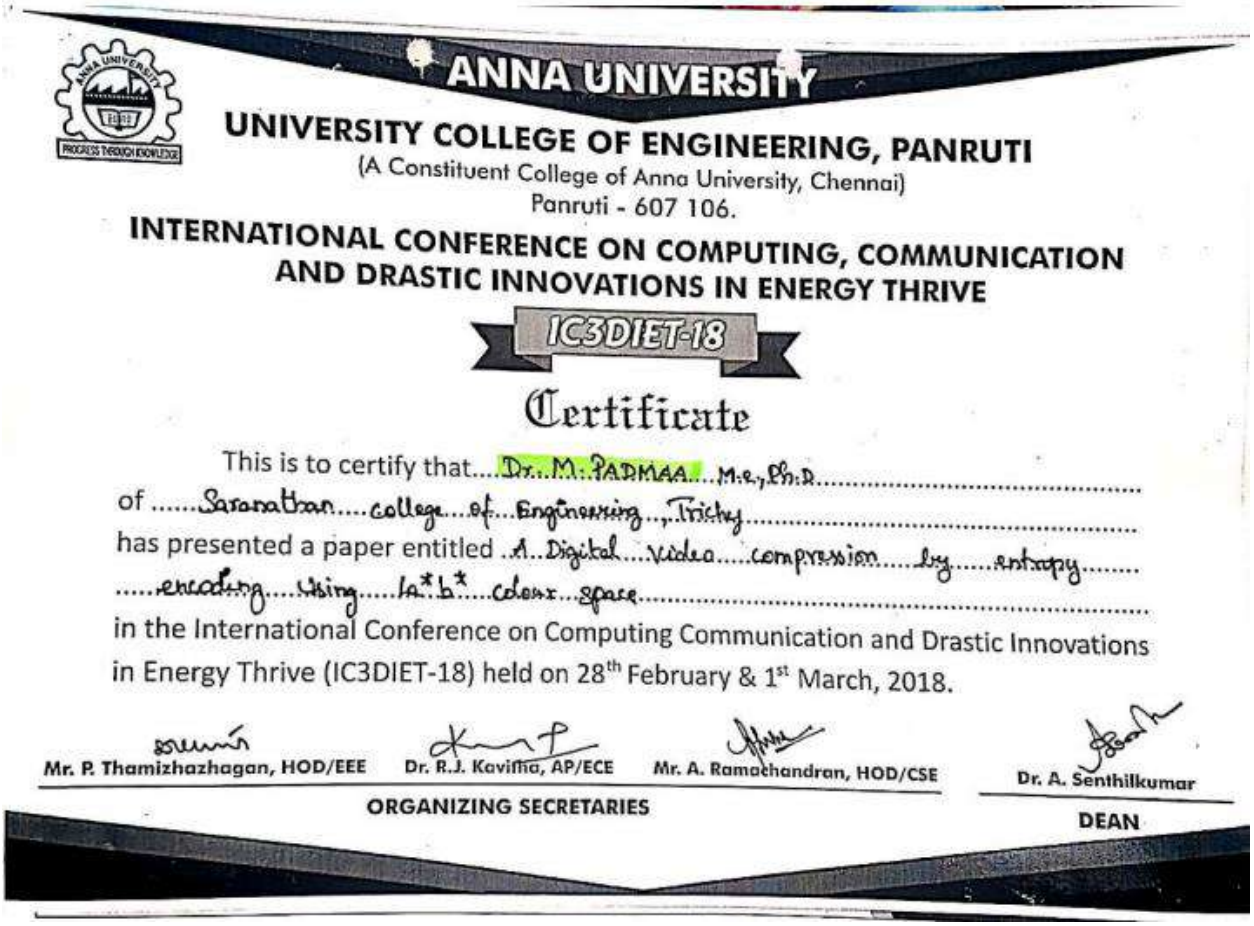

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Design of R3TOS Based Reliable Low Power Network on Chip

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***Abstract*—In this paper, design of a novel Network on Chip (NoC) structure and its integration with Reliable Reconfigurable Real Time Operating System (R3TOS) are presented. NoC has been recently identified as a scalable communication paradigm to avoid the communication bottleneck in bus based communications. Dynamically Reconfigurable Field Programmable Gate Array (FPGA)s are particularly suited for applications that can be broken into a number of different tasks. An interface is required to communicate between the different tasks. Hence, R3TOS can be used among other functionalities to manage the interface between different tasks on FPGA. Secondly, the speed is increased by introducing a novel architecture for removing the head of line blocking by designing a control unit. This architecture also removes the need for tail flit by including the information about number of data flits in the head flit. Third, the reliability factor is improved with incorporation of error Detection and Correction techniques into NoC structure. For verification, all the three schemes are implemented in Zync 7000 series. From the implementation results, it is verified that, the performance of the proposed NoC results in high speed and low power consumption compared to generic router.**

***Keywords*– NoC; Routers; Partial Reconfiguration; R3TOS**

I. INTRODUCTION

Real time communications have two constraints compared to the conventional data communications. First, they have time restrictions like meeting the deadline on exchanging of messages and secondly, they have to ensure the reliability of the transmitted data. This necessitates additional mechanisms that have an in-time and reliable message transmission for real time processing system [1]. In this paper, a novel NoC communication platform is presented to overcome these real-time communication problems. Such NoCs, also offer scalability, by which, the number of Intellectual Property (IP) cores and interconnection links can be dynamically modified resulting in better performance in high bandwidth data communication [2]-[4].

Reconfigurable FPGAs presents the best of worlds Application Specific Integrated Circuit (ASIC) and General Purpose Processor (GPP). They are reconfigurable in real time and are particularly suited for parallel processing applications. Reconfigurability can be profitably employed in applications which can be broken into number of sub units.

These sub units are referred as tasks in real time systems. Present day FPGA architecture presents dynamic partial reconfiguration where the reconfigurability of particular sub-module can be modified while other sub modules can run simultaneously. Such reconfigurable modules require an interface to communicate between each other. Such an interface is provided by Operating System (OS) which also does to task allocation and task scheduling. Moreover, OS can be used to place reconfigurable configuration bit streams at run time. If a silicon slice in a device is faulty, task can be allocated to a non-faulty silicon portion using OS. This greatly enhances the reliability and fault tolerance system. Such an approach has been found in various literatures [5]-[15].

NoCs structure used in R3TOS architecture will relieve the Operating System from coordinating inter task communication. R3TOS uses low bandwidth Internal Configuration Access Port (ICAP) and Processor Configuration Access Port (PCAP) ports for communicating with OS while NoC structure will enhance the communication channel bandwidth between OS and tasks.

Availability of various error detection and correction codes ensures that transmitted data is valid and consequently meet the timing constraints. In this paper, two error correcting schemes with dynamic reconfiguration are presented which are employed in R3TOS based NoCs. Hence, this paper presents the implementation of novel NoC structure with reliability for R3TOS communications.

This research paper is organized in the following manner: Section 2 provides an outline of Network on-chip. Section 3 explains the motivational factors behind the development of R3TOS system based NoC. Section 4 describes the new router architecture for R3TOS based NoC. The error detection and correction methods to improve the reliability of NoC for R3TOS are provided

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Design of Reconfigurable and Reliable Application Specific Network on Chip for R3TOS

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***Abstract*— In this paper, design of a novel reliable Application Specific Network on Chip (ASNoC) with reconfigurability and its integration with Reliable Reconfigurable Real Time Operating System (R3TOS) is presented. Network on Chip (NoC) is a well known scalable communication paradigm to avoid the communication bottleneck in bus based communications. Reconfigurable Field Programmable Gate Arrays (FPGAs) are particularly suited for applications that can be broken into a number of different tasks. Reconfigurability of tasks at runtime enhances the system performance metrics. In earlier literature, Operating System (OS) was used as the medium, for communication between different tasks at run time. This approach provided significant bottlenecks, as Operating System was using the low bandwidth Internal Configuration Access Port (ICAP) and Processor Configuration Access Port (PCAP) for communication between tasks and itself. In this paper, a novel NoC structure is used as the communication interface between different tasks. This approach releases the Operating System from managing the inter task communications. This will result in high bandwidth communication between different tasks. A novel architecture router for NoC which has been proposed removes the head of line blocking by using a dedicated head flit first in first out (FIFO) buffer and data flits being stored in different FIFOs for each input port with a control logic dedicated for this operation. It also removes the requirement for tail flit by introducing the number of data flits in the head flit itself. Also, in order to improve reliability level, we incorporate the novel partially reconfigurable Error Detection and Correction techniques in this NoC. This architecture is implemented in Zynq 7000 series.**

Keywords— NoC, Routers, Partial Reconfiguration, R3TOS

I INTRODUCTION

Real time communications have two constraints compared to the conventional data communications. First, they have time restrictions like meeting the deadline on exchange of messages and secondly, they have to ensure the reliability of the transmitted data. This necessitates additional mechanisms that have an in-time and reliable message transmission for real time processing system [1]. In this paper, a novel NoC communication platform is presented to overcome these real-time communication problems. Such NoCs, offer scalability and better performance in high bandwidth data communication [2]-[4].

A better option against Application Specific Integrated Circuits (ASIC) and General Purpose Processors (GPP) is Reconfigurable FPGA. They are reconfigurable in real time and are particularly suited for parallel processing applications. Reconfigurability can be profitably employed in applications which can be broken into number of sub units. These sub units are referred to as tasks in real time systems. Present day FPGA architecture presents dynamic partial reconfiguration where the reconfigurability of particular sub-module can be modified while other sub modules can be run simultaneously. Such reconfigurable modules require an interface to communicate between each other. OS presents such an interface in addition to task allocation and task scheduling. Moreover, OS can be used to place reconfigurable configuration bit streams at run time. If a silicon slice in a device is faulty, task can be moved to a non-faulty silicon portion using OS. This greatly enhances the reliability and fault tolerance system. Such an approach has been found in various literatures [5]-[15].

NoCs structure will relieve the Operating System from coordinating inter task communication. As compared to ICAP and PCAP ports which are of low channel bandwidth, R3TOS can use high bandwidth NoC's for inter-task communication and communicates with the OS.

Availability of various error detection and correction codes ensures reliability of the transmitted data. In this paper, dynamically reconfigurable two error correcting schemes in R3TOS based ASNoCs are presented. Hence, this paper presents the implementation of novel NoC structure with reliability for R3TOS communications.

This paper is organized in the following manner: Section 2 provides an outline of Network on-chip. Section 3 explains development of NoC for R3TOS system. Section 4 describes the router architecture for R3TOS based NoC. The reliable CODECs design is provided in section 5 to improve the reliability level of NoC. Dynamically reconfigurable error correction codecs is described in section 6. Section 7 provides the implementation details of such scheme using

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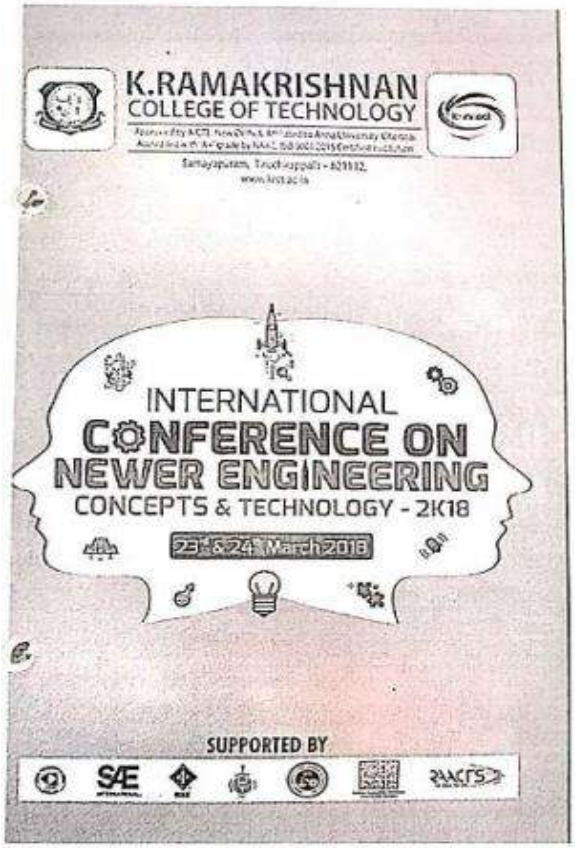

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Dear P.Aravind,

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Paper Title:	**Recursion based reduction of process error for a non linear process**
Technical Review Status:	**ACCEPTED**
Reviewer Comments:	**1. Volterra kernel model approach used as the analysis tool. 2. Lacks detailed analysis. 3. More References could be included 4. Paper should be of good quality technical English**

We are pleased to inform you that, based on the the review feedback, your paper has been **ACCEPTED** for 2018 ICCCI by the technical program committee for the oral presentation and publication in the proceedings. You are cordially invited to present your research work at ICCCI 2018 to be held at Sri Shakthi Institute of Engineering and Technology, Coimbatore during 04-06, January 2018.

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Analysis of Error Recursion Reduction Algorithm on Nonlinear Tank Level Process

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Abstract

This paper provides the design and implementation of an Error Recursion - Reduction Computational (ERRC) technique, in a two tank interacting spherical tank level process. The structure of the tank is nonlinear in nature. The models are identified as multi linear models and models parameters are identified at various operating conditions by influencing the step change technique. Optimized PI controller parameters are identified by using the conventional tuning technique. The simulation results are outfitted to delineate the adequacy of proposed technique and robustness is additionally investigated.

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Reduction of Process Error using Recursion Technique for a Real Time Transducer Interfaced Level Process

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Abstract - A linear tank level control process is considered for analysis. In this paper, particle swarm optimization (PSO) based PID controller have been designed on the basis of experimental process model, and therefore the output from thel PID controllers has been utilized to control the level process. Further, to fine tune the closed loop response, a method is applied, called Error Recursion Reduction Computational (ERRC) method. The effectiveness of the proposed control schemes has been demonstrated on a Linear Tank Level (LTL) process. The performance of the proposed technique has verified by implementing in real time transducers interfaced experimental process. The proposed technique results shows that better closed loop performance can be achieved than other tuning techniques.

Index terms **– Process Control, Error Minimization Computational Algorithm, ERRC, PSO.**

I. INTRODUCTION

Proportional (P), Proportional plus Integral (I), Proportional plus Derivative (PD) and Proportional plus Integral plus Derivative (PID) are generic three term controllers, widely used in feedback industrial control systems. PID controller can be implemented as a single or a combination of three controls. Proper tuning of these parameters is essential and important to get a stable control system. Over past half centuries, several sets of PIDs formulas have been discussed. Among all methods, Ziegler Nichols is the basic tuning method, 1942 [1].

Prolong research on PIDs control, new tuning techniques are emerged out such as Cohen and Coon technique, 1953 [2] and Astrom and Hagguland technique, 1984[3]. Many researchers appreciated these techniques due to maximum efficiency attained by minimum efforts.

An idea has come out of researchers community, aiming to implement a process model parameters[6], in obtaining PIDs formula. The outcome is model based PIDs formula. The most well known control method is Internal Model Control Technique, by morari and zafiriou, 1989 [7]. Apart from these techniques, several research works are carried out on human logical thinking ability [4,5] and human nerve structure [10,11,12] based control. Nowadays, to meet the system demands, research communities deal with numerical optimization algorithms. [13,14]. Generally optimization algorithms are classified as gradient and non-gradient algorithm. Genetic algorithms (GA), grid searchers, stochastic, non-linear simplex are families of non-gradient type algorithms. Non-gradient algorithms are used to find optimum solution, based on objective function evaluations. In case of gradient, it requires existence of continuous first derivatives of the objective function and possibly higher derivatives. It requires minimum number of design cycles to converge to an optimum compared to non-gradient based methods.

GAs are a part of evolutionary computing, adaptive heuristic search algorithm based on evolutionary ideas of natural selection and genetics [13]. GA's computational steps, competition between individual in sets and fitted individual ones dominating weaker ones. Particle Swarm Optimization (PSO), is a robust stochastic optimization technique based on movements and co-operation of swarms [21].

For process analyze and purpose of design controllers, researchers are following a common practices. They find a model of a physical system represented in terms of mathematical equation and to be used for further analysis. Such process model is represented as the first or second order process plus dead time[6].

II. PROCESS SETUP AND DEVELOPMENT OF MATHEMATICAL MODEL

To justify the efficiency of proposed method, real time transducer is interfaced to give a closed loop experiment model of linear tank level process is considered:

A. Level Experimental Process

The real time closed loop experimental system consisting of a process tank, reservoir, water pump, current to pressure converter, compressor, differential pressure transmitter (DPT) (National Instruments- Educational Laboratory Virtual Instrumentation Suite) NI-ELVIS interface module, using LabVIEW which acts as a controller, forms a closed loop system. The NI-ELVIS interfacing module, control valve, DPT are appeared in Fig. 1 and Fig. 2 separately. The piping and instrument diagram of the framework is appeared in Fig. 3: in Table 1, process tank particulars are given. The inflow rate to the process tank is controlled by changing the stem

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Abstract

There are various modelling methods. One of those is 3D Facial reconstruction for post mortem identification of humans from their skeletal remains is a challenging and fascinating part of forensic art. The former look of a face can be approximated by predicting and modelling the layers of tissue on the skull. Cyber forensics, also called computer forensics or digital forensics, is the process of extracting information and data from computers to serve as digital evidence for civil purposes or, in many cases, to prove and legally prosecute cyber crime.

INTRODUCTION

Forensic science is an application of science to criminal and civil laws. Forensic scientists collect, preserve, and analyze scientific evidence during the course of an investigation. While some forensic scientists travel to the scene to collect the evidence themselves, others occupy a purely laboratory role, performing analysis on objects brought to them by other individuals. In addition to their laboratory role, forensic scientists testify as expert witnesses in both criminal and civil cases and can work for either the prosecution or the defence. While any field could technically be forensics certain sections have developed over time to encompass the majority of forensically related cases. Forensic science mainly deals with study science and criminal justice. They learn how to analyze blood DNA and other evidence and to use it in court.[2]

ORIGIN

The rational values of the Enlightenment era increasingly permeated society in the 18th century criminal investigation became a more evidence-based, rational procedure Two examples of English forensic science in individual legal proceedings demonstrate the increasing use of logic and procedure in criminal investigations at the time.

IMPORTANCE OF FORENSICS

- Preserving life –the first priority in every crime scene is to preserve life and assist any victims if they are injured irrespective of the type of crime occurred.
- Suspects at the scene – suspects should be detained and removed from the scene. This also allows for searches, statements and behaviour to be documented. Sometimes their clothing or objects in their possession may be seized and protected for use as evident.
- Detaining witnesses – this means detaining both willing and reluctant witnesses. These people need not always be eyewitnesses. Witnesses should be separated ,so that they don't have the opportunity to discuss what they saw between each other which would dilute their recollections.

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DATA CENTRIC PROTECTION IN CLOUD

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Abstract

Cloud computing is an emerging technology to add capabilities without investing in new infrastructures. The features of Cloud Computing is instant availability, scalability and sharing of resources. But there are lots of hurdles and barriers in the adoption of cloud. They include security and privacy issues. The major issue in cloud is preserving data from hackers. It poses a major security challenge in terms of data, since the storage location of data is not known to users. Hence, the key challenge is to protect the data privacy. In this paper, a solution for data security is provided by Elliptic curve cryptography (ECC) that eliminates potential threats.

Keywords:CloudComputing,Cryptography,ECC, Data Centric.

I. INTRODUCTION

A. Cloud Computing:

Cloud computing, simply means "Internet Computing." Users can access database resources via the Internet from anywhere, for as long as they need, without worrying about any maintenance or management of actual resources, using cloud computing. Besides, databases in cloud are very dynamic and scalable. "Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

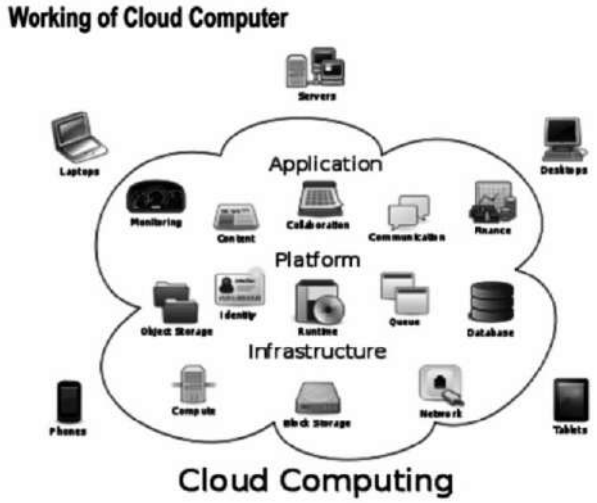

Fig.1 Cloud Computer Structure

Advantages of Cloud Computing: The capital investment is not needed for technology infrastructure. There is no in-house man power needed to control over the- technology infrastructure. Need not worry about software upgrades or version-changes. Pay only for recourses that we use (utility - computing). [1]

Disadvanta ges of Cloud Computing: Privacy: No guaranteed since Cloud Service Provider- can monitor your activities.

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PREPROCESSING IN INFORMATION RETRIEVAL

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1. ABSTRACT

Text categorization is a fundamental task in the document processing, it is automated to handle enormous streams of documents in electronic form. Major difficulty in handling documents is thepresence of morphological variant, homographs ,and textual errors such as spelling ,grammatical errors .In order to handle such situation preprocessing technique is used. Stemming is one of the major technique used in pre-processing , it conflate the variant forms of a word into a common form .The technique discussed in this paper are Stop words removal ,Case folding and Affix Stripping. These technique further reduces the size of the text in the input file

2. INTRODUCTION

The main aim of information Retrieval (IR) is to satisfy the user requirement and produce an readable automated summary.Automatic text summarization plays an important role in information industry, especiallydueto the exponential growth of data in recent years. Stemming technique conflate the variant words into common representation. Has an excellent trade –off between speed readability and accuracy .The availability of search-engines enable us to retrieve the colossal amount of information. Many words in the documents often have morphological variants .So before performingsummarization,the stemming techniques are applied on the target data set to reduce the size of the data set which will increase the effectiveness of IR System. In this paper, surveys of stemming techniques also presented.

3.RELATED WORKS

Jivanistatesthe that rule based approach may not always give correct output and the stems generated may not always be correct words.The problem of over stemming and under stemming can be reduced only if the syntax as well as the semantics of the Words and their POS(point of scale) is taken intoconsideration .Since However no perfect stemmer has been designed so far to match all the requirements[1]. Sharma statesthatthe performance of statistical stemmers is far superior to some well-known rule-based stemmers and among statistical based stemmers GRAS (GRAPH BASED algorithm[2].Giridhar N S discussed about varies algorithms most cases, morphological variants of words have similar semantic interpretations and can be considered as equivalent for the purpose of IR applications. In linguistic morphology ,stemming is the process for reducing inflected words to their stemthetechnique used to solve the problem of spellingexceptions and performs a number of transformations based on the letterswithin the stem..[3]. LailaKhreisatpoints out the results of classifying text documents using the N-gram frequency statistics technique employing a dissimilarity measure.N-gram text classification using the Dice measure outperforms classification.It calculates rank-order statistic for two profiles by measuring thedifference in the positions of an N-gram in two different profiles. For each N-gram in the document profile, search for the N-gram in the class profile and calculate thedifference between their positions.The N-gram method is language independent and works well in the case of noisy-text (textthat contains typographical errors). Tri-grams for text classificationis used. The trigramsof a string or token is a set of continuous 3-letter slices of the string [4].Vishalrefers that generally to the process of extractinginteresting and non-trivial information and knowledgefrom unstructured text. Text mining is a younginterdisciplinary field which draws on informationretrieval, data mining, machine learning, statistics and computational linguistics. As most information (over80%) is stored as text, text mining is believed to have ahigh commercial potential value. Knowledge may bediscovered from many sources of information, yet,unstructured texts remain the largest readily availablesource of knowledge[6]. Parmarpresented a paper in which, depends on the key-phrases extracted by the system and many other features extracted from the document to get the text summary most related words are added to the summary she proposed algorithm that strengthen and reduce time taken for execution of process. Take multiple document into consideration dataset document for each document from dataset D, with set of team T and Sentence S.. All have opted text mining approach. there can be graph mining, multiview leading . The result will

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Use of antimicrobial coating on food packaging is one of the most important technologies of active packaging for improving food safety. The objective of this study were to compare antimicrobial properties of cinnamaldehyde in solution , polylactic acid surfaces cast with cinnamaldehyde and glass and PLA surfaces coated with cinnamal dehyde nano-liposomes. The objective of this study were to compare antimicrobial properties of free nano encapsulated cinnamaldehyde in solution;polylactic acid surfaces cast with cinnamaldehyde . The cinnamaldehyde was nano-encapsulated by lipid bilayers of polydiacetylene-N-hydroxysuccinimide (PDA-NHS)nano liposomes. However when the liposomal encapsulated cinnamaldehyde was immobilized on PLA films, it did not show any antibacterial activity. Glass surfaces coated with nano-encapsulated cinnamaldehyde maybe used as an active packaging material in preserving liquid foods ;also studies are required to improve antimicrobial activities of PLA surfaces.

628. INTELLIGENT TECHNIQUE BASED AUTOMATIC DETECTION OF CERVICAL CANCER

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Cervical cancer is a disease which affects the cervix region. Most of the women in the world are affected by the cervical cancer next to the breast cancer. In image processing, segmentation and classification are two vital methods used for detecting the cervical cancer. In this paper, few latest segmentation and classification techniques have been reviewed and their performances were analyzed in terms of quantitative metrics.

629. AUTHENTICATION FOR MOBILE PAYMENT USING CYPTOGRAPHIC MECHANISM

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Mobile payment is the most payment methodology adopted by the users in the recent days, Contactless payment is one among the technology used recently with the NFC enabled device. Contactless payment is nothing which is secure method for customers to purchase products via smartcards by using RFID or NFC enabled device. In contactless payment system have many benefits to both customers and merchant as well as it has the disadvantage security risk in authentication and transaction. Henceforth, a cryptographic measures to achieve security in mobile wallet is proposed.

