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## Department of *Electronics and Communication Engineering* Presents **International conference on**

**"Smart Modernistic in Electronics  
and Communication"**

on 24<sup>th</sup> & 25<sup>th</sup> February 2023

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## Department of Electronics and Communication Engineering

4<sup>th</sup> Online International Conference on  
“Smart Modernistic in Electronics and Communication” (ICSMEC–23)

**ISBN No: 978-93-91420-16-1**

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CHAIRMAN



## MESSAGE

I am extremely pleased to know that the Department of Electronics and Communication Engineering of SMEC is organizing Online International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-23) on 24<sup>th</sup> and 25<sup>th</sup> of February 2023. I understand that the large number of researchers has submitted their research papers for presentation in the conference and for publication. The response to this conference from all over India and Foreign countries is most encouraging. I am sure all the participants will be benefitted by their interaction with their fellow researchers and engineers which will help for their research work and subsequently to the society at large.

I wish the conference meets its objective and confident that it will be a grand success.

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**Sri. G. CHANDRA SEKHAR YADAV**  
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## MESSAGE

I am pleased to state that the Department of Electronics and Communication Engineering of SMEC is organizing Online International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-23) on 24<sup>th</sup> and 25<sup>th</sup> of February 2023. For strengthening the “MAKE IN INDIA” concept many innovations need to be translated into workable product. Concept to commissioning is a long route. The academicians can play a major role in bringing out new products through innovations.

I am delighted to know that there are large number of researchers have submitted the paperson Interdisciplinary streams. I wish all the best to the participants of the conference additional insight to their subjects of interest.

I wish the organizers of the conference to have great success.

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**Dr P. SANTOSH KUMAR PATRA**  
**PRINCIPAL and GROUP DIRECTOR**



I am delighted to be the Patron & Program Chair for the Online International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-23) organized by the Department of Electronics and Communication Engineering on 24<sup>th</sup> and 25<sup>th</sup> of February 2023. *I have strong desire that the conference to unfold new domains of research among the Electronics and Communication Engineering fraternity and will boost the knowledge level of many participating budding scholars throughout the world by opening a plethora of future developments in the field of Electronics and Communication Engineering.*

*The Conference aims to bring different ideologies under one roof and provide opportunities to exchange ideas, to establish research relations and to find many more global partners for future collaboration. About 250 research papers have been submitted to this conference, this itself is a great achievement and I wish the conference a grand success. I appreciate the faculties, coordinators and Department Head of Electronics and Communication Engineering for their continuous untiring contribution in making the conference a reality.*

**(Dr. P. Santosh Kumar Patra)**  
**Principal & Group Director**



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**Dr. SANJAY KUMAR SUMAN**

**DEAN R&D**



## MESSAGE

Research, curiosity and discovery has been in existence ever since man's presence on this planet millions of years ago, civilization has been characterized by curiosity and discovery. Therefore, the curiosity to explore what will happen, how it happens, is there a better way to do it, has been the driving force behind all research efforts. During the past few decades, the engineering faculties have taken a number of initiatives to reorient the engineering machinery to play leading roles in the industrial development process.

I am delighted to acknowledge the international conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-23) organized by the Department of Electronics and Communication Engineering on 24<sup>th</sup> and 25<sup>th</sup> of February 2023. I appreciate organizing team for showing their keen interest in organizing a successful conference to provide a platform for contributors to explore new ideas and exchange research findings among researchers.

I thank the support of all students, authors, reviewers, conference team, faculty members, and conference Convenor for making the conference a grand success.

**Best Wishes**

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**Dr. Sanjay Kumar Suman**

Dean R&D



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## CONVENER

The world is always poised to move towards new and progressive engineering solutions that results in cleaner, safer and sustainable products for the use of mankind. India too is emerging as a big production center for world class quality. Computer Science, Electronics, Information Technology and Electrical Engineering play a vital role in this endeavor.

The aim of the Online International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-23) being conducted by the Department of Electronics and Communication Engineering of SMEC, is to create a platform for academicians and researchers to exchange their innovative ideas and interact with researchers of the same field of interest. This will enable to accelerate the work to progress faster to achieve the individuals end goals, which will ultimately benefit the larger society of India.

We, the organizers of the conference are glad to note that more than 250 papers have been received for presentation during the online conference. After scrutiny by specialist 102 papers have been selected, and the authors have been informed to be there at the online platform for presentations. Steps have been to publish these papers with ISBN number in the Conference Proceedings and all the selected papers will be published in Scopus / UGC recognized reputed journals.

The editorial Committee and the organizers express their sincere to all authors who have shown interest and contributed their knowledge in the form of technical papers. We are delighted and happy to state that the conference is moving towards a grand success with the untiring effort of the faculties of Department of Electronics and Communication Engineering of SMEC and with the blessing of the Principal and Management of SMEC.

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## Smart Traffic Congestion Control using Video Processing

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### ABSTRACT

Congestion in traffic is a serious problem nowadays. Although it seems to pervade everywhere, mega cities are the ones most affected by it. And it's ever-increasing nature makes it imperative to know the road traffic density in real time for better signal control and effective traffic management. There can be different causes of congestion in traffic like insufficient capacity, unrestrained demand, large Red-Light delays etc. While insufficient capacity and unrestrained demand are somewhere interrelated, the delay of respective light is hard coded and not dependent on traffic. Therefore, the need for simulating and optimizing traffic control to better accommodate this increasing demand arises. In recent years, video monitoring and surveillance systems have been widely used in traffic management for traveler's information, ramp metering and updates in real time. The traffic density estimation and vehicle classification can also be achieved using video monitoring systems. This paper presents the method to use live video feed from the cameras at traffic junctions for real time traffic density calculation using video and image processing. It also focuses on the algorithm for switching the traffic lights according to vehicle density on road, thereby aiming at reducing the traffic congestion on roads which will help lower the number of accidents. In turn it will provide safe transit to people and reduce fuel consumption and waiting time. It will also provide significant data which will help in future road planning and analysis. In further stages multiple traffic lights can be synchronized with each other with an aim of even less traffic congestion and free flow of traffic.

**Keywords:** Traffic, Image Processing

## Multibit Error Detection and Correction Codes for Fast Decoding of Critical Bits

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### ABSTRACT

A typical system-level technique to harden memory against multiple bit upsets (MBUs) would be the use of error correction codes (ECCs) for enhanced correction capabilities. Building updated ECCs with low redundancy and correction of errors however has been a significant issue, especially about adjacent ECCs. Present MBU mitigation codes concentrate primarily on correcting up to 3-bit explosive errors. The amount of impaired bits will quickly extend to even more than 3 bit as that of the software scales as well as the cell interval gap decrease. Consequently, the earlier approaches are not adequate to meet the criterion for durability in harsh conditions. In this project, a technique for multibit bursting error fix (BEC) codes was introduced with a multibit adjacent error correction (MAEC). Verilog HDL programming language is used, the Simulation & Synthesis Xilinx ISE method is used.

**Keywords:** Verilog, MBU, ECC, MAEC, Xilinx

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## Real Time Traffic Control System using Image Processing

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### ABSTRACT

Traffic is the major problem which every country faces because of the increase in number of vehicles throughout the world, particularly in large urban areas. Therefore, the need arises for simulating and optimizing traffic control algorithms to better accommodate this increasing demand. One of the ways to overcome traffic problems in large cities is through the development of an intelligent traffic control system which is based on the measurement of traffic density on the road. In this paper we presented techniques with which this problem of traffic is solved. We discussed morphological edge detection to solve this problem. For intelligent traffic light system, the most common technique is the use of fuzzy logic controller. Traditionally a fixed time controller is used which has certain disadvantages. They have predefined cyclic time which schedules off-line on a central computer based on average traffic conditions. Due to this there is wastage of time by a green light for same time on a less congested road as compare to more congested road, so to overcome this problem, the morphological edge detection method is proposed which is based on the measurement of the traffic density.

**Keywords:** Traffic, vehicles, morphological edge detection, fuzzy logic, traffic density.

## IoT based ATM Crime Prevention System

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### ABSTRACT

The main aim of this paper is to propose an embedded system which is used for ATM security applications. Automated teller machine (ATM) is extensively used all over the world for withdrawal of cash. Meanwhile because of insufficient security, the thefts in ATMs are exceeded. So, we are going to protect ATM machine with wireless technology. The real time data collected by Vibration sensor and IR sensor is processed by NODEMCU. Whenever robbery occurs the vibration sensor here is used to sense the vibrations and IR sensor senses any change in position of ATM Machine then the buzzer will produce an alert sound and same alert will be sent to IoT based bank server. For any case of theft attempts buzzer will activate to alert surrounding people and DC motor closes the door to catch that person. In this paper we used Arduino software to write and compile embedded c program.

**Keywords:** ATM, Node MCU, DC Motor, IR sensor

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## Smart Blind Stick

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### ABSTRACT

The main purpose of this project is to build a blind stick for visually impaired persons with multiple Sensors. Ultrasonic sensor for detecting range and object, fire sensor which detects the fire, water sensor which detect drainage/water. For alerting purpose a voice module is used for auto sound detection. This device automatically senses the presence of obstacles, fire and water in its path and helps blind people to deviate their direction of movement through messages using voice module. The obstacle detection mechanism is done by an Obstacle sensor, fire detection mechanism is done by a fire sensor, and water detection mechanism is done by water sensor. This device is designed in such a way that there is no requirement of manual attention towards it. It makes use of the Obstacle detection sensor and water sensor to detect the obstacle and water present in the way and gives an alert through voice. The system provides with a voice module using which messages are announced out. The data collected by the sensors are processed by Arduino UNO.

**Keywords:** Arduino UNO, Ultrasonic Sensor, Water Sensor, Fire Sensor, Voice Module (AAPR9600)

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## Obstacle Avoidance Robot

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### ABSTRACT

This project describes about an obstacle avoidance robot vehicle which is controlled by ultrasonic sensor. The robot is made using ultrasonic sensor and it is controlled by Arduino micro-controller. Ultrasonic sensor and IR sensor fixed in front portion of the robot vehicle. Ultrasonic fixed on right if obstacle detected then robot will take left diversion. IR fixed on Left if obstacle detected then robot will take Right diversion. The sensor gets the data from surrounding area through mounted sensors on the robot. The sensor is sensing the obstacle and deviate its path to choose an obstacle free path. The sensor will be sending the data to the controller is compared with controller to decide the movement of the robot Wheel. The robot wheel movement and direction will be based on the sensing of the ultrasonic sensor and using a wheel encoder.

**Keywords:** Arduino, IR sensor, Ultrasonic sensor.

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## New Lossless Image Encryption of Color Images

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### ABSTRACT

Image encryption is an effective approach for providing security and privacy protection for images. With the fast progression of data exchange in electronic way, information security is becoming more important in data storage and transmission. At present, images can be encrypted by combining different techniques, AES (Advanced Encryption Standard) and chaotic maps. It uses higher length key sizes such as 128, 192 and 256 bits for encryption. Drawbacks of using AES algorithm are as it uses too simple algebraic structure, Every block is always encrypted in the same way, these method also suffer from either high computational costs or low level of security due to leakage of original image information. To overcome these drawbacks, this project introduces a new lossless approach, called EdgeCrypt. The algorithm can fully protect the selected objects/regions within images or the entire images. It can encrypt color images using the information contained within an edge map. It can also encrypt other types of images such as grayscale images or medical images. The algorithm can be used for privacy protection in the real-time applications such as wireless medical networking and mobile services, multimedia networking.

