



Avinashilingam Institute for Home Science  
and Higher Education for Women

# **SCHOOL OF ENGINEERING**

Department of Electronics  
and  
Communication Engineering

**ECE QUEST**  
2018-2019



## **Avinashilingam Institute for Home Science and Higher Education for Women**

### **School of Engineering Department of Electronics and Communication Engineering**

#### **VISION OF THE DEPARTMENT**

To offer quality education in the field of Electronics and Communication Engineering, empowering the women students with good technical expertise, professional competence and moral values.

#### **MISSION OF THE DEPARTMENT**

To achieve the vision the department will,


- Foster a conducive learning environment to enable the students to get well versed with the concepts in the field of Electronics and Communication Engineering
- Associate with the industries to make the students develop sufficient skills
- Encourage the students to involve in research to meet the societal demands
- Educate the students to practice personal harmony for self development

#### **PROGRAMME EDUCATIONAL OBJECTIVES**

Our graduates will,

- **PEO1:** Have a meaningful career in electronics, communication and related fields
- **PEO2:** Practice lifelong learning and pursue higher education to solve real world problems individually and in a team
- **PEO3:** Have leadership qualities to serve the nation





# ECE QUEST

## 2018-2019

### Contents

\* Abstracts in International Conference

\* General Articles in Electronics

Staff in charge : Dr. D. Veera Vanitha (AP/ECE)  
Ms. K.R. Priyanga (AP/ECE)

Student Editors : Ms. R. Priyadharshini (IV ECE)  
Ms. K. Santhiya (IV ECE)  
Ms. S.L. Sowmiya (III ECE)



# ABSTRACTS IN INTERNATIONAL CONFERENCE

(Indian Council of Medical Research (ICMR) sponsored two day seminar on  
'Technological Advances in Smart Healthcare Monitoring System using IoT')

## Glucose Bottle Monitoring System using IOT

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**Abstract:** Saline, one of the most popular intravenous (IV) therapy which plays a major role in the patients management who are critically ill. Surveillance of drip bottle level is very important because when the bottle is emptied and the needle is not removed from the vein then the blood flows outward into the bottle. In hospitals, the nurses or caretakers are responsible for monitoring the saline bottle level. The aim is to design an Intravenous Drip Sensor, using a capacitive probe to measure infusion rate, and display the number of drops passing through the drip chamber per minute i.e. the drip rate. If nurses working in hospitals forgot to change the glucose drip bottle once it is emptied, it will bring bad consequences to the patient. We will find the level of glucose in the glucose drip bottles that are used in the hospitals. When the glucose bottle is about to be emptied, an alert message is made to send to the nurses, doctors and attenders. The monitoring screen gets the information from observing gadgets and displays them graphically.

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## Agricultural Monitoring and Functioning of UAV -The Ultimate Guide

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**Abstract:** Drones referred as UAVs are mostly associated with industry, military and other specialized applications but with recent technology developments in area of sensors, the scope of drones has been widened to other areas like Agriculture. The drones are widely increasing in agricultural application. The Agriculture and allied sectors are the most crucial sectors of the Indian economy, but agriculture sector is facing lot of difficulties now-a-days. One of the main reasons is the unavailability of labours for the farming processes. Manual spraying of pesticides and fertilizers are responsible for many chronic diseases of crops. The major case study of the paper is the analysis of crops at different views by satellite remote sensing technology. The crops on large area are observed (both interior and exterior) by multiple cameras and sensors. The drone will be helpful in spraying fertilizers, pesticides for nearly 7 kms being operated by a single person from a safe area at right time to help out farmers. By IoT Technology, the complete information about the crop and the drone condition will reach the farmer through message.

**Keywords:** Drone, Arduino, Remote sensing, Microcontrollers, IOT, GPS, GSM Module, Wireless sensor network.

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# IOT Based Smart Irrigation System with Wired Node Network

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**Abstract:** Irrigation is important source for agriculture cropping system. Water level is reducing because of continuous extraction of water from earth is reducing the water level thanks to that heap of land is coming back slowly within the zones of un-irrigated land. Improper planning of water usage leads to large amount of water goes waste. New water saving techniques is important and increasing rapidly right now. There is a good vary of crops and plants and plenty of forms of every plant or crop. Requirements for water, fertilizers and sun is different for Various plants and crops. Proper method of irrigation is important to improve the growth of the crops. In this project, Objective is to get real-time smart irrigation system by implementing a wired node network in small farming lands in different zones and irrigation will done by web application from remote area. This network structure control the irrigating lands by implementing periodic zone time based on water need of the crops with the help of Controller Area Network (CAN) also check the crop and land condition. User can irrigate the crops from remote area through web application and user can get frequent updates during running condition. This system provides user flexible and low-cost for the farmers. Higher end micro controller had used to design master device to control the nodes and submersible pump. Mid-range micro controller is use to design wired node devices to irrigate and check the crops.

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# Real Time Bus Arrival Monitoring System for Central Bus Station using Lora

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**Abstract :** Public bus service is one in all the foremost reasonable means that of transportation by majority of peoples to travel from place to place in the town area. The service in rural areas is not as frequent as like in the town area and the arrival time is unsure. This has caused inconveniences to the passengers. They are suffering and waiting for bus on their station for while since, they don't have updated real time information about their bus arrival. The foremost of the time wasted by the individuals is on awaiting for buses on the bus stations that is actually frightful. Here, a convenient and economical bus arrival info system is needed to provide services for the communities. So, it becomes essential to trace the buses real location using GPS and provide passengers foretold time of bus inward at the bus station and conjointly individuals should get the bus like where the bus is, is it in traffic. The proposed idea focuses on the implementation of a Real Time bus arrival monitoring system for central bus station by using Lora module. By putting in, LoRa module in central bus station observance unit and fixing LoRa module with GPS device on town buses. Bus unit can monitor the present GPS location and alternative information about the bus and therefore the central observance unit will monitor the bus arrival timing and other info about the bus. The proposed system that provides a real-time info concerning the current situation and calculable time of arrival of the buses.

**Keywords:** LoRa; Bus unit; Central bus monitoring unit; GPS; Bus location

# Sentiment analysis using additive regularization

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**Abstract:** Sentiment is a critical component of common dialect. It is utilized to comprehend semantic of writings and conclusion of individuals. There are numerous pragmatic applications, which require separating feeling from writings: publicizing examination, intelligent visit bots, sentiment mining. Today, unique administered procedures are utilized to remove sentiment from writings which require huge physically named datasets that are costly and tedious to construct. Besides, such datasets should cover vocabularies and examples of utilization of various settings. Moreover, the proficiency of administered strategies prepared on an elegantly composed writings can significantly diminish on people's writings from internet based life because of grammatical mistakes, slang, and short length of sentences. To take care of these issues and to lessen human association, we propose semi-regulated assumption examination strategy dependent on point demonstrating with Additive Regularization using R. To assess the effectiveness of this technique we connected it to a few open-source datasets for which sentiment labels are accessible. The examination indicates promising outcomes using R.

**Keywords:** Sentiment analysis, Topic modeling, ARTM

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# Smart Parking System Using Internet of Things (IoT)

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**Abstract:** Proliferation in the number of vehicles is leading to problems of vehicles parking at an appropriate place especially the car parking. This indirectly leads to traffic congestion. This is because of the fact that current transportation infrastructure and car park facility are unable to cope with the arrival of large number of vehicles on the road. To alleviate the aforementioned problem, the proposed system is a Smart Parking Management System that helps users to automatically find a free parking space with a smaller amount. Smart Parking involves use of Infrared sensor, arduino Uno, ESP8266-01 Wi-Fi Module, Cloud server and Android application. IOT based new parking platform enable to connect, analyze and automate data gathered from devices and execute smart parking possible. Smart parking would enable vehicle occupancy, monitoring and managing of available parking space in real-time that reducing the environmental pollution. Proposed system provides optimize usage of parking space and get considerable revenue generation.

**Keywords:** Smart Parking Management, Internet of Things, Traffic Congestion, Optimize Parking, Revenue Monitoring

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# Vehicle Accident Detection and Intimation using IOT

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**Abstract:** *When the vehicle met in an accident, many people loss their life, due to lack of information (time and place). To avoid this problem, in our project we introduce IoT (Internet of Things), for the continuous monitoring and analysis of the vehicle. The sensors like Ultrasonic sensor, Accelerometer sensor and Vibration sensors are place in the vehicle. When an accident occurs, the sensor will sense the parameters (tilt, speed, distance, vibration) of the vehicle. The sensed data will send to the Microcontroller (Arduino). If the sensed data is greater than the threshold limit, the microcontroller will send a message to the controller room through GSM Modem, which will include the location with help of GPS. Alert message with the latitude and longitude values also send to the family members. We use switch in this project with delay of one minute. If a person press this switch means, the message will not send to the control room. Otherwise, the message will send then the rescue team will reach the spot and save their life.*

**Keywords:** *IOT, Ultrasonic sensor, Accelerometer sensor, Vibration sensor, GPS, GSM.*

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# IOT Integrated Automated Guided Vehicle

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**Abstract:** *Garment production is an art of science which involves laying, marking, cutting, stitching, and checking of clothes for packing within the Industry. It is an important activity in the production process. Out of total time spend in Garment manufacturing 30% is for Material handling; remaining 70% is for actual process i.e., moving the material from one stage to another stage for the process. The Internet of Things(Iot) integrated Automated Guided Vehicle(AGV) has extremely great demand in the garment manufacturing Industry, though it follows the path allocated for it and moves from one stage to another stage within the industry by carrying the load for several process . It deals with the important moves includes horizontal, vertical and combination of both, stores the data of vehicle's departure from one stage and arrival to another stage with accurate time. The beneficial part of using AGV are as follows; Proper garment production without any damage, Increase the safety of worker while working, stores all the information in the cloud for the purpose of future reference for respective person to analyze past occurrence anytime and anywhere, Reduces manpower, and the productivity.*

**Keywords:** *Automated Guided Vehicle,Internet of Things*

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# IoT BASED USER FRIENDLY SMART TROLLEY SYSTEM USING RADIO FREQUENCY IDENTIFICATION

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**Abstract:** Supermarkets are the place where all the varieties of the consumable products are available in a single place. In today's world Peoples tend to buy the products in supermarkets and malls for time saving purpose. The difficulties faced by the consumers are standing in a long queue in that market. So, the solution for the difficulties faced by the customer and implemented by "RFID based intelligent trolley system".

**Keywords:** RFID Reader, GSM, LCD, Arduino

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## IoT Based Home Automation System using Smart Mirror

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**Abstract:** The future of Home Automation is fully depended on Internet of things (IoT). Internet of Things (IoT) is a concept where an object having the ability to transfer data over a network without the need for human interaction to human or human to computer. IoT is known for its advantage that can help simplify people's everyday routine. It is a concept of smart home-based Internet of Things (IoT). This system allows users to access information and also control the lights in the house. It's a server that supports data types such as time and date, weather, news, water purity readings, water level, energy consumption of the home, etc.(All kind of data as it is open source).The data from Wi-Fi modules to raspberry pi sent using MQTT protocol. With Smart Mirror system, users can manage their daily activities at ease as well as solving many problems and accessing the whole house control from a cloud server or mobile phone.

**Keywords:** Smart Mirror, Raspberry PI, Weather, Time, News, Multimedia, Artificial intelligence

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# Smart City using Automated Self Navigated Dustbin Dispensary System and Wireless Power Generation Technology

*Ganesh H<sup>1</sup>, Dr S.Sharmila Kishore<sup>2</sup>, G Abishek<sup>3</sup>, R Harish<sup>4</sup>, Sri Ragav<sup>5</sup> and Shiyaj<sup>6</sup>*

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***Abstract:** Today's main issue in the city is pollution especially land pollution and air pollution. In taking effort to control both air and land pollution, we have proposed a concept called smart city automation. It contains self-navigated garbage disposal system in smart dustbin and wireless power transfer from road to cars while running on road in the separate lane provided. Overflow of garbage creates unusual condition in the city and creates bad odour around the surroundings this ends in spreading some deadly diseases & human illness. To avoid all these problems, we are going to implement a project called IoT based waste disposal system using smart dustbin. The Internet of Things (IoT) is a concept in which surrounding objects are connected by wire and wireless communication without the help of humans. Objects communicate and exchange information.*

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## IOT Based Street Dustbin

*Vijayakumari V<sup>1</sup> and R. Sivaraman<sup>2</sup>*

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***Abstract:** The government of India aims at "Swachh Bharat Mission" and for that we need smart city with smart streets enabled with smart garbage monitoring system. The garbage bins around us placed at public places overflowing with due to increase in waste and results into unhygienic conditions for people and leads to deadly diseases. Thus to improve this situation, we proposed this work. In our proposed system, there are multiple smart garbage trash bins on a microcontroller board platform (Arduino Board) located throughout any city or the campus or hospital. The Arduino Board is interfaced with GSM modem and ultrasonic sensor. Once the level of threshold is being crossed, then ultrasonic sensors will trigger the GSM module which in turn continuously alerts the authorised person by sending SMS reminder after until the dustbin is cleaned. This is real time waste management by using smart trash bins that can be accessed anytime anywhere by the concerned person.*

**Keywords:** smart, dustbin, arduino, GSM modem, ultrasonic sensor

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# Security System and Smart Automation using IOT

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**Abstract:** In this paper we present a security technique and automation systems for home and many other places like school, holy places etc.,. The sensors will be interfaced with Arduino. The status of the appliances will get uploaded to a cloud platform through wireless module. System and mobile should be connected through the same wireless network. Sensors can be controlled by the user. The flex sensor depends upon the gestures of the fingers to control the devices. The magnetic sensor will enhance a door breaking security. This paper explains that how the IoT applications will help us to monitor the things.