630. PERFORMANCE EVALUATION OF DRILLING PROCESS PARAMETERS ON TITANIUM ALLOY

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Titanium alloys are used almost in all area include aerospace application, automobile industries, jet engine components, turbine blades due to its high strength to weight ratio and good corrosion even at high temperature and it is necessary to develop the effectiveness of drilling in titanium alloy at low

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A Fuzzy Logic Model to Evaluate the Surface Roughness in the Drilling of Oil Hardened Non - Shrinking Die Steel

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Abstract

Machining is an important material removal process in which materials are removed from the work piece in the form of chips. There are lots of machining operations like milling, grinding, drilling and turning is used in the manufacturing industries to develop the finished component with high quality and accuracy. Drilling is the one of the most important hole making process used in the manufacturing and assembly sectors. During the drilling process, heat is generated at the contact of drill bit and test specimen to produce hole at the required position. The selection of process parameters in drilling operation plays vital role in the quality of the drilled specimen. Recently Oil Hardened Non Shrinking die steel materials are used in the automobile, chemical, nuclear and marine industries. The experiments were conducted by the proper selection of drilling process parameters to obtain better mechanical strength by using the L_{27} orthogonal array. In this experimental investigation, Oil Hardened Non Shrinking die steel has been drilled by using the Bhagwan Udyog Milling machine with soluble oil as a coolant for wet conditions. The optimum level of drilling process parameters plays great impact in the manufacturing environment. The basic drilling parameters such as spindle speed, feed rate and drill size were selected and examined at three different levels, to study the effect of drilling process parameters on the surface roughness. The present experimental work is focused on the optimization of drilling process parameters using Taguchi design of experiments and the optimum level of parameters by using the Fuzzy Logic technique to be recommended for process planner.

Keywords: Drilling, Process Parameters, Fuzzy Logic, Surface Roughness.

Simulation And Modeling of the effect of Welding Process Parameters of Inconel 625

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Abstract

This paper examines effect of welding parameters for Inconel 625 alloy such as stress and temperature distribution. Inconel 625 alloy welding is widely used in space vehicles, marine applications which involves high cost of welding, therefore it is important to choose welding parameter wisely. FEA simulation data requirements are met by conducting design of experiments (DOE) for three levels of welding current(100-120 A), voltage(10-14 V) and speed(75 – 150 mm/min) are modeled and heat flow is obtained which is fed as input for analysis. Coupled field analysis of transient thermal and structural analysis is done on ANSYS 15.0 and results were tabulated and fed into historical data design in design expert software. Equation was obtained from regression model and is verified.

Keywords: Welding, Welding Simulation, ANSYS, Regression Equation, Temperature distribution, Stress, DOE

The power consumption of chip using water is 11.84% lower than air and 5.22% than engine oil and the lifetime of the electronic chip with water is 10% hrs (day) greater than the electronic chip using air and 1.53% hrs (day) engine oil as cooling medium. It is concluded that the electronic chip with water as a transfer medium is highly reliable to cool than that of air and engine oil.

Keywords: ANSYS-Fluent; Heat sink; Nusselt and Prandtl number; Reynolds number and Heat transfer coefficient.

Investigation of Mechanical Behaviours of Natural Fiber and Particulate Reinforced Hybrid Polymer Composites

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Abstract

Natural fiber has recently become attractive to researches, engineers and scientists as an alternative reinforcement for polymer (FRP) composites. Due to low cost, fairly good mechanical properties, they are exploited as a replacement for the conventional fiber, such as glass, aramid and carbon. The use of natural fibers reinforced polymer (NFRP) composites in automobile and commercial application stands as an evidence for remarkable development in NFRP composites. The impregnation of bio particles in natural composites has improvement in the mechanical properties, which extended the use of NFRP composites as engineering materials. The present work described the development and characterization of a natural fiber and particulates based polymer composite consisting of polyester resin. Babul wood is used as particle reinforcement along with natural green fibers like Sisal and Roselle in polyester matrix. The newly developed composites were characterized with respect to their mechanical properties. Experiments were carried out to study the effect of Babul wood particle on mechanical behavior of these polyester based polymers composite like tensile, flexural and impact behavior.

Study on Drilling Process Parameters - Review

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Abstract

Drilling is a cutting process to make hole of circular cross section by using drill bit and it is one of the important machining processes having vast application. This paper illustrate a literature review on drilling process for various metals and its alloy about the chip thickness, cutting speed, feed rate of machining, temperature distribution during drilling, surface integrity after machining, surface roughness, burr formation by considering the various input process parameters. This Paper reviews the main difficulties during drilling of various parts. Due to its distinctive properties, titanium and its alloys are used in major aeronautic and automotive industries, also used in jet engine components, turbine blades for its fine corrosion resistance even at high temperature. Titanium also used for replacement of human body parts because of its high strength to weight ratio. At the same time it has superior quality such as hardness and tensile stress at high temperature but they are regarded as hard-to-machine material. So it is necessary to develop the cost effectiveness of drilling in titanium and its alloy. Based on review, it is essential to improve the quality of drilling process with minimum cost.

Keywords: Drilling process, machinability, input process parameters, output responses.

A Fuzzy Logic Model to Evaluate the Material Removal Rate in the Drilling of Oil Hardened Non - Shrinking Die Steel

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Abstract- *Drilling process is one of the important machining processes for developing various components. Drilling process affects the mechanical properties of the work piece by creating low residual stresses around the hole opening and a very thin layer of highly stressed and disturbed material on the newly formed surface. This causes the work piece to become more susceptible to corrosion and crack propagation at the stressed surface. The factors affecting the drilling process are cutting speed, feed rate, depth of cut and drill bit material determine and influence the quality of the drilling. The conventional drilling technique results in disadvantages like poor surface finish, difficulty to achieve the close tolerance, low machining performance and high hardenability. Hence it is necessary to look for alternate methods in order to enhance the quality of drilling. In this study, a fuzzy logic rule based model is used to evaluate the effect of the input parameters on Material Removal Rate.*

Keywords: Drilling, Fuzzy Logic, Material Removal Rate.

1. Introduction

Now a days, objectives of all the manufacturing industries is to achieve the economical machining condition to increase the profit with desired quality. Many researchers have developed the mathematical models to predict the optimum level of input process parameters for increasing the profit of the component. Machining is an important material removal process in which materials are removed from the work piece in the form of chips. Various machining operations like milling, grinding, drilling and turning are used in the manufacturing industries to develop the finished component. Drilling is a form of machining, a material removal process, which utilizes drill bit to cut a hole of circular cross-section in solid materials and is adopted in various industries such as home appliances, automotives, aerospace, dies and marine industries. Tool life is heavily affected in drilling operation due to higher thrust force and wear rate of the drill bit. These increase the production cost of modern manufacturing industries. So this research work outlines the development of statistical and intelligent modelling techniques. During the drilling process, heat is generated at the interface of the drill bit and the test specimen. The basic drilling parameters such as cutting speed, feed rate, depth of cut and drill size are selected and examined to study the effect of drilling parameters on the roundness , surface roughness , metal removal rate and temperature. The present research work is focused on the development of a fuzzy logic model to predict the Material Removal Rate for any combination of the cutting speed, feed rate and drill diameter within the experimental range.

2. Literature Survey

Vitazoslav Krupa et al. (2017) investigated the penetration depth of rocks. The model quantified the decreasing drill bit ability to achieve maximum penetration depending on progressing bit wear. Area of efficient rock chipping in the drilling process was visualized as moving to higher thrust force with total drilled length due to progressing bit wear. Mahadi Hasan et al. (2017) reviewed and compared the features of different micro drilling techniques and found that due to the advantage of high speed, laser micro drilling has always shown to be a good choice in industrial application. Zhiqiang Huang et al. (2017) analyzed and studied the erosion wear law of drill pipe by theoretical derivation and laboratory experiment. They found that the gas injection volume has more impact on drill pipe erosion compared with ROP, and high ROP will suppress the erosion wear of drill pipe. Hemant S. Patne et al. (2017) developed a finite element model for evaluating temperature distribution in the process. They found that increase in cutting speed and feed rate results in significant increase in temperature. Long Sun et al. (2017) established a mathematical model of a sonic drill

Experimental Study of Hardness in Friction Welding of Aluminium Alloy

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Abstract: *Friction welding method is one of the most simple, economical and highly productive methods in joining of similar and dissimilar metals. Welding is the one of the joining technique to join similar or dissimilar combination of materials with or without application of filler rod. During the friction welding process, heat is generated at the interface of joining the specimen under plastic deformation by converting the rotational energy into heat energy by means of pressure. It is widely used in the automotive, aircraft and aerospace industrial applications. The principal advantage of frictional welding, being a solid-state process, low distortion, absence of melt-related defects and high joint strength, even in those alloys that are that are considered non-weldable by conventional welding techniques. An attempt is made to develop an empirical relationship to predict the hardness of the friction welded Aluminum Alloy of Grade 6061. The present work aims to determine the feasibility to join the Aluminum alloy (AA6061) rods having the diameter of 22mm and study the effect on Hardness of the welding Joints with respect to the process parameters such as friction pressure, upset pressure, friction time, upset time which have great influence on strength of the joints. The hardness of the welded specimen is measured by using the Rockwell Hardness testing machine. The experimental results shows that, input process parameters plays major role on the joining of Aluminum Alloy of Grade 6061 and the outcome of this research work useful for the further research.*

Keywords-Friction Welding Process; Aluminium Alloy Grade 6061; Hardness number; Design of Experiments.

I. INTRODUCTION

Friction welding is now an established solid-state welding proccess, with a number of industrial applications realized in aerospace, automobile, defence, and other industries. In this process, parts are to be joined by rotating against each other, while applying some axial force (friction force). As they are rotated, the surface oxide layers are broken up and heat generates at the weld interface due to friction, which locally softens the materials. As the parts continue to rotate, more heat generates, and the materials at the weld interface begin to plastically deform. The broken oxide layer is taken away from the weld interface by an outward plastic metal flow (which manifests as flash) and nascent metal surfaces are brought to intimate contact. The parts are then abruptly brought to rest and a higher axial force is applied to complete the weld. Some of the specific advantages of friction welding compared to other solid-state welding processes are: (i) extremely short welding times, (ii) no special tooling, clamping, atmosphere control or surface preparation required, (iii) suitability for welding rod/pipe geometries and for welding dissimilar metal combinations. The authors highlight the various literatures for this experimental work is listed below.

Chennakesava Reddy (2017) studied the evaluation of parametric significance in friction welding process of AA1100 and Zr705 Alloy using Finite Element Analysis. The main objective of this study is to evaluate the strength, Bulk deformation, Penetration and flame formation of the welded joint and the output responses are good penetration and mechanical bonding. It is concluded the welded parts must be stress relived using appropriate heat treatment process. Javed Akram et al. (2017) demonstrated the location of specific strain rates, temperatures and accumulated strains in the friction welds through Micro structure modeling. The main objective of this study is to predict the location specific strain rates, temperatures, grain evolution and accumulated strains in Inconel 718 friction welds by using the micro structural simulation method. The output responses considered are strain rates and different temperatures. The authors concluded that the strain rates predicted from simulation for both centers and edge location of weld formed to be increasing with increasing rotational speed. Kimmra et al. (2017) investigated the effect of friction welding condition of joining phenomena and mechanical properties of friction welded joints between 6063 aluminum alloy and AISI 304 Stainless steel. The main intention is to evaluate the effect of friction welding conditions on joining phenomena tensile strength and bending ductility of friction welded joints between test specimen by using the weld interface technique, mechanical and metallurgical test method and friction welding method. The output responses are joint efficiency and Vickers hardness. Thus, the authors concluded that the tensile strength, fractured point and hardness distribution not have difference between air and water cooling process. Meengam et al. (2017) demonstrated

Experimental Evaluation Of Milling Process Parameters On OHNS

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***Abstract*-Quality of machined surfaces and its integrity is strongly dependent on tool wear, which consequently depends on the tool life or machining time. Therefore, prediction of machining time of the cutting tool during machining processes is very important in order to obtain high precision parts and to reduce manual fit operations and production cost. The present study, optimization of Machining Time using Taguchi's dynamic design of experiments is proposed for face milling operations. This research could be applied in the manufacturing of automotive components and mould industries. Nine experimental runs based on an L9orthogonal array of Taguchi method will be performed. Milling is an intermittent cutting process of an accurate calculation of machining time is very important for predicting delivery time, manufacturing costs, and also to help production process planning. The machining surface may be flat, angular or curved. The technology of milling machine has been improved significantly to meet the advance requirements in various manufacturing fields, especially in the precision metal cutting industry. Quality of a process is measured in terms of characteristics. Machining Time is an important characteristic that could influence the performance of machining part and production quantity. The main objective of this paper is to study the effect of input parameters like spindle speed, feed rate, depth of cut with respect to machining time. The knowledge of appropriate cutting parameter selection and actual tool condition would be an important consideration when planning face milling process to produce a product with high surface quality and low machining time. If machining time of milling process for product is reduced then the number of product produced is increased.**

***Keywords*: Milling process, Input process parameters, machining time.**

I. INTRODUCTION

The machining industries are facing a great challenge to achieve high quality, good surface finish and high material removal rate with a view to economize in machining. Face mills are tools with a large diameter that are used to cut a wide Shallow path for a facing operation. Facing is used for machining a flat area, generally the top of the workpiece in preparation for other milling operation. Face milling is widely used in a variety of manufacturing industries including the aerospace and automotive sectors, where quality is an important factor in the production of slots, pockets, precision molds, and dies because good-quality milled surface significantly improves fatigue strength, corrosion resistance, and creep life. In face milling operations, Material Removal Rate (MRR) determines the economics of machining time and rate of production. In setting the machining parameters, the main goal is to increase material removal rate. The manufacturing process like machining, casting, grinding, forging, moulding and welding are used to produce the products of which customer need is satisfied. Milling is the process in which the metal removal rate and surface finish is high. The research findings from the various literatures are listed below.

II. LITERATURE REVIEW

Syzmonwojciechowski et al. (2018) studied the application of signal to noise ratio and grey relational analysis to minimise force and vibrations that the surface inclination angle and tool's overhang have significant influence on generated forces and vibration values. Tool overhang increases with vibrations [1]. Nor Khairusshimaa et al. (2017) investigated the optimization of Milling Carbon Fibre Reinforced Plastic using RSM. In this paper the cutting tool material is CFRP panel with solid uncoated carbide tool diameter of 8 mm. The main aim of this paper is investigates the influence of the cutting parameters which are spindle speed, feed rate and depth of cut to the surface quality of the CFRP by undergoing milling operation [2]. Wojciechowski et al. (2017) illustrated the optimization of machining parameters during ball end milling of hardened steel with various surface

523. PERFORMANCE ANALYSIS OF COOLANT FLOW RATE ON METAL REMOVAL RATE OF AISI 1040 STEEL IN CNC TURNING OPERATION

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The excellence of the machining is crucial for the manufacturing industries to satisfy the customer needs and specifications. CNC turning is the one of the material removal process to convert the raw materials in to required shape and size. In this CNC turning process, heat is generated at the interface of workpiece and tool insert which affects the quality of the machined component. In order to reduce the heat energy, soluble oil is used to reduce the heat and to enhance the quality of the machined component. Recently AISI 1040 steel plays important role in manufacturing, automobile, nuclear and marine industries. In this research work, CNC Lathe Sinumerik (802D) is used for performing the turning operation. The experimental investigation is focused on the impact of process parameters such as spindle speed, feed rate, depth of cut and coolant flow rate on the Metal Removal Rate in Computer Numerical Control turning process of AISI 1040 steel using tungsten carbide tool insert. The main objective of this research work is to study the effect of process parameters on the machining of AISI 1040 steel. The experiments are conducted based on the Taguchi Design of Experiments using L9 Orthogonal Array. The output response such as Metal Removal Rate is calculated by the ratio of difference between the metal weight before and after machining and to machining time. The experimental results shows that feed rate plays crucial role in the CNC turning process and the optimum level of process parameters is recommended to the process planner for manufacturing the component.

524. A FPGA IMPLEMENTATION OF A GF (P) ALU FOR ELLIPTIC CURVE CRYPTOGRAPHIC PROCESSORS

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A confidently endangered electronic and internet communicationsnecessitate public key cryptosystems to inaugurate and allocatepooledstealthydata for usage in the substance encryption of information. For fortificationcauses, key extents are in the array of hundreds of bits. This creates cryptographic processesdawdling in software. Hardware accelerators can achieve the computationally rigorousproceduresextrememore rapid. Field-Programmable Gate Arrays are well-matched for this use due to their reconfigurability and adaptability. Elliptic Curve Cryptosystems above GF(p) have acknowledgedprecisediminutiveconsideration to date due to the apparently more striking finite field GF (2m).In this paper, the path delay for 32 bit ECC architecture was reduced to 11.672ns when implemented in a Xilinx Spartan 3E xc3s500.

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Impact of Shear Strength in Friction Welding of Aluminium Alloy Grade 6061

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Abstract: ***The purpose of this study is to evaluate the welding characteristic of friction welded similar joints of AA6061 aluminum alloys. Welding is the one of the joining technique to join similar or dissimilar combination of materials with or without application of filler rod. During the friction welding process, two cylindrical metal parts end by end by means of a rapid rotation of one part with the other part generates thermal effect due to friction at the interface of joining the specimen under plastic deformation by converting the rotational energy into heat energy by means of pressure .The principal advantage of frictional welding, being a solid-state process, low distortion, absence of melt-related defects and high joint strength, even in those alloys that are considered non-weldable by conventional welding techniques. An attempt is made to develop an empirical relationship to predict the Shear strength of the friction welded Aluminum Alloy of Grade 6061. The present work aims to determine the feasibility to join the Aluminum alloy (AA6061) rods having the diameter of 22mm and study the effect on shear stress of the welded Joints with respect to the process parameters such as friction pressure, upset pressure, friction time, upset time which have great influence on strength of the joints. The shearing stress is considered as uniformly distributed over the entire cross section. The shear force is applied by a suitable test rig, two different cases of shearing may arise. In double shearing occurs across two surfaces. Knowledge of shear failure is important while designing any structures or machine components. The Shear of the welded specimen is measured by using the Universal testing machine. The experimental results show that, input process parameters play major role on the joining of Aluminum Alloy of Grade 6061 and the outcome of this research work will be useful for the further research.***

Keywords-Friction Welding Process; Aluminium Alloy Grade 6061; Shear Strength; Design of Experiments.

I. INTRODUCTION

Friction welding is now an established solid-state welding process, with a number of industrial applications realized in aerospace, automobile, defence, and other industries. In this process, parts are to be joined by rotating one part against other by applying some axial force (friction force). As they are rotated, the surface oxide layers are broken up and heat generates at the weld interface due to friction, which locally softens the materials. As the parts continue to rotate, more heat generates, and the materials at the weld interface begin to plastically deform. The broken oxide layer is taken away from the weld interface by an outward plastic metal flow (which manifests as flash) and nascent metal surfaces are brought to intimate contact. The parts are then abruptly brought to rest and a higher axial force is applied to complete the weld. Some of the specific advantages of friction welding compared to other solid-state welding processes are: (i) extremely short welding time, (ii) no special tooling, clamping, atmosphere control or surface preparation required, (iii) suitability for welding rod/pipe geometries and for welding dissimilar metal combinations. The authors highlight the various literatures for this experimental work and listed below.

Meisnar et al. (2017) investigated the micro structural characteristics of rotary friction welded AA6082 and Ti-6Al-4V dissimilar joints. Thus, the authors concluded that the grain elongation near the weld interface on the Ti-side. El-Oualid Bouarroudji et al. (2017) demonstrated about the thermal analysis during a rotational friction welding process. The investigation is to determine the optimal friction time. The output responses are Breaking limit, Temperature, Heating time, Optimal friction time. Thus, the authors concluded that the rupture has occurred outside of the welded joints for the majority of the conducted tests. Palanivel et al. (2017) investigated the microstructure and mechanical characteristics of continues drive friction welded grade 2 seamless titanium tubes at different rotational speeds. The authors concluded that, increase in rotational speed decreased the peak and equilibrium torque and increasing in rotational speed increases the weld time due to reduction in heating rate. Furkan Sarsilmaz et al. (2017) studied the microstructure and mechanical Properties of Armor 500/AISI2205 steel joint by using the friction welding process. The output responses are microstructural and mechanical properties and tensile strength. Thus, the authors concluded that the direct drive friction welding process without any defects.

Berna Balta et al. (2016) studied the optimization of process parameters for friction welded steel tube joints. The output responses are good tensile strength, elongation and crack length. The authors concluded that, higher forging pressure and higher forging time application lead extrusion of the coarse grain towards the welding lips and less amount of soften material is left in interface, which leads to higher tensile strength. Kimura et al. (2016) studied the optimization of

Recent Trends in Friction Welding Process

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Abstract- **The machine parts are produced by any one of the manufacturing methods such as forging, machining, casting, welding methods, etc. The selection of manufacturing methods purely based on the production cost and time. In general, the machine components are joined by welding process for higher dimensional accuracy. Welding is the one of the manufacturing technique to join similar or dissimilar combination of materials with or without application of filler rod. Friction welding is the one of the solid-state welding process for joining similar and dissimilar combination of materials without the use of filler rod. In friction welding process, heat is generated at the interface of joining the specimen under plastic deformation by converting the rotational energy into heat energy by means of pressure. Normally input process parameters considered for the experimental investigations are heating pressure, heating time, upset pressure, upset time, rotational speed and chemical composition of the test specimen and the output responses are axial shortening, hardness, tensile strength, impact strength and microstructure. The literature assessment on the friction welding process is crucial to study the effect of process parameters on the welding strength and quality of the welded specimen. Recently many researchers have dealt with the optimization of process parameters for various friction welding process. The specific objective of this paper is to review the collection of literature available on the friction welding process and optimization techniques by various research works. Recently, friction welding process is preferred in many industries to reduce the time and cost and increase the quality of the welded specimen. Based on the literature review, an investigation is essential to improve the quality of the welded specimen and reduce time and cost. The authors found that input process parameters play vital role in the quality and efficiency of the weld joint.**

Keywords-Friction Welding Process; Input process parameters; Output responses; Optimization techniques.

I. INTRODUCTION

All the manufacturing industries are aimed to increase the productivity. The productivity of the industry directly depends on the machining time and quality of the product. At the same time, reducing the machining time affects the quality of the machined component. These unbalanced situations are solved by using the optimization process. Optimization is the act of obtaining the best result under the given circumstances. There are a number of statistical techniques available for engineering and scientific studies. Many researchers worked in this area with different directions and their research findings are listed below.

Chennakesava Reddy (2017) studied the evaluation of parametric significance in friction welding process of AA1100 and Zr705 Alloy using Finite Element Analysis. The main objective of this study is to evaluate the strength, Bulk deformation, Penetration and flame formation of the welded joint and the output responses are good penetration and mechanical bonding. It is concluded the welded parts must be stress relived using appropriate heat treatment process. Javed Akram et al. (2017) demonstrated the location of specific strain rates, temperatures and accumulated strains in the friction welds through Micro structure modeling. The main objective of this study is to predict the location specific strain rates, temperatures, grain evolution and accumulated strains in Inconel 718 friction welds by using the micro structural simulation method. The output responses considered are strain rates and different temperatures. The authors concluded that the strain rates predicted from simulation for both centers and edge location of weld formed to be increasing with increasing rotational speed. Kimmra et al. (2017) investigated the effect of friction welding condition of joining phenomena and mechanical properties of friction welded joints between 6063 aluminum alloy and AISI 304 Stainless steel. The main intention is to evaluate the effect of friction welding conditions on joining phenomena tensile strength and bending ductility of friction welded joints between test specimen by using the weld interface technique, mechanical and metallurgical test method and friction welding method. The output responses are joint efficiency and Vickers hardness. Thus, the authors concluded that the tensile strength, fractured point and hardness distribution not have difference between air and water cooling process. Meengam et al. (2017) demonstrated the friction welding of semi solid metal 7075 aluminium alloy. The main aim is to appraise the

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Process Parameters Optimization of Oil Hardened Non shrinking Steel using Taguchi Method

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Abstract- **Recently the manufacturing industry faces major problems in improving the production rate which minimizes the time for production process. Thus improving the material removal rate in the manufacturing process significantly increases the production process in an overall manner. Milling is one of the predominant metal removal processes in the automobile and manufacturing sector. The work piece to be processed is to be fed against the multi point tool cutter which is rotating in a perpendicular axis. The spindle speed, feed rate and the depth of cut are the input process parameters which are to be used for optimization .the output parameter considered is the material removal rate .The main objective of this paper is to calculate the optimum material removal rate for the face milling operation considered .In the present study, optimization of Material removal rate using Taguchi's dynamic design of experiments is proposed for face milling operations. L9 orthogonal array of Taguchi method was conducted by using the Minitab18 software. MRR is an important characteristic that could influence the performance of machining part and production quantity. On increasing the metal removal rate the number of products manufactured will be high thus increasing the production rate in industrial sectors.**

Keywords: Milling process, Input process parameters, Material Removal Rate.

I. INTRODUCTION

The machining and manufacturing industries are facing a great challenge to achieve high quality, good surface finish and high material removal rate with a view to economize in machining. Face milling is a process which is widely used in a variety of manufacturing industries including the aerospace and automotive sectors, where quality is an important factor in the production of slots, pockets, precision moulds, and dies because good-quality milled surface significantly improves fatigue strength, corrosion resistance, and creep life. Milling is the most important conventional machining method with a wide range of metal cutting capability. Milling is the metal removing process which is used to removing the unwanted materials from the workpiece with the help of rotating cutters. The rotating cutter used is either single point rotating cutter or multi point rotating cutter. Flat or curved or irregular surfaces of many shapes can be machined by using the milling machine with good surface finish and accuracy. A milling machine can perform variety of operations like drilling, slotting, turning, making a circular profile and gear cutting by having suitable attachments. Face milling is one of the milling of surfaces that are perpendicular to the cutting axis. Face milling produce a flat surface and machines work to the desired length. In face milling, the feed can be either horizontal or vertical axis. In the face milling, the teeth on the end of the cutter does practically all of the metal removing process. However, when the cutter is properly ground, the face teeth actually remove a small amount of metal which is left as a result of the springing of the workpiece or cutter, thereby producing a proper finish. It is important in face milling to have the cutter rigidly mounted and to see that all end play or sloppiness in the machine spindle is eliminated.