**Keywords:** AES, EdgeCrypt.

## Automatic Traffic Density Control System

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### ABSTRACT

Traffic congestion is a severe problem in most of the cities across the world and it has become a nightmare for the citizens. It is caused by delay in signal, inappropriate timing of traffic signalling etc. The delay of traffic light is hard coded and it does not depends on traffic. Therefore for optimising traffic control, there is an increasing demand in systematic quick automatic system. This paper is designed to develop a density based dynamic traffic signal control. The signal timing changes automatically on sensing the traffic density at the junction. The microcontroller used in this project is ARDUINO. The system contains IR sensors (transmitter and receiver) which will be mounted on the either side of the road on poles. It gets activated and receives the signal as the vehicles passes close by it. Once there is no sign identified by any of the four sensors the traffic lights keep on dealing with an auspicious premise. The mean response time of the sensor was found to be 0.39 seconds. Further research is recommended to produce the device on a large scale to be deployed to all roads in the country.

**Keywords:** Arduino, IR sensor, LED indicators, Regulated power supply.

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## Text Dependent Speaker Verification System for Robotic Applications

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### ABSTRACT

The main objective of the proposed method is to enhance the performance of the human voice recognition (HVR) system by introducing more features from the signal. In an effort to provide a more efficient representation of the speech signal, the application of wavelet analysis is considered. This method presents an effective and robust method for extracting features for speech processing. Here, we proposed a new system for Text Dependent Human Voice Recognition (TD-HVR) system, which utilizes the discrete wavelet transform (DWT) for low-level feature extraction, and the Relative Spectral Algorithm (RSA) for denoising the voice signal. First, we will apply the proposed techniques to the training speech signals and then form a train feature vector that contains the extracted low-level feature and estimated formant coefficients. Afterward, the same process will be applied to the testing speech signals and will form a test feature vector. Now, we will compare the two feature vectors by calculating the Euclidean distance between the vectors to identify the speech and speaker. If the distance between two vectors is near zero then the tested human voice will be matched with the trained human voice.

**Keywords:** RSA, DWT, HVR

## IoT Smart Garbage Level Alert

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### ABSTRACT

Now a days certain actions are taken to improve the level of cleanliness in the country. We will try to build a system which will notify the corporations to empty the bin on time whenever it gets filled. In this system, we will put an Ultrasonic sensor on top of the garbage bin which will detect the total level of garbage inside it continuously. When the garbage will reach the maximum level, a notification will be sent to the corporation’s office, then the employees can take further actions to empty the bin. By using this system people do not have to check all the dustbins manually, but they will get a notification. The certain level of garbage will be determined by LED’s and values are displayed in LCD and concurrently buzzer turns ON, an ARDUINO microcontroller which controls system operation whereas everything will be connected to Thing Speak. It is expected that this system can create greener environment by monitoring and controlling the collection of garbage smartly through Internet-of-Things.

**Keywords:** Arduino, LCD, LED, Buzzer

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## Reduction of PAPR in OFDM Systems.

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### ABSTRACT

In this project, a new non-linear companding technique, called "companding", is proposed to reduce the high peak-to-average power ratio (PAPR) of orthogonal frequency division multiplexing (OFDM) signals. Unlike the  $\mu$ -law companding scheme, which enlarges only small signals so that increases the average power, the schemes based on companding technique adjust both large and small signals and can keep the average power at the same level. By transforming the original OFDM signals into uniformly distributed signals (with a specific degree), the companding schemes can effectively reduce PAPR for different modulation formats and sub-carrier sizes. Moreover, many PAPR reduction schemes, such as  $\mu$ -law companding scheme, cause spectrum side-lobes generation, but the companding schemes cause less spectrum side-lobes. Computer simulations, which consider a baseband OFDM system with additive white Gaussian noise (AWGN) channels and a solid-state power amplifier (SSPA), show that the proposed companding schemes can offer better PAPR reduction, bit error rate (BER), and phase error performance than the  $\mu$ -law companding scheme.

**Keywords:** OFDM, PAPR, Companding technique, BER rate

## Footstep Power Generation

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### ABSTRACT

Here we propose an advanced footstep power generator system that uses a dynamo to generate power from human footsteps. In this project, we propose a renewable non-conventional energy source based on a footstep mechanism using dynamo. The circuit is an Arduino micro-controller-based monitoring circuit that allows users to monitor the voltage and charge a connected battery by it. It also displays the charge generated and displays on an LCD display. Also, it consists of a USB mobile phone charging point where the user may connect cables to charge the mobile phone from the battery charge. Thus, we charge a battery using power from user footsteps, display it on LCD using an Arduino micro-controller circuit, and allow for mobile charging through the setup. We can tap the energy generated by moving vehicles and produce power by using the footstep as a power-generating unit using a dynamo as the first dc motor gear will rotate the second gear will also rotate with the shaft of the generator. This will induce EMF (Electro Motive Force) in the generator and electricity will be produced.

**Keywords:** ARDUINO, DYNAMO, LCD

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## RF Based Automatic Traffic Route Clearance System for Ambulance Using Arduino

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### ABSTRACT

The main goal of this Paper is to reduce the travel time of an ambulance to reach the hospital by automatically clearing the lane, before the ambulance reaches the intersection. Traffic congestion is the one of the reasons for accidents and delay for ambulance journey to save patients life. Due to that ambulances reach the hospital. To avoid this problem and providing solution for this we designing a smart and easy transportation system. The proposed system implemented with RF transmitter module activation. When the RF receiver signal receives the data then second section receive the data through RF receiver and turn traffic signals to green. The proposed approach is fully automated controlling the traffic lights thereby helping to reach the hospital in time. By using RF technology, it can send the data to traffic system when the ambulance vehicle is at longer distance then traffic automatically turns to clear traffic for this vehicle. Then only the emergency vehicle is quickly served and can reach the destination in time.

**Keywords:** RF Transmitter, RF Receiver, Arduino Microcontroller, Buzzer, LCD.

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## IoT Based Smart Energy Meter

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### ABSTRACT

The main aim of this paper is to propose a smart energy meter which is used in day-to-day applications. This paper aims at developing a system which helps in monitoring the readings from an energy meter and controlling the switching of an energy meter. This system also has tamper switch, which helps in alerting the authorities and the consumer whenever there is over consumption. IoT modem, Relay, LCD, tamper switch and energy meter are interfaced to Microcontroller (Arduino UNO). In this project we used Arduino software to write and compile embedded c program.

**Keywords:** Energy Meter, IoT modem, Tamper Switch, LCD Display

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## Efficient Design of Hybrid Subtractor Using QCA

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### ABSTRACT

International Technology Roadmap for Semiconductors summarizes several new nanodevices that can replace CMOS technology, such as single-electron transistor, resonant tunneling diode, carbon nanotubes and quantum-dot cellular automata. In this paper, novel energy and area-efficient QCA based adder-subtractor design have been proposed. QCA is the contemporary trend in the field of technology for the designing of any digital circuit dealing with inverters and majority gates that has the potential to substitute the age-old technology of CMOS at the order of Nano level. Here a 1-bit full adder and full subtractor circuit is proposed using 3-input majority gates. Further, a 4-bit hybrid subtractor using above full subtractor is developed.

**Keywords:** QCA, CMOS, Majority gate, Adder, Subtractor.

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## IoT Based Intelligent Irrigation System

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### ABSTRACT

Agriculture is backbone of any country. The IoT research presents a framework in which farmers may obtain extensive information on the soil. The purpose of this project is to design a system which monitors and controls the water flow to an irrigation system. The existing system is an automatic Smart Irrigation Decision Support System (SIDSS). The existing system model waters the plants whenever the water content goes below a threshold. In this project we are going to interface UNO with Wi-fi module, to send/receive information to farmers using IoT. also consists of IoT module for remote monitoring and control of water supply to irrigation system. Whenever the soil moisture content goes below some predefined level, and then this information is sent through WI-FI. Based on the command received from IoT the Microcontroller switches ON or OFF the electrical water pump. Here we are interfacing DHT11, Soil moisture sensors to the microcontroller, to monitor the weather and moisture content in the soil.

**Keywords:** Automation, Arduino UNO, IoT, Microcontroller, Soil Moisture Sensor, DHT11 Sensor, Thing Speak.

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## Video Enhancement using Spatial Filtering

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### ABSTRACT

The quality of outdoor images or videos can be severely degraded by haze due to smog, dust, and other environmental or climactic issues. Haze-removal became important part in processing images of outdoor scenes, and the results of haze-removal can affect the quality of the succeeding processing. Images or videos of hazy scenes have poor contrast. Haze-removal is, in most cases, to improve the image or video contrast and to reveal haze-veiled image/video details. With a view to restoring image/video details of heavily hazy images/videos, we propose an adaptive contrast enhancement algorithm specifically for haze removal by enhancing the color components. It is composed of 3 parts. The first part is to segment the input image into flat background of air space and foreground which is the rest of the image. A specific gradient matrix is defined to generate a gradient feature value to identify the pixels of very weak signals with the presence of noise of similar amplitude. In the second part, a CLAHE-based method is developed and applied to the foreground to provide a stronger enhancement to weaker signal variations while the background is protected from noise enhancement. A specifically designed filter is then applied to remove noise caused by the discontinuity between the foreground and background areas, while preserving the enhanced image details. The proposed algorithm has been tested and its effectiveness has been proven by the test results.

**Keywords:** MATLAB, CLAHE

## Content Based Medical Image Retrieval using Pattern Recognition

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### ABSTRACT

In previous projects images has been retrieved using K-means clustering and other wavelet transforms in which size of windows is fixed due to which the image retrieval process is not accurate. So, to overcome this in our project we had implemented a novel low level feature extractor and k-means clustering with bit wise Euclidean distance for similarity measurement between the feature vectors of query and database, which will be more secured and real time-based application. By using the biorthogonal spline wavelet filtering method, the computational time is high and the accuracy will be much lower. Hence, it can be extended to improve the efficiency and accuracy with inclusion of segmentation with k-means clustering (SKMC), which will represent the cluster pattern of a query and data base images. Therefore, to incorporate both cluster patterns and low-level features of image, we used a scheme in which both of them will be represented in a single composite feature known as bi-orthogonal spline discrete wavelet with k-means clustering (BSDW-KMC). This addition work provides adaptive window for filtering and had improved the system accuracy as well as the precision time in image retrieval system. To achieve this, we are using MATLAB software for simulation of images.

**Keywords:** CBIR, Bi-Orthogonal Spline Wavelets, DWT, Segmentation, K means Clustering

## Electronic Door Open & Lock System using IoT Technology

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### ABSTRACT

There has been a need of controlling electronic doors remotely for automation and security purposes. This proposal tries to fulfill the same using the IoT technology implementation over the electronic door lock making it a super advanced door opener cum locking system. The objective of achieving automation and security is simultaneously achieved using web connectivity of the project with IoT Application. IoT Based Electronic Door Opener Project is controlled by an Arduino. The layout communicates over internet using Wi-Fi Module. On the IoT application once the authorized person logs in he/she gets a direct access of the door to open or close it, no matter how far the door is physically from him/her. When a command of opening the door is received from the web interface the controller instructs the relevant drivers to start the motor of the door in a particular direction till the door fully opens and then stop. Likewise, when the system receives the command to close the door the controller instructs the drivers of the motor rotate in counter direction till the door fully closes. In this way the Automatization and security is achieved using this setup which gives access of the door authorized person even though they are physically present at some remote location from the door.