**KeyWords:** Arduino, Flex Sensor, Wireless Module, Flame Sensor, Internet of things (IOT)

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# GPS Tracker for Kids Based on IOT

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**Abstract:** This paper a system for increasing children safety is proposed. The focus is on daily route from home to school and vice versa, assuming the school buses. IoT paradigm is exploited together with different technologies like the GPS and GSM, in order to design a solution for parents willing to make certain of their child's following the main steps to school and home. This paper the applicability of mini GPS GSM technology is used in which the signals are directly sent to the parents mobile and is updated for every three minutes and is ON or OFF by the parent whenever needed.

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# A Blockchain and IOT Coupled Security Mechanism for Voting Systems to Prevent Election Data Tampering

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**Abstract:** Despite the claimed benefits of e-voting initiatives, wider adoption of e-voting mechanisms and implementation processes is slower than expected. Several technical, social, and cultural challenges hinder generability and applicability of e-voting. Amongst them, the evaluation and harmonization of e-voting systems, given different legal and statutory frameworks, is still an important challenge to overcome. Yet, only a few works have addressed this topic in the field

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## Fire Extinguishing Robotic Vehicle using IoT

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**Abstract:** Fire accidents cause damage to human life and physical properties on a large scale. Firefighting is one of the most dangerous work. With the advent of technological advancements in the field of robotics, fire detection and fire extinguishing has become more precise. The invention of fire extinguishing robotic vehicle has reduced the injury caused to human while extinguishing the fire. Also it prevents the property loss in densely fired area. The objective of this paper is to detect and extinguish the fire effectively by using this robotic vehicle. The proposed system can put off any kind of fire in any place. The robot can travel through the building and simultaneously scans for the flame. The various data that are collected from the affected area by using sensors are processed using the PIC microcontroller. The data from the cloud can be accessed by any person using the internet. The role of IoT (Internet of Things) is that it can send the alert and warning to the user about the stature of the fire. The robotic vehicle which is controlled using LabVIEW extinguishes the fire in a well-organized manner.

**Keywords:** fire extinguishing robot, IoT, microcontroller, LabVIEW.

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## Fault Analysis for Direct Torque Control using Fuzzy Based Three Phase Induction Motor Drive

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**Abstract:** Induction motors(IM) are intensively used in industrial motors with very high inertia loads, with maximum torque at minimal speed and current. They are of low cost, low maintenance and easy construction which stays as an advantage for industries to use it for the maximum production. It is necessary for these motors to perform with maximum efficiency. Hence the monitoring of these motors and maintaining fair performance of them is always a challenge in the industries. Any fault conditions occurring in induction motors is to be identified and corrected in a minimum possible time and any particular malfunctioning in the motor should be rectified soon to prevent considerable damage. In this paper, mathematical modeling for direct torque control (DTC) using Fuzzy logic technique. Here an intelligent based technique is employed to check the fault and diagnose using MATLAB/SIMULINK software. Fuzzy based fault detection system is developed for DTC of induction motor. The two main input parameters are the three phase stator current and the time. These inputs are given to the fuzzy detector for detecting the fault and for further decision making. Therefore the fuzzy detector in turn is responsible for acting on the particular fault and taking suitable corrective measures in order to safeguard the induction motor drive.

**Keywords:** Direct torque control, fault detection, Fuzzy Logic, Induction motor drive.

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# A Novel IOT Based Energy Control System used for Domestic Application

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**Abstract:** *Energy saving is the most important and challenging issue. Automatic Electrical Power meter is used in domestic electric distribution system. The integration of the Arduino, WIFI and GSM Short Message Service (SMS) provides the system as Smart Power Monitoring system. Smart power meter provides data to optimize and reduce their power consumption. This system can incorporate with embedded controller and GSM modem to transmit the data. This system also includes a motion sensor such that if there is no human in the place or house it will automatically cut the power supply. Domestic consumers get benefited through this system.*

**Keywords:** *Smart Power Meter, Arduino Board, GSM, motion sensor*

# Power Generation using Piezo Electric Transducer

*Ganesh H<sup>1</sup>, Dr S.Sharmila<sup>2</sup>, Vishakan<sup>3</sup>, Prakasha<sup>4</sup> and Dharshan<sup>5</sup>*

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**Abstract:** *As world technology develops, the need for power also increases. In future, the need or power will be high. This proposed method uses piezo electric transducer to produce power using its property. Countries like India are very convenient to establish this power transmission. We can keep the piezo electric tiles in pedestrian way, railway platforms and even in speed breakers. This also focuses in using the wasted human pressure. When a pressure is applied on the tiles, these are converted to electrical energy. This is done by piezo electric transducer by using its piezo electric effect. This electrical energy is stored. Later it is converted to AC using an inverter circuit and can be used for various AC components. The AC component used in the proposed method is Ac load bulb. This proposed method concentrates more on bringing an efficient output from the used piezo electric material. This power source can be implemented in the agriculture, industries, home applications etc. This proposed method uses 30 discs PZT type transducer. It is inferred that the total output voltage of transducer is 20-25 V in an efficient way.*

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## Solar Energy - Distillation of Brackish Water

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**Abstract:** *The aim of the paper is to enhance the performance of membrane supported water desalination techniques to reduce the consumption of energy by employing solar energy. Development of the pilot plant in the laboratory has been carried out to desalinate the brackish water using PV collector. Experimental study was carried out and report the effect of temperature, time and flow rate on permeates flux. Results show that permeates flux increases with increase in temperature. Also the analysis of the well water has been performed by various techniques and reported. It was found that vacuum membrane distillation using solar energy provide better quality of water in comparison to other treatment techniques. This study provides an idea for the application of renewable energy in the field of desalination of water on a small scale.*

**Keywords :** *Desalination, VMD, Permeate Flux, Solar Energy, Water Quality Analysis.*

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## Design and Experimental Analysis of Gripper using Shape Memory Alloy Spring Actuator

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**Abstract:** *In the developing technological scenario, the researchers are looking for a material that is highly reliable and having unique property to retaining its shape in certain high and low temperature. The shape memory alloy is having prescribed qualities and one of its unique property is to recover shape upon heating can be effectively packaged into compact, light, powerful silent actuators to replace DC motors and electrical motors. The objective of the paper is to design, fabricate and analysis of gripper on the principle of slide crank mechanism, which is actuate with Shape Memory Alloy spring .The designing and analysis Software used for experiment are Solidworks and Ansys respectively. The characteristics targeted in this experiment are of ensuring mechanical actions if stimulated with electrical current allows the development of simple, more compact and reliable actuators.*

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# Implementation of Reduced Inductor Scheme in Cascaded Dual Buck Inverter using Enhanced PI Controller

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**Abstract:** *This paper presents a new model cascaded inverter type which is dual buck inverter. This main drawback in this inverter is having more inductors. Due to this disadvantage, the power density of the system is reduced and the system cost is increased. The proposed inverter type consists of fewer inductors and no shoot through problems. Thus the efficiency of the inverter and harmonic distortion level is increased. Power MOSFETs are used for its features than IGBT. This inverter works on four strategies and SPWM technique. The output waveform is tuned using a PI controller and to improve accuracy PI algorithm is used. To show this theoretical and experimental analysis are presented in this paper.*

**Keywords:** *Power MOSFET, PI controller, Inductor, Dual buck Inverter, SPWM, Shoot through problem, H-bridge reliability.*

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## Design of Solar Biomass Hybrid Power Plant

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**Abstract :** *Electrifying the modern world is important. In rural areas the necessity of electricity is high which should be reliable and affordable. The solid fuels and kerosene is used for cooking and heating. One of the most suitable and environmental friendly solution is Renewable Energy Sources (RES) which is used to provide electricity in rural areas. The use of Renewable Energy Sources are increasing and they are clean, efficient, affordable, eco-friendly and used in various forms. Biomass and solar PV is used for long term in energy production. This survey describes the implementation of Solar-Biomass Hybrid Power System.*

**Keywords:** *Renewable Energy, solar, biomass, power*

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# Study on Performance of Solar Tube System for Daylighting

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**Abstract:** A tubular solar tube system in a building can create an energy efficient building reducing its energy costs. A tubular skylight or a solar tube system is a tubular vertical light guidance system that passively collects and transmits external natural daylight to building interiors for lighting purpose. It ensures good energy saving along with natural healthy working conditions. The use of such a solar tube system can reduce the use of electrical lighting expenses during daytime. The present paper focuses on the study of day lighting performance of tubular solar tube system. The importance of the study is to analyse the performance of solar tube that creates an energy efficient building that reduces the electrical lighting usage and saves its costs during day time.

**Keywords:** Energy efficient building, Tubular skylight, Daylighting, Light illumination, Acrylicdome

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# Implementation of a Robust Reputation Management Mechanism in the Federated Cloud

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**Abstract:** In the prioritize service paradigm of cloud computing computational resources are available for rent. Although it offers a cost efficient quick fix to virtual network requirements, low trust on the rented computational resources prevents users from using it. To reduce the cost, computational resources are shared. i.e., there exists multi-tenancy. As the computational resources and other communication channels are shared, it creates security and privacy issues. A user may not identify a trust worthy Co-tenant. But, it is in the cloud provider (CPs) interest that it gets maximum utilization of its resources. Hence, it allows maximum Co-tenancy irrespective of the behaviour of users. In this paper, we propose a robust reputation mechanism that encourages the CPs in a federated cloud to differentiate between good and malicious users and assign resources in such a way that they do not share resources. It shows the correctness and the efficiency of the proposed reputation management system using analytical and experimental analysis.

**Keywords:** cloud computing, multi-tenancy, federated cloud, Service providers, good providers, Malicious providers, History tracing.

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# Penalty Monitor for Violating Traffic Rules using Cloud Computing

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**Abstract:** Application to digitalize the paper receipt used by traffic police. To provide a better way of acknowledgement to the normal citizen to which they pay if they made any offence. The acknowledgement is provided by means of SMS which enhances the coverage of all the class of people. To monitor the individual police men during the working period by means of a mobile application. To establish a better way to maintain an entire database of offenders and offence with respect to the cops who caught the offenders. To provide a cloud computing connectivity to the department of police by which it facilitates better time efficiency. To provide a single cloud computing platform for both website and an application.

**Keywords:** Cloud Computing, Android.

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# Secured Data Processing with PKG in Distributed Cloud Computing

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**Abstract:** In today's world the data confidentiality is broken by the powerful attackers by obtaining cryptographic keys by means of compulsion in cryptographic software. As soon as the encryption key is exposed, the only way to preserve data confidentiality is to limit the attacker's access to cipher text. For example by spreading the cipher text blocks across multiple servers and thus came to a conclusion that the adversary cannot compromise all. In the existing scheme bastion is an efficient scheme that provide data confidentiality even the encryption key is leaked. To this end we propose identity based encryption which typically involves Private Key Generator (PKG) and user were the encryption is run by sender and then the decryption is based on two components identity component and time component which is provided by the admin to the user. With the help of the PKG performance and data confidentiality can be achieved in cloud.