II. Literature Review

Gopal (2018) demonstrated the minimization of Cutting Force, Temperature and Surface Roughness through GRA, TOPSIS and Taguchi techniques in End Milling of Mg Hybrid MMC. The study reveals that reinforcement weight % and feed has the dominant effect on almost all of the responses considered while the least dominance is shown by the speed. GHV Prasad Babu et al. (2017) studied the Taguchi based optimization of process parameters in orthogonal turn milling of ASTM B139. This paper is focused on the evaluation of the effect of various input cutting parameters on tool life. Joao Eduardo Ribeiro et al. (2017) studied the optimization of machining parameters to improve the surface quality. The process parameters like cutting speed, feed rate, radial depth, axial depth are considered to evaluate the surface roughness. Taguchi's L16 orthogonal array has been selected and Analysis of Variance (ANOVA) were performed to investigate the parameters. The results showed the most important

Recent Trends in Milling Process

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Abstract-**The manufacturing industries are facing a great challenge to achieve high quality, good surface finish and high material removal rate with a view to economize in machining. The selection of manufacturing methods fully based on the production cost, time and quality. *Milling* is the important machining process of cutting away material by feeding a workpiece past a rotating multiple tooth cutter. The cutting action of the many teeth around the *milling* cutter provides a fast method of machining. The machined surface may be flat, angular, or curved. Normally the input process parameters considered for the experimental investigations are spindle speed, feed rate and depth of cut and the output parameters are surface roughness, material removal rate (MRR), machining time and temperature. The literature assessment on the milling process is resolvable to study the effect of process parameters on the surface roughness and material removal rate. Recently many researchers have dealt with the optimization of process parameters for various milling process. The main objective of this paper is to review the collection of literature available on the milling process and optimization techniques by various research works. Recently, milling process is preferred in many industries to reduce the time, cost and increase the quality and material removal rate of the workpiece. Based on the literature review, an investigation is essential to improve the quality, material removal rate of the work piece and reduce the cost and time. The authors found that input process parameters plays major role in the surface quality and material removal rate.**

Keywords: Milling process, Input process parameters, Output parameters, Optimization techniques.

I. INTRODUCTION

The machining industries are facing a great challenge to achieve high quality, good surface finish and high material removal rate with a view to economize in machining. Face mills are tools with a large diameter that are used to cut a wide Shallow path for a facing operation. Facing is used for machining a flat area, generally the top of the workpiece in preparation for other milling operation. Face milling is widely used in a variety of manufacturing industries including the aerospace and automotive sectors, where quality is an important factor in the production of slots, pockets, precision molds, and dies because good-quality milled surface significantly improves fatigue strength, corrosion resistance, and creep life. In face milling operations, Material Removal Rate (MRR) determines the economics of machining and rate of production. In setting the machining parameters, the main goal is to increase material removal rate. The manufacturing process like machining, casting, grinding, forging, moulding and welding are used to produce the products of which customer need is satisfied. Milling is the process in which the metal removal rate and surface finish is high. The research findings from the various literatures are listed below.

Syzmonwojciechowski et al. (2018) studied the application of signal to noise ratio and grey relational analysis to minimise force and vibrations that the surface inclination angle and tool's overhang have significant influence on generated forces and vibration values. Tool overhang increases with vibrations. Gopal (2018) demonstrated the minimization of Cutting Force, Temperature and Surface Roughness through GRA, TOPSIS and Taguchi techniques in End Milling of Mg Hybrid MMC. The study reveals that reinforcement weight % and feed has the dominant effect on almost all of the responses considered while the least dominance is shown by the speed. Nor Khairusshimaa et al. (2017) investigated the optimization of Milling Carbon Fibre Reinforced Plastic using RSM. In this paper the cutting tool material is CFRP panel with solid uncoated carbide tool diameter of 8 mm. The main aim of this paper is investigates the influence of the cutting parameters which are spindle speed, feed rate and depth of cut to the surface quality of the CFRP by undergoing milling operation. GHV Prasad Babu et al. (2017) studied the Taguchi based optimization of process parameters in orthogonal turn milling of ASTM B139. This paper is focused on the evaluation of the effect of various input cutting parameters on tool life. Wojciechowski et

A Review: Comparative Study of Hybrid PV/T Water Collector

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Abstract

The objective of this paper is to review the collection of literature available on the Photo Voltaic and Thermal Solar Collector. The review paper is presented to show the comparison of findings obtained by various research works. In solar collector, the solar energy from the sun is converted in to electrical energy by means of Photo Voltaic panel and thermal energy by converting cold water into hot water. Nowadays, solar collector is preferred in many industries and house hold applications to reduce the demand of electricity by increasing the effective utilization of solar energy coming from the sun. The selection of collector design plays vital role in the development of heat energy and electrical energy. The input process parameters such as type of collector, time, mass flow rate, flow direction, flow pattern and size of the flow tube are normally considered for the research work and the output responses like thermal efficiency and electrical efficiency are appraised by using the Photo Voltaic Thermal Hybrid Solar Collector. Normally experiments are to be conducted based on the recommendation by the Traditional and Non-Traditional techniques. The output efficiency of the solar collector is purely based on the selection of input process parameters. Based on the literature review, an investigation is essential to improve the performance of the solar collector. The authors found that input process parameters plays vital role in the quality and efficiency of the solar collector.

Keywords: Solar Collector, Input process parameters, Output responses, Optimization techniques.

Introduction

Photovoltaic thermal hybrid solar collectors, sometimes known as hybrid PV/T systems or PVT, are systems that convert solar radiation into thermal and electrical energy. These systems combine a solar cell, which converts sunlight into electricity, with a solar thermal collector, which captures the remaining energy and removes waste heat from the PV module, and thus be more overall energy efficient than solar photovoltaic (PV) or solar thermal alone.[1] A significant amount of research has gone into developing PVT technology since the 1970s.[2]

Photovoltaic cells suffer from a drop in efficiency with the rise in temperature due to increased resistance. Such systems can be engineered to carry heat away from the PV cells thereby cooling the cells and thus improving their efficiency by lowering resistance. Although this is an effective method, it causes the thermal component to under-perform compared to a solar thermal collector.

Alibakhsh Kasaeian, and Giti Nouria, (2018), studied the solar collectors and photovoltaic as combined heat and power systems: the main method to increase the solar energy utilization efficiency is to combine heat and power generation together. Thus authors concluded that the solar collectors for combined CHP were focused on optimizing the performance of the maximum average useful power generation and minimum total heat transfer area, little environment impact analysis was conducted. Sobrina Sobria, and Sam Koohi-Kamalia,(2018) investigated the solar photovoltaic integration requires the capability of handling the uncertainty and fluctuations of power output. the authors conclude that solar photovoltaic power forecasting is a crucial aspect to ensure optimum planning and modeling of the solar photovoltaic plants. This paper investigates solar PV power generation forecasting techniques presented to date and describes the characteristics of various forecasting techniques.Yunfeng Wang, and Ming Li, Wenping.(2018) **presented** the experimental investigation of a solar-powered adsorption refrigeration system with the enhancing desorption: the solar adsorption refrigeration system prototype with activated carbon-methanol as working pair was designed and built the authors conclude that, the

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Study Of Friction Welding Parameters Using Design Of Experiment Approach

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Abstract- Joining of similar materials is increasing interest for a wide range of mechanical applications. The automotive industry, in particular, views similar materials joining as a gateway for the implementation of lightweight materials. During the welding process, input process parameter plays an important role in determining the quality of welded joint. Specifically, the introduction of aluminum alloy parts into a steel car body requires the development of reliable, efficient and economic joining processes. Since aluminium demonstrate different physical, mechanical and metallurgical properties, identification of proper welding processes and practices need to be done. In this experimental work, friction welding process is used to create joints between the Aluminum Al6061 materials. Nowadays, application of Design of Experiment (DOE) is widely used to develop a mathematical relationship between the welding process parameters and the output variables such as hardness of the welded joint that leads to increase the desired weld quality. A comprehensive literature review of the application of these methods in the area of welding has been introduced. This review was classified according to the output features of the weld, i.e. weld geometry and mechanical properties of the welds.

Keywords: Friction Welding Process; Input process parameters; Output responses; Optimization techniques

1. INTRODUCTION

Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics by causing fusion. It distinct from lower temperature metal-joining techniques such as brazing and soldering, which do not melt the base metal. In addition to melting the base metal, a filler material is typically added to the joint to form a pool of molten material (the weld pool) that cools to form a joint that is usually stronger than the base material.

Pressure may also be used in conjunction with heat, or by itself, to produce a weld. Although less common, there are also solid state welding processes such as friction welding or shielded active gas welding in which metal does not melt. Many different energy sources can be used for welding, including a gas flame, an electric arc, a laser, an electron beam, friction, and ultrasound. While often an industrial process, welding may be performed in many different environments, including in open air, under water, and in outer space. Welding is a hazardous undertaking and precautions are required to avoid burns, electric shock, vision damage, inhalation of poisonous gases and fumes, and exposure to intense ultraviolet radiation. Until the end of the 19th century, the only welding process was forge welding, which blacksmiths had used for centuries to join iron and steel by heating and hammering. Arc welding and oxy fuel welding were among the first processes to develop late in the century, and electric resistance welding followed soon after. Welding technology advanced quickly during the early 20th century as the world wars drove the demand for reliable and inexpensive joining methods. Following the wars, several modern welding techniques were developed, including manual methods like SMAW, now one of the most popular welding methods, as well as semi-automatic and automatic processes such as GMAW, SAW, FCAW and ESW. Developments continued with the invention of Laser Beam Welding (LBW), Electron Beam Welding (EBW), Magnetic Pulse Welding (MPW), and Friction stir welding in the latter half of the century. Today, the science continues to advance. Robot welding is common place in industrial settings, and researchers continue to develop new welding methods and gain greater understanding of weld quality.

2. LITERATURE REVIEW

Kimmra et al. (2017) investigated the effect of friction welding condition of joining phenomena and mechanical properties of friction welded joints between 6063 aluminium alloy and AISI 304 Stainless Steel. The output responses are joint efficiency and Vickers hardness. Thus the author concluded that the tensile strength, fractured point and hardness distribution not have difference between air and water cooling process. To obtain 100% efficiency, A6060 base metal with no crack and bend ductility of 90°C. Meengam et al. (2017) investigated the friction welding of semi solid metal 7075 aluminium alloy. The output responses are the Highest joint strength 104.53 MPa and joint

Influence of Aspect Ratio on Thermal Performance of Heat Sink Using Ansys

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Abstract

The intergerated circuits face a huge issue to meet out the cooling demand due to the rapid development in technology.Several researchers have investigated the different possibility of cooling medium to improve the heat dissipation in an integrated circuits. Heatsink is a kind of thermal heat transfer device used to dissipate heat from an integrated circuit (IC) to surrounding due to low cost and reliability in heat dissipation. In this numerically work, the electronic chip with the heatsink is analysed to study about the cooling rate, surface temperature of the chip, reliability and power dissipation of the chip with different heat transfer medium, fin height and fin thickness. The different heat transfer medium is air, water and engine oil. The ANSYS (v12) fluent software is used to study numerically about the electronic chip cooling. In this research work, the heat transfer rate of water is 9.5% greater than air and 1.4% than engine oil at the same Reynolds number is obtained. The power dissipation is increases up to 1.45% of the fin height 55mm and heat transfer rate is enhanced by increasing the fin thickness up to 2.10% in 6mm. However, the lifetime of the electronic chip with fin height 55mm is 2.06% hrs (day) greater than the fin with 35mm. It is observed that the electronic chip with water as a heat transfer medium with proper fin height and thickness is highly reliable to enhance the heat transfer than that of air and engine oil.

Keywords: ANSYS-Fluent; Heat sink; Nusselt number and Fin height.

Prediction of kerf width using artificial intelligence during CO_2 laser cutting of mild steel

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Abstract

Laser cutting is one of the established thermal based manufacturing processes used to cut thick metal sheets of complex profiles. In laser cutting process, kerf width is of greater importance and depends on the selection of appropriate parameters. The present study involves the prediction of kerf width using artificial neural network during CO_2 laser cutting of mild steel for which three input process parameters like cutting speed, laser power and assist gas pressure were considered. The box-behenken design was used to carry out the experiments by considering cutting speed, laser power and assist gas pressure as the input parameters. The models were developed based on three level box behenken design of experiments conducted on mild steel work material with cutting speed, laser power and assist gas pressure as the input parameters. The Artificial Neural Network predictive model of kerf width was developed using a multilayer feed forward neural network. 14 out of 17 experimental data were used to train the artificial neural network model and the remaining 3 data were used for testing. The average percentage error was calculated as 1.72% and 1.05% for training and testing, respectively. The model and target results were found to have extremely low error rates.

Keywords: CO2 Laser cutting, Cutting speed, Power, Pressure, Kerf width and Artificial neural network

Microstructural characterization of AA7050/TiB_2 aluminum matrix composite synthesized through in situ route

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Abstract
In the present investigation, an aluminum alloy AA7050 was reinforced with four different weight fraction (0, 3, 6 and 9 wt %) of titanium diboride (TiB_2) particles which were efficaciously synthesized through exothermic reaction of halide salts, potassium hexafluoro-titanate (K_2TiF_6) and potassium tetrafluoro-borate (KBF_4), with molten aluminium melt to bringout unique properties. In situ reaction between the halide salts K_2TiF_6 and KBF_4 in molten aluminum leads to the formation of TiB_2 particles. The synthesized final composites were characterized using X-ray diffraction (XRD) and scanning electron microscope (SEM). The SEM micrographs indicated the even dispersion of the TiB_2 filler in the composites. Tensile strength, compression strength and microhardness of the prepared composites is measured and compared with plain matrix alloy. The manufactured composites are mechanically characterized as per the American Society for Testing and Materials (ASTM) standards employing computerized universal testing machine. The mechanical properties of the composite were discovered to be obviously superior than that of the basic matrix alloy owing to augmented particle content.

Keywords: Fracture morphology, Tensile strength, In situ casting, AA7050 alloy, Mechanical properties.

Optimization of machining parameters on EN8 material using Genetic Algorithm

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Abstract
In present scenario multi-operations in CNC plays one of the vital role in metal based manufacturing industries. Therefore selection of optimum machining parameters, tool geometry and cutting conditions etc., for the variety of materials is an important and complicated task for manufacturing industries in providing best quality at affordable cost to the customers. In the present study the influence of parameters like cutting speed, feed and depth of cut are analyzed for objective like MRR for multi-operation like Turning, Grooving, Facing & Threading. These experiments have been performed on EN8 material, according to DOE central composite technique for the different combination of input parameters which are spindle speed & feed rate. The output response is considered as MRR. The experiments are conducted for different experimental run and the empirical equation is formulated based on the experimental results. By using the empirical equation, the predicted value of MRR is calculated. The empirical equation is solved by using Genetic Algorithm. The optimal parameters obtained by Genetic Algorithm is recommended to manufacturing industries.
Keywords: CNC multi-operations, optimization, MRR, surface roughness, Design of Experiments ,Genetic Algorithm.

Fixture for Plug Type End Cover Fit Up

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Abstract

In this project we are going to prepare a fixture which hold parent metals such that welding will be easier and defect free. The fixture is to hold a plug type end cover against a pipe with a root gap of 2mm. The main problem here in this type of joint is, the plug has to hold in a hanging condition so that the self-weight of the plug should not act at the root weld.

Effect of process parameters in turning of aluminium alloy (Al6061) – Alumina (Al_2O_3) Composite

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Abstract

The present study deals with the effect of process parameters in turning of aluminium alloy (Al6061) – alumina (Al_2O_3) composites fabricated by stir casting. Nowadays, aluminium alloy is used as structural material in automobile applications due to its high formability, high strength to weight ratio.But it has low tensile strength, impact strength, hardness and corrosion resistance.So to increase the above mentioned properties, alumina is added to the aluminium alloy. The sample specimens are made by varying the percentage of reinforcements with respect to aluminium alloy. The evaluation of mechanical properties indicates the variations in tensile strength, hardness and impact energy for different composite combinations. Aluminium is compared with the Al6061- Al_2O_3 composites because the composite samples have improved mechanical properties than the individual aluminium alloy. Finally, the most suitable composite that is having the best properties in material removal rate

Keywords: Aluminium, Alumina, Composites, Stir casting, Turning

Comprehensive Analysis of Interference Fit and its attributes

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Abstract

This paper examines about the stress and strain results for standard interference values to overcome the difficultie the selection of suitable interference values for shaft part and to reduce the welding application by interference method. Work is carried out analytically and experimentally in both soft and hardened type materials. interference values and dimensions are correlated using mini-tab software. FEA simulation is carried out us ANSYS17.2 software. After completion of modeling and analytical work, the obtained stress and strain results w analyzed with respect to dimensions of the shaft and hole parts and interference values. Experimental work is carr with various material, machining, assembly processes to get the fitment. Obtained fit is viewed with scanning elect microscope to get the fusion area in mating location.

Keywords: Fits, Interference Fit, FEA Analysis, Stress and Strain.

Experimental Investigation and Comparison of Mechanical Properties, Castability and Machinability of Aluminium Based Metal Matrix Composites

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Abstract

The aim of this experiment is to investigate the mechanical properties, castablity, and machinability on aluminium Al6061 Alloy composite reinforced with silicon carbide and rice Husk Ash which can be used in the ship hulls. In this study, four different ratios of alumina with volume based ratio of (100% aluminium), (100% aluminium+5%silicon carbide), (100%Aluminium+5%Rice Husk Ash), (100%Aluminium+2.5%slicon carbide+2.5%Rice Husk Ash) are made to be reinforced with aluminium alloy with volume based ratio to form hybrid metal matrix composites. Mechanical Tests are conducted on the composite specimens to determine the hardness value of those hybrid matrix composite materials. Castablity study was made on those composite materials, Roughness test was also based on the composite specimens. From the calculated result we conclude that comparing to the individual Aluminium alloy Al6061, Composite materials are superior in all aspect.

Key words : Aluminium, Silicon Carbide, Rice Husk Ash, Mechanical Properties, Castablity, Machinablity 0f Al6061, Sic, RHA

Improve the Effciency of Boiler by Reduce the moisture in Bagasse

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Abstract

The aim of project is remove the biogases moisture and improve the boiler efficiency. Bagasse is a by-product of sugar milling and improvement fuel resource for that industry. It is a fibrous, low density material with very a very wide range of particle sizes and high moisture content. Its chemical properties are similar to those of hardwood fiber. It is difficult to characterize the physical properties of bagasse particles in the usual ways (i.e. by particle density, size, drag co-efficient, etc.).These properties are necessary to apply normal design procedures. For example, pneumatic conveying, fluidization, drying, combustion, etc. Normally gravimetric method is used for moisture content determination. Generally the moisture level up to 50% after the milling process. Because of moisture content its calorific value are affected. So burning of bagasse at suitable level of moisture is essential from the viewpoint of furnace performance. Here the moisture is removed by direct and indirect methods. The method of influencing conduction, convection and radiation process. By the utilization of exhaust flue gas as a source for moisture removal of bagasse.

Keywords: Boiler, Bagasse, Calorific Value, Moisture content, Dryer, Heat transfer, Fuel.

Preparation and Characterization of Squeeze casted 6061 Aluminium matrix composite

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Abstract
Aluminium matrix composites (AMC) are effective and qualified material in the industrial domain. They are broadly used in automobile, aerospace, marine and structural applications due to their awesome mechanical properties. In this work, an attempt has been made to fabricate aluminium (A6061) metal reinforced with silicon carbide (SiC) and aluminium oxide (Al_2O_3) particles separately by the stir casting technique. The matrix metal aluminium has many unique properties like high strength, less weight and ease of machinability. Silicon carbide which has splendid hardness and wear resistance and aluminium oxide, which provides good compressive strength and wear resistance. Thus, they are chosen as the matrix and reinforcements. By using the squeeze casting technique, the needful quantities of reinforcements are mixed in the stirred molten stage of aluminium poured into the die under required high pressure on solidification, the fabricated samples are prepared and allowed to test. The purpose of this work is to study and evaluate the mechanical properties like hardness, tensile and compressive strength of the above AMC. The morphological analysis of the composites is observed by the XR-D (X-ray diffraction), SEM (Scanning electron microscope) and EDS (Energy dispersive spectroscopy).

Key words: squeeze casting, XR-D, SEM, EDS.

Optimization of Testing Parameters in Immersion Corrosion Testing of Aluminium Alloy (Al6061) – Alumina (Al_2O_3) Composites Fabricated by Stir Casting

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Abstract

The present study deals with the Optimization of testing parameters in Immersion Corrosion Testing of Aluminium alloy (Al6061) – Alumina (Al_2O_3) Composites fabricated by Stir casting used in Ship hulls. The sample specimens are made by varying the percentage of reinforcements with respect to aluminium alloy. Aluminium is compared with the Al6061- Al_2O_3 composites because the composite samples have improved corrosion resistance than the individual aluminium alloy. Finally, the most suitable composite that is having the best corrosion resistance is optimized using Box Behnken technique in Response Surface Methodology.

Keywords- aluminium; alumina; stir casting; box behnken; response surface methodology; composites; ship hulls

Fixture for Plug Type End Cover Fit Up

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Abstract

In this project we are going to prepare a fixture which hold parent metals such that welding will be easier and defect free. The fixture is to hold a plug type end cover against a pipe with a root gap of 2mm. The main problem here in this type of joint is, the plug has to hold in a hanging condition so that the self-weight of the plug should not act at the root weld.

Effect of process parameters in turning of aluminium alloy (Al6061) – Alumina (Al_2O_3) Composite

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Abstract

The present study deals with the effect of process parameters in turning of aluminium alloy (Al6061) – alumina (Al_2O_3) composites fabricated by stir casting. Nowadays, aluminium alloy is used as structural material in automobile applications due to its high formability, high strength to weight ratio.But it has low tensile strength, impact strength, hardness and corrosion resistance.So to increase the above mentioned properties, alumina is added to the aluminium alloy. The sample specimens are made by varying the percentage of reinforcements with respect to aluminium alloy. The evaluation of mechanical properties indicates the variations in tensile strength, hardness and impact energy for different composite combinations. Aluminium is compared with the Al6061- Al_2O_3 composites because the composite samples have improved mechanical properties than the individual aluminium alloy. Finally, the most suitable composite that is having the best properties in material removal rate

Keywords: Aluminium, Alumina, Composites, Stir casting, Turning

Comprehensive Analysis of Interference Fit and its attributes

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Abstract

This paper examines about the stress and strain results for standard interference values to overcome the difficulties the selection of suitable interference values for shaft part and to reduce the welding application by interference method. Work is carried out analytically and experimentally in both soft and hardened type materials. The interference values and dimensions are correlated using mini-tab software. FEA simulation is carried out using ANSYS17.2 software. After completion of modeling and analytical work, the obtained stress and strain results were analyzed with respect to dimensions of the shaft and hole parts and interference values. Experimental work is carried with various material, machining, assembly processes to get the fitment. Obtained fit is viewed with scanning electron microscope to get the fusion area in mating location.

Keywords: Fits, Interference Fit, FEA Analysis, Stress and Strain.

than water. It is also found that the Nu and pressure drop significantly increase with increasing particle volume concentration and Dean Number. It is also found that the experimental friction factor increases with increasing the particle volume concentration and Dean Number. The CFD Nu and pressure drop results have been compared with experimental results. So many investigations have been reported that double helically coiled heat exchangers are given the greater results is compared to straight tube heat exchangers. Helically coiled tube heat exchangers producing the secondary flow formation at the time heat transfer rate are improved. Very less number of investigations has been reported double helically coiled tube heat exchangers. So in this experimental work has been found the double helically coiled tube heat exchanger heat transfer rates and pressure drops. On relationship, it is found that the CFD results give the better results with the experimental results. It is conveyed that the CFD gives the better results for inner heat transfer coefficient and pressure drop in a double helically coiled tube heat exchanger using MWCNT/ water Nano fluids .The common deviation between experimental Nu, pressure drop results and CFD results are found to be 9.25% and 10.50% respectively.

Keywords: Computational fluid dynamics; MWCNT /water nanofluid; Particle volume concentration; Double helically coiled tube; Pressure drop; Thermal conductivity; Nanofluid viscosity

Analysis of latent heat energy storage system of paraffin with Al_2O_3 nanoparticle in a heat sink

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Abstract
This paper discusses on the solution to the limitations of conventional cooling methods for electronic packing, and also explains a method to increase the efficiency of the thermal storage system by using PCM and Nano matrix. The setup is used to take reading for 10W with setpoint temperature as 80°C and at three different compositions 0.5%, 1% and 3% Al_2O_3 with paraffinas phase change material. Differential scanning calorimetry was used to find the thermal energy storage properties of nano-enhanced phase change material. The FTIR results showed no evidence of new chemical bond due to nanoparticle addition. The calculated results showed that there was an increase in thermal conductivity from 0.212 w/mk to 0.216 w/mk by increasing the concentration from 0.5 % to 3% of Nanoparticles.

Key words: Phase change material (PCM), Nanoparticle (NP), latent heat, latent heat thermal storage(LHTS)

Development and characterization of LM4/AlN composites synthesized by liquid metallurgy technique

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Abstract
Liquid metallurgy method based aluminum matrix composites are extensively utilised in diverse engineering applications including shipbuilding, structural, non-structural, automotive and aerospace owing to their superior strength, weightless, low density, excellent corrosion and wear resistance. In the present investigation, liquid state technique was employed to prepare the LM4-AlN composites containing four different mass proportion of aluminium nitride (AlN) filler particles content. The weight proportion of filler particles from 0 to 12 wt% at 4 wt% intervals. SEM images demonstrated a even dispersal of filler particles in the matrix. The test outcomes discovered that the LM4/12wt% AlN AMCs had revealed extreme hardness, tensile, compression strength than the non-reinforced base matrix alloy. A considerable enrichment in the

Key Word: Surface Roughness, ANFIS, Stylus Probe, Accuracy

Evaluation of Optimal Machining Parameters for Turning by Using Genetic Algorithm

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Abstract

The experimental work for investigating and optimisation the surface roughness in Al6061 material by using cnc turning machine Aluminium 6061 has the major application in vehicle and automobile parts so we have taken aluminium 6061 for conduct the turning process. Surface roughness means the surface irregulars that were found in the workpiece. Design of experiments is used to select the different level of input parameter based on L9 orthogonal the levels of parameter are fixed for the output responses A circular cross section of aluminium 6061 have been machined for required dimensions by centre lathe. Then the experimental work was conducted on cnc turning machine. The surface roughness tester is used to calculate the surface roughness. The taguchi method is used to calculate the predicted result the regression equation from the taguchi method is used for calculate the predicted values in our work. The genetic algorithm is used for optimisation of experimental values. The feed rate is the most dominate factor affecting the surface roughness.