**Keywords:** Arduino, IoT, Wi-Fi Module.

## VLSI Implementation of Fault Tolerant Codec using Verilog

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### ABSTRACT

This work focused on the self-healing concept for hardware system is investigated and a brand-new approach is proposed. Self-healing is outlined by the ability of a system to detect faults or failures and fix them. One of the most problems in current self-healing approaches is space overhead and scalability for complicated structures considering they are based mostly on redundancy and spare blocks. This work implemented the hamming encoder and decoder-based self-healing circuit. Hamming Codes are linear block codes designed to detect and correct errors introduced in message bits transmitted from one end to another through a communication channel. These are single error-correcting codes that offer ease in encoding and decoding. The aim behind introducing it was to detect up to 2-bit errors at the same time and can correct a single-bit error. Easy encoding and decoding offer simplicity in error detection and correction. Hamming codes find applications in fields such as computing, and telecommunication services, like satellite communication, modems, and embedded processors,

Software used: Xilinx ISE 14.2

Programming language: Verilog

**Keywords:** Encoder, Decoder, Modem

## IoT Based Movable Road Divider

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### ABSTRACT

Road Divider is generically used for dividing the road for ongoing and incoming traffic. This helps keeping the flow of traffic; generally, there is equal number of lanes for both ongoing and incoming traffic. The problem with Static Road Dividers is that the number of lanes on either side of the road is fixed. Since the resources are limited and population as well as number of cars per family is increasing, there is significant increase in number of cars on roads. This calls for better utilization of existing resources like number of lanes available. For example, in any city, there is industrial area or shopping area where the traffic generally flows in one direction in the morning or evening. The other side of Road divider is mostly either empty or much underutilized. This is true for peak morning and evening hours. These results in loss of time for the car owners, traffic jams as well as underutilization of available resources. Our aim is to formulate a mechanism of automated road divider that can shift lanes, so that we can have number of lanes in the direction of the rush. The cumulative impact of the time and fuel that can be saved by adding even one extra lane to the direction of the rush will be significant. With the smarter planet application proposed below, we will also eliminate the dependency on manual intervention and manual traffic coordination so that we can have a smarter traffic all over the city. An Automated Road divider can provide a solution to the above-mentioned problem effectively. Here Low, Medium and High density of traffic value will be posted on IoT server as a graph.

**Keywords:** IoT/Server, Automated Road Divider, Traffic System, Underutilization

## IoT Based Smart Home Automation

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### ABSTRACT

The paper aims at designing an advanced home automation system using Wi-Fi technology. The devices can be switched ON/OFF using a Mobile App through Wi-Fi. Automation. The controlling device for the automation in the project is a Microcontroller (Arduino UNO). The data sent from Mobile App over Wi-Fi will be received by Wi-Fi module connected to Microcontroller. Microcontroller then reads the data and decides the switching action of electrical home appliances connected to it through Relays . The Microcontroller is programmed using embedded ‘C’ language.

**Keywords:** IoT, Wi-Fi, Microcontroller, Relay

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## Nano-Calculator using Quantum Dot Cellular Automata

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### ABSTRACT

The adders, multipliers are the essential building blocks for every integrated circuit(IC). Thus, the design of adder and multipliers must inhibit the area, delay and power efficient properties. But most of the CMOS based logic gates are failed to provide these properties in adders, multipliers implementation. To solve this problem reversible logic gates has been developed at nano technology level using the quantum dot cellular automata properties. The quantum cost for this reversible logic gates very low, thus in this process reversible logic gates-based N-bit adder, N-bit subtractor, N-bit multiplier and N-bit ALU developed with reconfigurable properties. The effective utilization of these gates provides more flexible nature for ICs. The implementations are conducted in Xilinx ISE environment, the simulation results shows that proposed method is area, power and delay efficient compared to the conventional approaches.

**Keywords:** CMOS, ALU, IC

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## Drowsy Driver Detection and Alert through Internet of Things

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### ABSTRACT

Drowsiness in drivers has become a serious cause of concern due to the occurrences of a large number of fatalities on the road each year. Lives of pedestrians and passengers are put to risk as drivers tend to fall asleep. In the past, many researchers have paid attention to the problem of drowsiness detection since safe roads are very less. This system focuses on the role of eye physiological signals in detecting driver’s drowsiness level. The proposed methods measure the eye physiological signals by means of eye blink sensor basically made using IR sensor. The main aim of this system is to alert the vehicle driver to avoid accidents when the driver was detected drowsy by using Eye blink sensor so that the vehicle driver and owner gets alerts as the vehicle speed is reduced and alerts through buzzer. This system is designed around a microcontroller which forms the main control unit, which is programmed with the help of embedded C instructions. This Microcontroller is capable of communicating with input and output modules. The Eye blink sensor provides the information to the Microcontroller which is interfaced with Buzzer and DC Motor.

**Keywords:** Eye blink sensor, Embedded C.

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## IoT Based Smart Helmet

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### ABSTRACT

Currently, accidents are a serious problem for everyone. Accidents are increasing day by day, so efforts are made to avoid them to minimize their consequences. We live in a world where the rules of the road have no importance for people and they are regularly violated. In addition, its human nature to resist what is imposed on them. Thus, using a different perspective, we provide safety with luxurious and intelligent features using a smart helmet. Smart Helmet is an AVR series microcontroller-based project. It is a helmet with some smart features to improve driving experience and to make drive safer. This smart helmet has two main features and each feature has its own purpose like the purpose of first feature is to encourage or force rider to wear helmet, similarly the purpose of second feature is to prevent rider to drink and drive.

**Keywords:** Prevention, Detection, IoT, Buzzer, Helmet with Switch, Dc Motor, Alcohol Sensor (MQ-3), Arduino Uno, Relay

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## IoT And GSM Based Tank Water Level Monitoring and Controlling System

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### ABSTRACT

The aim of this project is the design and development of IoT and GSM-based tank water level monitoring and controlling. Design and development of IoT and GSM-based tank water level monitoring and controlling. This system useful to real time domestic application for auto detect and alerting water overflow from tank. But there is no such technology used now. Here we proposed IOT and GSM based tank level monitoring. This project includes water sensors in different levels. We can install these level sensors in ponds or water reservoirs. Level sensors are magnetic type sensors interfaced with Arduino through digital I/O. On the other hand, WIFI (Esp8266/IoT module) and GSM module are connected to Arduino through UART port.

**Keywords:** LEVEL SENSOR, RELAY, MOTOR, IOT, GSM.

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## IoT Gas Pipe Leakage Detector Insect Robot

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### ABSTRACT

Gas pipes play very important roles for cities, industries and thus in growing economies. So, gas leakages lead to losses as well as are a threat because they can also lead to fire accidents. Placing sensors at each section of pipe is very costly. So here we propose an innovative robot that clings on to the outer surface of the gas pipe and moves with the pipe to check for leakages. The robot consists of gas sensor that is used to detect gas leakages. As the robot keeps moving along the metal pipe it keeps monitoring for any gas leakage, leakage detected over to the IOT login system. The main objective behind this paper is to develop a robot to perform the act of surveillance in gas pipelines industrial areas Robots can be manually controlled or can be automatic based on the requirement. The purpose of this robot is LPG/Methane Gas Leakage Detection to send that obtained information to the user. In this project, one can control the robot with the help of mobile or laptop through Internet of Things (IoT). This robot will collect data from remote place and able to send those data to a remote IoT cloud database. This robot will be controlled via android mobile phone. We can control the movement of the robot by sending instructions via IOT telnet app from our android phone. each sensor which can be constrained by Arduino dependent on IoT. Each gadget is extraordinarily recognizable by the controlling programming which is the center idea of IoT. The robot will move forward, backward, left and right direction by following the instructions given from the mobile. This system can be helpful for various purposes.

**Keywords:** Gas pipes, Arduino UNO ATMEGA, IOT, buzzer, Gas detection sensor, LPG, Methane gas, Motor driver.

## RFID-Based Toll Booth Management System using IoT

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### ABSTRACT

The major problem faced today is traffic congestion. Due to the increase in the growth of vehicles, the toll booth becomes a bottleneck while vehicles pass through the toll gate due to their manual operations. Since manual operations can be slow, the automated toll collection on the system is very successful right now. Every vehicle is tagged with an RFID tag. Since each RFID tag is unique, it represents the unique identification number for the vehicle. RFID reader can detect or sense the RFID tags and send the information to the controller (ARDUINO) and also post into IoT server. Sensed information can be looked into the database for getting the balance in the owner’s prepaid account, and then the toll tax can be automatically deducted. The purpose of this system is to overcome the drawback of a manual toll collection system. In this process reduction of hardships caused by the manual toll collection system and pass the subject’s vehicle through the toll barrier in a matter of few seconds without a halt.

**Keywords:** ARDUINO, RFID.

UGC AUTONOMOUS

## IoT Based Coal Mine Monitoring System

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### ABSTRACT

Safety is the most vital part of any type of industry. In the mining industry safety and security is an important factor of all. To avoid any type of accidents mining industry follows some precautions. Still accidents are taking place in underground mines due to rise in temperature, earthquakes, gas explosion and release of excess of hazardous gases which cause fatalities and economic losses. A cost effective IoT based coal mine monitoring system is proposed in this project to improve life safety in coal mine working environment and to reduce the hazards significantly and workers status can be easily monitored over IoT. This system constantly transmits the data from MQ135 sensor, DHT11 sensor and Vibration sensor to the Arduino UNO, which processes this data and keeps on transmitting it to the online web server over a WIFI connection. This data is live updated to be viewed on the online server system. This system also allows user to set alerts for different instances and it provides alerts to the workers with the help of buzzer and LCD if the sensor parameters cross the specified values.

**Keywords:** Arduino UNO, IoT, Thing Speak, Microcontroller, DHT11 Sensor, MQ135 Sensor, vibration Sensor, LCD.

## Implementation of FIFO using Ternary Content Addressable Memories

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### ABSTRACT

In electronic systems, Static Random Access Memory (SRAM) are used to do bit wise operations but in this we are going for TCAM for high speed make the reproduced sound fluctuations independent of the speed, the data rate of the A/D converter is controlled by a quartz crystal. The different data rates are compensated by buffering. In this way, the sound fluctuations are largely independent of the speed at which disks rotate. A FIFO is a special type of buffer. However, the conventional FIFO modules were developed using static random-access memories (SRAM). But these SRAMs resulted in higher resource utilizations like programmable logic blocks, slice registers, look-up-tables, and path delays, and power consumption. Therefore, this work is focused on implementation of FIFO modules using Ternary Content Addressable Memories (TCAM). The performance of TCAM is superior in terms of speed, compared to SRAM.

**Keywords:** Ternary content addressable memories (TCAM), First in First out(FIFO), Static random access memory (SRAM)

UGC AUTONOMOUS

## AI Face Mask Detection System

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### ABSTRACT

Design and Development of Real Time Face Mask Detection for COVID-19. The corona virus creates health problems and spreading fast than any other virus. Manual involvement in each case will not bring complete solution and consumes lot of man power. Especially for monitoring of manual entries at doors and gates is difficult and announcement of instructions also tough. To solve this issue, we propose system that can monitor face mask detection and temperature reading and announce through audio. Here project title is real time face mask for covid-19. Arduino and ESP32-CAM are connected together through Serial interface ESP32-CAM module has built-in WIFI and camera. It can connect to WIFI hotspot or WIFI router and established connection to local network. It will stream video on HTML web page through IP address. Also WIFI module (ESP8266/IOT) also connected to same network to post data to IOT server. In this project we have to show face in front of camera and press button then it will detect face mask status. If the mask not detected it will alert you through buzzer.