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# Voting System with Authentication using Block Chain Management to Prevent Data Tampering

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**Abstract:** *The advancement of the technology most of the countries adopted E-Voting system. This voting system must also protect voter's data from malicious attacks. This system establishes a network security is to base on Block chain management. The Block chain mechanism employs a distributed architecture that prevented from malicious attacks; which call for anonymity, authenticity, integrity, and non-repudiation. Dealing with authentication of voting integrity user's anonymity must be prevented ad the metric must be protected against the malicious attacks. The proposed voting system relies on the basis of Block Chain with smart contracts to generate a trusted voting system. The current system that gives idea about the bilinear pairing security mechanism to ensure the whole voting process under the secured Architecture. Future enhancement on this study is of implementing Fingerprint scanner that prevents the Biometric of voter more secured.*

**Keywords:** *Block Chain, Network Security, Bilinear Pairing, Fingerprint Scanner*

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## Security in MANET: Intrusion Detection Techniques

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**Abstract:** *MANET stands for "Mobile Ad Hoc Network". Mobile ad hoc networks and wireless sensor networks have been used in a wide variety of applications. A MANET is a type of ad hoc network which can change locations and configure itself on the fly. MANETS are mobile, and hence they use wireless connections to connect to various networks. Because of its dynamic nature, they are typically not very secure. In this paper, we present the parameters, challenges and goals in MANET security, classification of attacks and attacks in different layers. We elaborate Intrusion detection techniques to secure the mobile ad hoc networks. This paper reviews the performances of various Intrusion detection techniques used to detect the malicious node in the network.*

**Keywords:** *Attacks, challenges, goals, IDS, MANET, security*

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# Advanced Smart Door Lock using Android Smart Phone

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**Abstract:** *In this modern world everyone is changing their life style towards the modern technology. Everyone needs their life to be sophisticated. It is achieved by using smartphone. Thus we go for automation in our day to day life using android application in the smart phone. Today most of the homes are automated by controlling appliances in mobile phone. The part of the home automation relies on door automation which should be secured and authenticated. In our proposed system, we enhanced and came with different solution for door automation with high security concerns. In this system door respond only to the particular persons who are well authenticated to get access from the doors. It consists of voice recognition and pin entering portal in the android application which is connected to the microcontroller in the door lock. The system is enabled with WI-FI technology to get access over wide range. It also supports the Pin to be entered by the user in case they feel hard to use the voice recognition.*

**Keywords:** *smart door; smart phone; microcontroller; WI-FI technology; pin; voice recognition*

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# The Distributed Ledger- Blockchain Technology

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**Abstract:** *As we all are well proficient with the matter of course of the internet, but seldom know how the internet technology works! The rise of the Blockchain technology is a – syntactic shifting heat akin to the rise of the Internet. Blockchain is a tale of digital cash system with peer-to-peer connectivity employed to realize the making of digital payments from one litigant to another without a centralised financial institution such as banks. On a par, when you want to send money, you simply do it by with your account number and also with receiver's account number and the amount. Bitcoin is also used to send and receive money digitally. Akin to cheques, bitcoins also requires a kind of signature to prove that the sender is the real owner of the account, but it is based on the math rather than handwriting. This paper furnishes the scenario on how the transactions are taken place in blockchain using bitcoins .*

**Keywords:** *blockchain, cryptographic hashing, bitcoins, miner, transaction, cryptographic puzzle, digital cash, peer-peer connectivity, digital signature, cryptocurrency*

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## Mobile Internet

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**Abstract:** *The mobile internet is all about the mobile web and its application. The paper describes how the internet is been connected to the people all over the world. Mobile internet helps us to access our internet needs to set up our expectations more realistic and also help us to explain the challenges of mobile connectivity. These are fixed line services which are used in laptops and desktop computers.*

**Keywords:** *Mobile application, protocol, smartphones, mobile web, wireless.*

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## Emerging Issues and Changes in Cyber Security

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**Abstract:** *The information and communication technology industry evolve over last century. This technology is apt for modern technology .Lots of new developments are there in this field .This paper deals with cyber security its developments, its emerging issues and changes, advantages and disadvantages. The act to protect ICT and their issues is called as CYBER SECURITY .Cyber security is so opt for all fields. Lots of advantages and demands are there in cyber security. It has more developments day today changes.*

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## Latent Fingerprint Identification Crowd-Based Concept using Deep Learning

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**Abstract:** *Latent prints are produced when the body's natural oils and sweat on the skin are deposited onto another surface. Latent prints can be found on a variety of surfaces however, they are not readily visible and recognition often require the use of fingerprint powders, chemical reagents or alternate light sources. Latent fingerprints are one of the most vital sources of evidence in forensic investigation. One of the initial steps in manual latent processing is for a fingerprint auditor to perform a triage by assigning one of the following three values to a query latent: Value for Individualization (VID), Value for Exclusion Only (VEO) or No Value (NV). In this paper, we propose a crowd sourcing based framework for understanding the fundamental bases of value assignment by fingerprint examiners, and use it to learn a predictor for quantitative latent value assignment. Experimental results are reported using four latent fingerprint database, two from forensic casework (NIST SD27 and MSP) and two collected in laboratory settings (WVU and IIITD), and a state-of-the-art latent AFIS.*

**Keywords:** *Finger Vein, Cross Match, Value of Individualization , Value of Exclusion*

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# A Software Defined FOG Node Based Distributed Block Chain Cloud Architecture for IoT

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**Abstract :** *The recent expansion of the Internet of Things (IoT) and the consequent explosion in the volume of data produced by smart devices have led to the outsourcing of data to designated data centers. However, to manage these huge data stores, centralized data centers, such as cloud storage cannot afford auspicious way. There are many challenges that must be addressed in the traditional network architecture due to the rapid growth in the diversity and number of devices connected to the internet, which is not designed to provide high availability, real-time data delivery, scalability, security, resilience, and low latency. To address these issues, this paper proposes a novel blockchain-based distributed cloud architecture with a software defined networking (SDN) enable controller fog nodes at the edge of the network to meet the required design principles. The proposed model is a distributed cloud architecture based on blockchain technology, which provides low-cost, secure, and on-demand access to the most competitive computing infrastructures in an IoT network. By creating a distributed cloud infrastructure, the proposed model enables cost-effective high-performance computing. Furthermore, to bring computing resources to the edge of the IoT network and allow low latency access to large amounts of data in a secure manner, we provide a secure distributed fog node architecture that uses SDN and blockchain techniques. Fog nodes are distributed fog computing entities that allow the deployment of fog services, and are formed by multiple computing resources at the edge of the IoT network. We evaluated the performance of our proposed architecture and compared it with the existing models using various performance measures. The results of our evaluation show that performance is improved by reducing the induced delay, reducing the response time, increasing throughput, and the ability to detect real-time attacks in the IoT network with low performance overheads. INDEX TERMS Internet of things, software defined networking, security, blockchain, cloud computing, fog computing, edge computing.*

## Smart Surveillance System for Theft Detection using Deep Learning Method from Far-Field Surveillance Videos

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**Abstract:** *Theft is increasing day by day and it has become one of the never ending problems in the world. To solve this problem, Video Surveillance is used to observe unusual activity going on to prevent crime. Today most shop owners have CCTV cameras to record, these uncertain activities but these systems do not detect theft. If a system to detect theft which is efficient and faster is not designed, then it would be difficult to detect theft. This paper represents the detecting a crime taking place in an enclosed environment and catch the theft in an efficient manner. This paper proposes the use of a high precision, high speed and widely applicable Faster R-CNN method to detect human objects. The research analyzed various visual conditions and classified image frames according to their visual conditions. The image frames were input into Faster R-CNN according to different visual categories. The experimental results demonstrate that the high precision, high recall and fast speed of the method can effectively detect uncertain activities of human beings.*

**Key Words:** *Intrusion detection, Security, Video surveillance, deep learning, R-CNN.*

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## Chatbots in artificial intelligence

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**Abstract:** *In recent years Artificial intelligence and bots technology has a significant attention. Artificial intelligence is the creation of the intelligence which can interact with humans. Bots are like virtual assistants which can answer questions and help you get things done faster without needing to speak to another human. Bots are considered as the machine human communication which works via chats and communication and Bots are otherwise called as web robots. Web robots can be used for legitimate as well as malicious purposes. A Web robot is simply a software application (or a set of programs) that traverses any Web application and performs various automated tasks. Though these robots can perform various tasks over a Web application, they are widely used to perform repetitive tasks, which they do much faster than if performed manually. Artificial intelligence plays a vital role in web robots. In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems in artificial intelligence are the victims for the entire operations done by the web robots.*

**Keywords:** *Artificial Intelligence, Chat bots, Expert systems, etc..*

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## Design and Implementation of Emotional Mouse

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**Abstract :***In the era of digital revolution, computers play a vital role in everyone's routine life. Emotional mouse is a simple model which is implemented based on blue eyes technology, which monitors the user and also keeps track of their emotion. In case of any abnormality it responds by playing a track according to the user's emotion (sad, happy, anger, joyful). Since a person spends most of his time in computers it finds application in many fields. The eyes, fingers, speech are the elements which help to sense the emotion level of human body. By taking the input in the above mentioned forms the results will be more accurate and can be used to find the emotional state of the user. This project can be developed to supervise the patient's in hospital to reduce manual work. These type of systems also reduce manual errors.*

**Keywords:** *emotion, blue eyes technology, computer.*

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## Automatic Form Filler

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**Abstract:** Normally all the users depend on online applications for each and every purpose, even for a purchase. Generally users are required to provide information in the web forms for interacting with the web applications. In this case the user has to fill online forms for registration purpose. They have to type the same information repeatedly for filling forms. It could be a monotonous task for the user. In this paper we propose a new technique for filling online forms automatically. Our application takes a single input (i.e.) it may be a username, email id or a register number as a reference and fill out other fields automatically. For this purpose we collect information from the user and store it in a database which are used for later submissions. Our proposed system uses datamining technique for collecting and presenting information in the web forms. Through several experiments, we find that our approach is feasible and effective and it works well in filling different online application forms automatically.

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## Artificial Intelligence And Robotics

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**Abstract:** Artificial Intelligence (AI) and Robotics technology has received significant attention in the recent years of engineering research and development. AI is a study of how human brain think learn and work when it solves the problem. Robotics field has a great potential for assisting in some complex tasks just as the advent of computer technology has made our work style easier. Artificial Intelligence do play a vital role in Robotics. Artificial Intelligence describes the work process of machines that would require intelligence if performed by humans and how that knowledge should be represented; and how that knowledge should using in robotics. This paper will provide an overview of evolving trends and growing field of artificial intelligence and robotics research and development.

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# A New Approach for Improving Coding Performance in High Speed Optical Networks

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**Abstract:** One of the most widely used error control methods is Forward Error Correction. The idea behind FEC is to add some redundancy to the original message, which receiver can use to check the consistency of the delivered message and to recover the corrupted data. Very high speed optical transport systems, (100G) need increasingly powerful Forward Error Correction (FEC). Low density Parity Check (LDPC) codes are being studied intensively for 100 Gb/s class systems. Most important performance measures of FECs are Coding gain and Bit Error Rate (BER). This paper presents a triple concatenated soft decision FECs using Reed Solomon (RS) code, Turbo Product Code (TPC), and Low Density Parity Check Codes (LDPC). Results Show the improved coding gain and reduced BER in the proposed method.

**Keywords:** Triple concatenation, Coding gain, BER, RS code, Turbo Product Code, LDPC code, FEC.

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# Sentiment Analysis using Data Mining Technique

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**Abstract:** Sentiment Analysis (SA) denotes the usage of text analysis and computational linguistics to recognize and excerpt particular data in source materials and knowledge extraction through data mining. The main aim of sentiment analysis is to determine the perception of a particular person with relation to some subject, paragraph or document. The increasing importance of sentiment analysis corresponds with the progress of social media like reviews, discussion forum and blogs. In the recent years, there has been a massive progress in the usage of twitter which is an online micro-blogging through which users are permitted to inscribe a brief updates of the status. Also many of the media groups and enterprises are progressively looking for methods to extract data from twitter relating to opinion of people about their goods and facilities. In this work, the twitter data are collected, pre-processed by natural language processing tokenizer and the most important features are extracted using Part of speech tagger. The performance of the RIPPER algorithm is compared with other classifiers and the experimental results indicate that RIPPER classifier outperforms other classifier in terms of accuracy, precision, recall and F-measure.

**Keywords:** sentiment analysis, data mining, social network, tokenizer, RIPPER

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# Detection of Abnormal Tissues in Magnetic Resonance Images using Image Processing techniques

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**Abstract:** *Biomedical imaging methods facilitate easy visualisation as well as recognition of the slightest abnormalities within the human body. Cognizance of abnormalities before they turn detrimental plays a deterministic role in preserving the quality of human health along with enhancing life expectancy and longevity of life. Early diagnosis of brain tumour is an arduous task as discernible physical symptoms appear in the advanced stages of tumour. On the other hand, MRI provides an expeditious and accurate insight into the condition of tumours in advance to support its treatment at a preliminary stage itself and is therefore most widely preferred in the medical community. Implementation of image processing techniques on biomedical DICOM images assist in the detection of even the most minute cell abnormalities with faster speed, higher efficiency and low probability of human error. In this paper, a novel framework has been designed for the identification of abnormal tissue in MRI images using texture feature extraction methodology. Five texture features namely contrast, correlation, energy, homogeneity and entropy have been extracted from the GLCM matrix of the sample of tumour images and used as input to a Support Vector Machine. The low values of misclassification error in SVM and p-values in ANOVA are clearly indicative of the efficiency and accuracy of the algorithm.*

**Keywords:** *Image Processing, MRI images, Brain Tumour, Texture Features, Support Vector Machine*

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# Detection of Contact Lens in Iris Recognition using MLBP

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**Abstract:** *The security has become a major issue of concern in recent times. The threat occurs when an unwanted person tries to obtain access to any place or value. The possibility of identifying a person can be obtained from the biometric details. Iris recognition is one of the best biometric methods used for human identification and verification. The presence of contact lens has made a challenge to iris recognition as it destroys the natural iris pattern. So textured contact lens detection is an important step to prevent spoofing in iris recognition system. This paper utilizes IIT-D databases for lens detection. This helps in improving usability and reliability of iris recognition systems.*

**Keywords:** *Contact lens, lens detection, LBP, Neural network*

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# Image Quality Assessment for Biometric Security System using Image Processing Algorithms