Analysis of latent heat energy storage system of paraffin with Al_2O_3 nanoparticle in a heat sink

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Abstract

This paper discusses on the solution to the limitations of conventional cooling methods for electronic packing, and also explains a method to increase the efficiency of the thermal storage system by using PCM and Nano matrix. The setup is used to take reading for 10W with setpoint temperature as 80°C and at three different compositions 0.5%, 1% and 3% Al_2O_3 with paraffinas phase change material. Differential scanning calorimetry was used to find the thermal energy storage properties of nano-enhanced phase change material. The FTIR results showed no evidence of new chemical bond due to nanoparticle addition. The calculated results showed that there was an increase in thermal conductivity from 0.212 w/mk to 0.216 w/mk by increasing the concentration from 0.5 % to 3% of Nanoparticles.

Key words: Phase change material (PCM), Nanoparticle (NP), latent heat, latent heat thermal storage(LHTS)

Experimental Investigation of direct absorbing characteristics of THERMINOL®55-CARBON NANO TUBES(nHTF) using solar parabolic trough collector

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Abstract

This paper depicts the measurement of temperature absorbing characteristics of Therminol®55-Carbon Nano Tubes which is a nano heat transfer fluid (nHTF) in conjunction with concentrating solar parabolic trough collector. The experiment is conducted under the ambient outdoor conditions and solar radiation condition. The Volumetric Proportion of Carbon Nano Tubes is 0.025 vol% in 100 ml of Therminol®55. Two kinds of absorber tube is used for sealing 67 ml of nHTF ,one is copper tube of Diameter 10mm and another one is same copper tube enclosed in the evacuated tube whose vacuum pressure is 10^{-3}mbar.A highest temperature of 72.4°c was delivered by the solar collector using 0.025% concentration Carbon Nano tubes in the copper

Performance Comparison Analysis on Unglazed PV/T Solar Water Collectors Connected in Series and Parallel

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Abstract

The solar panel is one of the most sought after methods to produce electrical energy for domestic purposes. Solar PV/T systems converts solar irradiation into thermal and electrical energy. Module is made of Poly c-Si material. This experiment aims at analysing the comparative performance of hybrid solar PV/T water collectors connected in series and parallel. It was conducted in Saranathan College of Engineering, Tiruchirapalli-12. It is located at latitude of 10.7560°N and longitude of 78.6513°E. The maximum temperature of water obtained was 42.8°C and 40.8°C respectively in series and parallel. Overall the parallel connected PV/T system's performance is 12.12% higher than the series connected PV/T system.

***Keywords*:** Solar, PV/T, Unglazed, Series, Parallel etc.

Theoretical Investigation on Balanced Flow Double Pipe Heat Exchangers

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Abstract

-Heat exchanger is a device in which heat transfer takes place from one fluid to another. Effectiveness of any heat exchangers is governed by rate of heat transfer between hot and cold fluid. Effectiveness of a heat exchanger also depends on contact surface area, overall heat transfer coefficient, and mass flow rate of hot and cold fluid. The main objective of this study is to present the variations of parallel and counter flow heat exchanger for various combinations of balanced flow rates. Mass flow rates are varied theoretically between 1kg/min to 20kg/min. It is observed that average effectiveness of parallel flow heat exchanger (ε=0.4422) is lower than the counter flow heat exchanger (ε=0.5777).

Keywords: -Heat exchanger, Balanced, Flow rate, Parallel, Counter, Effectiveness

angle of 20.7905˚N. Evenly sliced pieces of carrot were used as the sample to investigate the drying performance on the basis of certain specific drying parameters such as: % reduction in moisture, amount of evaporated water, mass shrinkage ratio and drying rate of the sample. The results were compared with a simultaneous Open Sun Drying (OSD) as well as Electric Oven Drying (OTG oven at 105˚C). Practical Examinations of the dryer revealed that, carrot which was initially at a mass of 100 g was reduced to a mass of12.7 g after 5 hours of drying, removing 87.3 % of moisture content from the sample in % - wet basis. Whereas in case of OSD and Oven Drying 87.6 % and 87.1 % of moisture content was removed from the sample in a time span of 5 hours and 10 hours respectively. It has been practically observed that the absorber plate reaches an average temperature of 79.5˚C during the peak working hour when the solar Irradiance value reaches a peak value of 1128 W/m².

Keywords: Degradation, Natural Convection, FPC, solar dryer, glazing, Irradiance etc.

Exergy Analysis on Unglazed PV/T Solar Water Collectors Connected in Series and Parallel

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Abstract

Solar PV/T collector is a hybrid device which converts solar energy in to electrical and thermal energy simultaneously. In order to improve and assess energy systems, it is necessary to conduct exergy generated by a system. In this work, exergy, a thermodynamic junction is investigated for unglazed water collectors connected in series and parallel. Experimental results shows that over all series exergy is 49.9506 % and over all parallel exergy is 47.9572 %.

***Keywords*:** Solar PV/T, exergy, unglazed, series, parallel etc.

Automotive Application and Mechanical Property Characterisation of Sisal Fiber Reinforced Epoxy Composite Material

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Abstract

Many work described in the past refers to the mechanical characterisation of fibre reinforced composite materials with an epoxy matrix. Sisal is a natural fibre used as a base mat structure in which the epoxy resin is added for adhesion. Sisal with the botanical name Agave sisalana, is a species of Agave native to southern Mexico but widely cultivated and naturalized in many other countries. Sisal fibre is derived from the leaves of the plant. It is usually obtained by machine decortications in which the leaf is crushed between rollers and then mechanically scraped. The prepared sisal fiber composite is compared with a reference glass fibre reinforced composite and the other natural fibres composites is made. It is also presented the influence of the surface treatment in the mechanical characterizations of the natural fibres. The present study is to investigate the mechanical properties of sisal fiber reinforced composites. The sisal fiber used as mat form and epoxy used as reinforcement for fabricating of composites. The composites were prepared by hand layup technique. The tensile, hardness and impact tests were carried out of composites. The aim of the study is to fabricate new class of epoxy based composites reinforced with randomly oriented short sisal fiber. The results reveals that the major mechanical properties viz Tensile, Hardness and Impact were studied and found to be satisfactory.

Keywords: Sisal fiber, tensile, hardness, impact, mechanical testing.

Performance Comparison Analysis on Unglazed PV/T Solar Water Collectors Connected in Series and Parallel

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Abstract

The solar panel is one of the most sought after methods to produce electrical energy for domestic purposes. Solar PV/T systems converts solar irradiation into thermal and electrical energy. Module is made of Poly c-Si material. This experiment aims at analysing the comparative performance of hybrid solar PV/T water collectors connected in series and parallel. It was conducted in Saranathan College of Engineering, Tiruchirapalli-12. It is located at latitude of 10.7560°N and longitude of 78.6513°E. The maximum temperature of water obtained was 42.8°C and 40.8°C respectively in series and parallel. Overall the parallel connected PV/T system's performance is 12.12% higher than the series connected PV/T system.

***Keywords*:** Solar, PV/T, Unglazed, Series, Parallel etc.

Theoretical Investigation on Balanced Flow Double Pipe Heat Exchangers

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Abstract

-Heat exchanger is a device in which heat transfer takes place from one fluid to another. Effectiveness of any heat exchangers is governed by rate of heat transfer between hot and cold fluid. Effectiveness of a heat exchanger also depends on contact surface area, overall heat transfer coefficient, and mass flow rate of hot and cold fluid. The main objective of this study is to present the variations of parallel and counter flow heat exchanger for various combinations of balanced flow rates. Mass flow rates are varied theoreticallys between 1kg/min to 20kg/min. It is observed that average effectiveness of parallel flow heat exchanger (ε=0.4422) is lower than the counter flow heat exchanger (ε=0.5777).

Keywords: -Heat exchanger, Balanced, Flow rate, Parallel, Counter, Effectiveness

Experimental Investigation on Solar Pond Integrated with Solar Flat Plate Collector

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Abstract

Thermoelectric system owes its attention which produces power from available energy at cheaper price and having higher conversion efficiency than the other systems. This paper deals with the integration of thermal heat storage devices, Solar Pond (SP) and Solar Flat Plate Collector (SFPC) to develop a higher efficient system and to study each system performances with respect to each other for avoiding temporary unavailability of heat source for power generation. Solar Pond of dimensions 0.45 m * 0.15 m with a depth of 0.2 m had been split up into four equal sections for measuring the performances of pond by varying the salt compositions (NaCl and KCl) and Solar Flat Plate Collector of area 0.3 m^2 uses Stainless Steel as material for heat absorber plate and collector tube. The experiments were conducted at Saranathan College of Engineering, Tiruchirapalli (IND) during March 2018 and the data's were recorded using digital temperature sensors that were connected to the system.

Keywords: Energy conversion, Thermoelectric, Solar pond, Flat plate collector.

Experimental Investigation on Performance Variation of Solar PV Module with respect to Four Different Directions

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Abstract

The harvesting of electrical energy using PV panel is a rising trend. The study is to analyze the electrical efficiency by placing the PV panel at different direction. These experiments were conducted at Saranathan College of Engineering, Tiruchirapalli-12. It is located at latitude of 10.7560°N and longitude of 78.6513°E.From these experiments it is found that the maximum electrical efficiency of 7.21% and power of 37.68W are obtained while the PV panel is facing west direction.

Keywords —Solar, PV, Four, Directions, Efficiency etc.

Experimental and Comparative Analysis of a Direct Type, Natural Convection Solar Box Dryer

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Abstract—The drying temperature for most of the agricultural and food products range between 55˚C - 65˚C. This work deals with the experimental investigation of a direct type, natural convection solar box dryer typically working between the temperature ranges of 40˚C - 80˚C. The dryer was designed and fabricated at Saranathan College of Engineering, Tiruchirapalli (TN) India, located at latitude of 10.7560˚N and longitude of 78.6513˚E. The dryer consists of a stainless steel Flat plate collector - FPC (Area - 0.3 m^2) placed at an

tube. This was 21.1°c higher than that obtained in the pure Therminol®55 (51.3 °c). Under the same condition of by using evacuated tube over the copper tube a highest temperature of 85.3 °c was obtained which is 20.1 °c greater than the pure Therminol®55 (65.2 °c). By comparing the two cases the temperature rise of 12.9 °c is obtained in the evacuated tube, therefore directly absorbing nHTF along with evacuated tube developed in this study are predicted to be strong candidate than the conventional absorber tubes due to its higher temperature absorbing and concentrating characteristics.

Keywords : Solar,Parabolic trough, Therminol®55-Carbon Nanotubes(nHFT), Copper tube, Evacuator tube

Design and Analysis of a Digester in A Biogas Plant

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Abstract

We analysed the digester in a biogas plant using ansys,creo,cfd and obtained the flow of fluids,time of filling and drining and also performed the stress analysis. We calculated the diameter of the digester which helped us to find the load distribution and methane produced. We use floating balloon type digester to easy up the way of finding whether the methane gas is obtained or not. We mount the blades inside the digester horizontally so that we reduce the stress that is distributed in the walls and it does not interrupt with the flow.

Key words: cfd,creo,ansys

Design and Analysis of Cantilever type Vibration Energy Harvester using COMSOL Software

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Abstract

This paper deals with the modelling and analysis of a Cantilever type Piezoelectric vibration energy Harvester using COMSOL software. Piezoelectric energy harvesters are mostly used because piezoelectric materials have a large power and are simple to use in applications. Energy harvesting from environmental vibration nowadays is feasible because of natural oscillations like that caused by air or liquid flow and by exhalation or the heartbeat of a human body. The vast majority of piezoelectric energy harvesting devices uses a cantilever beam structure. Power consumption of current milli-scale commercial node has an average consumption of 0.1–1000μW which has made self-powered sensor nodes a reality. Zinc oxide (ZnO) a green piezoelectric material and it is used as it has Good transparency, High electron mobility, Wide band gap, and Strong room temperature Luminescence. This investigation was conducted to design and Analyse a Cantilever type piezoelectric energy harvester. The ZnO piezoelectric energy harvester is to be harvested using Physical vapour Deposition and compared with the model generated in COMSOL software.

Keywords: Piezoelectric Energy Harvester, COMSOL software, Zinc Oxide.

Experimental analysis of Turning Process in CNC Lathe using Nano Fluid as a Coolant

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Abstract-The latest development in the field of Nanotechnology is newly developed heat transfer fluids called as Nano fluids. Nano fluid is just the mixture of nano sized particles dispersed and stably suspended in the conventional heat transfer fluids. The various scientific experiments conducted in the past showed that when very small amount of nanoparticles suspended in the conventional fluid has the potential to enhance the thermo physical, transport and radiative properties of the conventional fluid to the maximum extent. Cutting fluid is the form of a liquid, are supplied to the chip removing zone in order to improve the better cutting conditions. The major role of cutting oil is maintain a perfect protective film in that place of the area between the tool tip and the work piece being cut where hydrodynamic conditions can exist. Such a film assists the chip in sliding readily over the tool. Besides reducing heat, proper lubrication lowers power requirements and reduces the rate of tool wear, particularly in machining tough, ductile metals. In This paper introducing nano fluid using as a coolant in CNC machine, it's increasing the machining condition and it is reducing the production time and considered the cutting condition and analyzed surface roughness of the material like high carbon high chromium.

Keywords- Nano materials; Nano fluids; Properties; Heat Transfer Enhancement.

I. INTRODUCTION

Most the machining operation is to be done by using the different raw materials in wide range of industries. Turning is the significant machining process for removal of materials from the workpiece by means of single point cutting tool. The important parameters that affect the machining parameters are spindle speed, feed rate, depth of cut, cutting conditions and constituents. The cutting fluid plays a vital role in removing heat occurs in between the workpiece and cutting tool. High Carbon High Chromium steel rods are recently used in many industries like automobiles, bearings and thread rolling dies. Number of researchers has dealt with the optimization of turning parameters in dry conditions. There are many combinations of coolant available to improve the surface quality of the machined specimen. The important significant of this experimental investigation is to forecast the temperature and surface roughness of the turned specimen on High Carbon High Chromium steel rods.

II. LITERATURE REVIEW

Normally variables considered for this experimental investigation are spindle speed, feed rate, depth of cut and percentage of nano particles of the test specimen. The literature assessment on the CNC turning process is crucial to study the effect of input process parameters on the test specimen.

Mehrdad. Kavosh (2016) studied the viscosity study of CuO nano fluid based on propylene glycol. Heat transfer performance of nano fluid depends on viscosity, thermal conductivity, specific heat and density. Viscosity affects the pressure and the pumping power of fluids. The authors concluded that the decrease in viscosity of propylene glycol-based nano fluids with increase in CuO nano particles concentration. Faiza M. Nasir and Aiman Y. Mohamad (2016) demonstrated the heat transfer of CuO-water based nano fluids in a compact heat exchanger. The authors investigate the effect of copper-oxide (CuO) nano particles volume concentration and the operating temperatures on the rate of nano fluids heat transfer in a compact heat exchanger. The authors indicated that nano fluids have the potential to enhance the heat transfer of a compact heat exchanger if properly designed. Vasudevan Nambeesan et al. (2015) demonstrated the Experimental study of heat transfer enhancement in automobile radiator using Al_2O_3/water-ethylene glycol nano fluid coolants. The experimental results shows that the heat transfer performance of the radiator reduced with the addition of Ethylene Glycol (EG) and increased with the addition of nano particles to the water–EG mixture. Mahendra Godley et al. (2015) explained the Investigation of Automobile Radiator using Nano fluid-CuO/Water Mixture as Coolant. The authors concluded that overall heat transfer coefficient & heat transfer rate increased different volume concentration by mixing CuO particle and flow rate range 2 -5 LPM respectively. Hafiz Muhammad Ali et al. (2015) investigated the heat transfer enhancement of car radiator using aqua based magnesium oxide nano fluids. The authors focused the application of water based MgO nano fluids for thermal management of a car radiator. The authors concluded that, the MgO/water nano fluids showed good

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ME030

ANALYSIS AND OPTIMIZATION OF CNC WIRECUT EDM PROCESS PARAMETERS BY GREY RELATIONAL ANALYSIS

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Abstract

Wire cut Electrical Discharge Machining (WEDM) is one of the important nontraditional machining processes. This is used for machining of difficult to machine materials and intricate profiles. Being a complicated process, it is very tough to determine optimal parameters for improving cutting performance. WEDM is extensively used in machining of conductive materials when precision is of prime importance. WEDM allowed success in the production of newer materials, especially for the aerospace and medical industries. This process employed for the parts demanding higher accuracy levels with complicated shapes. The main objectives of this research work is to investigate and evaluate the effect of different input process parameters (Ton,Toff,Fp,Wt,Sv,Wf) on MRR, Tm, SR as response parameters have been considered for Each Experiment. Experimentation was planned as per Taguchi's L27 Orthogonal array during machining of AISI UNS S31803 work material. Brass wire electrode with 0.25mm Diameter was used as tool in the Experiments. Grey Relational Analysis (GRA) is applied to determine the suitable selection of machining parameters for WEDM process. Grey relational grade obtained from the grey relational analysis is used to optimize the process parameters. By analyzing the Grey relational grade we can find the optimum parameters.

Keywords: WEDM,Ton,Toff,Wf,Sv,Wt,Fp,Tm,MRR,SR,GRA

ME046

A COMPARATIVE STUDY ON PERFORMANCE OF TITANIUM COATED & UNCOATED TOOL INSERTS ON FACE MILLING OF EN-8 IN VERTICAL MILLING MACHINE

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Abstract

Vertical Milling is the most popular machining process of removing metal from a work piece surface in the form of tiny chips by the action of irregularly shaped abrasive particles. It has wide range of applications like automobile, aircraft, and marine industries. Precision and quality have been the critical issues for all these industries. To enhance the quality of tool insert, to reduce the machining costs and to increase the production rate, it is very important to use the hardened tool. The success of any milling operation depends upon the proper selection of various operating conditions like work speed, feed rate, depth of cut etc. This research aim is to analyse and compare the machining parameters of titanium coated tool insert and uncoated tool insert in Vertical Milling process on EN - 8. It has High tensile strength, hardness and low machinability. Its application is emerging in the fields like aerospace, automobile and industries. The titanium coating was done by Chemical vapour Deposition (CVD) process. In the present study, L-9 Orthogonal array of Taguchi Design of experiments has been used to analyse and compare the effect of milling parameters such as work speed, feed rate and depth of cut on the surface roughness and Metal Removal Rate (MRR). Surface finish is measured using Surface roughness tester and MRR is measured with the help of Load Cell. The results of the analysis are evaluated to compare the optimum input values for high surface finish and Material Removal Rate (MRR). For all the three levels of input values main effect plot and Signal to Noise (S/N) ratio are obtained. The results of the analysis are evaluated to find the optimum input values for high surface finish with maximum MRR.

Keywords: Face milling, Tool insert, Titanium coating, chemical vapour deposition, Taguchi L9 orthogonal array, Surface roughness, Material Removal Rate (MRR).

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ME091

EXPERIMENTAL INVESTIGATION AND OPTIMIZATION OF TURNING PARAMETERS ON DELRIN USING RESPONSE SURFACE METHODOLOGY

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Abstract

The modern machining industries is mainly focused on achieving high quality, in term of part/component accuracy, surface finish, high production rate and increase the product life with lesser environmental impact. We have so much of manufacturing methods in industries and they are Milling, Welding, Forging, Machining, Casting, Drilling, and Turning methods. The method will be selected based on the Manufacturing cost, Productivity time, and other factors. Turning is one of the processes for removal of material in the form of chips manner from the specimen. Many of the authors surveyed is that in turning process the main affecting parameters is machining time. The selection of optimal cutting parameters is a very important issue for every machining process in order to improve the quality of machining products and reduce the machining costs. This project work investigates the effects of cutting parameters like spindle speed, feed and depth of cut on material removal rate in turning on DELRIN material. The experiment is carried out on CNC machine. The Response Surface Methodology (RSM) is used as the optimisation technique. In RSM box behnken method is used. L_{17} Orthogonal array is used to formulate the experimental layout and Analysis Of Variance (ANOVA) is used to find out which parameter is significant .Genetic Algorithm (GA) is used to find out the optimum cutting conditions.

Keywords: Turning process, Delrin, RSM, ANOVA, Material Removal Rate, GA.

ME111

MULTI-OBJECTIVE OPTIMIZATION OF CYLINDRICAL GRINDING ON STAINLESS STEEL 304 USING GREY RELATIONAL ANALYSIS

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Abstract

The machinability and the process parameter optimization of cylindrical grinding operation for Stainless Steel type 304 has been investigated based on Taguchi based grey relational approach. This steel known as free cutting steel has higher machinability. Although advances have been made in near-net shape technology, finishing operations are often required to obtain dimensional tolerance as well as good surface finish. Grinding which is a finishing process in complex manufacturing process, influenced by factors such as wheel, work piece, machine and process setting. Work speeds, feed rate, depth of cut and coolant flow rate are the important input parameters under investigation. Surface roughness and Material Removal Rate are performance measures. Taguchi method is applied to find optimum process parameters for grinding of SS304. Performance characteristics of machining process are studied using signal to noise ratio and optimization is done by find out the grey relational grade.

Keywords: Cylindrical grinding, Austenitic Stainless Steel 304, Taguchi's Design of Experiments, Grey Relational Analysis.

ME024

OPTIMAL DETERMINATION OF PROCESS PARAMETERS IN ABRASIVE WATER JET MACHINING ON NICKEL ALLOY USING GREY THEORY

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Abstract

Owing to its corrosive resistance, low thermal expansion and heat resistance Nickel alloy (Ni750) is mainly utilized in high pressure boilers, gas turbine, aircraft, and nuclear power system and petro-chemical industries. Abrasive water jet machining involves less kerf width, low thermal distortion and less heat affect zone compared to other unconventional machining process, because of this AWJM is used to machine high strength materials. This Abrasive water jet cutting is a non-traditional machining method that provides a productive alternative to traditional conventional techniques. It reduces the machining loss. The most effective process parameters that is undertaken for this study are cutting speed, Abrasive flow rate and Standoff distance. The cutting speed and abrasive flow rate influence the machining time. It has also been observed that the abrasive flow rate and standoff distance has the most significant role on determining the kerf geometry.

Key words: AWJM, Nickel alloy and GRA

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ME047

INVESTIGATION OF DIFFUSION BONDING USING MECHANICAL TESTING METHODS ON DISSIMILAR MATERIALS

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Abstract

Mg-Az31 and commercially pure aluminum were joined through diffusion bonding without using an interlayer at various temperature by maintaining the constant time and pressure. The diffusion bonding process parameter such as pressure, temperature, time of a bond specimen plays major role to determine joint strength. The bonding quality of joints was checked by tensile test, Micro structural test and Micro hardness test. From this investigation it is found that bonds fabricated with the bonding temperature of 425oC under pressure 15 MPa for holding time of 45 min shows the tensile strength of 105 MPa and micro hardness of 103 HV.

Keywords: Mg-Az31, pure aluminum, tensile test, microstructure test, micro hardness test

Metal Nano Additives as Thermal Conductivity Enhancer incorporated with PCM - A review

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Abstract - **The demand for high performance systems that deliver faster solutions is growing at a tremendous pace. Generally the commercial and domestic electronic devices are needed to operate from 70°C and above based on the operating load. Such devices release huge amounts of heat and this heat for most part is concentrated at the chip. The developed heat if not conducted properly will deteriorate the chip performance and the system performance too. Thus thermal management systems with heat sinks incorporating PCM (Phase Change Material) come into picture and are emerging as one of the effective techniques to remove the heat. However, the low thermal conductivity of the PCM is a hindrance to the development. Various authors have published their works on the TCEs (Thermal Conductivity Enhancers) and some have also published review papers on the PCM materials used along with TCEs. At present internal fins, metallic foams and nano particles are mixed with PCM to enhance the performance of heat sinks. It has been found that metallic foams perform better among the three. This article reviews various papers on metal based TCEs that have been incorporated with PCMs.**

Keywords – Phase Change Materials, Thermal Conductivity Enhancers, metal additive, metal foams.

I. INTRODUCTION

The technology is growing in a large unimaginable scale and along with this grows the power needs of each and every individual. The rapidly depleting fossil fuel resources is a cause of worry because of their increased usage adversely affecting ecology due to the emission of harmful gases, which are supposed to be responsible for climate changes and environmental pollution. [1] At present thermal energy storage systems are becoming the need of the hour and they pave way for reducing reliance on the fossil fuels by providing efficient eco-friendly energy use. [2] Due to humanity's huge scale of thermal energy consumption, any improvements in thermal energy management practices can significantly benefit the society. One key function in thermal energy management is thermal energy storage (TES). This has motivated a number of R & D efforts to develop novel materials and design new applications based on phase change material (PCM). [3] Thermal energy is the model in the energy field in correcting the gap between supply and demand and improving the performance and reliability of the thermal system. Thermal energy is considered as low grade energy because of its abundance and is generally associated as a waste in industrial processes. It is of prime importance that the thermal conductivity of the PCMs is enhanced as PCM has low energy charging/discharging rates is evident. [4] In the recent past PCM based cooling has attracted many researchers owing to the large latent heat storage capacity of PCMs and its possible gamut of applications. Review papers [3, 5-7] have presented various PCMs available, heat-transfer characteristics, their properties and also the behaviour of the PCMs as TES was presented. In this review a novel yet familiar class of thermal conductivity enhancement (TCE) for PCM (metals and metal foams) is presented.