**Keywords:** Microcontroller, Arduino UNO, IOT, ESP32-CAM.

UGC AUTONOMOUS

## IoT Based Data Acquisition in Powergrid

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### ABSTRACT

The purpose of this project is to acquire the remote electrical parameters like Voltage, Current and Frequency and send these real time values over WIFI network using IoT Modem along with temperature at power station. This project is also designed to protect the electrical circuitry by operating an Electromagnetic Relay. This Relay gets activated whenever the electrical parameters exceed the predefined values. The Relay can be used to operate a Circuit Breaker to switch off the main electrical supply. User can send commands in the form of IoT command messages to read the remote electrical parameters. This system also can automatically send the real time electrical parameters periodically (based on time settings) in the form of AT commands. This system can be designed to send IoT based alerts whenever the Circuit Breaker trips or whenever the Voltage or Current exceeds the predefined limits.

**Keywords:** Voltage, Current, Frequency, Electromagnetic Relay, IoT.

UGC AUTONOMOUS



## Underground Power Cable Fault Detection using IoT

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### ABSTRACT

The aim of the project is to design an underground cable fault detection and location identification with distance in LCD and IoT using microcontroller. Earth fault or leakage of current is a very common problem in underground cable circuits. This leads to unnecessary power loss. The purpose of this project is to develop a system that senses the earth fault in the cables and alerts the user about it with distance. The system also calculates the distance of the fault occurrence and the location can be identified exactly. Upon identification of fault, it operates a Relay. The microcontroller-based control system continuously monitors the amount of voltage passing through the power supply circuit. In case of fault, the amount of voltage will be dropped in the circuit. In such situations the microcontroller-based system alerts the user about this in the form of text message displayed on LCD and IoT along with the distance.

**Keywords:** Arduino IDE, IoT

UGC AUTONOMOUS

## Area Power Tradeoff of Full Adder using GDI Technique

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### ABSTRACT

The full adder is an important component for controller or processor design like microprocessors, digital signal processors etc. It is also used to do arithmetic and logical operations. The objective of this project is to reduce power, delay and increase the stability factor of a full adder by using various 1bit full adder designs and techniques. Here 10T full adder circuits using GDI technology plots the minimum power consumption rather than others. Because GDI technology dissipates low power. A comparative data analysis is shown for power, delay and stability using CMOS, PTL (Pass Transistor logic), GDI (Gate Diffused Input) method with different number of transistors which is used to extend the battery life.

**Keywords:** Gate Diffusion Input , Complementary Metal Oxide Semiconductor, Pass Transistor Logic

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## Iterative Partitioning Mean Shift Clustering for Segmentation of H&E Stain Images

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### ABSTRACT

Image encryption is an effective approach for providing security and privacy protection for images. With the fast progression of data exchange in electronic way, information security is becoming more important in data storage and transmission. At present, Images can be encrypted by combining different techniques, Mean shift clustering and K-means. Drawbacks of K-means algorithm is over segmentation. The image should segment into only 4 parts but in the K-means the image is over segmented. It has been proven to be a weak cipher; this method only protects text-based information. To overcome these drawbacks, this project introduces a new lossless approach, called Edge Crypt. To encrypt color images using the information contained within an edge map. The algorithm can fully protect the selected objects/regions within images or the entire images. It can also encrypt other types of images such as grayscale images or medical images. The algorithm can be used for privacy protection in the real-time applications such as wireless medical networking and mobile services, multimedia networking

**Keywords:** Mean shift clustering, Image segmentation.

## Tissue Segmentation for MR Brain Image

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### ABSTRACT

Image segmentation is to partition an image into meaningful non overlapping regions with similar features. Segmentation of brain magnetic resonance (MR) images is necessary to differentiate white matter (WM), gray matter (GM), and cerebrospinal fluid (CSF). Such segmentation is essential for studying anatomical structure changes and brain quantification. It is also a prerequisite for tumor growth modeling as tumors diffuse at different rates according to the surrounding tissues. Due to potential existence of noise, bias field, and partial volume effect, segmentation of brain images remains challenging. Therefore, this project proposed an adaptively regularized kernel-based fuzzy means clustering framework for segmentation of brain magnetic resonance images. The framework can be in the form of three algorithms for the local average grayscale being replaced by the grayscale of the average filter, median filter, and devised weighted images, respectively. The algorithms employ the heterogeneity of grayscales in the neighborhood and exploit this measure for local contextual information and replace the standard Euclidean distance with Gaussian radial basis kernel functions. The main advantages are adaptiveness to local context, enhanced robustness to preserve image details, independence of clustering parameters, and decreased computational costs.

**Keywords:** WM, GM, CSF, Kernel based clustering, Segmentation

## IoT Based Smart Street Light

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### ABSTRACT

The main consideration in the present field technologies are Automation, Power consumption and cost effectiveness. Automation is intended to reduce man power with the help of intelligent systems. Power saving is the main consideration forever as the source of the power are getting diminished due to various reasons. As we all know that energy consumption has been increasing day by day so, to overcome these consequences we are using IoT devices. This project proposes a modal for modifying street light illumination by using sensors at minimum electrical energy consumption. When presence is detected, all surrounding street lights glow at their brightest mode, else they stay in the dim mode. LED bulbs shall be implemented as they are better than conventional incandescent bulbs in every way. This shall reduce heat emissions, power consumption, maintenance and replacement costs and carbon dioxide emissions. Also, a demonstration with a real-time proto type model involving costs and implementation procedure has been developed using internet of things to visualize the real time updates of street processing and notifying the changes occur.

**Keywords:** Microcontroller, Arduino UNO, IoT, IR Sensors, LDR Sensor.

UGC AUTONOMOUS

## Palm Print Biometric Authentication System for Security Applications

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### ABSTRACT

Biometric technology can offer better protection improved accuracy to protect personal classifications and very access control problems. This has turned into a developing innovation as of late because of the exchange fakes, security ruptures and personal identification and so forth. It gives each person a special code that cannot be repeated or produced by anyone, and the splendour of biometric invention. These mechanisms are commonly accepted in the networking society and are replacing passwords and keys due to their trustworthiness, their simplicity, and the steady increase in protection requests. We have here implemented an extraordinary, protected palm print identification method with removal from region of interest (ROI), using a morphological process, using the use of a Discrete Wavelet Transform (DWT) to eliminate the low -level features of the included palm prints

**Keywords:** Discrete Wavelet Transform (DWT), Region of Interest (ROI), Biometric.

UGC AUTONOMOUS

## IoT Fingerprint Attendance Monitoring System

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### ABSTRACT

Here we propose a smart fingerprint based biometric attendance system that works over IOT so that attendance can be monitored from anywhere in the world. Our system uses a microcontroller-based circuit with fingerprint sensor, push buttons, power supply, power supply and wi-fi modem to interact with internet-based system. We here use IOT to develop the online attendance display system. Our system allows users/employees/UG Scholars to first register their fingerprint on the system. After successful registration the print is stored in system with class assigned using push buttons. The system also displays these details over LCD display. Now as soon as the next time a registered user scans the modem, the system checks for authentication and authenticated users data is transferred online to IOT App using the gecko development API codes. Thus, our system allows for remote monitoring of biometric based attendance from anywhere over IOT.

**Keywords:** IOT, Microcontroller, LCD.

UGC AUTONOMOUS

## Design of Reconfigurable LFSR for VLSI IC Testing

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### ABSTRACT

The design of a reconfigurable Linear Feedback Shift Register (LFSR) for Very Large-Scale Integration (VLSI) Integrated Circuit (IC) testing. The advancement in VLSI technology have made chip testing more complicated which has led to the popularity of Logic Built In Self-Test (LBIST) compared to Automatic Test Equipment (ATE). Logic BIST allows in-built chip testing with the help of an additional hardware structure inside the circuit. The test patterns are not applied by ATE but are generated by inbuilt testing circuits. Thus, it reduces testing costs considerably. LFSR is commonly used as a test pattern generator since it is more efficient than binary counters. Reconfigurable LFSR can be used as the test pattern generator inside Logic BIST to improve the fault coverage of IC testing. As per requirement it can be configured to generate maximum length sequence or any length patterns depending on the feedback polynomial provided. It increases the random patterns generated that are applied as test vectors.

**Keywords:** Verilog, BIST, LFSR, ATE, Xilinx

UGC AUTONOMOUS



## Self Service Automated Petrol Pump using RFID

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### ABSTRACT

In Today’s world almost all the sectors and industries have been automated and Petroleum industries are not an exception to that. Petrol pumps have been very much automated, they have micro controllers to monitor the outlet of petrol and display the appropriate amount to the customer. Even though everything is automated, customers have to carry the money and there is a high possibility of human error while handling hard cash. This is designed in such a way that the person need not worry about carrying the cash with himself/herself. A smart card, which contains an RFID tag is given to the customers and the petrol pump will have an RFID reader and payment can be made through the RFID technology without any hard cash or Human interaction. In this way, human errors in calculation can be saved and efficient transactions can be carried out. These types of cards have been used in lots of applications including attendance management and employee registration systems in schools, workplaces and large industries. All the details will be displayed on LCD screen. LCD works when information are been passed from the micro controller when the RFID card is been scanned.

**Keywords:** - RFID, Arduino, petrol pump.

## GSM Vehicle Security Theft Control System

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### ABSTRACT

This deals with the design & development of vehicle theft control system, which is being used to prevent/control the theft of a vehicle. The developed system makes use of an embedded system based on **Global System for Mobile Communication (GSM)** technology. An interfacing mobile is connected to the microcontroller, which is in turn, connected to the engine. Here we are having of two cases: 1. Ignition is OFF 2. Ignition turned ON. In case 1 we use IR sensor. Here the motion is detected and information is sent to the owner and it also connected to the alarm system. In case 2 we use GSM modem to send message to the owner as warning indication when the switch is turned on, by the reply of the owner GSM reacts to it turns OFF the engine and can be on only by giving predefined password by the owner.

**Keywords:** Arduino, GSM, IR sensor, DC motor, LCD display.

UGC AUTONOMOUS

## Railway Track Fault Detection and Reporting Over IoT

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### ABSTRACT

In India, most of the commercial transport is being carried out by the railway network and therefore, any problems in the same has the capacity to induce major damage to the economy by impact of loss of life because of accidents. This paper proposes a cost effective yet robust solution to the problem of railway crack detection utilizing a method that is unique in the sense that while it is simple, the idea is completely novel. There is an increasing with the number of accidents at railroad railings. Now a days we use different types of transport facilities like Track, bus, flight and car etc., but above these facilities we chose to travel with rail because by travelling through the rail is cheap, takes less time to deliver our product, system and it is the cost efficient but the number of accident on railway track due to fault on track and when any obstacle came in front of the train. This paper deals about one of the efficient methods to avoid Train accidents. Here we are using Microcontroller for automatic control of Infrared sensor to detect the fault on railway track. After detecting the fault Microcontroller will give information about the fault to the loco pilot in the train indicating red led, gives buzzer alert and Train automatically stops, it sends the information to control room through IoT. The main components used in this project are Microcontroller (Arduino), IR sensor, IoT, Buzzer, DC motor. We are using Infrared Sensors because it is the directional data transferring device it can show the output of fault and help us to take action according the fault on the track. With the help of this proposed project train can run on time during winter season on foggy condition and on night also where driver unable to see anything. It can be helpful for the Indian railway.