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**Abstract:** *A novel software-based fake detection method that can be used in multiple biometric systems to detect different types of fraudulent access attempts. To ensure the actual presence of a real legitimate trait in contrast to a fake self-manufactured synthetic or reconstructed sample is a significant problem in biometric authentication, which requires the development of new and efficient protection measures. To enhance the security of biometric recognition frameworks, by adding liveness assessment in a fast, user-friendly, and non-intrusive manner, through the use of image quality assessment. The proposed approach presents a very low degree of complexity, which makes it suitable for real-time applications, using 25 general image quality features extracted from one image (i.e., the same acquired for authentication purposes) to distinguish between legitimate and impostor samples. Multi-biometric and Multi-attack protection method which targets to overcome part of these limitations through the use of Image Quality Assessment (IQA). Moreover, being software-based, it presents the usual advantages of this type of approaches: fast, as it only needs one image (i.e., the same sample acquired for biometric recognition) to detect whether it is real or fake, non-intrusive; user-friendly (transparent to the user), cheap and easy to embed in already functional systems and no hardware is required).*

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# Plant Disease Detection in Image Processing using MATLAB

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**Abstract:** *For increasing growth and productivity of crop field, farmers need automatic monitoring of disease of plants instead of manual. Manual monitoring of disease do not give satisfactory result as naked eye observation is old method requires more time for disease recognition also need expert hence it is non effective. So in this paper, we introduced a modern technique to find out disease related to both leaf and fruit. To overcome disadvantages of traditional eye observing technique, we used digital image processing technique for fast and accurate disease detection of plant. In our proposed work, we developed k-means clustering algorithm with multi SVM algorithm in MATLAB software for disease identification and classification.*

**Keywords:** *Plant disease, K-means clustering, GLCM, Multi SVM algorithm.*

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# Estimation of Left Ventricular Motion from Cardiac Gated Tagged Mri using Fuzzy Local Information Algorithm

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**Abstract:** In this project novel image-matching deformable mesh model (DMM) to estimate a dense LV motion field directly from cardiac-gated tagged MRI series of images. DMM is an NRR technique that uses a regularized image-matching similarity measure to determine the optimal mapping between tagged images in consecutive frames. The existing DMM method uses a free-form deformable mesh that takes into account the geometry of the heart (i.e., inner and outer LV walls), thus providing additional motion stability. This algorithm was combined with Active Contour method. Active Contours have been widely used as attractive image segmentation methods because they produce sub regions with continuous boundaries. The algorithms have been implemented and tested on MRI images. The comparison is made with existing conventional Fuzzy C-means method. The new algorithm is called fuzzy local information C-Means (FLICM). FLICM can overcome the disadvantages of the known fuzzy c-means algorithms and at the same time enhances the clustering performance. The major characteristic of FLICM is the use of a fuzzy local (both spatial and gray level) similarity measure, aiming to guarantee noise insensitiveness and image detail preservation. Furthermore, the proposed algorithm is fully free of the empirically adjusted parameters incorporated into all other fuzzy c-means algorithms proposed in the literature. Experiments performed on synthetic and real-world images show that FLICM algorithm is effective and efficient, providing robustness to noisy images .

**Keywords:** DMM, MRI Image, Fuzzy Clustering, Active Contour Model.

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## A Survey on Existing Expert Systems for Medical Diagnosis

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**Abstract:** With the invent of computer-mediated technologies, urge of medical diagnosis, surveillance system and the rapid development in satellite and sensor networks, demands an efficient data fusion techniques , methodologies and machine learning algorithms. Expert system and Data fusion has materialized as a promising research area for medical diagnosis in the upcoming years. In Data fusion, information may be in various nature : it ranges from measurements to verbal reports. Data fusion is a framework for analysis of data sets such that different datasets can interact and inform each other. Machine learning together with data fusion provides results with high accuracy and prediction. This paper presents a comparative analysis of existing expert systems for medical diagnosis which uses data fusion and machine learning algorithms to diagnose various diseases.

**Keywords:** Medical Diagnosis, Expert System, Data Fusion, Machine Learning

# Innovative IR Based Interactive Smart Surface using MATLAB

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**Abstract:** This paper presents a novel and cost-effective approach to convert any projected display on a flat surface into interactive touch board, through the aid of computer vision techniques. An interactive touch board is similar to that of a touch screen available in mobile phones and tablets, but then uses a special stylus for its input and a LCD projector for projecting the display on the surface. Commonly used techniques fall under any of the four categories – Resistive, Capacitive, Electromagnetic and Optical. The paper proposes a method pertaining to the optical technique – involving an infrared camera, a light emitting stylus and an image processing algorithm to determine the position pointed by the user. The stylus has an infrared LED at its tip and capable of producing a tiny spot of light on the projected surface, which is invisible to human eyes. But an IR camera with IR pass filter can be used to capture the light spot and can be processed further. This is the principle technique behind the proposed method. The image from the camera is processed using an algorithm, which determines the coordinates of the IR light. This obtained position along with some calibration parameters is sufficient to calculate the mouse cursor coordinates and thus the cursor can moved to the intended position. The whole of the image processing algorithm has been implemented using the MATLAB software. Further, the paper deals with the study of potential applications in education and scientific research.

**Keywords:** Interactive Touch Board, Image Processing, MATLAB, IR stylus, IR camera, Gaussian Filtering.

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## A Case Study of Key Frame Extraction in Video Processing

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**Abstract:** Video plays an important role in our day to day life and in too many fields such as content based video browsing, compression, video analyzing, etc.,Video has complex structure consisting of scene,shot, and frame.One of the fundamental techniques in content based video browsing is key frame extraction. Generally the key frame should be representative of the video content to reduce the redundancy. It can be more than one for a video. The use of key frame extraction algorithm speeds up the system by selecting essential frames and therefore eliminating extra computation on redundant frames. Key frame extraction significantly reduces the video processing overhead time and increase the throughput.In this paper different types of key frame extraction techniques are compared with their advantages anddisadvantages.

**Keywords:** key frame extraction, content based video, video processing, redundancy, key frame extraction techniques



# An Expert System for Heart Disease Diagnosis using Data Fusion & Machine Learning

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**Abstract:** *With the invent of computer-mediated technologies, urge of medical diagnosis, surveillance system and the rapid development in satellite and sensor networks, demands an efficient data fusion techniques, methodologies and machine learning algorithms. Expert system and Data fusion has materialized as a promising research area for medical diagnosis in the upcoming years. The remarkable advances in biotechnology and health sciences have led to high throughput genetic data and clinical information, generated from large Electronic Health Records (EHRs). To this end, application of machine learning and data mining methods in biosciences is presently, more than ever before, vital and indispensable in efforts to transform intelligently all available information into valuable knowledge. In the health care systems, the decision support system and the analysis of clinical data requires an interdisciplinary field of data mining, which guides the automated knowledge discovery process to apply the complex task of clinical data analysis. The wide spread of electronic data collection in medical environments leads to an exponential growth of clinical data extracted from heterogeneous patient samples.*

**Keywords:** *Clinical Decision making, Expert system, WSO*

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## Brain Gate Technology

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**Abstract:** *The mind-to-movement system that allows a quadriplegic man to control a computer using only his thoughts is a scientific milestone. It was reached, in large part, through the brain gate system. The Brain Gate System is based on Cyber kinetics platform technology to sense, transmit, analyse and apply the language of neurons. The principle of operation behind the Brain Gate System is that with intact brain function, brain signals are generated even though they are not sent to the arms, hands and legs. The signals are interpreted and translated into cursor movements, offering the user an alternate Brain Gate pathway to control a computer with thought, just as individuals who have the ability to move their hands use a mouse. The 'Brain Gate' contains tiny spikes that will extend down about one millimetre into the brain after being implanted beneath the skull, monitoring the activity from a small group of neurons. It will now be possible for a patient with spinal cord injury to produce brain signals that relay the intention of moving the paralyzed limbs, as signals to an implanted sensor, which is then output as electronic impulses. These impulses enable the user to operate mechanical devices with the help of a computer cursor.*

\*\*\*

# Medical Image And Signal Processing

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**Abstract :** *Biomedical imaging deals with the capturing of images for both diagnostic and restorative purposes. The science and engineering behind the sensors, instrumentation and software used to obtain biomedical imaging has been emerging continuously. Medical imaging is not only used to diagnose disease; it also provides an essential tool for understanding human biology and is widely used to assess the effectiveness of new drugs. Processing of biological and medical information has long been an active field of biological science. Signal processing involves the techniques that apply mathematical tools to extract important diagnostic information from biomedical and biological data. Biomedical imaging technologies utilize either x-rays in CT scans, ultrasound, magnetism in MRI, radioactive pharmaceuticals (nuclear medicine: SPECT, PET) or light (endoscopy, OCT) to assess the present condition of an organ or tissue and can monitor a patient over time for diagnostic and treatment estimation. Image reconstruction and modeling techniques allow instant processing of 2D signals to produce 3D images.*

**Key words:** *medical imaging, signal, processing, tool, sensors.*

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# Ultrashort Microwave – Pumped Real Time Thermocoustic Breast Tumour Imaging System

*Ramya. A and G Shanmathi Shobana*

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**Abstract:** *Breast cancer is the most frequent type of disease among women in India and abroad. Breast cancer increases mortality in India especially in women, as it is considered the second – largest form of the disease that leads to death. This helps in early identification and treatment. The proposed system shown is a frame work for efficient and automatic breast cancer detection. We have proposed a new region growth segmentation algorithm for mammogram image segmentation to detect breast cancer. The wiener filter filters the noise in pictures very efficiently. The region segmentation methods are time-consuming, although they detect the tumour very precisely. These are noise removal (WIENER filtering), enhancement (CLAHE), seed selection, seed growth segmentation, breast mass detection, the method was tested on CT images. Depending on the type of clustering, we can find that entropy and energy are oppositely related. Information Measure related to correlation differs for benign and malignant. The SOM with KNN clustering method is accurate at 9[3]%, Specific at 80%, and Sensitive at 90% which are high compared to the achievable Classification*

**Keyword:** *Breast cancer detection, WIENER filtering, SOM with KNN clustering method*

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# Holography

*Bhargavalakshmi SG<sup>1</sup>, T Divya<sup>2</sup>, S Pavithra<sup>3</sup> and S Dhiya<sup>4</sup>*

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**Abstract:** *The holography is all about image that appear to be in three dimensional. The paper describes how the hologram works and explained its types, uses. Holography has three things in common with photography: It consumes light energy; it utilize a light sensitive surface; and the result is a visible image. And it is non-objective, experimental, conceptual.*

**Keywords:** *Three dimensional, Light Source, Laser light, Transmission, Reflection*

\*\*\*

# Signal Processing Application –Data Compression

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**Abstract:** *Data Compression is an area that needs to be given almost attention is text quality assessment. Different methodologies have been defined for this purpose. There is a necessity to choose the right method for text compression purposes and hence an algorithm that can reveal the best tool among the given ones which consumes less time while provides more compression ratio as compared to existing techniques. The paper represents a hybrid approach to compress the text data. This hybrid approach is combination of Dynamic Bit reduction method and Huffman coding.*

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# Survey on ROI Segmentation for Feature Extraction from Human Fingernail

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**Abstract:** *The segmentation of the nail and to extract the ROI from nail plate, the ROI segmentation technique is used which helps to mask the texture based properties from the required portion from the fingernail. In this paper, we present the literature survey on segmentation of fingernail patterns.*

**Keywords:** *fingernail, nail plate, ROI segmentation.*

\*\*\*

# Signal Processing Techniques in Smart Grids

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**Abstract:** Smart grid is a electrical power grid which allows bidirectional power flow along with the information interchange between the supplier and user. It promises that, the power can be more efficiently and reliably generated, transmitted and consumed over conventional electricity system. This paper presented the applications, recent advances of the signal processing techniques, role in overcoming the challenges and limitations in smart grids.

**Keywords:** Smart grid, signal processing techniques, Security detection, digital signal processing.

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# Swallow Able Wireless Capsule Endoscopy Progress and Technical Challenges

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**Abstract:** Wireless capsule endoscopy is a relatively new diagnostic technique for the detection of small bowel disease. Currently represents an increasingly used method for diagnostic evaluation of the small intestine. It is important for surgeons to be familiar with its uses and complication that may arise. We report an interesting case of spontaneous video capsule entrapment in small bowel Crohn's disease in which diagnosis was made radio logically.

**Keywords:** Wireless capsule endoscopy, minimally invasive, capsule battery, intestinal structures.

\*\*\*

# Automatic Car Parking Space Detection using Image Processing

*Mahalakshmi Malini G<sup>1</sup>, M Divya<sup>2</sup>, R Nagashruthi<sup>3</sup> and R Ragavi<sup>4</sup>*

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**Abstract:** Nowadays vehicle is most important to every human being .To go anywhere we prefer car rather than bus or train.So, number of vehicles continue to grow higher. As the vehicle count increases parking area also increases. Due to this we find difficult to park our vehicles in malls, hospitals, ect., Because we don't know where the space is available. This paper provides an automatic car parking space detection system through image processing. This system helps in identifying the number of free parking space available in parking area. A camera is installed at high and fixed position in the parking lot. The live images are scanned under the object recognition algorithm and result is based on the pixels of scanned image which helps the driver to find the number of empty parking slots available.