II. METALS INCORPORATED WITH PCM

Srikanth Salyan et al [8] presented an experimental study on the thermo physical behaviour, thermal cyclic characteristics and energy storage performance of liquid metal (LM) laden in organic solid-liquid phase change material (PCM) for energy storage. They added Gallium (Ga) to D-mannitol (DM) in weight fractions of 0.1% and 0.5% by dispersion technique using ball milling. Repetitive melting and freezing cycles was carried out for 350 cycles and the samples were characterized using Differential Scanning Calorimetry (DSC), Thermogravimetry analysis (TGA) and Fourier Transform Infrared (FTIR). Thermal conductivity enhanced to ~8.4%, ~27% for 0.1 and 0.5 wt. % Ga as compared to pure DM, also the charging and discharging time reduced compared to pure DM. The FTIR and TGA analysis confirm the thermal and chemical stabilities of the composites in the range of 50-200°C. The degree of

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A REVIEW ON OPTIMIZATION OF PROCESS PARAMETERS OF WIRECUT EDM WITH THE APPLICATION OF TAGUCHIMETHOD

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(19)

***Abstract* - Wire-cut electrical discharge machining is one of the most widely using un conventional machining processes for machining hard materials like titanium, stainless steel, tool steels. This project reviews the effect of various process parameters such as pulse on time, pulse of time, wire feed on different process response parameters such as surface roughness and kerf width. The design experiment is used to design the WEDM experiments .The various tools of D.O.E. are used to analyze the final results of the experiments with the help of graphs. The analyze is being done with the help of Minitab-17 software. The results of the experiments are the optimum values of SR (Surface roughness), KW (Kerf width).**

Keywords – Optimization; EDM S/n.

1. INTRODUCTION .

WEDM is a most popular modern manufacturing process in the present manufacturing industry[2010]. The mechanism of metal removal is similar to that of conventional EDM process, in which the erosion effect is produced by series of electrical sparks between work piece and wire electrodes which are surrounded by dielectric fluid. During wire electrical discharge machining a large amount of temperature of 8000 C - 12000 C is developed in the form of thermal energy after applying voltage between wire electrode and work piece. When the discharge occurs a small amount of material is melted and removed from the work piece surface. The [illegible] electric [illegible] machining [illegible]

2. LITERATURE SURVEY

M. Geetha [1] proposed modeling and analysis of performance characteristics of wire EDM of SS304 input parameters are pulse on time, pulse off time, wire tension, water pressure taken into consideration for the research. Experimental data obtained after conducting experiments as per the design of experiments. Later RSM is used to find the empirical models .Then the models were for its adequacy using ANOVA .The output response is MRR and surface roughness.

V. Muthu kumar [2]Optimization of the WEDM Parameters on Machining Incoloy 800 Super alloy with Multiple Quality Characteristics using combination of Grey Relational analysis and Taguchi method to achieve higher Material Removal Rate (MRR), lower surface roughness (Ra) and Kerf width (KW). Finally, the analysis of variance (ANOVA) and necessary confirmation tests were conducted to validate the experimental results The optimal 'process parameters' based on Grey Relational Analysis for the Wire-Cut EDM of Incoloy 800 include a 50 V Gap Voltage, 10 µs pulse on-time, 6 µs pulse off-time and 8mm/minute Wire Feed rate.

A.Pratik [3] Optimization of process parameters in wire-EDM response surface methodology. This research paper deals with Response Surface Methodology approach for maximizing the material removal rate in wire electrical discharge machining. The investigated machining parameters were wire tension, pulse on time and peak current. Machining was carried on AISI D2 cold work steel, which is widely used in die and mold making industries. After the

ISBN [illegible]

Experimental Investigation and Analysis of Process Parameters for Face Milling Operation

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Abstract

In this paper, Taguchi method has been used to identify the optimum condition of input parameters in the milling process .In the present study optimization of surface roughness and material removal rete (MRR) using Taguchi method is doing for end milling operation. Milling experiment has been performed on Aluminium LM25 material, according to Taguchi orthogonal array [L9] for the different combination of input parameters which are spindle speed, feed rate, depth of cut (DOC) .Signal to noise ratio is applied to measure the performance characteristics deviating from the actual value .Analysis Of Variance (ANOVA) is used to identify the variables affecting the MRR, surface roughness, machining time, temperature.

Keywords: Aluminium LM25 material, Milling machine, Taguchi methodology, S/N ratio , ANOVA

INTRODUCTION

The machining industries are facing a great challenge to achieve high quality, good surface finish and high material removal rate with a view to economize in machining. End Milling is widely used in a variety of manufacturing industries including the aerospace and automotive sectors, where quality is an important factor in the production of slots, pockets, precision molds, and dies because good-quality milled surface significantly improves fatigue strength, corrosion resistance, and creep life. In end milling operations, material removal rate (MRR) determines the economics of machining and rate of production. In setting the machining parameters, the main goal is to increase MRR.

The manufacturing process like machining, casting, grinding, forging, molding and welding are used to produce the products of which customer need is satisfied. Milling is the process in which the metal removal rate and surface finish is high. During milling process, a rotary cutter is used which are in direct contact with the material. One of the important advantage of milling process is that it is suitable for mass production and having high dimensional accuracy and surface finish process. The significant factors normally considered for the experimental investigations are spindle speed, feed rate, depth of cut and dimensions of the test specimen. During milling, high amount of heat is produced at the interface of tool and work piece. The quality of machining depends on the proper selection of materials and process cutting parameters. The main objective of this experimental investigation is to showcase the Surface Roughness on the milling of Aluminium LM25 material.

The present experiment the optimization speed obtained using taguchi technique is 2487rpm , Similarly the result obtained for feed and depth of cut are 1540 mm/min , 1.5mm/min .The optimum coolant flow is 4.8 litres /min , The S/N ratio value of verification test is within limits predicted value and objective of work is full filled [1]

It consist of two method taguchi , regression , analysis ,choice of operation condition , cutting speed parameter , feed rate parameter , engagement parameter , To minimize the surface roughness and maximum the material removal rate in two methods [2]

This experiment were carried under three stages, First stage – experimental work , were carried out using taguchi method . The various spindle speed, feed and depth of cut was investigated, Second stage – the effect of control factor on response was determined by analysis of variance, Third stage – this response was optimized by MINITAB [3]

The work was carried by various milling parameter such as doc , feed and speed for the better of surface roughness, AISI304S.S plate material, M/C ; vertical milling machine using

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A REVIEW ON OPTIMIZATION OF WELDING PARAMETERS USING GAS TUNGSTEN ARC WELDING

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Abstract **- Optimization means finding the optimum input values for a specific constraint in any manufacturing process. It is a way to improve a system or a process to work at optimum conditions, reduce waste and increase productivity. Optimization is currently applied in various manufacturing processes such as machining, welding, alloy preparation, etc. This is the collective information about optimization in welding using Gas Tungsten Arc Welding (GTAW) by various experiments. Its aim is to give complete outline of various techniques, methods, procedure to optimize the welding parameters.**

Keywords – Optimization; GTAW; Welding.

I. INTRODUCTION

Welding is a metal joining process. It aims to joining similar or dissimilar metals with or without filler rod. GTAW is a non consumable type welding process in which an inert shielding gas is used to prevent weld pool quality from atmospheric contamination .In GTAW, the following input parameters are welding current, voltage, speed, torch angle, nozzle to plate distance involves in welding. These parameters may change with respect to welding types. The major parameters are welding current, voltage, speed. Optimization of these parameters involves three major stages are process measurement, process control and optimization.

II. LITERATURE SURVEY

Optimization of welding parameters of Friction stir welding to obtain a good quality weld the process parameters for a welding process which affect the desired output for a welding process are welding speed ,arc voltage, welding current etc . Process parameters were measured by Design of Experiment. Taguchi method. FEA simulation. Welding process controlled by Multiple Regression Analysis. Response Surface Modeling, Artificial neural network. [1]

An experiment is carried out to study optimization of welding parameters in GTAW of an Inconel 825 alloy. The following welding parameters involved in GTAW are welding voltage(V) ,welding current (I), Gas Flow Rate(GFR),Nozzle to Plate Distance (NPD),torch angle(Θ).Relationship between parameters found by developing mathematical model using factorial design approach. Experimental results suggested that increase in welding current, gas flow rate, torch angle increases weld deposit area, whereas voltage, nozzle to plate distance decreases the weld deposit area. [2]

The application of design of experiment is studied Plasma Arc welding process.DOE is statistical approach in which a mathematical model is developed through experimental runs. DOE predicts possible output based on the input parameters of the experimental setup. Response Surface Methodology uses model to make contour plots of predicted behavior.RSM has an edge over the Taguchi method in terms of significance of interactions and square terms of parameters.[3]

Demonstrated the experiment to predict and optimize the weld bead geometry of PGTAW Inconel 718 alloy using RSM and DOE .The experiments were performed based through three level five factor Box- Behhen design. Here, peak current, base current, pulse on time are the input parameters and bead geometry parameters (bead depth, bead width, depth to width ratio) are output parameters. The developed prediction models can be efficiently used to calculate the bead width, bead depth and depth to width ratio of GTAW welded Inconel 718 alloy at 95% accuracy level [4]

Application of weld overlay using Gas metal arc welding process using solid Inconel 625 wires is

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eco-friendly and also the abundance makes it more economical.In the present study we explore the reducing and capping potential of Aloe vera gel extract for the synthesis of gold nanoparticles. The immediate change in color from pale yellow to ruby red indicated the reduction of Au^{3+} ions to Au^{0}. The synthesized AuNP's were characterised using UV-Visible spectrophotometer , FESEM ,EDAX and XRD. Surface Plasmon Resonance (SPR) occurred at 540 nm and steadily increased in intensity with longer duration of incubation time without shift in wavelength. FESEM analysis showed the presence of polydispersed spherical AuNP's. EDAX confirmed the presence of elemental gold. The broadening of peaks in the XRD patterns was attributed to particle size effects.The antimicrobial property of the synthesized nanoparticles was also investigated.

Keywords; gold nanoparticles , aloe vera , UV-Visible, SEM, EDAX, XRD and antimicrobial activity.

PP -131

A NEW MANNICH BASE *N*-[PHENYL(PYRROLIDIN-1-YL)METHYL]ACETAMIDE - SYNTHESIS, SPECTRAL PROPERTIES, ANTIBACTERIAL AND ANTIFUNGAL STUDIES OF SOME OF ITS METAL COMPLEXES

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Abstract

Synthetic heterocyclic complexes of transition metals have attracted much attention as promising objects in coordination chemistry. The coordination and organometallic chemistry of metal-nitrogen and metal-oxygen bonded compounds have come to occupy a prominent position in the research due to their economical importance in the field of agriculture, medicinal and industrial chemistry. This communication deals with a description of synthetic procedure and spectral characterization on the basis of analytical and spectroscopic techniques of a new class of coordination compounds of Mn^{II}, Co^{II}, Ni^{II} and Cu^{II}ions with new Mannich base ligand *N*-[Phenyl(pyrrolidin-1-yl)methyl]acetamide(PBA).

The ligand was prepared by Mannich condensation reaction between acetamide, benzaldehyde and pyrrolidine in 1:1:1 mol ratio. The decomposition temperature is 120-124°C.Elemental analysis and spectral data(IR, ^{1}H, ^{13}C NMR, UV-Vis and Mass) confirm the structure of the ligand.The molecular weight of the compound was determined by Rast method. Manganese(II), iron(II), cobalt(II), nickel(II) and copper(II)complexes having the

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Removal of Toxic Metal Ions from Treated Industrial Wastewater by Using New Mannich Base Ligands Derived from Compounds containing Active Hydrogen atom

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Abstract

The use of organic ligands as metal binding compounds for the removal of heavy metals from industrial wastewater has been gaining momentum for quite sometime. The ligands: *N*-[(Diphenylamino)methyl]acetamide(DPA), *N*-[Phenyl(pyrrolidin-1-yl) methyl] acetamide (PBA) and *N*-[Morpholino(phenyl)methyl]acetamide(MBA) were synthesized by Mannich condensation reaction and characterized by spectral techniques. The complexation property of each of the above ligands with Zn^{II}, Cd^{II} and Hg^{II} metal ions was performed. The wastewater containing zinc, cadmium and mercury together was used. The heavy metal recovery was found to be efficient. About 96% of the metals could be removed from the wastewater.

Keywords: Heavy metals, wastewater, chelation, ligands, Metal ion uptake

Introduction

Environmental pollution by heavy metal ions is a potential threat to living beings, because such ions do not undergo biodegradation. Hence, wastewater-containing heavy metals must be treated before being discharged into the environment. Removal of heavy metals from waste streams employs various techniques, which are either expensive or inefficient, especially in very low residual concentrations(at ppm level) in the wastewater. Chemical industries, electroplating industries, ore processing industries, oil refineries etc. let out their effluents, which have large proportions of various metals. Our human body requires trace amount of many metals. But they become toxic; when they are in higher concentrations. So it is necessary to reduce the metal ion concentration of waste water from various industries to permissible levels.

The removal of heavy metals from the treated industrial effluent with acceptable concentrations is the aim of this work. Therefore, a chelating ligand containing carbonyl oxygen and azomethine nitrogen was synthesized by the Mannich synthetic route. The ligands having multiple coordination sites are known to form complexes with transition metal ions readily. These ligands are expected to show affinity and selectivity towards the metal ions at an appropriate pH.

Synthesis of the ligand

(DPA):*N*-[(Diphenylamino)methyl]acetamide, (PBA):*N*-Phenyl(pyrrolidin-1-yl) methyl]acetamide and (MBA): *N*-[Morpholino(phenyl)methyl]acetamide were synthesized by Mannich condensation reaction between acetamide, formaldehyde/benzaldehyde and diphenylamine/pyrrolidine/morpholine respectively in 1:1:0.5 mol ratio. Ethanolic solutions of the respective amides were mixed with corresponding aldehydes and amines and stirred in an ice bath. After 10 days, the colourless solid formed in each case was filtered, washed with water, acetone and dried. All the above ligands have been characterized by elemental analysis, IR, UV-Vis. ^{1}H & ^{13}C-NMR and mass spectral studies. Based on the

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ABSTRACTS

Production of valuable resources from the emerging pollutant in the cities

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The earth is a wonderful place. We humans exploit its natural resources and harming the environment by producing large amount of pollutants. We must preserve the land we live on. A pollutant is any substance which contaminates the air, water and land. Pollution is the introduction of harmful substances or products into the environment or harmful changes that occur in the environment due to human actives. As these harmful substances, gases and quality of life of all living beings will affect the humans. In some way or other there is continuous emission of pollution. Therefore we have come up with a solution to produce valuable products from the pollution emerging from the cities. The main objective of this project is to fuel up the city with its own waste products like Water waste, Air waste and Land waste.

The waste water coming out from the city is collected and sent to a natural water treatment plant. The water is treated with the help of natural water purification system which consist of 5 steps of purification (whirlpool, pebbles, activated charcoal, chipped bricks, fine sand, membrane etc.). Each step has specific properties to remove the impurities present in waste water. The purified water is divided into two categories.

A part of purified water is distributed to agricultural fields because the treated water contains high amount of Nitrogen level which enhance to cultivation. The remaining part of water is sent to Solar Ray system for production of electricity with the help of steam produced in it. Solar ray system is the process of producing steam with help of sunlight and concave mirrors which is set up in a definite pattern around the pipes which consist of treated water. The steam produced is sent into the generator which helps to rotate the turbine. Due to the movement of turbines the Electrical Energy is produced which serves as a power source for the city. The steam which comes out from the generator is condensed with help of condensation apparatus.

The condensed water is sent into Di-Hydrogen-Monoxide fuel generator cell. Di-hydrogen-monoxide fuel generating cell is dry cell which helps to split up the hydrogen and oxygen molecules present in water. Condensed water is our primary source to split hydrogen molecules. Di-Hydrogen-Monoxide fuel generator cell consist of Stainless Steel plates which is connected in series with some neutral plates. The Hydrogen and Oxygen gas which are separated from water serves as fuel for vehicles. The combustion of H2 and O2 gives out water vapor which is a non-pollutant.

The Air waste product which are emitted from the industries are collected and sent into a biological reservoir which contains a special kind of algae called Chlamydomonas reinhardtii which converts CO2 into H2 gas which can be used for several purposes. The biological hydrogen production with algae is a method of photo biological water splitting

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Degradation of Emerging Pollutants by Photo Catalytic Reduction and Oxidation\

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Several heavy metal ions such as Cd(II), Cr(VI), Cu(II) and Pb(II) can be distributed in the environment from wastewater disposal of some industries including electroplating activities, paint, electric equipment, nylon and plastic factories. Removal of Cd(II), Cr(VI). Cu(II) and Pb(II) ions has been intensively studied by conventional adsorption method, i.e. by using zeolite and activated carbon. This method is normally simple and effective, but it is unable detoxify the hazardous ions, except the method only transfers the ions from the solution into the solid adsorbent. Hence, a treatment method which is able to remove as well as detoxify the hazardous ions is required. Such method may be satisfied by photo catalytic reduction-oxidation.

Photo catalytic reduction and photo catalytic oxidation are reduction and oxidation induced by photon or UV light and sensitized by photo catalyst such as TiO_2. The Generated hole contacts with water and TiOH photocatalyst surface, OH radical is formed. The photo generation of electron and hole, and formation of OH radical are written as reactions (1), (2) and (3).

$$TiO_2 + h\nu \rightarrow TiO_2 + e^- + h^+ \quad (1)$$

$$H_2O + 2h^+ \rightarrow OH. + H^+ \quad (2)$$

$$TiOH + h^+ \rightarrow TiOH \quad (3)$$

The OH radical can act as a strong oxidizing agent that has been tested for removing pesticide through photo degradation, as well as Pb(II) from the solutions through photo oxidation mechanism.

Meanwhile, Ag(I) could be reduced into Ag(0) deposited on the photo catalyst surface, enabling it to be easily taken out as pure and valuable silver metal. Moreover, the study on photo catalytic reduction of Cu(II) in the presence of TiO_2 for removing the ion from its solution has also been reported. In the present paper, the removal of Cu(II), Cr(VI), Cd(II) and Pb(II) ions by photo catalytic technology and the study on the influence Cr(VI), Cd(II) and Pb(II) with varying concentration and solution pH on the photo reduction of Cu(II) ion are reported.

Photo Catalytic Experiment: Removal of Cu(II) in the solution was carried out in a closed reactor equipped with a 40 watt UV lamp having wave length in the range of 290-390 nm. For that purpose, 100 mL solution containing 10 mg/L, of Cu(II) with alteration pH as designed, was mixed with 50 mg TiO_2, then the suspension was irradiated by UV light in the photoreaction apparatus for 24h. The solution obtained by filtering the suspension, was analyzed by AAS (Atomic Absorption Spectrum) to determine the concentration of unreduced Cu(II) ions. By subtracting the initial and unreduced concentrations of the ions, the degree of Cu(II) photo reduction could be calculated. The removal of Cr(VI), Cd(II) and Pb(II) as a single solute in the solution was performed by using the same procedure. The influence of respective Cr(VI), Cd(II) and Pb(II) on the photo reduction catalytic of Cu(II) was performed by irradiating 3 serial suspension of Cu(II) solutions suspended with TiO2 that was added by Cr(VI), Cd(II) and Pb(II) respectively and repeating the process.

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in the International Conference on Chemical and Environmental Research (ICCER 2017), organized by the PG and Research Department of Chemistry, Jamal Mohamed College (Autonomous), Tiruchirappalli, held on 07th January 2017.

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A Traffic Classification Approach for Dispatcher in Web Cluster based on User Request Pattern using SVM

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ABSTRACT

Increasing demand of Internet data center applications leads to more and wider usage of Internet services. An effective task-server assignment policy is essential to improve the performance of the Web cluster. Effective classification of the traffic at dispatcher always enhances the performance. Existing dispatcher of the Web cluster do not consider the behavior of the request for the improvement of QoS. Hence this paper proposes a machine learning classification method based on SVM for the dispatcher which classifies the requests using request pattern and statistical properties of the Web cluster. The proposed classifier aims to improve the utilization of the server and to minimize the makespan. The classification is performed using LibSVM. The performance in terms of classification precision and waiting time are measured and the simulated results have shown considerable performance improvement over traditional dispatcher.

Keywords: Traffic classification, Support Vector Machine, Server assignment.

I. INTRODUCTION

The growth of data intensive computing and the demand for incessant availability of Internet services necessitates the improvement of the performance of Web cluster [2]. A Web cluster or Server farm is a collection of two or more independent servers networked together which provides a single system image. It is mainly used in web hosting, commercial applications and scientific computing. The performance of this Web cluster depends on the performance of the servers and the dispatcher in the cluster and so the QoS in task assignment policies at dispatcher is to be improved [4]. Scalable techniques that categories the traffic is believed to be the foremost basic practicality to enhance the performance of the dispatcher [10]. Prediction of network flow gives valuable information about the network traffic and helps to improve bandwidth allocation and server utilization [4]. Understanding of network flows also helps in analyzing Denial of service attack [17]. Much research work has been carried out on applying machine learning techniques to traffic identification and classification [3,7]. On the present traffic scenario i.e., both biased and unbiased traffic scenario, perfect classification for the improvement of QoS has not been discussed yet.

SVM (Support Vector Machine) is an effective supervised machine learning method. It defines a separating hyper plane that perfectly discriminates the data into two categories. Due to its generalization ability and discriminant function, it is widely used in classification application [5]. SVM operates on high dimensional input space which can be easily mapped to network traffic. In [18] authors presented that the SVM based classification method has higher accuracy than other machine learning methods. Existing classification which are designed to identify the traffic are not efficient in Web cluster because those techniques have not been designed to make use of the behavior of the request and properties of Web cluster.

II. RELATED WORK

This section presents a brief overview of some important existing work on traffic identification and classification. Classifier using supervised machine learning based on a Bayesian trained neural network is modeled in [1]. The model is trained using the features that are derived from each packet header. But it does not use port or host information. Authors applied Bayesian neural network model for offline classification and the feature selection is also not optimum.

Internet traffic identification algorithm based on Genetic Algorithm(GA) and Particle Swarm Optimization (PSO-SVM) is proposed in [11]. GA is used to select best feature subset and weights of the features are calculated by PSO. Feature selection and weight computation are measured when behavior of the applications changes. The port and signature based methods still have virtuous outcomes for some network applications, but they are not considered here.

A SVM based P2P flow identification method using multidimensional flow properties is studied in [12]. Discriminatory selection procedure is used for nominating the properties which enhances the classification accuracy. In [14], authors presented various methods of identification of P2P traffic using three characteristics, average flow duration, ratio of the IP address number and port number. Authors analyzed and summarized that flow identification, based on SVM effectively identifies P2P traffic.

In [15], a machine learning method based on SVM is suggested. The constructed traffic flow is denoted in the form of regular expressions, called application signature. The applications were classified by mapping the signatures with popular applications and the optimal feature set is identified using biased and unbiased training samples. Authors never mapped the classification for the improvement of QoS. In DAG-SVM, the classification error present in a layer spreads over other layers. Authors of [16] presented Improved DAG-SVM to attain accurate hyper-plane based on decision function and distance. Here the classification error is rectified in the same sublayer. Both the methodologies are applied to classify the traffic based on the application.

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MIDDLEWARE INTEROPERABILITY PERFORMANCE USING SOA FOR ENTERPRISE BUSINESS APPLICATION

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Abstract

*In general a business level service can be implemented by multiple objects/components, or by a non-OO approach. SOA can be achieved with many types of middleware. The middleware works in terms of services. Quality of Service provided by Security, Transactions, Routing, Logging, Failover, Protocols and of course Message formats. This may help to keep the business and implementation levels separate for the designers and implementers. To improve the performance of B2B(Business to Business) and B2C(Business to Consumer) in terms of enterprise-wide SOA, we need to have middleware interoperability. The interoperability takes care of the ability of software and hardware on different machines from different vendors to share data. But middleware doesn't interoperate because the "service" interfaces are different. A service has an interface, and this is the key to hiding details such as the operating system, programming language, network addresses, etc. But this interface doesn't hide/abstract the middleware itself. In this paper, I examine how to improve the performance of Middleware interoperability in Service Oriented Architecture (SOA) environment.*Keywords — *Web Services, SOA, Interoperability, RPC, CORBA, ORB.*

I. INTRODUCTION

A service is a Software component that is well-defined, well-structured, self-contained, and does not depend on the context or state of other services. Nowadays, service-oriented architecture (SOA) is used as an efficient solution to integrate the distributed applications in an enterprise model. In a SOA-based environment, Performance is one of the major concerns when developing enterprise business applications. SOA is used to provide an integrated, flexible, and cost efficient (Web) Service-based enterprise. It promises interoperability, reusability, loose coupling, and protocol independency of services as core principles of SOA ([1][2]). In the context of SOA, developers must focus the interoperability of services. Thus, SOA experts must provide the capability to secure the architecture instead of securing a service itself [1].

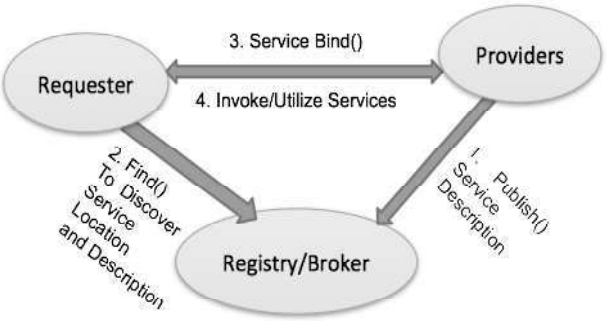

Fig. 1. SOA Components and Operations

In Fig.1 in order to overcome these matters, the various functional and non-functional security requirements are needed to be considered. Some of these requirements such as authentication, end-to-end security, interoperability, access control, auditing, secure configuration, assurance, and compliance have been presented by [1], [2], and [4]. In addition, some technologies and standards

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WIRELESS ELECTRONIC NOTICE BOARD

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ABSTRACT

Notice Board is a primary display device in any institution / organization or public utility places like bus stations, railway stations and parks. But sticking various notices day-to-day is a difficult process. This project deals with an advanced wireless notice board. The main objective of this project is to develop a wireless notice board that displays messages sent from the user's mobile. When a user sends a message from his mobile phone, it is received by a SIM loaded GSM modem at the receiver unit. The GSM modem is duly interfaced through driver for establishing communication. The message so received is sent to the microcontroller. Further the message is displayed on the electronic notice board which is equipped with a LCD display and interfaced to a microcontroller from 8051 family. The circuit is portable, it consumes less power and it is easy to operate. Thus this Project is of great use in colleges and organizations.