**Keywords:** Microcontroller, Arduino, Infrared Sensor, Iot.

## Real Time Secure Text Transmission using Video Steganography

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### ABSTRACT

In Recent years there is a rapid growth in wireless technologies, Giga bytes of information has been exchanging over many communication channels. However, few applications like military, medical, multimedia, web and civil etc. need to provide the security to the information sending over. In addition to this, patient's records in medical images such as Magnetic Resonance (MR) or Computed Tomography (CT) and medical signal reports such as electrocardiogram (ECG) or electro encephalogram (EEG) will be shared among most of the doctors from different branches of health service organizations (HSO) over wireless networks for diagnosis purpose. All these medical images, signals and digital videos may contain some private information, which is more confidential. Hence, it is an important task to provide security for this sort of images and videos. Developing and employing schemes to enhance the lifetime of digital images or videos is an important, imperative and challenging task, which protects the content of original data for many years. To protect an image or video encryption is an effective approach, which transforms the image or video into different format. Among them all of the techniques have their own drawbacks like computational complexity, time consumption and reconstruction of secret information etc. Here in this, we supposed to introduce a new secure text image transmission scheme by using pixel mapping through video steganography, which is based on the very simple easy method called as pixel mapping. In the proposed scheme, the video is divided into number of frames then after number of images afterwards the secret message will be kept into the video sequences. The simulation results have been shown both the image and video steganography outputs and the performance comparison done in terms of Peak Signal to Noise Ratio (PSNR), and MSE.

**Keywords:** RSA, DWT, Pixel Mapping Algorithm, Video Steganography

## Vehicle Accident Detection and Rescue System using GSM & GPS Modules

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### ABSTRACT

This Project presents an automotive localization system using GPS and GSM-SMS services. The system permits localization of the automobile and transmitting the position to the owner on his mobile phone as a short message (SMS) at his request. The system can be interconnected with the car alarm system and alert the owner on his mobile phone. This tracking system is composed of a GPS receiver, Microcontroller and a GSM Modem. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The Microcontroller processes this information and this processed information is sent to the user/owner using GSM modem. The presented application is a low cost solution for automobile position and status, very useful in case of car theft situations, for monitoring adolescent drivers by their parents as well as in car tracking system applications. The proposed solution can be used in other types of application, where the information needed is requested rarely and at irregular period of time (when requested).

**Keywords:** Arduino, GSM, Microcontroller, GPS

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## Fault Space Transformation: A Generic Approach to Counter Differential Fault Analysis using AES Based Block Ciphers

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### ABSTRACT

Classical fault attacks such as Differential Fault Analysis (DFA) as well as biased fault attacks such as the Differential Fault Intensity Analysis (DFIA) have been a major threat to cryptosystems in recent times. DFA uses pairs of fault-free and faulty ciphertexts to recover the secret key. DFIA, on the other hand, combines principles of side channel analysis and fault attacks to try and extract the key using faulty ciphertexts only. Till date, no effective countermeasure that can threat both DFA as well as DFIA based attacks has been reported in the literature to the best of our knowledge. In particular, traditional redundancy-based countermeasures that assume uniform fault distribution are found to be vulnerable against DFIA due to its use of biased fault models. In this work, we propose a principle CRC (Cyclic Redundancy Check) that work on Fault Space Transformation to achieve security against both DFA and DFIA based attacks on Advance Encryption Standard (AES) like block ciphers. As a case study, we have applied our proposed technique to obtain temporal and spatial redundancy-based countermeasures for AES-128, and have evaluated their security against both DFA and DFIA.

**Keywords:** Security, Block Ciphers, Fault Attacks, Biased Faults, Countermeasure, Redundancy, Fault Space Transformation

## Optimizing the Power Accuracy Trade-Off in Approximate Adder

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### ABSTRACT

Approximate circuit design has gained significance in recent years targeting applications like media processing where full accuracy is not required. We propose an approximate adder in which the approximate part of the sum is obtained by finding a single optimal level that minimizes the mean error distance. Therefore, hardware needed for the approximate part computation can be removed, which effectively results in very low power consumption. This work proposes an error avoidance method for sign bits in an approximate adder. Carry- Maskable Adder (CMA) as well as most existing approximate adder does not target signed numbers and thus sign bit errors frequently occur. Unfortunately, a deep neural network, where the CMA is adopted, seriously fails handwritten digit recognition. One of the reasons is that the approximate adder is not suitable for signed numbers. The proposed method exploits dynamic configurability of the CMA and turns it to operate precisely when a sign bit error is predicted. Using Lower part OR adder, which consists of the precise adder in the leading bits and OR gates in the trailing bits and works similarly to the CMA.

**Keywords:** XILINX – Software, Verilog Code, CFMA, CLA

UGC AUTONOMOUS

## Health Monitoring System using IoT

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### ABSTRACT

Health monitoring for active and assisted living is one of the paradigms that can use the IoT advantages to improve the elderly lifestyle. We present a wearable health sensor network system for Internet of Things (IoT) connected safety and health applications. This project is helpful to those people who regularly need checking up their health parameters irrespective of formalities and abnormalities, collects the data and relays it to the cloud where it is processed and analyzed. Feedback actions based on the analyzed data can be sent back to the user. A prototype of the proposed architecture has been built to demonstrate its performance advantages.

**Keywords:** Sensors, IoT.

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## Robot Controlled by IoT

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### ABSTRACT

Robot controlled by wi-fi communication is one of the important aspects of robotics. The purpose of this robot is to roam around. In this project, one can control the robot with the help of mobile or laptop through Internet of Things (IoT). This robot will collect data from remote place and able to send those data to a remote IoT cloud database. This robot will be controlled via android mobile phone. The Microcontroller is programmed using embedded ‘C’ language

**Keywords:** IoT, Wi-Fi, Arduino

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## An Interactive Segmentation for Face Segmentation in Real Time Images and Videos

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### ABSTRACT

Face detection is one of the challenging problems in image processing. This project proposes a face segmentation technique for detecting faces in color images using skin color model algorithm combined with skin likely-hood, skin Segmentation, Morphological operation and Template matching. Color images with skin color in the chromatic and pure color space YCrCb, which separates luminance and chrominance components. Adaptive thresholding for segmentation to localize the faces within the detected skin regions. Further, mathematical morphological operators are used to remove noisy regions and fill holes in the skin-color region, so that candidate human face regions can be extracted. These systems can achieve high detection accuracy, high detection speed and reduce the false detecting rate. In this project, we used YCbCr to detect the skin color of humans by setting appropriate thresholds. We have proposed and implemented a method named skin color mapping.

**Keywords:** Face Segmentation, Skin Color Mapping, YCBCR Color model, Matlab

UGC AUTONOMOUS

## IoT Based Industrial Security System

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### ABSTRACT

The industrial sensor monitoring is very important for employee security. Now a day’s technology enhances the security system to next level. In the proposed article we monitor the Industrial security parameters and alerting system to prevent the over damage in case of emergency. Proposed system uses temperature sensor, smoke, fire sensors for security monitoring and data will process by Arduino Microcontroller. All the sensor data will post into IOT server and LCD which inbuilt in Arduino. Buzzer module used to alert at home for security and alert in iot server. This proposed article will enhance the people security and necked eye monitoring about the emergency in home.

**Keywords:** Arduino, IoT Module, Fire Sensor, Gas Sensor, Temperature Sensor, Buzzer

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## GSM Based Home Security System

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### ABSTRACT

The home security sensor monitoring is very important for security. Now a day’s technology enhances the security system to next level. In the proposed article describes the monitoring of home security parameters and alerting system to prevent the over damage in case of emergency. Proposed system uses intruder theft detection sensor, smoke, fire sensors for security monitoring and data will process by Arduino Microcontroller. All the sensor data will post into GSM SMS and LCD which inbuilt in Arduino. Buzzer module used to alert at home for security and alert through GSM SMS. This proposed article will enhance the people security and necked eye monitoring about the emergency in home.

**Keywords:** Arduino, GAS sensor, IR sensor, Fire sensor, GSM module, LCD display, Buzzer.

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## IoT Based Wheelchair Fall Detection and Prevention System

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### ABSTRACT

This process describes a robustness of MEMS for wheel chair fall prevention, detection, and alert over IOT. When it comes to old age, it becomes necessary to monitor our old ones for their health and safety. Due to weakness and weak joints, they have a great risk of falling. Now it is important to know if an old age person has fallen so that he/she can be helped on time or to prevent them from a fall. Also, people on wheelchair need to be checked for fall detection. For this purpose, we propose a smart fall prevention and detection system. The system uses MEMS accelerometer sensor to detect person movements, It can be mounted on persons hand or wheelchair for detection. The sensor is connected to a microcontroller to constantly transmit the acceleration data. Now the system keeps monitoring for fall detection and abrupt movement changes in person. When there is a fall alert then Dc motor gets activated and a helping stand will be produced for support to the wheel-chair and automatically triggers alert through Wi-Fi connection to alert the loved ones of the person about the situation instantly.

**Keywords:** Arduino, MEMS sensor, Servo motor, LCD display, Wi-Fi module.

UGC AUTONOMOUS

## Automatic Tumor Extraction from MRI Brain Images using Hybrid Clustering Algorithm

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### ABSTRACT

Segmentation is a process of partitioning the image into several objects. It plays a vital role in many fields such as satellite, remote sensing, object identification, face tracking and most importantly in medical field. In radiology, magnetic resonance imaging (MRI) is used to investigate the human body processes and functions of organisms. In hospitals, this technique has been using widely for medical diagnosis, to find the disease stage and follow-up without exposure to ionizing radiation. Here in this project, a hybrid clustering algorithm is proposed for detecting the tumour from MR brain images with improved performance in terms of precision time and accuracy.

**Keywords:** Arduino, IR sensor, Ultrasonic sensor

UGC AUTONOMOUS

## Design of Median Data Sorting using Multiplexer Logic

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### ABSTRACT

A Novel Area efficient and low power multiplexer-based data comparator for median filter in Denoising application is proposed. This classic implementation has proven to be far from optimal since improved FPGA implementations have been developed over the years. A 9-input sorting network can be created, which is composed of 19 exchange nodes, significantly reduces the amount of FPGA resources used. In order to process every image pixel, the 3x3 square window should be moved through the image. However, in FPGAs, this can also be achieved using a nine-pixel stream that sequentially passes through the median filter. Each group of nine pixels can be sorted using a structure composed of two input exchange nodes. The two inputs are internally compared and the higher (H) and lower (L) values are obtained.

**Keywords:** FPGA, Median filter, Data comparator.

UGC AUTONOMOUS

## Verilog implementation of 4\*4 crossbar switching based NOC

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### ABSTRACT

A router is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. Data sent through the internet, such as a web page or email, is in the form of data packets. A packet is typically forwarded from one router to another router through the networks that constitute an internetwork until it reaches its destination node. A router is connected to two or more data lines from different networks. When a data packet comes in on one of the lines, the router reads the network address information in the packet to determine the ultimate destination. Then using information in its routing table or routing policy, it directs the packet to the next network on its journey. Network-on-chip (NoC) has emerged as a vital factor that determines the performance and power consumption of many-core systems. A hybrid scheme for NoCs, which aims at obtaining low latency and low power consumption. The hybrid scheme is a novel switching mechanism, which uses virtual circuit switching is used to intermingle with circuit switching and packet switching. Multiple virtual circuit-switched (VCS) connections are allowed to share a common physical channel.