**Keywords:** MATLAB, Object recognition algorithm.

# Image Based Graphical Authentication and Multi-Factor Authentication Scheme on Exam Scheduling Management

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**Abstract:** *In this paper, a series of methods to authenticate a user with a graphical password. To that end, employ the user's personal handheld device as the password decoder and the second factor of authentication. In the methods, a service provider challenges the user with an image password. To determine the appropriate click points and their order, the user needs some hint information transmitted only to her handheld device. Show that proposed method can overcome threats such as key-loggers, weak password, and shoulder surfing. With the increasing popularity of handheld devices such as cell phones, proposed approach can be leveraged by many organizations without forcing the user to memorize different passwords or carrying around different tokens. In addition staff is wanted to download a university question paper the corresponding department HOD and Staffs recalling the click point on an image. System showed very good Performance in terms of speed, accuracy, and ease of use. Users preferred click points, saying that selecting and remembering image points was easier and mobile helps considerably in recalling the click points. The University Questions can be downloaded between the corresponding time periods. So it becomes more security for all and it overcomes the screen recording because each time click points generated randomly.*

**Keywords:** *Multi-Factor Authentication, Authentication, Exam Scheduling Management, and University Questions.*

\*\*\*

# Detection of Leukemia in Human Blood Sample using Microscopic Images

*Archana KV, B Kanniya Vikashini, M Vaishnavi, S Indhu*

**Abstract:** *Leukemia is a type of blood cancer which when detected late results in death. Leukemia occurs when lot of abnormal white blood cells are produced by bone marrow. So the balance of the blood system will be disrupted. The detection of the abnormal white blood cell is done by the haematologists by taking the microscopic images of blood samples and examining it visually. The process of detecting Leukemia is time consuming and prone to errors due to the variation in the perception of the individual. To overcome these defects automatic detection method is been proposed in this paper. In this the microscopic images of the blood sample is taken. It is preprocessed, features are extracted and the levels of leukemia are classified.*

**Keywords:** *Preprocessing, Segmentation, Extraction, Classification.*

\*\*\*

# Design of Hybrid Filter for Quality Enhancement in Image Deblurring Process

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**Abstract:** *The blind Image Deconvolution/Deblurring (BID) problem was realised in the early [1]960s but it still remains a challenging task for the image processing research community to find an efficient, reliable and most importantly a diversely applicable deblurring scheme. The main challenge arises from little or no prior information about the image or the blurring process as well as the lack of optimal restoration filters to reduce or completely eliminate the blurring effect. Moreover, restoration can be marred by the two common side effects of deblurring; namely the noise amplification and ringing artefacts that arise in the deblurred image due to an unrealizable or imperfect restoration filter. Also, developing a scheme that can process different types of blur, especially for real images, is yet to be realized to a satisfactory level. This research is focused on the development of blind restoration schemes for real life blurred images. The primary objective is to design a BID scheme that is robust in term of Point Spread Function (PSF) estimation, efficient in terms of restoration speed, and effective in terms of restoration quality. A desired scheme will require a deblurring measure to act as a feedback of quality regarding the deblurred image and lead the estimation of the blurring PSF. The blurred image and the estimated PSF can then be passed on to any classical restoration filter for deblurring.*

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# A Multi-Level Set Based Plaque Segmentation Framework for Atherosclerosis Detection

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**Abstract:** *Cardiovascular Disease (CVD) tends to be one of the common cause that contributes to the rise of mortality rate in recent times. Coronary intravascular imaging technologies have seen a rapid growth due to advancements in interventional cardiology practice. Ultra sound imaging and Intra-Vascular Ultra Sound imaging techniques are predominantly implemented in order to capture the plaque in arteries. Early detection of plaque is essential for efficiently handling the detection of atherosclerosis. Intima-Media Thickness (IMT) is perceived as a significant indicator of the risk evaluation process while tracking the risk of atherosclerosis development. The segmentation of IMT of the Common Carotid Artery (CCA) poses varied challenges such as speckle noises, low contrast, echo shadows and artifacts. Though conventional techniques are available for speckle noise reduction, they are not efficient in extraction for identification of plaque density and the cholesterol deposit levels. In order to overcome the aforementioned limitations, a Novel Multi-level Set Based Plaque Segmentation Framework (NMSPSF) is proposed for detection of atherosclerosis via plaque segmentation. Comparative analysis is performed to ensure the efficiency of the proposed framework.*

# Atm Shoulder-Surfing Resistant PIN Entry by using Rand Word Generators

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**Abstract :** Presently, all the keypad based authentication system is not secured which provides several possibilities of password hacking by means of shoulder surfing. Shoulder-surfing is the easiest way for the identification of password viewing and it has a major attack on password authentication. It is very hard to withstand. This problem has come up with a new solution by the proposal idea designing Automated Teller Machine which displays the shuffled words in the display and confuses person who standing near you to figure out the password. The concept of rand word generator will help us to overcome the password guessing by shoulder surfing technique. In this concept the Rand word can be elaborated as the addition of alphabetic letter along with the password and the words for the particular alphabetic letter to be constantly changed for every transaction is done. The rand word for every user changes constantly for every transaction. In addition to that GSM application affixed with Automated Teller Machine for communicating via the wireless medium. If someone tries to input the old password got through some hacking techniques a message will be sent to the account holder.

**Keywords:** ATM, password, shoulder surfing, GSM, hacking

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## Gsm Based Preemies Incubator

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**Abstract:** This project is automatic monitoring of humidity, atmospheric temperature, water content, heart pulse and oxygen concentration inside the incubator. By using the GSM module, if any critical situation, it will send the SMS to the doctor and nurse and simultaneously it will ring the alarm to intimate the ward member. The water content decreases the pump will get the water and automatically open the nozzle if the level of carbon monoxide increases and closes the nozzle immediately after the reduced condition.

**Keywords:** Microcontroller, GSM, Water level, Humidity, Temperature

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# Low Cost Microcontroller Based Automatic Diesel Generator Starter with Low Fuel Auto Shutdown Feature

Unni MR<sup>1</sup>, A Abhijit Krishna<sup>2</sup>, CK Abhiram<sup>3</sup>, R Athul Kamal<sup>4</sup> and Aravind S Sankar<sup>5</sup>

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**Abstract** :The process plants are continuously operating round the clock. Any power supply interruption will result in process stoppage leading to severe productivity loss and financial implications. In the event of any failure of TANGEDCO main supply, the standby power should come in line without much time delay. For meeting this requirement an Automatic Mains Failure(AMF) arrangement is required for automatically changing over from utility supply to DG supply in the event of utility supply failure. In this project work, an AMF arrangement is fabricated, wired up, interfaced with laboratory three-phase Alternator and was tested for different sequences. Also a real time AMF circuit was studied for interlocks and various sequences of operation. The connected load details in the college campus were collected and sizing of cables was analyzed from the perspectives of generator operation. Based on the load details collected, the generator was adequately sized, neutral arrangement were all examined and proper sizing is arrived to ensure reliable operation of Diesel Generator for standby mode of operation. The present continuous mode of DG sets along with TANGEDCO supply is compared with the ongoing HT conversion mode of operation. The economics Diesel consumption/TANGEDCO tariff is estimated based on comparative analysis. The location of proposed DG set is also optimized for better flexibility of operation to feed the campus loads without any interruption and also to ensure efficient operation of DG set. Complete role of DG set is investigated by properly taking into consideration all the aspects namely AMF, economics, flexibility of operation etc.

**Keywords:** Automatic changeover; Generator; Optimum Location, Power supply, Single phase preventer

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## Forest Fire Detection System

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**Abstract:** As we all know, the forest is considered as one of the most important and indispensable resources and Forest fires represent a constant threat to ecological systems, infrastructure and environmental aspects of a community, forest fire detection is a very important issue in the pre-suppression process. This gives rise to the urgent need to detect forest fires as fast as possible. This paper highlights the powerful feature of wireless sensor networks as a potential solution to the challenge of early detection of forest fires. The device presented makes use of various sensors attached and wireless data transmission, to fulfill the task in question. These collected data are transmitted to the small RF transmitter and the transmitter, transmits the data to the ground station where they are analyzed. The proposed scheme based on wireless sensor networks performs early detection of any fire threat

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# Smart College Management System with Improved Security using Tiva C and Android Application

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**Abstract:** *In this paper, we propose a design for smart management system using android application to manage college. It will have students' and faculty details in all aspects, the various academic notifications to the staff and students updated by the college administration. It also includes all official circulars which are to be circulated in the class rooms. Administrator will be given privileges to update the data or circular. Staffs and students logging in may access the system and know about the recent circulars and the data modified by the management. To overcome the drawback of browsing websites for long time for fetching information for short contents. This system ignores the requirement for maintaining the manual records and also requires very small amount of time in viewing the required information.*

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# Traffic Control and Vehicle Tracking using RFID

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**Abstract:** *Currently people tend to face major issues a familiar one in that is traffic congestion. The system tries to reduce possibilities of traffic jams and allows the vehicle to pass through it. The main objective of this project is to control the traffic and the special privileges for emergency vehicles like ambulance and fire extinguisher by using the RFID technology. The software used in this system is pseudo python it helps to track the emergency vehicle. The micro-controller used in the system is Raspberry pi 3. According to this project if any ambulance comes near the traffic post, the traffic signals automatically stop the signals and give green signal for this ambulance with the using of RFID Module.*

**Keywords:** *IoT, Raspberry Pi-3, RFID Tag, RFID Reader*

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# Survey on Microcontroller Based Automatic Source Changeover between Solar and Main System

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**Abstract:** *Electricity generated from sunlight through solar panels is used commonly in many homes today. Only a limited amount of electricity will be able to provide to the household utilities from Solar Energy Generation (SEG). But the appliances need more electricity to work efficiently. The survey is based on how to utilize the solar power in homes both efficiently and economically. In this paper various methods of solar energy generations are surveyed to analyze the difficulties to obtain the power efficiently.*

**Keywords:** *Solar Energy Generation, Household Utilities, Electricity, Solar Panels.*

\*\*\*

# Detection of Failure Crop using Artificial Neural Network

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**Abstract:** *Detection of rows in crops planted as rows is fundamental to cite specific management of agricultural farms. The detection of rows in an open field crop by analyzing images acquired using an Unmanned Aerial Vehicle (UAV) is proposed. The proposed methodology is used to identify diseases and consistently monitor specific areas. In pre processing step, resizing and colour transformation is done using the original images. After resizing the image, median filter is used to remove the noises. The statistical and texture features are extracted and feature Selection is done by using Particle Swarm Optimisation. By using selected feature classification is done by Artificial Neural Network (ANN) to classify the failure and normal crop field. It is possible to make decisions regarding the future plantation, such as applying pesticides or replanting empty areas.*

**Keywords:** *unmanned aerial vehicles, Expectation Maximisation, Artificial Neural Network.*

\*\*\*

# Psychological Treatment using EEG Waves

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**Abstract:** Our main objective is to calculate the brain waves using the electroencephalography. By using an Passive silver-plated electrode dipped into an saline solution that is passed over an head. They used to read the brain waves such as alpha, beta, gamma waves etc., This will carry an two steps to read the results first step is to amplify the signal and second step is to filter the signal. The major component used in this method is AVR microcontroller and UART. The basic method is to convert the analog signal into an digital signal. so we are using an ADC functionality microcontroller to convert analog signal into an digital signal. UART will send the ADC signal values to the USB port of an micro controller. the AVR microcontroller will run under the format of software that we dumped into it. This will written in the format of MATLAB and C to perform an FFT and run machine learning algorithm to get an resultant values, here we also wrote an software to read our sleep and play an song when we are in depressedcondition. The depressed condition will note down using our brain waves.

**Keywords:** AVR microcontroller, brain waves, electrodes, ADC, Emotions

\*\*\*

# Internet of Elevator System

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**Abstract :** This elevator system is an interfacing of lift to the web server by making use of the internet of things. The cloud is quite appropriate for the Internet deployment of things, since it provides the bridge between the devices that send information and the application or server that will receive it. First, the cloud application initiates the database, which contains all the information received from the sensor installed in the elevator. The sensor intimates the desired information along with the detection of fault, to a cloud using Wi-Fi network. Upon receiving such information, the status of the elevator is displayed in the web server. This makes the elevator maintenance to get notified before the situation gets worse.

**Keywords -** Elevator, Internet of Things, Cloud, Sensors

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# IOT Integrated Automated Guided Vehicle

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**Abstract :** Garment production is an art of science which involves laying, marking, cutting, stitching, and checking of clothes for packing within the Industry. It is an important activity in the production process. Out of total time spend in Garment manufacturing 30% is for Material handling; remaining 70% is for actual process i.e., moving the material from one stage to another stage for the process. The Internet of Things(Iot) integrated Automated Guided Vehicle(AGV) has extremely great demand in the garment manufacturing Industry, though it follows the path allocated for it and moves from one stage to another stage within the industry by carrying the load for several process . It deals with the important moves includes horizontal, vertical and combination of both, stores the data of vehicle's departure from one stage and arrival to another stage with accurate time. The beneficial part of using AGV are as follows; Proper garment production without any damage, Increase the safety of worker while working, stores all the information in the cloud for the purpose of future reference for respective person to analyze past occurrence anytime and anywhere, Reduces manpower, and the productivity.