1. INTRODUCTION

Wireless communication has announced its arrival on big stage and the world is going mobile. As we wish to control everything and without moving an inch. This electronic notice board is possible through Embedded systems. The use of Embedded system in the communication has given rise to many interesting applications that ensures comfort and safety to human life. GSM (Global System for Mobile Communication) is globally accessed by more than 212 countries and territories. Global system for mobile communication is optimized for duplex voice telephony. GSM, initially developed for the replacement of first generation (1G) technology, now it is upgraded for second generation (2G) technology and third generation (3G) technology. With the alliance of microcontroller, GSM MODEM could be further used for some of very innovative applications including, GSM based home security system, GSM based robot control, GSM based DC motor controller, GSM based stepper motor controller, GSM based voting machine control etc.

2. OUR PROPOSED SYSTEM

The key objective of our project is to send messages to notice board from remote area wirelessly. The additional features incorporated are:

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RFID BASED LIBRARY MANAGEMENT SYSTEM

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ABSTRACT

Abstract—RFID systems are becoming very popular nowadays as they play a very vital role in reducing thefts with less human effort. Industries, shopping malls and departmental stores have started using RFID tags and readers inorder to reduce the theft. Nowadays RFID systems have become an integral part of day-to-day life. RFID in libraries are a developing technology and is being implemented in small to small and medium sized libraries. Implementation of RFID will help in reducing the work burden of the administrator as well as the user in arranging and searching the books respectively. In the present systems employed there are special methodologies for arrangement of books, journals, DVDs and so on. These techniques need to be strictly followed inorder to help the users find their book or their requisites. This paper helps in finding a solution to this tedious problem faced by most libraries in an easy way.

I.INTRODUCTION

The current library systems are employed with barcode technology which requires line of sight and is time consuming so we decided to use RFID which is a wireless technology and it does not need LOS. When a patron takes a book containing a tag from the library, it is read by the RFID reader. Keil software is used to interface the microcontroller with RFID reader as the microcontroller the transmitted bits from tag is received. These bits are decrypted by the microcontroller and sent to the PC where encryption occurs. Visual basic software is used for creating a database. The database has information regarding the patron name, book name, due date, etc. Flash magic software is used to dump the embedded C program from Keil software into ARM7 LPC2148. Hyper terminal software is used to interface PC and Microcontroller. Once the PC has information about the tag that is read, it sends an SMS to the patron regarding the book that is issued and its due date. We have implemented some conditions

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A New Efficient Text Compression with Encryption Scheme

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Abstract

The compression algorithm reduces the redundancy of data representation which the memory space for data storage. Text compression and encryption are crucial to proper storage and transmission of data. Simultaneous text compression and encryption aims at achieving enhanced bandwidth utilization and security at the same time. The proposed algorithm introduces the new BRHE text compression with encryption algorithm (BWT, RLE, Huffman coding and with encryption). The proposed Compression Encryption (BRHE) algorithm employs four combination algorithms solve congruence and hence realize the twin ideals of compression and encryption simultaneously. The BRHE algorithm has been implemented in input text files The text compression (BRHE) coding results, calculated from the actual text input size and encoded text file, are comparable to the results obtained through much more sophisticated and complex methods. In addition, the algorithm has been applied to the scenario of BRHE in order to obtain an enhanced level of security along with compression.

Keywords: BWT, RLE, Huffman coding

1. Introduction

Compression algorithms are classified as lossy and lossless compression. Text compression is lossless compression. Text compression has two types of coding. One is statistical coding another one is a dictionary based coding. In statistical based coding codeword is generated by the frequency of the symbol. Most well known statistical based coding techniques are Huffman coding, arithmetic coding and PPM [11, 13]. Previous researchers follow the dictionary based text compression to compress the data. In this coding words selected from the input files and it forms as a dictionary. Dictionary based coding achieved better compression ratio compared to statistical coding. But it faces the following disadvantages: The dictionary must be prepared in advance, and must be known to the compressor and decompressor [1, 5]. For dictionary some memory space must be allocated in source and destination. In this technique each word in the dictionary has to replace by the ASCII character [7]. A long time is required to form the dictionary. One of the disadvantages, without dictionary decoder cannot retrieve the original data. Another one of the disadvantage, suppose this dictionary hack by the attacker easily data retrieved from the dictionary.

All communication systems required the following fundamental three requirements. These are transmission efficiency, the correctness of signal recovery and the security of information transferred. Transmission efficiency is determined by how much data is transmitted in per unit time. It is calculated by bit/sec. Accuracy of the signal recovery is defined by as the confidence between the transmitter and signal recovery system. It's calculated from error probability of the signal security of the signal. The transmitter transmits the information cannot be received by third party. This should be implemented by key complexity or enough time required deciphering the intercepted message. The objective of the paper develops the efficient compression algorithm and it achieves the best compression ratio, transmission efficiency, 100% accuracy and security. The proposed compression algorithm first compressed by existing compression algorithm such as BWT [12], RLE and Huffman coding. But this compression combination better achieve better compression ratio and security compared with dictionary based compression. For overcoming this problem, generally Encryption can be applied after compression, but it requires additional processing or hardware. By doing encryption cum data compression, can be a high compression ratio, the encryption strong, and no additional processing required for encryption [2,3 and 4].

In BRHE algorithm first data compress by BWT, RLE and then Huffman coding. The compressed data are encrypted and then compressed using a new encryption with compression algorithm without compromising the compression efficiency and the information security. This new technique compared with other standard compression algorithm and dictionary based compression algorithm achieves a better compression ratio, reduces the bit representation required for data and it gives confidentiality. The reverse operation is performed in receiver side as shown in figure 1. The rest of the paper is organized as follows. Section 2 presents Encoding algorithm. Section 3 presents Reduction array of Encryption and Decryption algorithm. Section 4 presents Decoding algorithm and Section 5 presents performance analysis. Section 6 provides Discussion. Section 7 concludes the paper.

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Analysis of Speaker Verification System Using Support Vector Machine

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ABSTRACT

The integration of GMM super vector and Support Vector Machine (SVM) has become one of most popular strategy in text independent speaker verification system. This paper describes the application of Fuzzy Support Vector Machine (FSVM) for classification of speakers using GMM super vectors. Super vectors are formed by stacking the mean vectors of adapted GMMs from UBM using maximum a posteriori (MAP). GMM super vectors characterize speaker's acoustic characteristics which are used for developing a speaker dependent fuzzy SVM model. Introducing fuzzy theory in support vector machine yields better classification accuracy and requires less number of support vectors. Experiments were conducted on 2001 NIST speaker recognition evaluation corpus. Performance of GMM-FSVM based speaker verification system is compared with the conventional GMM-UBM and GMM-SVM based systems. Experimental results indicate that the fuzzy SVM based speaker verification system with GMM super vector achieves better performance to GMM-UBM system.

Keywords

Gaussian Mixture Model; Fuzzy Support Vector Machine; Speaker Verification System

Academic Discipline and Sub-Disciplines

Modeling the Signals and Analysis of modeling techniques

SUBJECT CLASSIFICATION

Nonlinear classification

TYPE (METHOD/APPROACH)

Experimental

1. INTRODUCTION

Speaker verification is a method to determine whether a person is who he/she claims to be. Identity given by the claimed speaker and his/ her test speech utterance are the two inputs applied to the system. The system will verify whether the test speech utterance correspond to the claimed identity or not.

For text independent speaker verification system, where there is no prior knowledge of what the speaker will say, the successful model for speaker is Gaussian Mixture Model (GMM). GMM models are trained using the standard Expectation Maximization (EM) training algorithm. Universal Background Model (UBM) represents the whole set of target speakers and background speakers. Individual model for each target speaker are obtained through Maximum A Posteriori (MAP) adaptation. Recently, the idea of stacking the mean vectors of GMM model to form a GMM mean super vector has become successful in speaker verification using Support vector Machine [6, 7].

Support Vector Machine (SVM) is a two class classifier based on the principles of structural risk minimization. SVMs perform a non linear mapping from an input space to an SVM expansion space. Linear classification techniques are then applied in this potentially high dimensional space.

In the early 1990s, SVMs were first proposed by Vapnik [1] as optimal margin classifier. In pattern recognition works [3], SVM had been used for isolated handwritten digit recognition [2], object recognition [4] and speaker identification [5]. Then, in order to combine the advantage of SVM and the state of art technique GMM-UBM for speaker verification system, a new GMM-SVM system was proposed by Campbell W M et al [6]. In this approach, the

GMM super vector is the input for SVM. The experiments done by Campbell W M et al [7] using SVM-GMM and NAP variability compensation with 20 female and 20 male speakers has achieved an error rate of 0.4% and average accuracy rate of 95.5% with 27 order MFCCs for the 2004 NIST speaker recognition evaluation corpus.

The main design component in an SVM is feature space. Since inner products induce distance metrics and vice versa, the basic goal in SVM kernel design is to find an appropriate metric in the SVM feature space relevant to the classification problem. A study on the use of MFCC and SVM for text dependent speaker verification is carried out by Shi-Huang Chen et al [8]. By using discrete events and their probabilities from speech signal to construct super vectors based on Bhattacharyya distance as input for SVM, Kong Aik Lee et al [9] obtained an Equal Error Rate (EER) of 5.51% and a Decision Cost Function (DCF) of 2.63. The performance of SVM depends on the selection of Kernel functions used to

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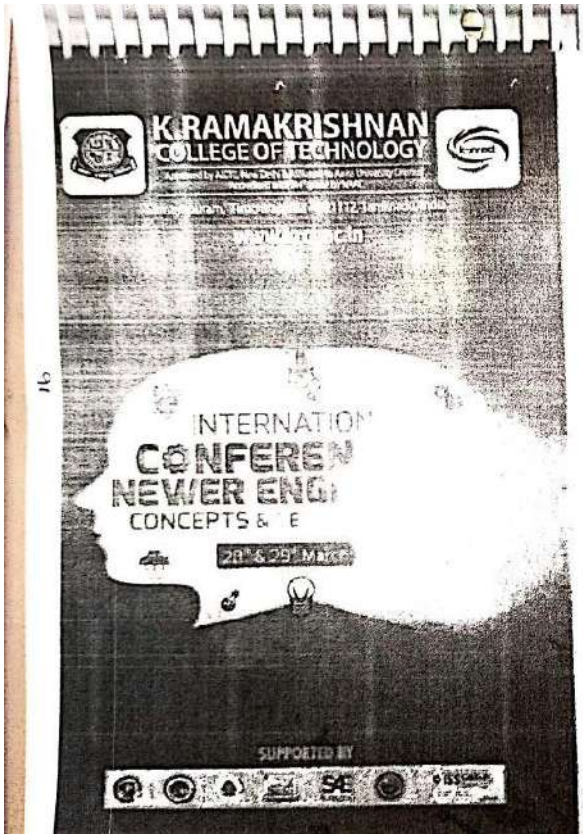

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Terrestrial Free Space Optical communication : Design Challenges and its Mitigation Techniques

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Abstract-In this paper we are going to present the details of the design description and the challenges for the establishment of the Free Space Optical Communication(FSOC) and its mitigation techniques. FSOC describes the transfer of the signal/data/information between two points using optical modulator as the carrier signal through the unguided channel .The data to be transported could be modulated on the intensity, phase or frequency of the optical carrier. An FSO link is essentially based on the line-of-sight(LOS)Use in the transmission in the unguided channel i.e., atmosphere there are so many turbulence effects. This paper briefly describes the survey of various turbulence effects and its mitigation techniques.

Index terms-Free space Optical Communication, Turbulence Effects, Mitigation Techniques

I. INTRODUCTION

Free Space Optical Communication[1] has become a very viable alternative to the RF and Millimeter wave Technologies for reliable and rapid deployment of communication networks with the very wide license-free bandwidth. The fundamental features of the technology includes the following Huge modulation Bandwidth, Narrow Beam Size, Unlicensed Spectrum, Quick to Deploy & Redeploy, Free from Electromagnetic interference, Low power Consumption. The areas of Application includes the following like Last mile Access, Optical fibre backup link, Cellular communication back haul, Disaster recovery/Temporary links, Multi campus Communication network, Difficult Terrains.

When the laser beam is propagating in the atmosphere it undergoes various effects like Optical losses, Ray losses, Misdirected Transmitter, Atmospheric attenuation, Atmospheric Turbulence which also includes the Absorption, Turbulence and Scattering effects. By these effects there are chances of Beam Wandering, Beam Dancing effects also takes place.

In this paper we describe a survey of various methods to reduce turbulence factors .

II. FSOC DESIGN

The Block diagram of the Typical Terrestrial FSO link is shown below The essential parts of the system comprises of three units the Transmitter, the Channel and the Receiver and their detailed description is provided below.

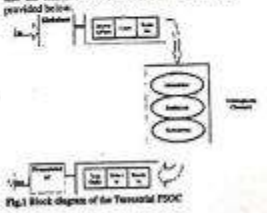

Fig.1 Block diagram of the Terrestrial FSOC

The block diagram shows a representation of the transmission of the laser beam within the atmospheric

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FACE RECOGNITION ACROSS NON UNIFORM MOTION BLUR, ILLUMINATION AND POSE

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Abstract: Current Face recognition systems consider the motion blur as a space invariant feature and uses simple convolution model for approximating motion blur. But in natural imaging, motion blur is non-uniform. So for face recognition in the presence of space varying motion blur, a methodology comprising of arbitrarily-shaped kernels is used. The blurred face is modeled as a convex combination of geometrically transformed instances of the focused gallery face using TSF Model. The probe image is compared with the convex combinations to find the best match. To handle illumination variations illumination normalization using DWT is used for the test image.

Keywords: Non uniform motion blur, TSF Model, DWT-MIN, Transformation Spread Functions, Illumination.

I. INTRODUCTION

The goal of a Face recognition system is to automatically identify a person's identity from a digital image Normally the system compares any of the features of the face image and finding a best match for recognition. But in case of a degraded image the system fails to recognize. This method presents a Face recognition system which aims to identify a person's face, even if the captured image is degraded by non uniform blur, change in illumination and pose variations. A facial recognition system is a computer application for automatically identifying or verifying a person from a digital image or a video frame. One of the ways to do this is by comparing selected facial features from the image with a facial database. Non-uniform blurring situations may arise due to tilts and rotations in hand-held cameras. Also degradations occur due to changes in illumination, pose, expression, partial occlusions etc. Image captured at certain illumination condition and pose is taken as reference image. The lighting conditions and pose for the test images will not be same as that of reference image. So the resulting images will have illumination and pose variations and this may also affects the accuracy of the system. Hence a facial recognition system that overcomes these difficulties is required. At present individual systems that can recognize across non uniform blur, change in illumination and pose variations are available. Also the system, that available for blur, considers the blur as a space invariant feature. In practical case blurring effect is space variant or non-uniform in nature. But the requirement is a system that can

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A WIRELESS PROTOTYPIC HAND TALK ASSISTIVE TECHNIQUE FOR HEARING AND SPEECH IMPAIRED

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Abstract: About nine billion people in the world are deaf and dumb. Communications between deaf-mute and a normal person have always been a challenging task. They have their own manual-visual language known as sign language. The languages do not have a common origin and hence difficult to interpret. The project aims to facilitate people by means of a data glove based deaf-mute communication interpreter system. The sensors output a stream of data that varies with degree of bend. The output from the sensor are analog values, it is converted to digital and processed by using a PIC microcontroller and a signal converter then it will be transmitted through wireless communication (RF), finally it will be received in the receiver section and processed using responds in the voice using speaker. The gestures can be converted to voice by using an APR 9600 Voice storage and retrieval chip. Prerecorded voices are stored into APR Memory and when corresponding gestures are received, the appropriate voices are reproduced by the APR through the speaker. Thus corresponding finger gestures are converted into voice commands. This project was meant to be a prototype to check the feasibility of recognizing sign language using sensor gloves.

Keyword: Flex sensor, APR9600, PIC Microcontroller

I. INTRODUCTION

An embedded system is a computer system with a dedicated function within a larger mechanical or electrical system, often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices in common use today. Sign language is an expressive and natural way for communication between normal and dumb people (information majorly conveys through the hand gesture). Most of the commercial sign language system uses the glove technique. It's simple to attain data concerning the bending of finger flexure and three dimensional position of the hand.

In the recent years, there has been tremendous research on the hand sign recognition. The technology of gesture recognition is divided into two categories

A. Vision based method:

In vision-based methods, computer camera is the input device for observing the information of hands or fingers.

B. Glove based method:

In glove based systems data gloves are used which can archive the accurate positions of hand gestures as its positions are directly measured. The Data-Glove based methods use sensor devices for digitizing hand and finger motions into multi-parametric data.

The American Sign Language (ASL) gestures are considered as the images to be worked upon by decoding them with English alphabet [1]. The implementation focuses on deriving SIFT features from

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Single Image Haze Removal using Weighted Guided Image Filter

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Abstract— **Haze removal is the process of converting hazy image into a haze free image. The transmission map for a haze image is estimated based on edge preserving decomposition technique. The weighted guided image filter is introduced by adding edge aware weighting to guided image filter. The minimal color channel and dark channel of the haze image is computed. Using the weighted guided image filter the dark channel of a haze image is decomposed into base layer and detail layer. From the base layer the transmission map is estimated. The transmission map is used to restore the haze free image.**

Keywords*— *single image haze removal, edge preserving smoothing, weighted guided image filter, dark channel, minimal color channel.

I. Introduction

Bad weather conditions such as haze, mist, fog and smoke degrade the quality of the outdoor scenes. Under this condition the light is reaching the camera severely scattered by the atmosphere. This degradation fades the color and reduces the contrast of captured objects and often lack visual vividness. The degradation is more serious when increasing the distance between camera and object. The main sources of haze particles include farming, traffic, industry, volcanic ashes and wildfires. Haze is the combination of airlight and direct attenuation. While observing an extensive landscape quickly notice that the scene points appear progressively lighter as our attention shifts from foreground towards the horizon is called airlight or atmospheric light. The light beam is attenuated when it is travel from a scene point through the atmosphere due to scattering. The attenuated flux reaches from a scene point to an observer is termed as direct attenuation.

Haze removal is the process to remove haze effects in captured image. It increase the both local and global contrast of the scene, correct the color distortion caused by airlight and produce depth information. Haze removal is highly demanded in image processing, computational photography and vision applications.

In multiple images the haze is removed by weather condition based method [1], polarization based method [2], depth based method.

The automated method [3] is used that requires only a single input image. It based on two observations: the first one is the clear day images have more contrast than haze images. The second one is airlight variation depends on the distance of objects to the viewer. This method does not require geometrical information of the input image. It is applicable to both color and gray images. The refined image formation model [4] used for estimating the optical transmission from a single haze image. This model includes scene transmission and surface shading. In this method eliminates the scatter light, increase the scene visibility and recover the haze free scene contrast. The failure of this method is insufficient SNR. Based on the dark channel prior [5, 6] the haze is removed. The dark pixels are referred to as low intensity pixels in at least one color (rgb) channel. These pixels are used to estimate the haze transmission. For every pixel the transmission map is calculated. The prior is used to estimate the thickness of the haze. The haze image is recovered by combination of haze image model and soft matting technique. Soft matting technique is used for refine the transmission map. It is suitable for rgb images. In the reconstructed image the halo artifacts are present. Instead of soft matting the guided image filter [7] is used for refine the transmission map. It is also based on the dark channel prior. It gives better result than soft matting.

In this paper the weighted guided image filter is used for estimating the transmission map of a haze image. Weighted guided image filter is an edge preserving smoothing technique. This algorithm requires only single input image rather than multiple images. It is based on the concepts of minimal color channel and dark channel. The atmospheric light is estimated using the quad-tree subdivision method [8]. Then compute the minimal color channel and dark channel of the haze image. The minimal color channel is the minimal value among all color components of the pixels. The dark channel is some pixels have very low intensity in at least one color channel. Using WGIF [9] the dark channel is decomposed into base layer and detail layer. It requires the guidance image. The guidance image is generated from the minimal color channel. The transmission map is estimated from the base layer. The estimated transmission map is used to recover the haze image.

The paper is organized as follows. In section II describes the related works on filters. In section III describes the background of the haze image model. In section IV describes the proposed system of weighted guided image filter. The results are shown in section V.

II. Related Work

Edge preserving smoothing is an image processing technique. Edge preserving filters preserve the edges. It is used to smooth an image, it also reduce the edge blurring effects across the edges. In edges the larger weights are assigned than flat areas because the edges provide efficient information.

Two types of edge preserving image smoothing techniques are available. One type is global optimization

Residue Coding by Mode Dependent Fuzzy Vector Quantization in HEVC

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***Abstract*— The HEVC standard supports thirty five intra prediction modes. Intra mode prediction in HEVC uses prediction of pixel values within a frame. The edges of the frame give high energy prediction residues. This standard is used for reducing the high energy prediction residues after intra prediction. This paper proposes a new method for encoding the high energy prediction residues using a Mode dependent Fuzzy vector quantization (MDFVQ). The Fuzzy clustering method is used to generate the code book from the training sequences. The MDFVQ code book is optimized by using rate-distortion (RD) optimization criteria.**

Keywords*— *MDFVQ; Quad tree Decomposition; Intra Prediction; Residue coding;

I. INTRODUCTION

HEVC is the efficient video coding developed by JCT-VC (Joint collaborative Team on video coding). The intra prediction in HEVC is still limited in parts of an intra frame where there are lots of details, texture, edges present.

By extrapolating the reference pixel intensities from previously reconstructed frame blocks, the intra prediction is performed in H.264 and HEVC video coding schemes. In a block of pixel intensities predicted using planar or DC mode, the residues will have homogeneous patterns. If the block of pixels predicted using angular prediction modes, high energy prediction residues with directional structures are generated.

In [1], directional transform followed by an adaptive coefficient scanning procedure is used to encode the high energy prediction residues. In [3], a vector quantization based code book is developed through iterative training procedure to model the intra prediction residues.

In our proposed technique, the same procedure as given in [3], mode dependent but fuzzy vector quantization is followed. The code books for encoding the residues are developed using stochastic optimization technique PSO (Particle swarm optimization) algorithm. The PSO [2] model is used to design the code book for vector quantization. In PSO, particles (codebooks) alter the values based on their previous experience to generate the code book.

II. FUNDAMENTALS OF MDVQ BASED RESIDUE CODING

One of the efficient data compression techniques is Vector quantization method, which exploits correlation between vectors. In the vector quantization very difficult to find the best matching code word in the code book. The mode dependent vector quantization (MDVQ) is illustrated in Fig 1.

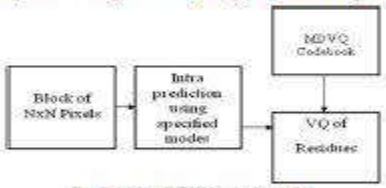

Fig1. Illustration of MDVQ based residue coding

In the mode dependent vector quantization process, initially the image divided into NxN block which are used in intra prediction. The MDVQ method is used to generate the code books for encoding the residual signal, which are performed after intra prediction in the image block. The code books are learned from the training vectors. The matching codeword corresponding index only sends to the receiver. After that the quantization error will be processed by the DCT transform and entropy encoding.

III. PROPOSED MDFVQ SYSTEM

The proposed work encoder and decoder diagram are shown in Fig 2(a) and Fig 2(b), the key frames are extracted from the input video and the HEVC standard is used to predict the intra modes in the initial frame of the video. The HEVC standard using the block sizes from 4×4, 8×8, 16×16 upto 64 × 64 pixels. First I frame is chosen as a key frame.