**Keywords::** Packet, Web. NOC, VCS,



## IoT Based Visitor Count Energy Saving System

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### ABSTRACT

In today’s world, there is a continuous need for automatic appliances with the increase in standard of living; there is a sense of urgency for developing circuits that would ease the complexity of life. The objective of this project is to make a controller-based model to count number of persons visiting particular room and display on the IoT. In our project we use IR sensors to detect the presence of a person. According to this project, two IR sensors are placed apart with a fixed known distance. Whenever IR rays are interrupted by a person during first sensor the count up timer is started. This count value is displayed on the IoT; if it is obtained at second sensor then the count will be decreases depending upon the crowd, lights will be on or off. Depends on the no of count inside the room according to that lights will turn on, when the count in room decreases automatically lights in the room turn off. We proposed the microcontroller which interfaces the IR sensors and IoT module, process input and produce regarding output.

**Keywords:** Arduino, IR sensor, IoT.

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## Implementation of Psuedo Test Pattern Generation and Reseeding

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### ABSTRACT

The aim of the paper is to generate the non-repeating random numbers, by using DCMs and BRAM, D-flipflop and post-processing unit. Built-In Self-Test are the major building blocks in every integrated circuit, which corrects the memory faults, stuck-at faults automatically by applying the random patterns. The performance of BIST modules purely depends on randomization of patterns. However, conventional liner feedback shift registers (LFSR) failed to provide the higher randomization with lower hardware resource utilization. Not only BIST, but the random numbers are also used in many other applications like pin generations, OTP generations, authentication systems, and security protocols. Therefore, this work is focused on implementation of Pseudo Random Test Pattern generation (PR-TPG) frameworks to solve this problem. Further, the ring oscillators in the conventional methods were replaced by Digital Clock Managers (DCM), which implements the tuneability of phase, frequency of random numbers. In addition, the beat frequency detection operation is achieved by D-flip flop (D-FFs), post processing units, and counters, which generates the random numbers.

**Keywords:** VERILOG, BIST, LFSR, ATE, XILINX

## Fingerprint and Iris Authentication System for Biometric Applications

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### ABSTRACT

A biometric system is a computer system which is used to identify the person on their behavioural and physiological characteristic, for example fingerprint, face, iris, key- stroke, signature, voice, etc. A typical biometric system consists of sensing, feature extraction, and matching modules. But now a days biometric systems are attacked by using fake biometrics. It introduces three biometric techniques which are face recognition, fingerprint, and iris recognition and also prevents the attacks on that system and by using Image Quality Assessment for a liveness detection it shows how to protect the system from fake biometrics. It explains how multi-biometric system is secure than uni-biometric systems.

Software used: MATLAB V8.10; Programming language: MATLAB

**Keywords:** Fingerprint, Signature, Iris, Key, Fake Biometric

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## IoT Based Smart Women Security System

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### ABSTRACT

This Paper presents an automotive localization system using GPS and IOT, alert over IOT for woman security. The system permits localization of the woman and transmitting the position to the rescue team over Internet. The system can be interconnected with the car alarm system and alert the surrounding people to help woman. This security tracking system is composed of a GPS receiver, Microcontroller and IOT module. When woman need help, she will press security alert switch then GPS Receiver gets the location information from satellites in the form of latitude and longitude. The Microcontroller processes this information and is sent to certain person using IOT modem. If vibration sensor senses any movement, it also activates the device.

**Keywords:** Arduino, vibration sensor, IoT, GPS, microcontroller, Thing Speak.

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## Medical Image Water Marking using DWT and SVD Algorithm

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### ABSTRACT

Protection of digital multimedia content has become an increasingly important issue for content owners and service providers. As watermarking is identified as a major technology to achieve copyright protection, the relevant literature includes several distinct approaches for embedding data into a multimedia element (primarily images, audio, and video). Because of its growing popularity, the Discrete Wavelet Transform (DWT) is commonly used in recent watermarking schemes. In a DWT based scheme, the DWT coefficients are modified with the data that represents the watermark. In this project, we present a hybrid scheme based on DWT and Singular Value Decomposition (SVD). After decomposing the cover image into four bands, we apply the SVD to each band, and embed the same watermark data by modifying the singular values. Modification in all frequencies allows the development of a watermarking scheme that is robust to a wide range of attacks.

**Keywords:** DWT, SVD, Wavelet Transform, Decomposition, Watermarking.

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## IoT Based Vehicle Parking System using IR Sensor

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### ABSTRACT

Parking is a major issue in many malls and cities. Efficient and smart way to automate the management of the parking system that allocates an efficient parking space using internet of things technology. To avoid that problem, we developed a project on smart parking system. User can find the slot, so we use IR sensor to find the parking slot on the vacancy position. The project aims at designing an advanced smart parking system. In this system we use IR obstacle sensors as vehicle presence detection and these sensors are connected to Arduino Microcontroller. Microcontroller reads the data display over LCD and IOT then user can easily access the data. This proposed system will reduce waiting time at parking area and by this system we can effectively use parking zone smartly. This proposed system implemented using embedded 'C' programming language.

**Keywords:** RSA, DWT, HVR

UGC AUTONOMOUS

## IoT Based Aerial Defence and Attack System

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### ABSTRACT

The main aim of this paper is to propose an embedded system which is used for number of military and aerial defence applications. To detect and destroy the target, the destroying system moves automatically in the direction of target and fires it upon detection. An sonar based object tracking system is used to continuously monitor the target, upon detection it sends the target’s location to Arduino based Central Control System. The Central Control System is responsible of moving the firing unit in the direction of target. Upon Fixing the direction, it sends the control command to firing system ordering attack on the target. The buzzer will be activated on detection of target. Ultrasonic radar system and a dc motor driven firing unit interfaced with a Micro controller-based control unit. In this project we used Arduino software to write and compile embedded c program.

**Keywords:** Arduino UNO, DC Motor, Ultrasonic sensor, Aerial defense

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## Hand Gestures Identification Using PCA and SVM

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### ABSTRACT

In order to receive information people, repeat same mouse and keyboard actions, inducing waste of time and inconvenience. To improve these situations, we have proposed a system in which user can interact with system by using hand gesture. Communication through gestures has been used since early ages not only by physically challenged persons but nowadays for many other applications. As most predominantly hand is use to perform gestures, Hand Gesture Recognition have been widely accepted for numerous applications such as human computer interactions, robotics, sign language recognition, etc. This paper focuses on bare hand gesture recognition system by proposing a scheme using a database-driven hand gesture recognition based upon skin color model approach and thresholding approach along with an effective template matching with can be effectively used for human robotics applications and similar other applications. Initially, hand region is segmented by applying skin color model in YCbCr color space. In the next stage OTSU thresholding is applied to separate foreground and background. Finally, template based matching technique is developed using Principal Component Analysis (PCA) for recognition. The system is tested with the controlled and uncontrolled database and shows 80% accuracy with controlled database and 74.43% with low brightness images.

**Keywords:** PCA, SVM, MATLAB V8.10; Programming language: MATLAB.



## RFID Based Smart Shopping Trolley for Auto Billing System

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### ABSTRACT

The modern technology has increased the standard of living for the humans. To handle the large crowd, we must reduce the process of the billing time. This is done using smart shopping system based on RFID. Items that are put in a smart shopping cart are read one by one and the bill is generated and displayed. After the final bill is generated, the customer pays the bill by using their Pre charged cards provided by the shopping mall. The aim is to reduce the time consumption needed for the billing system. This is a smart way to shop in malls that has been developed. Each product has an RFID tag instead of a traditional barcode. The Smart Trolley features an RFID reader, LCD and Bluetooth module. When a person places any product on the trolley, it is scanned and the product's cost, name and total amount are displayed. The total cost will be added to the final check out bill. The bill is stored in the microcontrollers memory and also transfer through Bluetooth module for counter check-up through android application. Once the purchase is complete, the purchase details are sent to the customer through the Bluetooth module. Arduino IDE software tool is used for programming and to check simulation results before hardware implementation.

**Keywords:** Arduino, RFID Reader Module, LCD Display, Bluetooth Module

## Chest X-ray Image Denoising for Covid-19 Detection Application

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### ABSTRACT

The paper introduces a novel tone mapping operator, designed to offer a good rendering of the local structures. The new operator fusions the multiple versions of a single HDR input obtained by clipping and normalizing its intensity based on a complete set of disjoint intervals. Defining the weight map associated to each version to be its clipping interval indicator function promotes contrast enhancement but induces artifacts when neighbouring pixels belong to distinct intervals. We thus propose to smooth out the indicators across neighbouring pixels with similar intensity, using a standard cross bilateral filter. With such weight maps, the fusion operator becomes equivalent to applying histogram equalization on the image regions on which the cross-bilateral filter diffuses the indicators and is therefore referred to as Bilateral Histogram Equalization (BHE) operator. It compares favourably to previous tone mapping algorithms.

**Keywords:** HDR, bilateral filter, BHE.

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## IoT Controlled Bomb Detection Robot

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### ABSTRACT

The main objective behind this paper is to develop a robot to perform the act of surveillance Robots can be manually controlled using IOT app which is used for detection of metals and bomb detection. The purpose of this robot is to roam around environment to detection of metals and bomb detection and to send that obtained information to the user. In this project, one can control the robot with the help of mobile or laptop through Internet of Things (IoT). This robot will collect data from remote place and able to send those data to a remote IoT cloud database. This robot will be controlled via android mobile phone using Bluetooth communication. We can control the movement of the robot by sending instructions via IOT app from our android phone. In proposed system we are going to designed a low-cost Microcontroller Based Android controlled Robot. The robot will move forward, backward, left and right direction by following the instructions given from the mobile. This system can be helpful for various purpose of metal detection.

**Keywords:** IOT, Robots, Cloud, Bluetooth, Android.

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## Design of FIR Filter using Vedic Multiplier

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### ABSTRACT

Nowadays, demand for image processing systems is increasing rapidly. People are getting more involved day by day with latest technologies in every sector possible were generating and storing image data is related. Various important applications such as remote sensing, medical imaging, object detection and so on are based on image processing. Digital filters are the key components of this image processing techniques. FIR (Finite Impulse Response) filters are widely used in digital signal processing applications. It basically consists of multipliers, adders and a series of delays. Improvement of power efficiency and compactness of those subcomponents will enhance miniaturization and low power consumption of the filters which could potentially lead cost reduction and increase battery life of the portable devices. This work focusing on implementation of modified square root CSLA with vedic multiplier-based FIR filter implementation. In any processor, the performance of the system is based on the speed of the multiplier unit involved in its operation. Since multiplier forms the indispensable building blocks of the FIR filter system. Its performance has contributed in determining the execution of the FIR filter system. Also, due to the tremendous development in the technology, many approaches such as an array, Vedic methods are made to speed up the multiplier computations. The problem in speed-up operation and resource utilization of hardware with all the conventional methods due to the critical path found in partial products has to be optimized using proposed method. This architecture is coded in Verilog, simulated and synthesized with Xilinx-ISE.