**Keywords:** Automated Guided Vehicle, Internet of Things.

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# Wsn Scada-Dcs Implementation for Industrial Automation using Labview through Zigbee

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**Abstract:** Monitoring and control of industrial parameters are important in the efficient implementation of industrial process. Connecting and placing various sensors and devices for monitoring the faraway places increases the cost and complexity, which leads to implementation of wireless communication for monitoring and control application. In this paper, an industrial automation system is implemented with a low-cost wireless monitoring and control system based on Zigbee wireless communication protocol. Supervisory Control And Data Acquisition is a supervisory control that plays a tremendous role in the field of automation. A complete process field can be brought into visualization using LabVIEW software.

**Keywords:** is developed with a SCADA, Zigbee, LabVIEW, Industrial Automation

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# Measurement of Physiological Parameters of Human Body using Raspberry Pi

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**Abstract:** The main aim of our project is to measure human physiological parameters such as Body Temperature, Heart Rate, Body Blood Pressure, Oxygen Saturation Level, Respiratory Rate and sending message to doctor using Raspberry Pi Processor. Proper evaluation of those parameters would let us immediately know about sudden health state changes, accidental. Despite this outlook, it's still rather new field of application and most of prototypes of the system are still under investigation stage. In this work we analyze the physiological parameters applicable for human health state indication as well as their registration methods and means. We also make a survey of individual long-term health state monitoring systems design, based on wearable technologies and active clothing appliance.

**Keywords:** IoT, Raspberry Pi-3, RFID Tag, RFID Reader

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# LPG Detection and Monitoring

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**Abstract:** The most common problem experienced in our day-to-day life is gas container going empty. Security problem is a major issue. This paper is mainly used for the people those who have not enough time to do their work. It is about the leakage detection and automatic booking. The automatic booking of cylinder is done through IOT and we measure the weight continuously with the help of LVDT which is interfaced with a Microcontroller. In addition to that, some sensors are used like LM35 (temperature sensor) and MQ-2 (Gas sensor) to measure the temperature and gas respectively. If any changes happen in any one of the sensors, the siren (60dB) will trigger

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# Design of Pollution Monitoring System in Smart Cities

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**Abstract:** The main aim of this project is retrieving the data of real time pollutants from Garbage Bin in smart cities using LORA device. This paper provides a method of monitoring the air pollutants data using different sensors (CO<sub>2</sub>, NO, CO, Temperature and Humidity) in Garbage Bin along with its location. The location of the Garbage Bin is found by using GPS module. The level of the Garbage Bin is monitored using the Ultrasonic sensor. Using an Arduino board, the data are collected from the sensors and are sent through the LORA transceivers. LORA is based on technology of wireless systems and it is designed to transmit and receive desired data from a point to another point even in remote areas. The values of contents in the air are sent through the wireless network to the PC. This smarter equipment is smaller, economical, has a better accuracy, it is compact and less complex in operation. This can be extended to be used in other places like industry purpose, military etc. to monitoring areas.

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# Arduino Based Uroflowmeter using 3D Model

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**Abstract:** Uroflowmetry is a non-invasive technique which can be used for testing patient with various urinary dysfunctions such as output obstruction, urinary incontinence, and stress incontinence. The device serves as monitoring the flow rate curve and analyzes the data of a given sample using PC based application. The system comprehends two parts. The data acquisition part contains sensor which acquires the signal during the time while the patient passes urine. In this project, instead of a live subject, a 3D model of urinary bladder is used to test the effectiveness of the device. Arduino and RS232 (serial communication port) are used to transmit data to display device. In addition, data from the given sample are updated in LabVIEW software for processing.

**Keywords:** Flow meter, Flow rate, load cell, flow sensor, Arduino, LabVIEW

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# Automatic License Plate Recognition and Toll Collection

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**Abstract:** Toll collection is usually considered an inconvenience as it involves long time at the toll booths. Earlier methods such as Electronic Toll Collection and Radio Frequency Identifier have restrictions due to the factors such as the increasing population and distance. In the case of Radio Frequency Identifier, if the distance between the reader and the barcode is wider, the radio frequency produced by the RFID reader will not reach the RFID flags which are fit in the vehicle. In this paper, we propose the Automatic License Plate Recognition and toll collection technology, in which the vehicle's number plate will automatically be detected by the webcam, the details of the image are collected and correlated with the database. If the vehicle's number plate matches, the amount will be debited from their account directly. If the available balance is minimum, the concerned person will be informed about the sufficient amount required to be maintained, in the previous transaction itself. The image processing is done using Python programming in the OpenCV tools. The vehicle number is checked in the database for automatic amount detection from the account. Then the toll gate open for the vehicle to move. In case of any mismatch in data, a security alarm is initiated to intimate the fraudulent.

**Key Words:** Electronic Toll Collection(ETC), Radio Frequency Identifier(RFID), Automatic License Plate Recognition(ALPR).

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## Gesture Talk using Tiva C Series for deaf and Dumb People

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**Abstract:** This paper elucidates the design and implementation of low-cost hand gesture recognition system for deaf and dumb people. The deaf and dumb people express their feelings and emotions by sign language and motion of their hands called gesture. Some of the normal people can understand the sign language and others not able to communicate with them. Thus to overcome this complexity this paper converts the gesture movement into the voice output. A code snippet is included to send a message to the person-in-charge in case of an emergency by the deaf or dumb people. A mobile number is included in the code and the message read from the sensor is sent to the respective number. This message option can be enabled by the person having the glove.

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# Analysis of Power Consumption of Air Conditioner using Arduino

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**Abstract :** *Energy saving in air conditioners is a primary concern in buildings, since air conditioners consume large proportion of the energy in building service equipment. Research on energy saving in air conditioners focuses mostly on the chiller system and the associated control strategies. For air conditioners in buildings, the thermal control strategy to adjust the temperature set point is very easy to implement and very effective to save energy. This paper presents an evaluation of the potential energy savings from adding temperature set point control to existing packaged air conditioners. Thus a microcontroller and temperature sensor is used to measure the temperature. The indoor and outdoor temperature difference is calculated to set the AC cooling temperature for maintaining the energy consumption at optimized level.*

**Keywords:** *Airconditioner, Powerconsumption, Energycrisis*

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# Intelligent Intensive Care Unit and Patient Monitoring System

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**Abstract :** *The technology and the world both are growing at a speed that we can never think of. To overcome this growth we should improve our technology to reduce the man work and the timing. To do the work soon is becoming more important for every individual, we tend to neglect the most important factor health, which conquers the whole world. We all know that health is wealth but we don't like to spend most of our hard earned money in the hospital and also doesn't like to spend our time on the regular check-up in the hospital. And also people who are in out of the station or if they are in abroad have to leave their kids or old aged persons alone during their checkups. Nowadays, the evolution of the internet plays an essential part in everyone's life. The usage of the internet of things in the medical world to make everyone's work easier. One of the problems which are faced in every hospital is the maintenance of the Intensive Care Unit. It should assure patient safety and optimal patient outcome and it should enhance satisfaction among the patients, staffs, and physicians. So for a secured and hygienic ICU, we monitor the room with the help of internet. The concept of our project is to maintain the medical records without the help of pen and paper and to update the conditions of every patient on the internet when they are in the ICU.*

**Keywords:** *IOT, Pulsesensor, BMP180, DHT11*

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## Smart Bin for Segregation of Household Waste

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**Abstract:** *In this paper we have presented a smart waste bin for segregation of house hold wastes .To recognize the type of waste whether it is degradable or non degradable or metallic waste for efficient waste management system. In urban India the total municipal waste generated is very large, Segregation of this bulk waste is a tedious process and costly. In order to find solution to such a problem we step into a product “Segregating bin”, which would separate the wastes right from house could be an effective solution to avoid burden over large scale*

**Keywords:** *SmartWaste-bin; WasteManagement*

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## Automated Fire Fighting Robot

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**Abstract:** *Fire-fighting robot works on behalf of humans in hazardous area. This system is used to protect human lives and surroundings from fire mishaps. The objective of this work is to develop a fire fighting robot which aids the society to protect them from fire accidents. The robot helps in emancipation and helps people by suggesting emergency medical assistance to the person suffering from injuries caused during fire accidents.*

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## Development of Smart Shoes for Visually Impaired People using IoT

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**Abstract:** *Visually impaired people require continuous assistance from other people, as blindness restricts them to survive independently. Presently, blind people use a white cane as a tool for directing them to the destination. In this paper, smart shoes are developed, which work efficiently in both indoor and outdoor environment by providing obstacle free path to the visually impaired people. Assistive technology promotes greater independence and automates the navigation for the disabled by using raspberry pi with ultrasonic sensor and camera which detects obstacles and also sense the type of objects or obstacles.*

**Keywords:** *visually impaired, obstacle, assistive technology, navigation, ultrasonic sensor.*

# Artificial Intelligence and Robotics

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**Abstract:** *Artificial Intelligence (AI) and Robotics technology has received significant attention in the recent years of engineering research and development. AI is a study of how human brain think learn and work when it solves the problem. Robotics field has a great potential for assisting in some complex tasks just as the advent of computer technology has made our work style easier. Artificial Intelligence do play a vital role in Robotics. Artificial Intelligence describes the work process of machines that would require intelligence if performed by humans and how that knowledge should be represented; and how that knowledge should be used in robotics. This paper will provide an overview of evolving trends and growing field of artificial intelligence and robotics research and development*

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## An Intelligent Live Streaming Rescue System for Women using Raspberry PI

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**Abstract :** *In recent days, women plays an outstanding role in each and every aspect. At the same time, they are facing unethical atrocities like physical and sexual abuse and other violence, especially who are working at night shifts. In todays world, eventhough many attempts have been made to make the women in safer zone, still they feel insecure in all circumstances. To safeguard women from endangerment, this intelligent live streaming rescue system is proposed to ensure more security and reliability to the victim. This system is designed around raspberry pi zero interfaced with sensors such as flex sensor, sound sensor, pulse rate sensor, MEMS accelerometer sensor, temperature sensor to sense the abnormal condition of the victim's health when the women is in threat. This system gets activated when four out of five sensors exceeds the threshold level, the buzzer alerts automatically and GPS module is being interfaced to acquire current location of the victim, an alert message will be sent to the registered mobile number and to the nearby police station through the GSM module. Raspberry pi camera is attached here to make a live streaming facility will be sent to the registered helpline instantly for immediate recovery of the women from danger.*

**Keywords:** *Raspberry pi, Temperature sensor, Pulse rate sensor, MEMS Accelerometer sensor, Flex sensor, Sound sensor, GSM module, GPS module, camera.*

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# Smart Walking Device for Visually Impaired Person

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**Abstract:** "Independence is the building methodology in achieving dreams, goals and objectives in life." Visually impaired persons find themselves challenging to go out independently. There are millions of visually impaired person or blind person in the world who are always in need of helping hands and they feel more difficulty to reach their destination. To avoid uncomfortable experience for visually impaired person, a smart walking device was designed. It helps the blind people to navigate easily outside the home without helping hand. The device which is used to detect an obstacles, water and pit. Remote which is always hold by the visually impaired person is used to find the smart device when it is misplaced. The device is capable to indicate the blind people which signal is activated in the road traffic light.

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# Indoor Person Tracking System using Bluetooth

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**Abstract:** An Indoor Positioning System acts like a location engine to point the location of the device. In this method Received Signal Strength Indicator (RSSI) on Bluetooth low energy indoor positioning system is used. There are plenty of challenges related to this technology, especially in terms of received signal strength indicator. It receives the information about the student location and Bluetooth low energy provides correct and precise information regarding the location of a device using BM71 Bluetooth modules which is inserted in ID card. The goal of this method is to locate student in college buildings at 10m to 15m distance.