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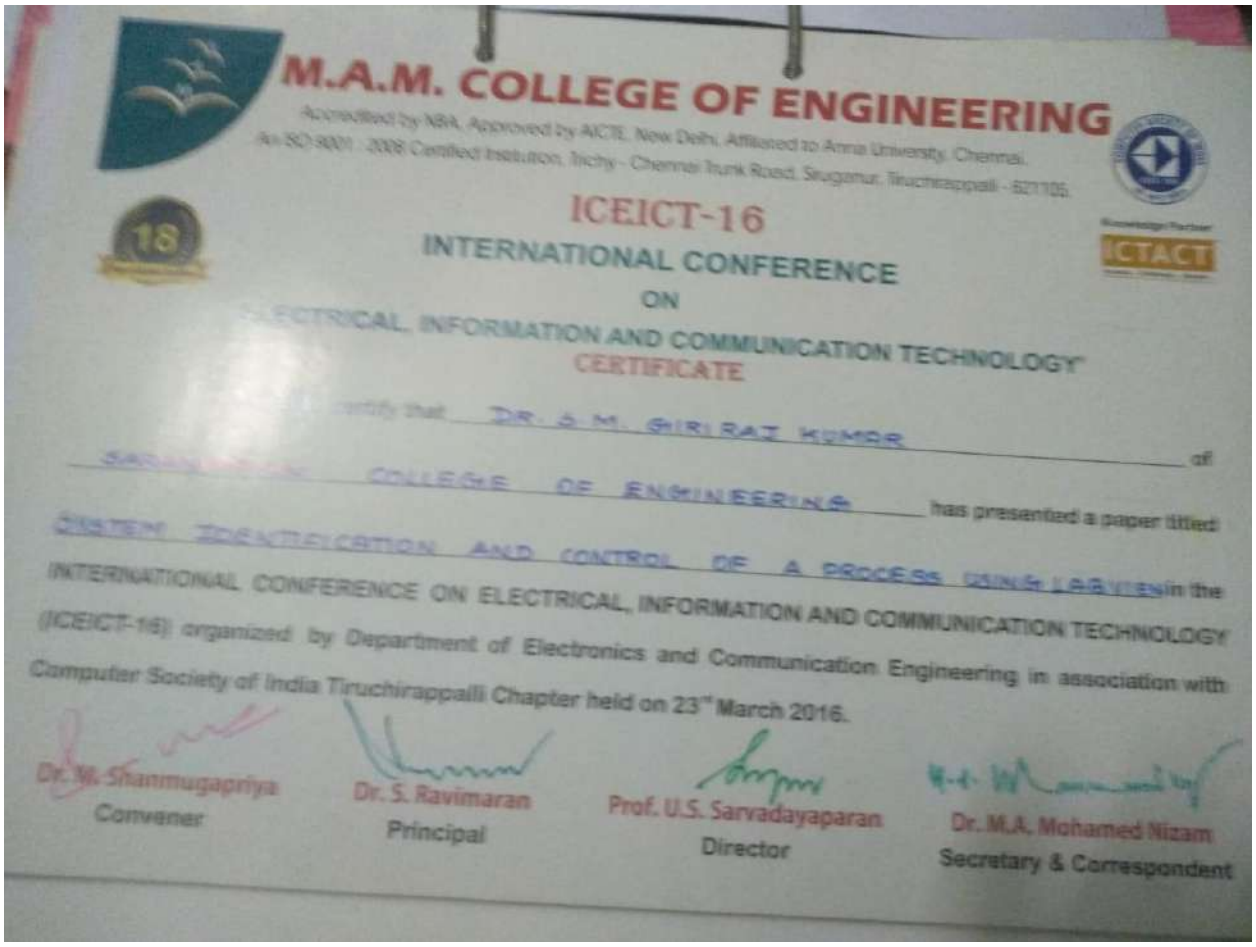

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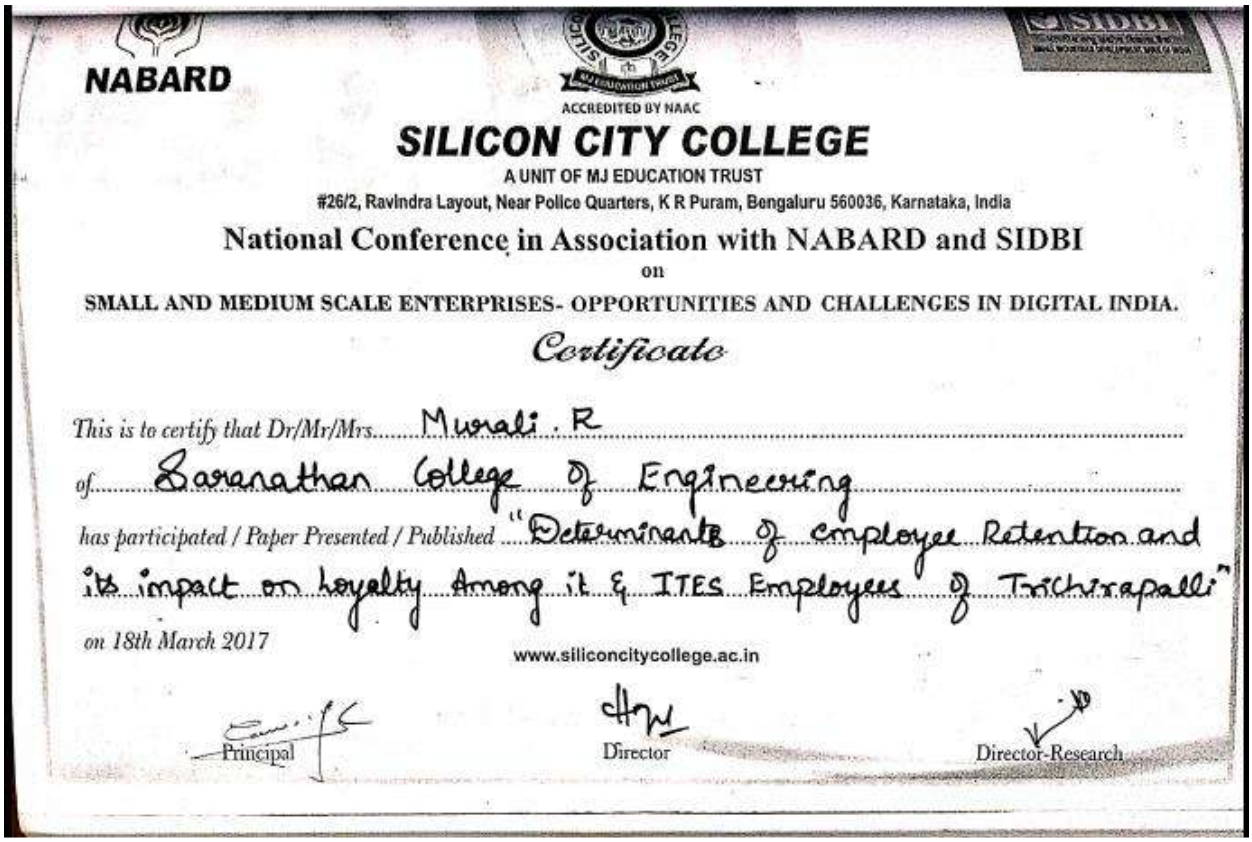

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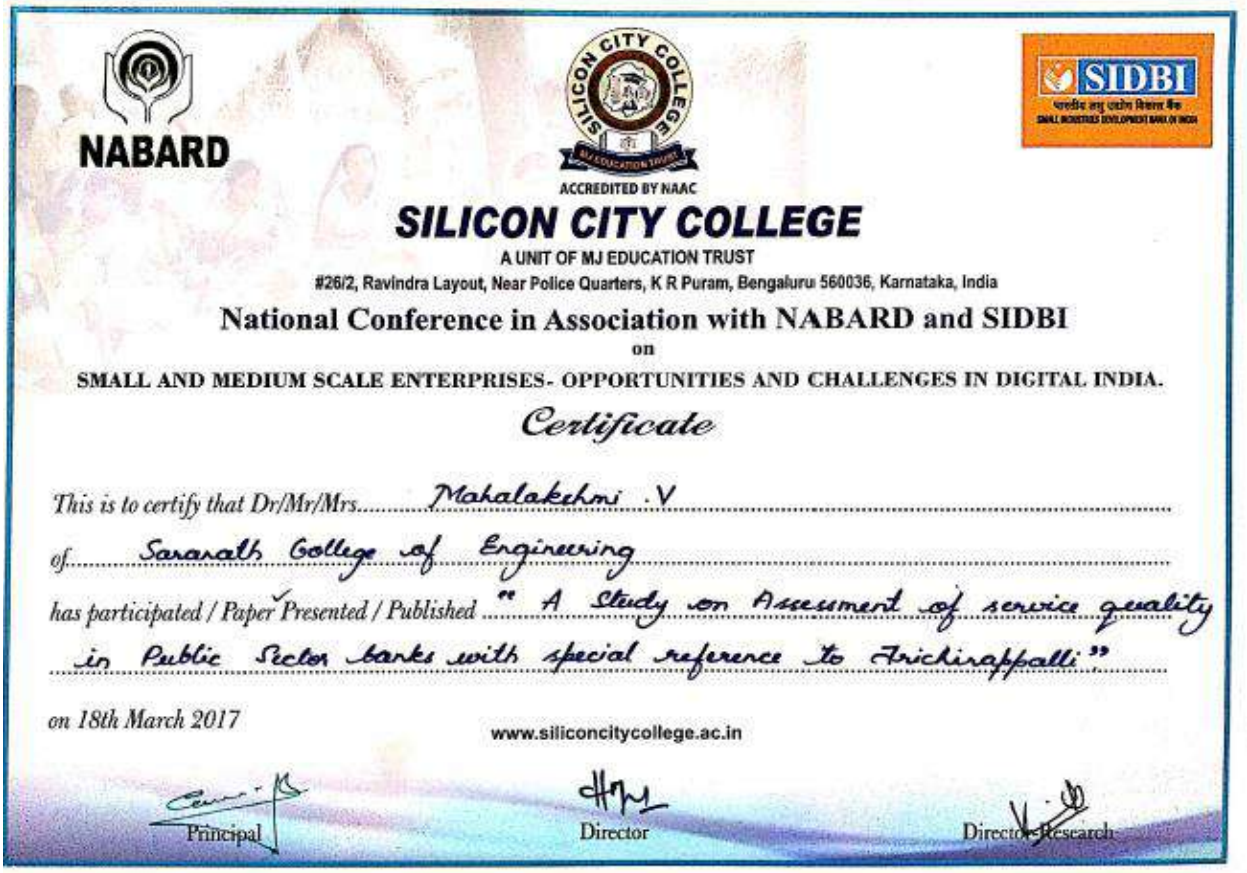

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CHE OP 13

COORDINATION MODES OF A NEW MANNICH BASE *N*-[PHENYL(PYRROLIDIN-1-YL) METHYL]ACETAMIDE AND ITS METAL COMPLEXES: SYNTHESIS, SPECTROSCOPIC AND ANTIMICROBIAL STUDIES

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Abstract

Synthetic heterocyclic complexes of transition metals have attracted much attention as promising objects in coordination chemistry. Transition metal complexes of Mannich base ligands are also widely studied because of their potential therapeutic uses. They are also useful in health and skin care products and in paint manufacturing. Our present study focused on the complexation behaviour of the biologically and important ions, oxovanadium(IV), manganese(II), iron(II), zinc(II), cadmium(II) and mercury(II). The complexes having the general formula MLX, ML_2X, $MLX.H_2O$ and $MLX.2H_2O$ (M= V^{IV}, Mn^{II}, Zn^{II}, Cd^{II} and Hg^{II}, L= ligand and X = $2Cl^-$, $2NO_3^-$ and SO_4^{2-}) have been prepared with *N*-[Phenyl(pyrrolidin-1-yl) methyl]acetamide(PBA). The complexes have been characterized by elemental analysis, molar conductance values, magnetic susceptibility measurements and various spectral studies. The spectral data reveals that the ligand acts as bidentate and tridentate coordination to the metal ion through the CNC nitrogen, carbonyl oxygen and amido nitrogen atoms. All the complexes are of high spin and most of are octahedral geometry. The conductance measurements indicate non-electrolytic nature of the complexes. The low molar conductance values of 10^{-3} M solution of the complexes in DMF reveal their non-electrolytic behaviour. The biological activities of the ligand and complexes have been screened in vitro against the bacteria *E.coli, S.typhi, P.aeruginosa, B.subtilis, S.pyogenes and S.aureus* and pathogenic fungi *A.niger* and *A.flavus*. The complexes are more antibacterial and antifungal activities than the ligand against all the bacteria and fungi studied.

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CHE OP 11

STUDIES OF CORROSION INHIBITION ON MILD STEEL IN ACID MEDIUM WITH SOME NEW MANNICH BASE LIGANDS CONTAINING AZOMETHINE NITROGEN AND CARBONYL OXYGEN ATOMS

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[b]Department of Chemistry, Mount Zion College of Engineering & Technology, Pudukkottai.

Abstract

In the present study aims at the inhibition performance of Mannich bases towards the corrosion of mild steel in hydrochloric acid medium at different concentrations. We have used four Mannich bases *N*-[Morpholino(phenzyl)methyl]acetamide(MBA), *N*-[Morpholino(phenzyl) methyl]benzamide(MBB), *N*-[Phenyl(pyrrolidin-1-yl)methyl] acetamide(PBA) and *N*-[Phenyl (pyrrolidin-1-yl)methyl] benzamide (PBB) for studying their inhibiting properties on corrosion of mild steel in 5%, 10%, 15% and 20% HCl solution. Inhibition of mild steel corrosion in acidic solutions by ligands can be explained on the basis of adsorption. These compounds inhibit the corrosion by controlling both the anodic and cathodic reactions. In acidic solutions, the compounds exist as protonated species. These protonated species adsorb on the cathodic sites occurring through the π-electrons of aromatic ring and the lone pair of electrons of nitrogen and oxygen atoms, which decreases anodic dissolution of mild steel. The values of metal loss and inhibition efficiencies of all the compounds were found to depend on their molecular structure. The inhibition efficiencies have been found to be in the order PBB > PBA> MBB> MBA. Among these compounds, the pyrrolidine substituted compound showed the highest IE. The presence of pyrrolidine group in PBB increases the density of electrons on nitrogen atom caused by resonance effect which facilitate stronger adsorption of PBB on the mild steel surface. The IE goes on decreasing with decrease in molecular weight as a consequence of the decrease in the electron density on nitrogen atom From the data it is clear that the corrosion rate of mild steel decreases with increase in concentration of the inhibitor. The inhibitor efficiency was found to increase with increase in concentration of the inhibitors.

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Hydrocast Pressure Based Routing Mechanism for Underwater Acoustic Sensor Networks

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Abstract: An energy efficient and attack resistant trust model named ARTMM (Attack Resistant Trust Model for Multidimensional trust Metrics) is used for increasing the performance of the network. The proposed work tends to increase the routing efficiency of the network by minimizing the number of packet transmission through the multiple hops. For this, the proposed system for trust model involves HydroCast which uses a novel opportunistic routing mechanisms to select the subset of forwarders which is used for the transmission of data to sonobuoys. This routing scheme is a hydraulic pressure based any cast routing protocol which has a set of selected data forwarders in the network. The sensor nodes transfer data to the forwarder and the forwarder further transfer data to the sonobuoys. Hence a group of nodes is assigned for each data forwarders. When a higher priority node transmits a packet, other low priority nodes should be able to suppress forwarding in order to prevent redundant packet transmissions and collision. All neighboring nodes that receive the packet will assess their priority based on how close they are to the destination, i.e., the closer to the destination, the higher the priority. This mechanism will increase the throughput and reduce the delay of the transmission and hence achieves the reliability.

Keywords: ARTMM, sonobuoys, trust, opportunistic routing, multidimensional.

I. INTRODUCTION

Traditional methods such as remote telemetry and sequential local sensing cannot satisfy many application needs but technology demands a real-time, highly precise, fine grained spatio-temporal sampling of the ocean environment, which in turn gave rise to the need for wireless underwater acoustic networking.

Basically, the communication links of Under Water Acoustic Sensor Networks (UW-ASN) are based on acoustic wireless technology, which has unique challenges due to the harsh underwater environment, such as high and variable propagation delays, limited bandwidth capacity, high error rates in BER, and temporary losses of connectivity caused by multipath and fading phenomena.

There are two different communication architectures for Underwater Wireless Sensor Networks (UWSNs), i.e., the *two-dimensional (2D) architecture*, where sensors nodes are anchored to the ocean bottom, and the *three-dimensional (3D) architecture*, where sensors float at different depths in ocean covering the whole volume of monitored region. While the former is designed for networks whose goal is to monitor the ocean bottom, the latter is more appropriate to detect and observe phenomena that cannot be sufficiently done by means of ocean bottom sensor nodes.

Fig. 1- General scenario of underwater mobile sensor networks

The general scenario of node deployment in underwater environment is shown in Fig. 1.Sensor networks that are used for underwater communications varies in different aspects from conventional wired or even terrestrial sensor networks. Firstly, consumption of energy are different for each stage because some important applications require large amount of data, but very rarely. Secondly, these networks usually work on a general task instead of representing independent users. The ultimate objective is to maximize the successful rate of packet delivery rather than fairness among the nodes. Thirdly, for these kind of

Comparison of Modulation Techniques for Underwater Optical Wireless Communication at Mallipattinam, Tamil Nadu

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Abstract— In this survey, we explore the possibilities of water attenuation in an underwater optical wireless communication system by using different modulation techniques(QPSK,ASK and OOK) and laser based systems .For underwater light propagation scattering and absorption are the leading sources that may bound the transmission length. We consider for parameters such as transmitter optical power, transmitter divergence angle, transmitter efficiency, receiver efficiency, receiver diameter, receiver sensitivity, chlorophyll concentration and water concentration and also converse the other considerations. The laser based wireless communication systems are feasible solution to high speed and large distance data transmission applications with data rate of 155 Mbps, wavelength of 650 nm and power of 15 mw.

Keywords—underwater communication, modulation, optical wireless communication

I. INTRODUCTION

A most important challenge facing ocean exploration and surveillance is how to rapidly and precisely communicate the data obtained by the unmanned system to a surface ship or shore-based station. Underwater communication is broadly used in military, industry, and scientific communities. This communication interface with data rates in the range of few to tens of Mbps. Optical fiber or copper cabling can be used for sufficiently large devices, a wireless link is desirable in many situations. Radio frequencies are profoundly attenuated in seawater. For short-range links, optical communication shows potential alternative. LED-based systems are used for low-cost, low power, and compact systems. Laser-based systems can be used for extended ranges, high data rates and low latencies. Underwater optical wireless communication is an attractive alternative for high speed data links and is more directional in nature [1]. It is important to understand not only the spatial properties of scattered light in the ocean, but scattering will affect the temporally encoded information. Optical links appear to be an attractive alternative to acoustic methods as laser sources in the blue/green region of the spectrum, which shows a minimal absorption in seawater. In addition, data rates are not limited by frequency-dependent absorption as they are in acoustic. Underwater optical communications have the potential to achieve much higher data transfer rates than an acoustic communication system at considerably lower power consumption, simple computational complexity, and smaller packaging. The physical or geographical location of the optical link plays an important part in the total attenuation of the signal [2]. Various types of ocean water are used for analyzing the water quality and according to that quality various modulation and line coding techniques are used.

II. BACKGROUND AND RELATED WORK

Milonni Anoop (2010) has presented for three different types of optical wireless communication links: (a) a line-of-sight link, (b) a modulating retroreflector link, and (c) a reflective link. From their results, it is clear that as the water absorption increases, the communication performance decreases dramatically [3]. Tajbir Singh Hanora et al (2012) investigated the performance of the modulation techniques-BPSK and QPSK in the Nakagami channel and the Rician Channel. It is clear from experimental results, QPSK modulation provides double data rate than the BPSK modulation technique. Certain impairments associated with the FSO system, effect of scintillation index and Free Space Path Loss (FSPL) are also discussed [4]. Vennelas, A. et al (2014) using set of numerical results revealed the relations between various parameters such as error probability, wavelength, node density, transmitted power, data rate, etc., in order to achieve k-connectivity. They proposed model forms the basis of deploying reliable underwater optical networks suitable to deliver broadband services at far distances [5]. Mazin Ali A. Ali (2015) investigated the effect of water attenuation on an underwater optical wireless communication based on LOS model. Experimental results show that the performance of OOK and 2DPSK is more suitable for the underwater optical wireless communication [6].

Mazin Ali A. Ali (2015) theoretically analyzed the performance of an underwater optical wireless communications system using different modulation techniques and an avalanche photodiode APD receiver over underwater environment channels. Characteristics of bit error rate BER for different optical modulation techniques are studied [7].

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An Energy-Efficient Attack- Resistant Trust Model for Underwater Wireless Sensor Networks

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Abstract -Underwater wireless sensor networks have been recently proposed to support time-critical aquatic applications such as submarine tracking and harbour monitoring. In Wireless Sensor Networks (WSNs), sensors collaborate to perform various tasks, such as routing. A trust-based scheme of routing can be used to route around compromised nodes that attempt to upset this collaboration. In the existing system, the unique characteristics of Underwater Acoustic Sensor Networks (UASN) make it impossible to directly use these trust models. In this paper, a novel Attack-Resistant Trust model based on Multidimensional trust Metrics (ARTMM) is implemented for UASNs. In the ARTMM, multidimensional trust metrics including communication and energy levels are considered.

Keywords: submarine tracking, harbour monitoring, compromised nodes, trust and multidimensional metrics.

Survey over On-Chip Buses for VLSI Architecture with Optimized Delay for Multiprocessor System Design

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Abstract In VLSI system design speed, area, and power are the three parameters playing a vital role. Among them the speed is purely determined by the delay taken by the design for its processing. In the delay, the design delay is mainly decided by gate delay. Nowadays in the design, the path or routing delay dominates more towards the design delay compare to the earlier days where gate delay dominates more towards the design delay. Because of scaling down in the design, it is essential to concentrate more towards routing delay of the design to get the optimized delay or desired speed of the design. In this paper, various on chip buses used for VLSI Architecture for multi processor system design were surveyed in intention with delay optimization towards system design.

Keywords: VLSI Architecture, on chip buses, Multi core processor, System design, routing delay, path delay.

I-INTRODUCTION

For any system design, the speed is the important parameter to make it as a successful design. The speed of design is determined by the interconnect delay, which makes link between the IP by means of buses. So, in a System design on a chip, buses play a vital role to determine the speed of the system like design of System in Chip, Network on Chip and Multi-core Processor system. Buses like PLB, OPB, AXI, DCR buses plays a major role, in high speed system design. These buses are connecting the master with slave processors, peripherals and IPs. For any design there is a need to use buses in the optimum way to make optimum interconnect path in turn to increase the speed. Without those buses none other blocks in system design can be communicated. By concentrating the delay as the minimum in multi- core processor system design, leads to make impact in minimizing the delay. So, if the speed is achieved by minimizing the delay in the architecture of the system design surely it leads to better performance in the speed of the design in the multi processor system. So, various buses with their features were surveyed, compared and their contribution was viewed in connection with delay, which was briefed with various literature papers.

The flow of the paper is organized in the following way as, Section - I give about the Introduction. Section - II gives out the details about Multi-Processor System design using Micro Blaze. Section - III deals with Literature Survey with the existing on-chip buses. Section -IV says about bus Architecture for achieving optimum delay. Section - V deals with conclusion and future work.

II-MULT- PROCESSOR SYSTEM DESIGN USING MICROBLAZE ARCHITECTURE

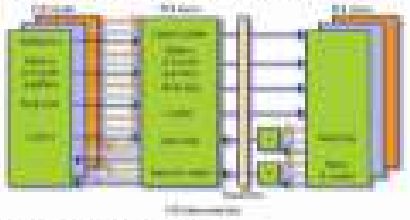

Fig 1 PLB interconnection[14]

In Fig.1 it was clearly expressed that the way how Processor Local Bus is making connect between the Microblaze with peripherals and memory.Fig.2 elaborates the same. But while using Multiprocessor system, one processor is working as a master and others as slave. The interconnect between the master and slave is also channelized by the bus PLB. [14]

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Novelty in Architecture of ROBDD for the Minimization of Interconnect Delay

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Abstract - In VLSI design of system configuration, three parameters are of major important. Among these three parameters speed, area and power the speed is dependent on the delay of the system. In high speed system design the design delay is contributed by interconnect delay which is the connecting delay of various modules (nodes) i.e. Integrated Protocol. Because of scaling down in the design of high speed system, it is essential to concentrate more towards interconnect delay of the system design to get the optimized delay. Two level and Multi-level logic minimization is a major problem in logic synthesis and also has the application in modeling in the stages of placement and routing, in fault modeling and in verification of combinational and sequential circuits. Binary Decision Diagram (BDD) is a well-known and widely used in logic synthesis and formal verification of integrated circuits. In this paper various structures of Binary Decision Diagram was studied and experimented to justify the reduction in interconnect delay.

Keywords – BDD, ROBDD, Algorithm, High speed system design, VLSI, routing delay, Logic minimization, High level synthesis.

I-INTRODUCTION

Various methods are there for the minimization of Boolean functions like Karnaugh map, Quine McCluskey method, Espresso method. Binary Decision diagram is a rooted acyclic graph. Each node is of in-degree one and out-degree two. These two has got indicated by the descending lines. One of the successors is drawn as a dashed line, called 'low', and the other is drawn as a solid line, called 'high'. These branch nodes define a path in the diagram for any values of Boolean variables. The '0' and '1' nodes are also called as the sink node. From the root, if the low branch is being followed then the path will reach to sink node '0' and , if the high branch is being followed then the path will reach to sink node '1'.[9]

This paper is organized as follows. Section - I says about the Introduction. Section - II deals about Binary Decision Diagram. Section - III deals with Literature Survey with Existing Architecture. Section -IV says about the proposed Architecture. Section - V deals with experimental results with conclusion of the work completed Section - VI brief about the future work.

II– BINARY DECISION DIAGRAM

Due to the symbolic representation of cubes for larger problem instances, the methods are orders of magnitude faster than the previous enumerative technique. But the quality of the approach largely depends on the variable ordering of the BDD. In BDD the computation time is not depend on path, but it mainly depends on the number of nodes. The BDD obeys two important restrictions. First it must be ordered (canonical representation) second, a BDD must be reduced, but which didn't waste the space. In this work, by studying different architectures of Reduced Ordered Binary Decision Diagram with different patterns of nodes leads to reduced routing delay which is realized by implementation.[10]

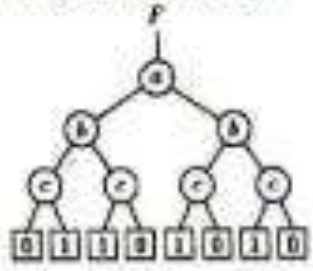

Fig.1. The Binary Decision Diagram with three variable for the realization of Boolean expression.[21]

A BDD is a directed acyclic graph Gf = (V, E) that represents a Boolean function f: Bn → Bm. The Shannon's decomposition g = xigxi + xi'gxi' is carried out in each internal node 'v' labeled with label (v) = xi of the graph, therefore 'v' has the two successors then (v) and also (v). The leaves are labeled with 0 or 1 and correspond to the constant Boolean functions. The root node root (Gf) corresponds to the function f. In the following, BDD refers to a reduced ordered BDD and

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Securing Cognitive Radio Network against Primary User Emulation Attack

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Abstract -Cognitive Radio (CR) is a promising technology for next-generation wireless networks in order to efficiently utilize the limited spectrum resources and satisfy the rapidly increasing demand for wireless applications and services. This technology allows the secondary user to access channel from the spectrum range without interrupting the primary (licensed) user. The intermittent spectrum sensing undertaken by the CR users, the activity of the licensed users of the spectrum, large-scale bandwidth variation based on spectrum availability, and the channel switching process need to be considered in the transport protocol design. Security is an important issue in the CR network. In this project we focus on security problems arising from Primary User Emulation (PUE) attacks in CR networks. In order to secure CR networks against PUE attacks, detection and defense approach is proposed. The proposed approach results in the increase of the performance of the CR networks.

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ENERGY DEPRIVED ROUTING PROTOCOL WITH AN EFFECTIVE QUEUE FOR WMNS

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Abstract-In WMNs, energy efficient routing protocols are required to optimize network performance. It has been devised an efficient Routing Protocol for Wireless Mesh Networks which achieved good energy efficiency and reliability. Probability of a sleep node is changed adaptively within the deployed network. This results in minimum energy consumption and maximum reliability in the communication network. Equivalent mathematical model of the same work is discussed in this paper. We used traffic models of Constant Bit Rate (CBR) and a smart Queuing technique to analyze the performance of this protocol. We have used the NS-2 simulator.