**Keywords:** Digital Filters, FIR, CSLA.

## Moving Target Detection in Real Time Videos

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### ABSTRACT

Intelligent video surveillance is a new research direction in the field of computer vision. It uses the method of computer vision and detects the movement target in the monitoring scene by automatic analysis the Image Sequence by the camera recording. The research on moving target detection and extraction algorithm can Be Said to be key issues in intelligent videos. Its purpose is the detection and extraction of the moving targets From the scene of the video image sequence. The effective detection of moving targets determines the system Performance. This article focuses on key technology in the moving target detection and extraction. In this paper, firstly ,it has a brief introduction of pretreatment of the video image. It reduces the errors. In the image processing after. Secondly the paper focuses on analysis comparison the two algorithms: the Background subtraction and the frame difference. Lastly, this paper selects based on the background Subtraction method to improve it and present a moving target detection algorithm based on the background Which has dynamic changes. The background image used to process the next frame image is generated though superposition of the current frame image and the current background image with a certain probability. This algorithm makes the objects which stay long time to be a part of the background after a certain period Period of time , but not be detected as a part of foreground. The experimental results show that this algorithm Can detect moving targets more effectively and precisely.

**Keywords:** Real time videos, Moving target

## Style T-GAN: Modifying the Power of GANs for Fast Large-Scale Text-to-Image Synthesis

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### ABSTRACT

Text-to-image synthesis has recently seen significant progress thanks to large pretrained language models, large-scale training data, and the introduction of scalable model families such as diffusion and autoregressive models. However, the best-performing models require iterative evaluation to generate a single sample. In contrast, generative adversarial networks (GANs) only need a single forward pass. They are thus much faster, but they currently remain far behind the state-of-the-art in large-scale text-to-image synthesis. This paper aims to identify the necessary steps to regain competitiveness. Our proposed model, StyleGAN-T, addresses the specific requirements of large-scale text-to-image synthesis, such as large capacity, stable training on diverse datasets, strong text alignment, and controllable variation vs. text alignment tradeoff. StyleGAN-T significantly improves over previous GANs and outperforms distilled diffusion models — the previous state-of-the-art in fast text-to-image synthesis — in terms of sample quality and speed.

**Keywords:** diffusion, GANs, StyleGAN.

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## IoT based Intelligence Vehicle Presence Detection System for Smart Parking

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### ABSTRACT

More and more people cluster in major cities and thus causing urbanization challenges. In this scenario, many cities are employing technologies to lessen the impact on the environment and increase productivity and efficiency to cope with the high demand. Among which, smart transportation is essential in fulfilling the mobility in the urban areas and promising to meet the increasing demand of passengers. IoT application in a smart parking system has been facilitated in various ways. To achieve its full potential, we need to understand the associated issues and principals. Therefore, this paper focus on understanding the principals within IoT, the process for the layers to function in vehicle detection, and introducing different IoT sensors empowered by different technologies, including cloud computing, big data, RFID, and WSN, that facilitate the smart parking system. After assessing the potential use cases of the IoT in the vehicle presence detection of the smart parking system, this paper will identify and discuss the benefits and challenges along with the recommendation and consideration that serve as the manual to help the industries and the governmental institutions to select appropriate sensors according to different scenarios.

**Keywords:** Internet of Things (IoT), Smart Parking System, Vehicle Presence Detection

## Design and Implementation of Wireless Voice Controlled Intelligent Obstacle-Avoiding Toy Car System

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### ABSTRACT

This system combined speech recognition and wireless technology together. It overcame the defect that the chip was embedded in car body, which was far away from the speech source and led to high noise in traditional system. Moreover, the new system adopted ultrasonic rangefinder which made the car can avoid obstacles. The control process of this design was that speech information in SPCE061A were identified and translated into control commands, and then sent to a terminal device through ZigBee coordinator CC2430. Then the obstacle- avoiding information detected by the ultrasonic rangefinder together with voice control commands were transmitted to the 51 MCU, which analyzed these signals and finally decided the car’s driven control signals.

**Keywords:** Speech Recognition; SPCE061A; ZigBee; Ultrasonic Ranging

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## Automatic Vehicle Accident Detection and Instant Messaging using GPS and GSM

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### ABSTRACT

Day by day man improving technology and introducing new technologies to make human lifestyle so simple, safety and secure. But still we have some problem whenever we face some sudden unexpected situation occurs like accident. We are losing so many lives because of delay in reaching the hospitals or intimating to ambulances. This paper is designed to inform about the accident location that has occurred to concerned persons. The main application of this system is track the vehicle using the GPS modem. This modem gives the information about its position whenever required in the form of latitudes and longitudes. This is done with the help of the GPS satellite and the GPS module attached to the vehicle which needs to be tracked. GPS works in any weather conditions, anywhere in the world, 24 hours a day. GPS receiver must be locked on to the signal of at least three satellites to calculate a 2D position (latitude and longitude) and track movement. Whenever the accident occurs to any vehicle with any other vehicle or with something else, it will be detected by the input sensors, this information is sent immediately to the controlling unit i.e. to the ambulance using a GSM modem by. The provision to change the mobile number to which the message has to be sent is also provided in this system.

**Keywords:** GPS, Satellite, GSM, Modem.

## Combustible Gas Detection with GSM Alert using Arduino

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### ABSTRACT

Combustible gases are a very common reason for blasts and fire accidents, causing large damage to life and property. So here we propose an automated gas detection and alerting system that alert users wherever they are using SMS message. So for this purpose we use a PIC microcontroller along with Combustible gas sensor, LCD display, GSM modem for sending message and buzzer. The system is powered by a 12V power supply. The system constantly scans the gas sensor to detect leakages. As soon as gas is detected at the sensor, it produces an equivalent voltage and signals the microcontroller. The microcontroller on reading the signal checks the amount of gas detected, On detecting gas above certain level it then goes into alert mode. The system now displays the status of the event occurred on an LCD display, also sounds a buzzer to alert. It now uses the GSM modem to send an SMS message to the user/authority to inform about the situation so required action can be taken for it.

**Keywords:** Gas Sensor, LCD, GSM, MAX232.

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## Underwater Image Color Correction and Contrast Enhancement Based on Hue Preservation using Deep Learning

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### ABSTRACT

Underwater Image suffers from serious colour distortion and low contrast problems because of complex light propagation in the ocean. In view of computing constraints of underwater vehicles, we propose a high-efficiency deep-learning based framework based on hue preservation. The framework contains three convolutional neural networks for underwater image colour restoration. At first, we use the first CNN to convert the input underwater image into the grayscale image. Next, we enhanced the grayscale underwater image by the second CNN. And then, we perform the colour correction to the input underwater image by the third CNN. At last, we can obtain the colour-corrected image by integrating the outputs of three CNNs based on the hue preservation. In our framework, that CNNs specialize on each work can be able to simplify each architecture of CNNs at most and improve the regression quality to achieve the low computing cost and high efficiency. However, the problem of the underwater CNNs is that the underwater training data is too few and without the corresponding ground truth. Thus, we use the unsupervised learning method CycleGAN to train the underwater CNNs. We design a training method as the combination of three CycleGANs that can train the three CNNs at the same time to share the regression status. This training method may let the three CNNs of our proposed framework support each other to avoid the training overfitting and without constraint. By the proposed framework and training method, our method can process the underwater images with high quality and low computing cost. The experimental results have demonstrated the correct colours and high image quality of the proposed method's results, compared with other related approaches.

**Keywords:** Deep learning, CNN

## College Faculty Dashboard Implementation using IoT

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### ABSTRACT

In this digital era, the life of human beings is getting simpler as almost everything is being automatic, replacing the old manual systems. Nowadays internet have become an integral part of human’s everyday life without which they are helpless. In this project we are using Internet of Things (IoT) provides a platform where devices can be connected, sensed and controlled remotely across a network infrastructure. Single admin controls the various devices connected to the cloud server and also facilitates a number of sensors. This, project will benefit college UG Scholars by letting them know when the faculty is in his chamber and when he is not. Using this they can save time and work efficiently. It uses Ultrasonic sensors which sense the presence of the faculty in a room and update their status in real time. The status is shown on the web server and is very simple.

**Keywords:** IoT, Ultrasonic Sensor, Dashboard

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## Fingerprint Voting System

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### ABSTRACT

It has always been an arduous task for the election commission to conduct free and fair polls in our country, the largest democracy in the world. Crores of rupees have been spent on this to make sure that the elections are riot free. But, now- a -days it has become common for some forces to indulge in rigging which may eventually lead to a result contrary to the actual verdict given by the People. This paper aims to present a new voting system employing biometrics in order to avoid rigging and to enhance the accuracy and speed of the process. The system uses thumb impression for voter identification as we know that the thumb impression of every human being has a unique pattern. Thus, it would have an edgeover the present day voting systems. As a pre-poll procedure, a database consisting of the thumb impressions of all the eligible voters in a constituency is created. During elections, the thumb impression of a voter is entered as input to the system. This is then compared with the available records in the database. If the particular pattern matches with anyone in the available record, access to cast a vote is granted. But in case the pattern doesn't match with the records of the database or in case of repetition, access to cast a vote is denied or the vote gets rejected. Also, the police station nearby to the election poll booth is informed about the identity of the imposter.

**Keywords:** Arduino, Power Supply Unit, Fingerprint Sensor, Buzzer, Lcd, Switches

## Vehicle Movement Street Light with Light Sensing ATMEGA

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### ABSTRACT

The main purpose Vehicle Movement Based Street Lights with External Light Sensing Using ATmega is that it saves energy by putting on the lights of the system only when the system detects movement of vehicle. The system switches on the street light ahead of the vehicle and switches off the trailing lights simultaneously. The movement of vehicle gets detected by sensors. The system automatically puts on the lights that are ahead of the vehicle detected and as soon as the vehicle moves ahead, the trailing lights are switched off. This system is more efficient for saving a lot of energy than existing system where the street lights are kept on always unlike this system where the street lights are put on only when movement of vehicle is detected. During day time these lights are dim as this system has the capability to sense external lights. Thus this system senses the external light and then accordingly switches ON or OFF the street lights. It uses PWM to control the intensity through microcontroller. The IR sensors sense the vehicle movements and send it to a ATmega microcontroller that initiates commands for switching the lights ON/OFF.

**Keywords:** Street light management, vehicle movement sensing, Detecting the light source, ATmega.

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## Heart Disease Prediction using Long Short-Term Memory (LSTM) Deep Learning Methodology

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### ABSTRACT

Heart disease is one of the deadly diseases. A large population in the world is suffering from this problem. As we consider death rate and a large number of people who are suffering from heart disease, it is revealed how important is early diagnosis of heart disease. There are many traditional methods of prediction for such illness but they are not looking sufficient. Previous dynamic prediction models rarely handle multi-period data with different intervals, and the large-scale patient hospital records are not effectively used to improve the prediction performance. This paper aims to focus on the prediction of cardiovascular disease using the improved long short-term memory (LSTM) model. Based on the traditional LSTM, this paper proposed a new model by improving the internal forgetting gate input. First, the irregular time interval is smoothed to obtain the time parameter vector, and then it is used as the input of the forgetting gate to overcome the prediction obstacle caused by the irregular time interval.

**Keywords:** Cardiovascular disease, dynamic prediction, LSTM.

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## Related Issues in a Polynomial-Based Efficient Key Management System for IoT Wide Area Network

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### ABSTRACT

However, due to distributed nature and their deployment in remote areas, these networks are vulnerable to numerous security threats that can adversely affect their performance. This problem is more critical if the network is deployed for some mission-critical applications such as in a tactical battlefield. Random failure of nodes is also very likely in real-life deployment scenarios. Due to resource constraints in the sensor nodes, traditional security mechanisms with large overhead of computation and communication are infeasible in WSNs. Key establishment is a fundamental security issue in wireless sensor networks (WSN). It is the basis to establish the secure communication using cryptographic technologies between sensor nodes. Due to the current resource constraints on sensors, it is infeasible to use traditional key management techniques such as public key cryptography or key distribution center based protocols. Therefore, the key pre distribution schemes are paid most attention in key management of WSN. In this paper, we study an enhanced polynomial-based key establishment scheme (EPKES) for WSN. In EPKMS, it introduced an auxiliary set to improve the security level compared to previous schemes.