**Keywords:** Bluetooth low energy, BM71 Bluetooth module, Received Signal Strength Indicator

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# GPS-GSM Based Student Bus Tracking Along with Qr-Code Based Attendance Monitoring

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**Abstract:** *The Wi-Fi Technologies were developing strongly in day by day in this modern international. Many vehicle tracking structures are based on Global Positioning System (GPS) and Global System for Mobile communications (GSM) because of the extensive regions protected by way of those services. In those structures, the GPS coordinates of a shifting automobile is encapsulated in an Map layout and transmitted to the tracking server. In this paper, a GPS-GSM based system is designed and implemented to economically song school automobiles transferring over huge geographical areas. Performance evaluation beneath hypothetical and practical test instances showed the capability of the proposed system to attain massive attendance monitoring device to allow the presence of the child. The attendance may be monitored primarily based at the Unique QR code for person child that allows you to be supplied in the academic organization. The proposed device additionally presents a trade-off between price reduction, protection development, attendance monitoring and monitoring accuracy. This enables the fashion designer to choose appropriate machine parameter values to reduce the price for a given level of tracking accuracy.*

**Keywords:** *Tracking systems, GPS, GSM, QR-code, Attendance monitoring Microcontroller, Android application, Tracking protocol.*

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# Voice Based Notice Board using Android Application

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**Abstract:** *This paper is based on advanced voice based notice board using rolling display. This notice board provides information in an efficient manner. The voice of the user is recorded and converted by the android application installed in the android phone. The Bluetooth technology handles the wireless part of the communication channel. The microcontroller stores the converted messages. The complete rolling display is made up of 512 individual matrix LEDs. The rolling display will display the messages. It reduces the man power and loss of time. By reducing the problems, the notice board used to display notices in the institutions, organizations or public places like bus station, railway station, schools and colleges.*

**Keywords:** *Android Application, Bluetooth Module, Microcontroller, Display Device.*

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# Design and Development of Quality Detector for Guava Fruit

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**Abstract:** *Guava is a climacteric, perishable produce with short shelf life. The shelf life of guava fruit can be extended or increased by adjusting the controlled atmosphere (CA) and cold storage durations. In order to evaluate the fruit quality changes, the relationship among quality variable is identified in response to atmosphere composition and storage duration which varies due to ripening stage. The objective of this work was to develop and fabricate the ripening quality detector for guava fruit using moisture and sno2 sensor . The moisture sensor measures the fruit moisture content (MC) and relative humidity (RH) and the Sno2sensor segregate the fruit based on its ethylene composition. When the moisture content and relative humidity is in the range of (40.2-47.6%MC and 90.594.7%RH),(40.2-7.6%MC and 90.5-94.7%RH) and (68.5-80%MC and 95.6-98.2%RH) then the result will be displayed as before ripened, half ripened, decayed. The amount of ethylene in the ripened fruit range from (10-100ppm) and in the artificially ripened fruit the ethylene concentration ranges from (101-180ppm). The sensors are able to detect spoilage of common household items like dairy, meats and fried items. The employed Sno2sensor screens the artificially ripened guava fruit and also the presence of chemicals due to unintentional exposure, therefore contributing towards food safety and security.*

**Key words:** *Sno2sensor, quality of fruit, moisture sensor, microcontroller.*

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## Multi Banking ATM System With FFO

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**Abstract :** *Now a days, ATM systems provides the facility to access any ATM card in any ATM system. The objective is to know the enhanced smart ATM security system which is developed using the embedded system and advanced technologies. The problem is that if an user has more than one account, he has to carry all the cards for accessing multiple bank accounts and also has to remember multiple password. Here we are integrating multiple cards into single ATM card. We also introducing fingerprint, face recognition based authentication and also OTP(One Time Password) to prevent fraud and to avoid PIN. Here the fingerprint and face recognition is most secured, unauthorised access are restricted and also makes an unique identification for everyone. RFID card is used as ATM card. If ATM is tampered then SMS is sent to two main stations via GSM. GPS is used to track the location in case of cashbox is robbed.*

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# LPG Leakage Detection & Gas Booking with Alert System

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**Abstract:** Gas leakage is a major problem with industrial sector, residential areas and gas driven vehicles like CNG (Compressed Natural Gas) buses, cars etc. One of the preventive methods to stop accidents related with the gas leakage is to install a gas leakage detection device at permeable places. The aim of this project is to develop such a device that can automatically detect and stop gas leakages in those permeable areas and also a weightsensor is installed along with it. The system detects the leakage of the LPG (Liquefied Petroleum Gas) using a gas sensor and uses the GSM to alert the person about the gas leakage via SMS. And also a weight sensor is used to calculate the weight so that if the LPG is going to over it will automatically Book the next cylinder .When the LPG concentration in the air exceeds a predetermined level, the gas sensor senses the gas leakage and the output of the sensor goes LOW. This is detected by the microcontroller and the LED and buzzer are turned ON simultaneously .The system then alerts the customer by sending an SMS to the specified mobile-phone .Similarly If the weight of the gas is low, then LPG will be booked automatically.

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## Interventions of Nanotechnology in Food Packaging – An Overview

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**Abstract:** Nanotechnology is the study and use of structures between 1 nanometer and 100 nanometers in size. It involves the application of the altered physical and chemical properties of nanomaterials and nanoparticles for many new profitable productions and applications. The capability to manipulate, control, assemble, functionalise, produce and manufacture things at atomic precision ,makes nanoscience and technology a potential area that can construct a wide range of new materials, devices and technological systems. The novel properties of nano materials offer many new opportunities for food and agricultural industries, for example more potent food coloring, flavoring and nutritional additives, antibacterial ingredients for food packaging and more potent agro chemicals and fertilizers. Nanotechnology holds great promise to provide benefits not just within food products but also around food products. Nanopackaging is defined as the process of interconnecting, powering, cooling, and protecting the food materials for greatly improved functionality and cost. Nano packaging is already making an impact on the development on of functional or interactive foods, which respond to the body's requirement and deliver nutrients more efficiently .This paper presents an overview on the interventions of Nanotechnology in food packaging.

**Keywords:** Nanometers, Nanocomponents, Food material, Nano packaging etc.

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# Quality Indicators used as a Device for Monitoring the Food Quality and Safety in Intelligent Packaging –A Review

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***Abstract:** Intelligent packaging is an emerging technology that uses the communication function of the package to facilitate decision making to achieve the benefits of enhanced food quality and safety. This packaging technique monitors the condition of packaged foods to give information regarding the quality of the packaged food during transport and storage. In this technique indicators are used instead of time consuming, expensive quality measurements for improving the food quality and safety. Recognition of the benefits of intelligent packaging technology by the food industry for food safety and quality, development of economically viable packaging systems and increased consumer acceptance is necessary for commercial realization of this packaging technology. In this review, the role of indicators such as time-temperature (TTI) indicators, freshness indicators and gas indicators are evaluated for possible use in food application.*

***Key words:** packaging, intelligent, food safety.*

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## GENERAL ARTICLES IN ELECTRONICS

### **New Technologies and Breakthroughs for 3D Printing, AI and Batteries Held the Most Interest in 2018**

As we head into the new year, Electronic Products looks at some of the most popular stories of 2018. Not surprisingly, some of the most-read stories focused on technology breakthroughs as designers tried to stay on top of the latest and greatest advances, ranging from 3D printing and blockchain to artificial intelligence (AI) and the internet of things (IoT). Over the past year, one of the biggest trends — and one that will continue into 2019 — is the drive toward more practical applications of AI. We saw a tremendous amount of work in the area of processors for AI applications, including embedded products and new sensors for automotive, industrial, and consumer electronics products.

As we look ahead, Electronic Products also expects the technology needle for virtual reality/augmented reality (VR/AR) to move significantly as more uses emerge beyond gaming applications. Tie this together with advances in IoT, and designers have a tough job staying ahead of new products and technologies for their next-generation designs. In 2019, we expect 5G, AI, autonomous vehicles, VR, and IoT to have a significant impact on electronics design. A huge enabler of these technologies will be new electronic components, ranging from passive components and interconnects to processors and power devices, that are designed specifically for these new applications.

Here are 10 of the most popular articles in 2018 that helped engineers, designers, and makers stay ahead of the technology curve, along with a few articles that piqued the curiosity of technology enthusiasts.

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### **Battery that Charges in One Minute Could Beat Tesla in the Race for Tomorrow's Car**

Most of the major technological advancements that have been made in the world of electric cars belong solely to Tesla, but someone has stepped forth to change this. According to Henrik Fisker, once a chief designer for Aston Martin and a former Tesla consultant, a new battery is about to revolutionize the way that electric cars will be powered. He offers a new design to batteries that could replace lithium-ion batteries for the electric cars of the future.



*A new battery can revolutionize the way that electric vehicles will be powered. Image source: Fisker.*



Fisker’s electric car company, Fisker, has filed a patent for a new type of car battery, a new form of a solid-state battery that, in theory, could hold 2.5 times the charge of a conventional battery. If that isn’t impressive enough, Fisker claims that these new batteries have the potential to charge in less than a minute and could allow an electric car to travel up to 500 miles on a single full charge. If what Fisker claims is true, these are game-changing advancements that could shake the world of electric cars forever. A traditional lithium-ion battery uses an electric charge that is conducted through a liquid organic solvent between electrodes, producing an electric current. In the new solid-state batteries that Fisker has designed, that current is transported via a solid electrolyte. The use of a solid, rather than a liquid medium, in the batteries gives the solid-state batteries a multitude of advantages. Solid-state batteries are more stable and, therefore, much less likely to catch fire or corrode. They also barely degrade over time, meaning that they will not lose their charge and will last almost indefinitely. These solid-state batteries also offer a higher energy density than liquid batteries, allowing them to achieve a greater charge in even less occupied space. There do not seem to be any downsides to this form of solid energy storage.

In April 2008, Tesla Motors filed a lawsuit against Fisker alleging that they had agreed to a contract to gain access to Tesla’s design concepts and trade secrets. Fisker won the case, and Tesla ended up paying over \$1 million in legal fees. And although the design and specifications for this new battery have yet to be released, it seems that we have some advancements to look forward to. “This breakthrough marks the beginning of a new era in solid-state materials and manufacturing technologies,” said Dr. Fabio Albano, vice president of battery systems at Fisker Inc. “We are addressing all of the hurdles that solid-state batteries have encountered on the path to commercialization, such as performance in cold temperatures; the use of low cost and scalable manufacturing methods; and the ability to form bulk solid-state electrodes with significant thickness and high active material loadings.” Though solid-state batteries are still in their infancy and not currently being mass-produced, if Fisker’s predictions on the power of these new batteries come true, we will be seeing them in cars on the road in as few as six years.

#### 4 WAYS AMAZON ECHO AND ALEXA POSE SERIOUS THREATS TO YOUR PRIVACY



People used to dream about having a robotic assistant to obey their every command, and now, thanks to the Amazon Echo, the future has arrived. But with privacy concerns becoming an ever-growing issue in our tech-heavy world, is having a digital assistant secure? Below are four ways that the Amazon Echo and its obedient voice, Alexa, pose threats to your privacy. **Amazon’s Echo-and-Alexa-enabled devices** constantly monitor sounds in the area for the pre-programmed wake word unless its mute setting is toggled. Amazon claims that all sounds recorded prior to the wake word are processed locally and then deleted a few seconds later. Once the wake word has been registered,

the command is then sent to the Amazon cloud servers, from where the response to your command is taken. Exactly how much information recorded or sent prior to or after your request is unknown, along with the identity of who may be listening to it. The potential for some outside party to hack into your device and then pick and choose what Alexa listens for is a worrisome possibility. The Amazon Echo is not immune to the advances of hackers who could use it and its automated features to spy on you or your family. **According to Wired**, an Echo has already been turned into a wiretap in just a few minutes by an experienced hacker. This means that used devices, or ones bought from less-than-reputable dealers, could potentially have been previously hacked and could have the ability to spy on you and reveal your sensitive information to crooks and cyber-thieves.

Your conversations with Alexa are recorded and saved. Being digitally saved, your searches and overheard conversations could be referenced later by Amazon or anyone else that can get a hold of them. These conversations are stored on Amazon's servers, and you can actually go back yourself and listen to or delete any that you choose. If you can access this server, then obviously a net-savvy hacker or improper authority could, too. The most annoying of its security flaws is the Echo's ability to be used in advertising. When you talk to Alexa or use your Echo to order things online, the items are recorded and stored in Amazon's databanks. That information is then analyzed and used to suggest future purchases with customized advertisements. This development leads to the dreaded scenario in which you mentioned cat food once and now have advertisements for tasty canned cat food for the next two weeks even though you don't actually own a cat. To make it even worse, information about your life and habits that are being stored by Amazon are being sold to advertising companies so that they can, in turn, use it to try to make money off of you. Remember, before you set up your Amazon device, you agree to its terms of use, but the thought of your personal information being sold to the highest bidder, with no monetary gain being offered to you for your services, is truly disturbing.

## **HOW TECHNOLOGY IS ENABLING COMMUNICATION WITH ANIMALS**



Humans communicate among themselves through different languages that can be understood only if they know those languages. Distant communication has been made possible by electronics and has progressed to its present unimaginable level of communication. Electronic translators for different languages are flooding the market, and by using these humans can get any language translated into a desired language. Scientists and technologists are also working hard to make use of electronics for intercepting and translating any signals, if any, being sent by aliens, too. We are all around surrounded as well as associated with different types of animals and birds. Communication with animals has always been an integral part of our civilisation, but it happens mostly through intuition and gestures. Humans can interpret the sounds produced by animals or birds as demands or as warnings.

There are a number of mythological stories about people understanding the language of animals and birds, whether through meditation or spiritualism, but the practice is uncommon and unscientific. Many traditional songs indicate that certain people are masters of knowing or understanding the language of crows. It is a belief that all living things other than humans possess a sixth sense and therefore interpret sounds made by different animals and birds. However, without any scientific basis, these beliefs have been termed as superstition. While living with animals and birds, humans may recognise the intentions, emotions or thoughts behind the sounds made by these animals and birds, even if the sounds themselves are not totally understood. These interpretations can be based on eye gaze, facial expression, vocalisation, body posture (including movement of bodies and limbs) and gustatory communication (scent, pheromone and taste). At the primitive level, humans communicate with animals using vocalisation, hand signals, body postures and touch to express love and care. Artificial intelligence (AI) can help humans express feelings in a more effective way. This may soon become a reality as scientists are making use of electronics through the implementation of AI to decode the different dialects of animals.

There have been continuous attempts to create translation devices that can interpret animal sounds and their meanings. While some such attempts have failed or managed to simply mimic animal sounds, others have seen some success, translating a few sounds. Although, these endeavours have been exciting and novel, these have not reached the ability to truly translate what is going on inside the mind of animals. Much of this technology is being used to study animals in the wild, but someday soon it may be parlayed into a device for humans to talk to the animals around them.