Keywords: WMNs Routing Protocol, Throughput, Energy Consumption, WFQ, Reliability, CBR

I. INTRODUCTION

An ad-hoc network is a collection of wireless mobile nodes dynamically forming a temporary network without the aid of any established infrastructure or centralized administration. The system may operate in isolation, or may have gateways to interface with a fixed network. Ad hoc networks have no fixed routers; all nodes are capable of movement and can be connected dynamically in an arbitrary manner. Nodes of these networks, which function as routers, discover and maintain routes to other nodes in the network. The topology of the ad hoc network depends on the transmission power of the nodes and location of the mobile nodes, which may change with time. The nodes (a router with multiple hosts and wireless communications devices) are free to move about and organize themselves randomly. Ad hoc wireless networks are self-creating, self organizing, and self-administering networks. Hence, they offer unique benefits and flexibility for a variety of situations and applications. Because of these features, the Ad hoc networks are used where wired network and mobile access is either unproductive or not feasible. A fundamental problem in ad hoc networking is how to deliver data packets among nodes efficiently without predetermined topology or centralized control, which is the main objective of ad hoc routing protocols. Since mobile ad hoc networks change their topology frequently, routing in such networks is a challenging task. Moreover, bandwidth, energy and physical security are limited. With the increasing popularity of mobile devices and wireless networks over the past few years, wireless ad-hoc networks has now become one of the most vibrant and active fields of communication and networking research.

II. ROUTING PROTOCOLS

Routing in Wireless Mesh Network has been a subject of extensive research over the past several years. Because of the fact that it may be necessary to pass several hops (multi-hop) before a packet reaches the destination, a routing protocol is needed [4]. Routing protocol has some problems that are Asymmetric links, Routing Overhead, Interference, Dynamic Topology. Mesh routing protocols can be classified based on different criteria. Depending upon the routing mechanism employed by a given protocol, it may fall under more than one class. Routing protocols for mesh networking can be classified [1] into table-driven and source initiated, while depending on the network structure these are classified as flat routing, hierarchical routing and geographic position assisted routing. Both the Table-driven and source initiated protocols come under the flat routing. A simple sleep active ad-hoc network is illustrated in the diagram. Based on routing information which includes updating the routing mechanism (proactive or) table-driven, (reactive or) on-demand and hybrid protocols, packets are transmitted in wireless mesh network. Since routing is the most important task and challenge also in WMNs, it should be executed efficiently in WMNs. Power management is an important technique to reduce the energy consumed in the wireless interface of battery-powered mobile devices. So, Energy Conservation is taken as a prime factor since all wireless devices usually rely on portable power sources such as batteries to provide the necessary power.

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Enhanced Image Steganography using DCT and DWT

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Abstract— **The rapid development of internet technology generates the requirement for hiding information to maintain the secrecy of the secret information during communication process. Steganography has become a predominantly employed information hiding technique in this modern era. Steganography transmits data by hiding the existence of the message over a carrier medium so that a viewer cannot detect the transmission of actual message. The goal of steganography is to embed secret data in the cover without making any significant changes to the cover medium. Steganography can utilize various medium such as image, audio, video as carriers for the secret message. The image steganography is very popular due to popularity of digital image transmission over the internet. It can be done by either spatial or spectral domain. During communication process, image steganography based on spatial domain does not provide full security. In this paper transform domain approach was proposed. The proposed scheme uses DCT and DWT for image steganography. In the proposed method cover image is transformed from spatial domain to spectral domain, where the transformation is done by two dimensional DCT and DWT. The performance metrics such as PSNR and MSE are taken into account in order to compare the quality of the stego image obtained from both DCT and DWT. From the performance evaluation, DWT based image steganography provide better quality when compared to DCT.**

***Index Terms*— Steganography, DCT, DWT, MSE, PSNR**

I. INTRODUCTION

Internet technology plays a vital role in our day to day life. The secure transmission of digital media conveniently over the internet has faced many problems. Security and privacy are major issues when digital communication is considered. Nowadays, several techniques are developed for security and privacy issues to protect the data from unintended receivers. Steganography is the knowledge of communicating secret information by hiding content of the data to be transferred and also hiding the existence of the data from the eyes of the intruder. Modern steganography uses multimedia objects like image, audio, video as cover media to hide the secret information. Hiding information into a medium requires three elements:

- The cover medium that holds the secret message
- The secret message
- Stego key

On the basis of cover object, steganography can be divided into: i) Text steganography, ii) Image steganography, iii) Audio steganography, iv) Video steganography. Images are most commonly used cover medium for steganography. The secret message to be transmitted is embedded in a digital image using an embedding algorithm. The cover image with the secret image embedded is known as "stego image" which is sent to the receiver. At the receiver, secret message is extracted by using an extraction algorithm. During the transmission of stego image over the network, unauthorized persons can only notice the transmission of an image but cannot see the existence of the image. Therefore the stego image is safe from intruder.

Image steganography mainly classified into two categories.

- Spatial domain steganography
- Transform domain steganography

Spatial domain methods are easy and fast but are less robust again attacks. Frequency domain methods take the advantage of the human visual system's low sensitivity to high and middle frequency information. The primary motivation of the proposed work is to compare PSNR obtained by both DCT and DWT.

II. REVIEW OF PREVIOUS WORK

When doing survey and analysis of different methods, each method has so many advantages and disadvantages. Different steganographic techniques are discussed in spatial domain and frequency domain. In paper [1] an enhanced security technique for steganography using DCT and RSA was proposed, which describes a secure DCT based steganography algorithm. In this algorithm, secret image is encrypted before it is embedded into the cover image. In paper [2] LSB based image steganographic was proposed to enhanced data hiding capacity. The secure image based steganography and cryptography with watermarking was proposed in paper [3] to protect the secret information. This method proved to be a highly secured method for data communication. Wavelet based ECG steganography was proposed in paper [4] for protecting patient confidential information. The proposed method combines the encryption and scrambling technique that would provide a secured communication and confidentiality in a point of care system. The cryptography-combination of cryptography and steganography technique was proposed in paper [5] to secure the secret information. Image steganography and security enhancement using S-DES technique was proposed in paper [6] that provides a secure data communication over internet. Text based steganography was proposed in paper [7] that could provide a two layer of authentication system.

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Design and Simulation of Superior Quality Input Current Rectifier Based on Boost Topology

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Abstract— **This paper deals with an active input power factor correction with single phase bridge rectifier fed boost converter topology using hysteresis current control technique. The duty ratio is obtained by the comparison of a inductor current and a ramp carrier waveform which is associated with hysteresis controller in each switching period. In this work MATLAB/Simulink power system toolbox is used to simulate the proposed system. Simulation results are presented and the improvement in the supply current is illustrated in this work. As the result, the input current waveform is fashioned to strictly sinusoidal and in-phase with supply voltage, entailing high power factor.**

Key Words — **Power Factor Correction (PF), AC-DC converter, Boost topology, Total Harmonic Distortion (THD).**

I. INTRODUCTION

Principally, Harmonic pollution and low Power Factor (PF) in power systems are usually caused by inductive loads such as transformers, electric motors and high intensity discharge lighting and this low Power Factor has been corrected by implementing different types of available schemes. However, currently the trend is shifting to electronic equipments are more and more being used in everyday life. A fixed ac into variable dc converter is a innermost part of any power supply unit used in the all electronic equipments. In this converter, input current on AC side is wealthy in low order harmonics due to filter capacitor, inductor and switching device. Due to the occurrence of these harmonics, the Total Harmonic Distortion (THD) is high. Hence the input power factor is poor. Harmonic voltages and currents in an electric power system are a outcome of non-linear electric loads. The harmonics is measured by the factor THD. Due to the presence of harmonics the current increases which will decrease the input Power Factor. In order to improve the input Power Factor in case of the non-linear load, the Power Factor Correction circuit is necessary [1]. The harmonic and power factor characteristics of switched-mode power supply have attracted more attentions in the power electronics community in the last decade or so. There are various researches on the topology and control method of the active PFC applications. Among them, boost converter is a common one for PFC purpose due to its improved noise performance, less total harmonic distortion and easy implementation with commercial Integrated Circuits [2]. For single-phase power-factor correction (PFC) converters, two main approaches are followed for converter and control design. The input current does not inherently track the input voltage, an input-current controller is now required. The most commonly employed topology for this purpose is the boost converter [3]. In Pulse Width Modulation (PWM) dc–dc converters with current-mode control, the relationship between duty cycle and inductor current is an essential characteristic in closed-current loop behavior [4],[5]. In recent years, the power factor correction (PFC) technique has gained wide attention in low-power off-line power supply development due to the requirements imposed by the European standard IEC 1000-3-2 [6]. The boost front-end is used to achieve a close-to-unity power factor and low total harmonic distortion (THD) [7]. Even though all the earlier works made a great contribution to improve the power factor of AC to DC converters, the proposed system developed in this paper will be effective for improving the power factor and insist on harmonic standards and guiding principle which will limit the current twist permitted into the utility i.e. AC side.

II. CURRENT SHAPING TECHNIQUE ON AC SIDE

An input-current waveform can be imposed by either active or passive methods. Passive methods have the advantage of simplicity, but the current waveform is generally load dependent. The maximum Power Factor that can be obtained in passive method is in the range 0.7 to 0.8 Active schemes

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Simulation and Performance Analysis of CCM Zeta Converter with PID Controller

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Abstract— **DC-DC conversion is the chief stem of Power Electronics and is progressing rapidly. Many new topologies are still created every year. The Zeta converter is another converter topology to provide a regulated output voltage from an input voltage that varies above and below the output voltage. The benefits of the Zeta converter over the SEPIC converter include lower output-voltage ripple and easier compensation. The non-pulsating output current of the Zeta converter allows for the use of small output capacitors for satisfying the load voltage ripple requirement. The objective of this paper is to design and implement the CCM mode operation of non-isolated Zeta converter. The design formulas for the continuous conduction mode (CCM) are given. This paper deals with design and steady state analysis of closed loop non-isolated Zeta converter using PID control technique. The simulations have been performed by using MATLAB/Simulink. Through simulation it is confirmed that a PID compensation method improves the output response of the system.**

Index Terms—**Zeta Converter, Continuous Conduction Mode (CCM), PID controller, DC-DC Converter**

I. INTRODUCTION

DC-to-DC converters are circuits which convert sources of direct current (DC) from one voltage level to another by changing the duty cycle of the main switches in the circuits. These converters are widely used in regulated switched mode dc power supplies and in dc motor drive applications. Operation of the switching devices causes the inherently nonlinear characteristic of the DC/DC converters. Due to this unwanted nonlinear characteristics, the converters requires a controller with a high degree of dynamic response. Pulse Width Modulation (PWM) is the most frequently consider method among the various switching control method. In DC/DC voltage regulators, it is important to supply a constant output voltage, regardless of disturbances on the input voltage. The input to these converters is often an unregulated dc voltage, which is obtained by rectifying the line voltage and it will therefore fluctuate due to variations of the line voltages [1], [2].

There are various types of DC-DC converters such as, Buck converter, Boost converter and Buck-Boost converter. The output of buck converter is less than the input voltage whereas the boost converter output is greater than the input voltage. The polarity of buck-boost converter is inversed of input signal. Fourth order converter had made applications of power possible where the demand for such requires less input voltage and high output voltage. Zeta, CUK and SEPIC converter are examples of these. These converters have the ability to either buck or boost the voltage applied to their inputs depending on their applications [3], [4].

Typical PWM DC/DC converters including the well-known buck, boost, buck-boost, CUK, Zeta, and SEPIC are categorized into buck and boost families. Using an alternative approach to modelling PWM DC/DC converters out of basic converter units (i.e., buck and boost converters), the small-signal model of the Zeta converter with CCM is derived in terms of h parameter (for buck family) [5].

At low charge level, the voltage may drop below the battery voltage for continuously supplying the load with constant voltage. Simplified steady-state analysis of the PWM Zeta converter for both continuous and discontinuous inductor current modes was described. Treating the converter with separate inductors as a particular case of the more general coupled-inductor case, the analysis results cover both the converter versions coupled and non coupled inductor [6].

Controller design for any system needs knowledge about system behaviour. This involves a mathematical relation between inputs to the system, state variables, and output called modelling of the system. The State variable approach is a power technique for analysis of switching converters. The state model of a system consists of the state equation and output equation [7], [8].

The input signal is given to the DC-DC converter, the output of the converter is send as feedback to a controller. A PID controller attempts to correct the error between a measured process variable and a desired set point by calculating and then outputting a corrective action that can

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Modeling and Simulation Of PWM Based Sliding Mode Voltage Controller For Boost Converter In Continuous Conduction Mode

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Abstract— **SM control is a kind of nonlinear control which has been developed predominantly for the control of variable structure systems. Being a control method it has a high degree of flexibility in its design choices, the SM control method is relatively easy to implement as compared to other nonlinear control methods. The design procedure and mathematical modeling for the Boost Converter has been interpreted. In this paper the sliding coefficient for the controller has been selected based on fulfilling the hitting, existence and stability conditions. The controller equations for the selected bandwidth have been derived and modeled using MATLAB/SIMULINK.**

Keywords—Sliding Mode Control, Boost Converter, Sliding coefficient, Modeling

I. INTRODUCTION

Power electronic converters are key stone in power systems. All power electronics converters are intrinsically variable structured in their control methodologies, be it linear or nonlinear. DC-DC Converter is the circuits which convert sources of direct current (DC) from one voltage level to another. The measured output voltage will not be equal to the desired output voltage due to external disturbance like noise, wide input voltage variations, load variations and change in the parameter value. To get the desired output irrespective of the external disturbances control is needed[1].The average control value is obtained from the controller by comparing the measured output voltage and the reference voltage then it is given to the PWM modulation to get a modulated output, then this is given as an input to the power electronic converter. So the control technique suitable for DC-DC converter must cope with their wide input voltage variations and load variation[3]. The general control principle for a power electronic converter is shown in the figure 1. There are linear and nonlinear controls, to design a linear controller for switching power converters a class of linear equations or a circuit model for system description is derived[4]. Having this model one can use different methods for syntheses of linear controllers. In this nonlinear control linearization is not required. The system easily adapts to the input and load variations[5]. Compared to linear control, nonlinear control is more accurate and reliable.

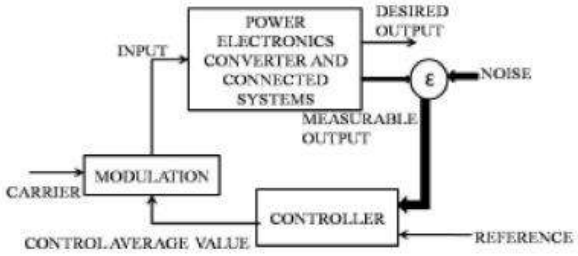

Fig 1. General control principle for a power electronic converter

SM Control is a nonlinear control approach which compiles with the nonlinear characteristic inherent in the DC-DC Converters[6]. The general function for the switching control law for a specified surface was it will drive a nonlinear plant state trajectory to its specified surface at a stipulated time[7]. This surface is called as sliding surface[8].The difference between conventional control methodologies and the actual SM control methodology can be distinguished by the way in which the controllers are being designed [9]. In this SM control initially the mathematical model of the Boost converter for the précised output has been modeled[10]. Then the control parameters are chosen by satisfying the hitting condition, the existence condition, and the stability condition of the SM control law [11]. The selection of sliding coefficient and the controller equations for the desired bandwidth is derived. The control structure is formed and then it is simulated using MATLAB/SIMULINK.

II. BOOST CONVERTER MODELING

Designing a Boost Converter using the specifications: Input Voltage V_s = 12V; Output Voltage V_o= 30V; Frequency= 25 KHz; Variation in inductor current is about 20%; Output voltage ripple is less than 5%.

By using the above specifications the values are calculated and tabulated below:

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EFFICENCY AND POWER PACKING DENSITY IMPROVEMENT FOR DC-DC BOOST CONVERTER BY SOFT SWITCHING TECHNIQUES

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***Abstract*— This paper focuses on power loss analysis of non-isolated hard switching boost converter and quasi resonant ZVS (zero voltage switching) soft switching boost converter for various switching frequency in Power Conditioning System (PCS). Efficiency comparison and power losses of passive components are calculated for various switching frequency. The design and performance of the system is verified through simulation using PSPICE software.**

Keywords—power conditoning system, pspice simulation, hard switching, soft switching, Boost converter .

I. INTRODUCTION

Power supply technology is an enabling technology that allows us to build and operate electronic circuits and systems. All active electronic circuits, both digital and analog, require DC power supplies. In future, most of the application requires high efficient dc–dc converters. Major thrust for dc-dc converters is to achieve a high power packing density and conversion efficiency. To achieve the above task, frequency of the switching converter is often increased and it reduces the size and weight of the passive components like inductance, capacitance [1,2]. For high frequency operation MOSFET (Metal Oxide Field Effect Transistor) is suitable choice for dc-dc converter based applications. At high switching frequencies, capacitive turn-on losses in power MOSFETs become the predominant switching losses. However turn on losses affect the system performance, in order to reduce the turn on loss one of the attractive solution is soft switching technique. As for [8] Figure.2 clearly explains during turn ON condition both V_{ds} and I_{ds} greater than zero, which leads to switching power loss[3,5]. But in case of soft switching technique it shapes the switch current and voltage so that high switch current and high voltage is never present simultaneously. In case of ZVS it reduces the turn on losses, for ZCS it reduces turn off switching losses. For high frequency application ZVS is more preferable choice for compare to ZCS [4].

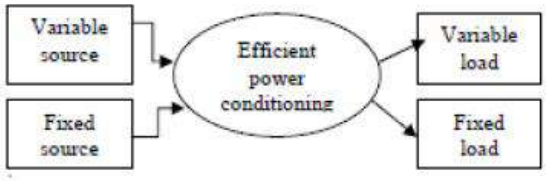

Fig.1. General block diagram for PCS

This paper presents the power loss analysis and efficiency comparison of the non-isolated hard switching boost converter for non-ideal case in section 2. In section 3, power loss analysis of quasi resonant ZVS boost converter for non-ideal case. Then, to verify and validate the proposed topology, a 250W dc dc converter was simulation and a test was performed to compare the efficiency before and after using advanced soft switching techniques. Finally, the point of efficient operation of the boost converter is determined graphically.

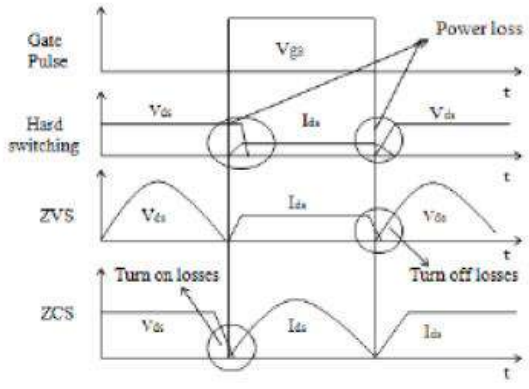

Fig .2 Effects of hard switching.

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Vitals Admonisher

Enhancement in Mobile Health using LabVIEW and myRIO

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***Abstract*—Vital signs of human beings include body temperature, heart rate, blood pressure and respiratory rate. These vital signs are collectively called as vitals, measurement of these parameters are used to measure human body's basic functions. These measurement help assist general health care, determine the intense of diseases and progress in recovery. This paper aims to measure these parameters with cost efficient digital sensors, processing and manipulating the acquired signals with Linux RT OS and FPGA (*Field Programmable Gate Array*), Embedded system using LabVIEW and RIO (*Reconfigurable Input/Output*), (*Design and development platform combining software and hardware*). FPGA performs tasks with programmable hardware parallelism with reduced latency and in much lesser clock cycle than a microprocessor/microcontroller. The acquired data are logged and handled in decentralized data management system which can be used for future analysis. This leads to the new technological enhancement of mHealth (*mobile health*).**

***Keywords*—RIO (Reconfigurable Input/Output), FPGA (Field Programmable Gate Array), NI LabVIEW and myRIO, mHealth.**

I. Introduction

There is still a struggle to control diseases such as hypertension, heart diseases where the cause of disease is not a particular germ or bacteria but the mental tensions or the stress due to our faulty lifestyle. The improper lifestyle particularly the Dietary habits (junk food consumption), insufficient sleep or rest and addiction to drugs (Smoking, drinking) makes anyone susceptible to these diseases. Unfortunately, with the modern lifestyle everyone is susceptible to these diseases. Patients suffering from these diseases need sophisticated devices to monitor their body functions, which are expensive and need trained persons to handle it [1].

This project is development of a system to monitor the vital signs. The design of this system employs the inexpensive system design approach, making use of the existing technological devices we use in our day-to-day life, PC-Laptop and Smartphone. Vital signs (often shortened to just vitals) are measurements of the body's most basic functions. The four main vital signs include Body temperature, Pulse rate, Respiration rate and Blood pressure. Measurement of these parameters help assist general health care, change in these parameters determine the type and nature of the disease, effects caused by the diseases and progress towards recovery. Precision centigrade temperature sensor (LM35), photoplethysmography sensor (XD53) and MEMS microphone to measure human body temperature, heart rate, blood pressure and respiratory rate.

myRIO an embedded system with Linux RT OS and FGPA (Field-programmable gate arrays). FPGAs are reprogrammable silicon chips, combine the best parts of Application-Specific Integrated Circuits (ASICs) and processor-based systems. Hardware-in-the-loop (HIL or HWIL) simulation, using LabVIEW provides an effective platform by reducing the complexity of the system under control to the test platform making the embedded system to be interact able with the simulation and real time. User interface to system is made through the server and client (Internet) VIs (Virtual Instrument) GUI (Graphical user Interface) of personal computers. Portable monitoring and of the parameters using Data Dashboard for LabVIEW through smartphones and tablets. The acquired data are logged and handled in decentralized data management system which can be used for future analysis. This leads to the new technological enhancement of mHealth (mobile health) which helps both the patients and their doctors to keep track of progress towards recovery from the disease.

II. setup

The vitals admonisher setup consists of three stages namely Biological signal sensing & acquiring, signal processing and user interface [1]. The block diagram of the vitals admonisher setup is shown in Figure 1.

A. *Sensors Network*

The sensor network consists of these sensor to measure
Body temperature
Heart rate
Blood pressure
Respiratory rate.

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ABS – 153

EXTRACTION OF LITHIUM AND COBALT FROM USED UP LITHIUM ION BATTERY BY HYDROMETALLURGY PROCESS

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In this work, a hydrometallurgical process based on leaching is applied to recover cobalt and lithium from spent lithium ion batteries (LIBs) using hydrogen peroxide was introduced as leaching reagent. This hydrometallurgical process is found to be simple, environmentally friendly and adequate for the recovery of valuable metals from spent LIBs.Effects of reaction variables on leaching in hydrochloric acid of $LiCoO_2$ contained in cathodic electrode of spent lithium ion batteries were investigated. The dissolution of $LiCoO_2$ was found to increase with an increase in temperature, concentration of HCl, time and solid/liquid (S/L) ratio. The metal values contained in the leach liquor were recovered by chemical precipitation. Cobalt was separated as cobalt hydroxide and lithium was separated as lithium carbonate. A leaching process for the recovery of cobalt and lithium from spent lithium-ion batteries (LIB) is developed in this work. The cathode active materials before and after acid leaching are characterized by X-ray diffraction (XRD), FTIR, EDAX and scanning electron microscopy. The leaching mechanism likely begins with the dissolution of the active material ($LiCoO_2$) in the presence of HCl and H_2O_2 .An environmental analysis of the process indicates that it may be less energy and greenhouse gas intensive to recover Li & Co from spent LIBs.

ABS – 154

PREPARATION, SPECTRAL CHARACTERIZATION AND BIOLOGICAL STUDIES OF A NEW MANNICH BASE SYNTHESIZED BY THREE COMPONENT CONDENSATION OF MORPHOLINE, BENZALDEHDYE AND BENZAMIDE AND SOME OF ITS TRANSITION METAL CHELATES

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research. A great deal of attention in this area has been focused on the complexes formed by transition metal ions with hydrozones. In view of their applicability in various fields, hydrozones, with diatomic >C=O & HN< linkages, takes the forefront position in the development of coordination chemistry. Here, we present the preparation, spectral characterization and biological studies of a new Mannich base ligand N-[Morpholino(phenzyl)methyl]benzamide(MBB) derived from morpholine, benzaldehyde and benzamide. Elemental analysis and spectral data (IR, ^{1}H, ^{13}C NMR, UV-Vis and Mass) confirm the structure of the ligand. The complexes of Zn^{II}, Cd^{II} and Hg^{II} with MBB have been synthesized. The resulting complexes were characterized by elemental analysis, conductivity measurements, IR and ^{1}H NMR spectral studies. On the basis of spectral data, it is inferred that the ligand acts as a bidentate/tridentate coordination to the metal ions. Based on the conductance measurements, the complexes were found to be non-electrolytes. The presence of coordinated water molecules in some of the complexes was indicated by IR spectra and TG analysis. From the analytical and spectral data, the stoichiometry of these complexes have been found to be [$M.SO_4.L.H_2O$, $M.Cl_2.L.2H_2O$ and $M.SO_4.L$] {where M = Zn^{II}, Cd^{II} and Hg^{II}}. From the data obtained, Hg^{II} sulphato complex exhibits tetrahedral geometry and the other three correspond to octahedral geometry. The antimicrobial activities of the ligand and its complexes were studied against six bacteria and two fungi by disc diffusion technique. Zn^{II} sulphato complex was found to be more active than the rest.

ABS – 155

NEW MANNICH BASE LIGANDS DERIVED FROM ACETAMIDE USED FOR THE REMOVAL OF TOXIC METAL IONS FROM TREATED INDUSTRIAL WASTEWATER

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Now a day the industrialization and urbanization releases excessive amount of toxic metals into the environment has posed a great problem worldwide. The rapid increase in industrial development has enhancing pollutants, which affect plants, animals and human

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