The man credited with leading the charge in decoding animal sounds, Dr Constantine Slobodchikoff, is an expert in animal referential communication studies using prairie dogs as a model species. Dr Slobodchikoff has been able to index the sounds made by prairie dogs to synthesise their language into English using electronics with AI to maintain and develop the catalogue and to further allow the computer to learn on its own to translate the animal talking to a great extent. Dr Slobodchikoff does not hesitate to mention that a bias exists among biologists and linguists. He believes that animals are only able to communicate and cannot express emotions, or have conversations based solely on instinct. As per consensus, there is no universal agreement on a common level of consciousness across all animal species, but scientists who have studied the gorilla named Koko have proven that apes are more than capable of thought and feeling.

Over the years, researchers have recorded hundreds of hours of prairie dog calls using hidden microphones. A sophisticated combination of electronics and AI is used to analyse each recording by looking at how different frequencies and overtones stack on top of one another. This is how researchers have learned that the calls can be clustered into different groups, with each cluster having its own signature set of frequencies and tones. Dolphins have always been one of the most fascinating animals for scientists to study, as they are considered to be the second most intelligent animal on Earth, next to humans. The first effective animal translator was Cetacean Hearing and Telemetry (CHAT) translator, which was used to communicate with dolphins. Using this translator, a team of scientists studying a particular group of dolphins decoded whistles and their meanings, and CHAT translated the dolphins' whistles to the word. Further, a company is developing a program using AI analysis software along with CHAT to decipher what dolphins speak. The software for decoding human language is currently used to collect information about the type of emotion a speaker is exuding, and the program has already mastered 40 human languages. Companies interested in this utility believe that decoding dolphins will further this capability.

The same technology is also being used to translate the sounds of other animals. Sounds made by animals have different patterns and intonations tied to different concepts and words. Scientists feed these to a computer that maps out their meaning and context. So far, the program has recorded with refinement, distinguishing hundreds of different gibbon calls. Although having an AI translator does not necessarily mean humans will be able to have a heart-to-heart conversation with their pets, as there are vast differences between human and animal cognition, and humans are a long way from understanding the latter. However, this kind of communication technology could help humans better understand animals and their behaviour—this would mean more than just forging closer emotional ties with them. Simple communication with animals could eliminate guesswork in caring for animals and even save their lives. Similarly, AI-based electronics communication technology could make things easier for farmers and ranchers, for instance, by quickly identifying animals that are sick by detecting signs of pain on their faces.

Growing success of neural networks in applications like speech recognition, vision and autonomous navigation has led to great excitement not just among the members of the AI community but also among general public. Over a relatively short period of time, AI has helped manage automation of tasks that have defied convention for decades. Some such achievements have even reached human-level intelligence.

Under its newly-acquired label, called deep learning, a new trend is emerging where machine learning research is being streamlined into neural network research. Systems such as Google Translate have made major strides in human translation in recent years, using neural machine translation technology to support interpretation for 103 languages. Some earpieces developed recently can instantly translate various human languages. Advances in the field of machine learning have led to improved speech recognition technology, and taking on animal speech represents an entirely new horizon for AI translation technology. New algorithms can learn to interpret languages on their own by analysing massive sets of data; however, it is still unclear whether such technology can really deliver accurate interpretation of animal communication.

Scientists and technologists are experimenting with AI-based electronic devices to decode and interpret animal sounds such as barks, growls or howls into a language that humans can understand. According to researchers, this is the result of combining latest technologies in three different areas of technology, namely, electroencephalography (EEG) sensing, micro-computing and special brain-computer interface software. The operating system relies on sensors in the headset, which detects electric signals in the animal's brainwaves. Technology from an in-built processing device then analyses signal patterns and deciphers these into distinct feelings like anger, curiosity or tiredness. Scientists are working to develop the technology that aims to distinguish canine thought patterns and then issue these as short sentences via a microphone that could soon allow dogs to speak with humans. Even though brainwaves vary in individual races as well as individual dogs, it is possible to detect some common patterns.

With the growth in technology, there is no doubt that in the future this will open an era of communication between animals and humans. How precisely the scientists can attach sensors to an animal brain is yet to be ironed out. Such issues in addition to ethical and social concerns are the reasons why there is a lot more research to be done before the technology becomes commercially-available. It is expected that AI-based electronics translation technology capable of interpreting at least a dog's language for human understanding could become a reality within the next ten years.

## **Mobile Apps for Optical Communication**

### **Gamma OTDR**

Gamma OTDR (optical time domain reflectometer) is an easy-to-use application that serves not only as an optical trace viewer but also as a full function OTDR, having connected an external measuring module. The measuring module connects to any iOS device via Wi-Fi using TCP/IP. It has a flexible interface for both smartphones and tablets to characterise the traces due to manual and auto-analysis modes. The remote-control function for the OTDR controller makes Android and iOS devices a part of a powerful measuring system. It supports Bellcore/Telcordia-compliant trace format (SOR files version 2.0) according to GR-196-CORE OTDR (SR-4731) data standard.

### **Network Map-GIS**

Network Map is a fibre cable management application using geographic information system (GIS) for designing and drawing fibre network routes for fibre-to-the-premises (FTTP) and fibre-to-the-home (FTTH) layouts. It allows users to plan, design, document and maintain a fibre network structure simply and effectively. Signal loss per kilometre of fibre cables, loss at fibre patches and loss of each device such as couplers and splitters are customisable. Fault-location assistance is provided when an OTDR input is given. There are three-tier user access permissions: administrator, user and viewer. Network Map Starter Assist can be helpful in completing each step in a logical order.

### **Catv**

Catv is a handy application for people involved in the maintenance and design work in the telecommunications area. It enables users to perform theoretical calculations easily and quickly, helping solve problems and failures of their network. The available database allows an efficient search for a node or voltage source of the network by locating them in Google Maps. Easy sharing of images of the designs or calculations is present. Other resources include the connector, polishing and colour code information on optical fibres.

### **Fiberizer MOBILE**

This allows users to look through and analyse reflectograms on-the-go. The interface is user-friendly. Graphical zoom with multi-touch features is provided for iOS. Measurement of reflectance, optical return loss and fibre attenuation can be done with two or five markers. Integration with cloud allows easy sharing. The app is compliant with universal Telcordia GR-196 and SR-4731 \*.sor formats. It is useful for fibre-optic test and measurement engineers, telecommunication engineers, fibre-optic line installers and other technicians.

### **THE BEST OF TWO WORLDS: MAGNETISM AND WEYL SEMIMETALS**

Imagine a world in which electricity could flow through the grid without any losses or where all the data in the world could be stored in the cloud without the need for power stations. This seems unimaginable but a path towards such a dream has opened with the discovery of a new family of materials with magical properties.



These materials -- magnetic Weyl semi-metals -- are innately quantum but bridge the two worlds of topology and spintronics. Topological materials exhibit strange properties including super-fast electrons that travel without any energy loss. On the other hand magnetic materials are essential to our everyday lives from magnets for electric cars to spintronic-devices in every hard disk drive in computers and in the cloud. The concept of a magnetic Weyl semi-metal (WSM) was in the air but a real life material has only just now been realized by the team of Claudia Felser, Director at the MPI CPfS, Dresden, in two very different compounds  $\text{Co}_2\text{MnGa}$  and  $\text{Co}_3\text{Sn}_2\text{S}_2$ .

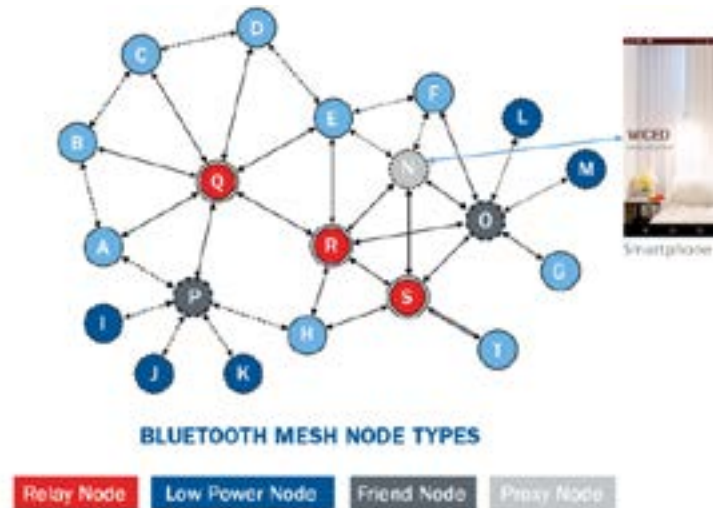
To find these extraordinary materials, Felser's team scanned the materials database and came up with a list of promising candidates. The proof that these materials are magnetic WSMs was obtained via electronic structure investigations of  $\text{Co}_2\text{MnGa}$  and  $\text{Co}_3\text{Sn}_2\text{S}_2$ . Scientists from Claudia Felser's group at the MPI CPfS and Stuart Parkin's team at the MPI of Microstructure Physics, Halle, in collaboration with M. Zahid Hasan's team from Princeton, Yulin Chen's team from Oxford University, and Haim Beidenkopf's team from the Weizmann Institute of Science, have experimentally confirmed the existence of magnetic Weyl fermions in these two materials in studies that were published in three papers in *Science* today. For the very first time, using angle-resolved photoemission spectroscopy (ARPES) and scanning tunneling microscope (STM) experiments, time-reversal symmetry broken WSM states were observed, made possible by the high quality single crystals grown at the MPI CPfS. "The discovery of magnetic WSMs is a big step towards the realization of high temperature quantum and spintronic effects. These two materials, that are members of the highly tunable Heusler and Shandite families, respectively, are ideal platforms for various future applications in spintronic and magneto-optic technologies for data storage, and information processing as well as applications in energy conversion systems," says Stuart Parkin, the Managing Director of the Max Planck Institute of Microstructure Physics, Halle.

The magnetic topological states in  $\text{Co}_2\text{MnGa}$  and  $\text{Co}_3\text{Sn}_2\text{S}_2$  play a crucial role in the origin of the observed anomalous quantum transport effects, due to the strong Berry curvature associated with their topological states. With Weyl nodal line and nodal point band structures,  $\text{Co}_2\text{MnGa}$  and  $\text{Co}_3\text{Sn}_2\text{S}_2$  are the only two currently known examples of materials that host both large anomalous Hall conductivity and anomalous Hall angle. "Our materials have the natural advantages of high order temperature, clear topological band structure, low charge carrier density, and strong electromagnetic response. The design of a material that exhibits a high temperature quantum anomalous Hall effect (QAHE) via quantum confinement of a magnetic WSM, and its integration into quantum devices is our next step," says Claudia Felser.



The discovery of magnetic WSMs is a big step to the realization of a room temperature QAHE and is the basis for new energy conversion concepts. “A Quantum Anomalous Hall effect enables dissipationless transport via chiral edge states that are innately spin-polarized,” realized Yan Sun immediately. Realization of the QAHE at room temperature would be revolutionary by overcoming limitations of many of today’s data based technologies, which are affected by large electron scattering-induced power loss. This would pave the way to a new generation of low energy consuming quantum electronic and spintronic devices.

**MICROCHIP DIGITAL SIGNAL CONTROLLERS, TI SYNCHRONOUS BUCK CONVERTER AND MORE CYPRESS BLUETOOTH MCUS**



Cypress Semiconductor is sampling two low-power, dual-mode Bluetooth 5.0 and Bluetooth Low Energy (BLE) microcontrollers (MCUs) that include support for Bluetooth mesh networking for the Internet of Things (IoT). The CYW20819 and CYW20820 MCUs each provide simultaneous Bluetooth 5.0 audio and BLE connections, delivering low-power wireless systems that enable music and voice commands for battery-powered fitness bands, health monitoring devices and voice-activated remotes.

Microchip has announced dual- and single-core dsPIC33C Digital Signal Controllers (DSCs), which include more options to meet changing application requirements across memory, temperature and functional safety. The dsPIC33CH512MP508 dual-core DSC provides support for applications with larger program memory requirements, while the dsPIC33CK64MP105 single-core DSC adds a cost-optimized version for applications that require smaller memory and footprint. Developers can scale across product lines using the devices, which are pin-to-pin compatible within the dsPIC33CH and dsPIC33CK families.



RS Components has added 14 lines of industrial automation devices from KUNBUS, including industrial computers, PLCs, and data acquisition and human-machine interface (HMI) systems. A key device line from KUNBUS is the Revolution Pi series of open-source and modular industrial PCs, which are based on the Raspberry Pi platform. This modular system, which meets the EN61131-2 international standard for PLCs, offers a family of central processing units that include the RevPi Connect, RevPi Core and RevPi Core 3. Installed in DIN rail housings, all the devices come with USB, Ethernet and HDMI connections and are based around the Raspberry Pi Compute module.

### **Synopsys Fusion Compiler Updated for Automotive Designs**



Synopsys has improved its Fusion Compiler to provide functionality for next-generation automotive designs. Built using a single, highly scalable data model, and based on an analysis backbone that utilizes technology from golden-signoff analysis tools, Fusion Compiler helps ensure that critical PPA metrics work efficiently and effectively throughout the entire RTL-to-GDSII design flow.