**Keywords:** sensor network, sensor authentication, IoT authentication, symmetric, polynomial



## Fault Detection of Underground Cables through Node MCU Based on IOT

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### ABSTRACT

In many cities, underground cables are used rather than of overhead transmission lines. It is hard to go through the specific spot of the shortcomings. As India become prominent as a progression country, civilized field is too boosting every day. The underground lines are beat under the same circumstances its uses is additionally growing a result of its clear advantages such as lower line losses, lower maintenance cost and they are less powerless to the effects of serious climate. As it isn't clear it moves extreme to identify propel area of the shortcoming. In this proposed work we are trying to rectify this problem by proposing a method which is good enough to the digital world. In this paper we have used IOT based technique with Google database for the fault detection with the help of Node MCU Wifi Module. It is totally based on IOT. We used here Node MCU which connects arduino sensors to Internet. We had created a Hot spot through router for communication. We connected each MCU Module with transformer and used Google data base to checking the status of transformers. The accuracy and efficiency of our proposed method is more as compare to the other techniques.

**Keywords:** IOT, Node MCU Wifi Module, Arduino, Power Lines, Google Database, LL, LG and LLL

## Pollution Monitoring System Over an IoT

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### ABSTRACT

In the present era, air and noise pollution is the growing hazardous issue. It is necessary to monitor air quality and keep it under control for a better future and healthy living for all. Here we propose an air quality as well as sound pollution monitoring system that allows us to monitor and check live air quality as well as sound pollution in a particular area through IOT. System uses air sensors to sense presence of harmful gases/compounds in the air and constantly transmit this data to microcontroller. Also, system keeps measuring sound level and reports it to the online server over IOT. The sensors interact with microcontroller which processes this data and transmits it over internet. This allows authorities to monitor air pollution in different areas and take action against it. Also, authorities can keep a watch on the noise pollution near schools, hospitals and no honking areas, and if system detects air quality and noise issues it alerts authorities so they can take measures to control the issue.

**Keywords:** Microcontroller, IOT, monitoring, Air pollution, Noise pollution.

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## Internet of Things (IoT) for Next-Generation Smart Systems: A Review of Current Challenges, Future Trends and Prospects for Emerging 5G- IOT Scenarios

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### ABSTRACT

The Internet of Things (IOT)-centric concepts like augmented reality, high-resolution video streaming, self-driven cars, smart environment-health care, etc. have a ubiquitous presence now. These applications require higher data-rates, large bandwidth, increased capacity, low latency and high throughput. In light of these emerging concepts, IOT has revolutionized the world by providing seamless connectivity between heterogeneous networks (Het Nets). The eventual aim of IOT is to introduce the plug and play technology providing the end-user, ease of operation, remotely access control and configurability. Fifth Generation (5G) cellular networks provide key enabling technologies for ubiquitous deployment of the IOT technology. These include carrier aggregation, multiple-input multiple- output (MIMO), massive-MIMO (M-MIMO), coordinated multipoint processing (CoMP), device-to-device (D2D) communications, centralized radio access network (CRAN), software-defined wireless sensor net- working (SD-WSN), network function virtualization (NFV) and cognitive radios (CRs). This paper presents an exhaustive review for these key enabling technologies and also discusses the new emerging use cases of 5G-IoT driven by the advances in artificial intelligence, machine and deep learning, ongoing 5G initiatives, quality of service (QoS) requirements in 5G and its standardization issues. Finally, the paper discusses challenges in the implementation of 5G-IoT due to high data-rates requiring both cloud-based platforms and IOT devices based edge computing.

**Keywords:** Internet of Things (IOT), 5G, carrier aggregation, CoMP, CRAN, CRs, Het Nets, MIMO, M-MIMO, NFV, SD-WSN, QoS

## Design and Development of Precision Agriculture System Using Wireless Sensor Network

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### ABSTRACT

Crop farming in India is labour intensive and obsolete. Farming is still dependent on techniques which were evolved hundreds of years ago and doesn't take care of conservation of resources. The newer scenario of decreasing water tables, drying up of rivers and tanks, unpredictable environment presents an urgent need of proper utilization of water. We have the technology to bridge the gap between water usage and water wastage. Technology used in some developed countries is too expensive and complicated for a common farmer to understand. Our project is to give cheap, reliable, cost efficient and easy to use technology which would help in conservation of resources such as water and also in automatizing farms. We proposed use of temperature and moisture sensor at suitable locations for monitoring of crops. The sensing system is based on a feedback control mechanism with a centralized control unit which regulates the flow of water on to the field in the real time based on the instantaneous temperature and moisture values. The sensor data would be collected in a central processing unit which would take further action. Thus, by providing right amount of water we would increase the efficiency of the farm. The farmer can also look at the sensory data and decide course of action himself. We have made the interface of our project keeping in view the educational and financial background of average Indian farmer. In this paper we are proposed a low cost and efficient wireless sensor network technique to acquire the soil moisture and temperature from various locations of farm and as per the need of crop controller take the decision to make irrigation ON or OFF.

**Keywords:** Crop Farming, Water Usage, Water Wastage, Temperature, Moisture, Wireless Sensor Network.

## Harmful gases Wireless Network Monitoring System Design

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### ABSTRACT

Single network for traditional wired and monitoring systems in the wiring, coverage, scalability, compatibility and other aspects of the problem, this paper proposes to Zigbee technology-based, GSM technology, supplemented by the master-slave wireless network, this system architecture designed remote detection terminal, control master station, mobile monitoring terminal Communication protocol. Remote monitoring terminal is used to detect the site environment and gas concentration. Remote sense terminals to detect scene conditions and gas concentration state. Control station is used to handle the main station to join the network of remote detection terminal data, timely alarm information sent to your phone via GSM module monitoring terminal. In addition, through the serial port to transfer data to a computer monitor server, to achieve the status of each remote terminal data analysis and management. Experimental results show that this paper designed system is capable of long-term stable and reliable operation with low power consumption, always online, covering a wide area advantage.

**Keywords:** Zigbee, GSM, Wireless Network, Remote Monitoring, Remote sensing.

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## Offline Handwritten Alphabetical Character Recognition SVM and MQDF Hybrid Classifier

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### ABSTRACT

Digital image processing and the pattern recognition are the constituents of digital signal processing (DSP). Majority of the applications used in the 21st century are developed and designed based on these constituents. The character recognition is the first of its kind application in the field of pattern recognition and, with collaborating with recent technologies and algorithms it has become automatic. Research work in character recognition has high potential to bring tremendous changes in various areas such as blind reading, financial organizations such as banks, communication organizations such as post office, defence operated organizations, to automate the library, to process the available languages, to design the multimedia stuff, to digitalize the legal documents and others. The offline handwritten alphabetical character recognition is a popular methodology in the field of pattern recognition and in this work the Telugu handwritten characters are recognized in offline. The Dravidian family poses a unique character ascent and it is different from its peers namely Indo-Aryan family and European family. The Telugu language and its characters are thousands of character shapes and, the implementation of two sets of the attribute is calculated and two classifiers are mingled together to achieve better precision level in the character recognition. The second feature set computation is done based on curvature feature which is guided to get the gradient information. Achieving the convincing performance better than the existing method is challenging offline character recognition. SVM and, the MQDF combined together to form as the hybrid classifier are helpful in attaining the handy results with good performance levels.

**Keywords:** Handwritten character recognition, Indian script, Telugu character, (SVM) Support Vector Machines, (MQDF) Modified Quadratic Discriminant Function.

## Wireless Blackbox for Cars using Sensors and GPS Module

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### ABSTRACT

The main purpose of this wireless black box project is to develop a vehicle black box system that can be installed into any vehicle all over the world. This paradigm is often designed with minimum range of circuits. Wireless black box is basically a device that will indicate all the parameters of a vehicle crash and will also store and display its parameters such as temperature, location, vibration, alcohol limit etc. At the time of accident, the message will be sent from the system built inside the car to the registered mobile numbers such as emergency numbers of police stations, hospitals, family members, owner etc. We have used various types of sensors like temperature sensor, which is used to measure temperature. Vibration sensor measures vibrations felt by the car during accident. Alcohol sensor is located on the steering wheel which will indicate whether the driver is drunk. Gyroscope sensor is used to indicate tilt during the accident. GSM module, GPS module are some of the devices used in this research which helps in accomplishing the output.

**Keywords**-Arduino, Gas sensor, Temperature sensor, Vibration sensor, Accelerometer, GSM, GPS, SMS.

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## Deferral Enhanced Full Adder Proposal for High Speed VLSI Applications

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### ABSTRACT

The most broadly utilized math activity in advanced requests is expansion. Full snake is the greatest significant structure hinder in computerized signal computers and supervisors as it is utilized in number juggling rationale circuit (ALU) , in the drifting point unit then if there must arise an incidence of stock or memory become to address age. As thickness of IC chip expands, power utilization additionally increments. Henceforth low force plans are the essential necessity in the VLSI field. Decreasing deferral of an advanced circuit is a significant point in rationale structure for proficient usage of viper. In this paper a half and half “CMOS full snake circuit structured utilizing both transmission entryway and correlative metal oxide semiconductor (CMOS) is executed and an adjusted rendition of this full viper is proposed”. Configuration was actualized utilizing “Cadence Virtuoso Tools in 180nm and 90nm innovation”. At that point examination is done against these full adders regarding force, speed and force defer item.

**Keywords:** CMOS, TG, Power Delay Product

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## Evaluation of Different Processor Architecture Organizations for On-Site Electronics in Harsh Environments

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### ABSTRACT

Microcontrollers to be used in harsh environmental conditions, e.g., at high temperatures or radiation exposition, need to be fabricated in robust technology nodes in order to operate reliably. However, these nodes are considerably larger than cutting-edge semiconductor technologies and provide less speed, drastically reducing system performance. In order to achieve low silicon area costs, low power consumption and reasonable performance, the processor architecture organization itself is a major influential design point. Parameters like data path width, instruction execution paradigm, code density, memory requirements, advanced control flow mechanisms etc., may have large effects on the design constraints. Application characteristics, like exploitable data parallelism and required arithmetic operations, have to be considered in order to use the implemented processor resources efficiently. In this paper, a design space exploration of five different architectures with MIPS- or ARM-compatible instruction set architectures, as well as transport-triggered instruction execution is presented. Using a 0.18  $\mu\text{m}$  SOI CMOS technology for high temperature and an exemplary case study from the fields of communication, i.e., power line communication encoder, the influence of architectural parameters on performance and hardware efficiency is compared. For this application, a transport-triggered architecture configuration has an 8.5 higher performance and 2.4 higher computational energy efficiency at a 1.6 larger total silicon area than an off-the-shelf ARM Cortex-M0 embedded processor, showing the considerable range of design trade-offs for different architectures.

**Keywords:** ASIC, Design tradeoff analysis, Harsh environment, Processor architecture organization · Transport triggered architecture

## Design of Smart Healthcare Monitoring Framework Using Cloud Computing and IoT

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### ABSTRACT

Modern technology is widely used in different fields to improve the quality of life for people. One of the major challenges that have been identified as having a direct impact on both an individual's quality of life and the growth of the country is health-related difficulties. Avoiding medical supervision has harmful impacts in numerous areas. Healthcare is one of several significant industries where applications using the Internet of Things (IoT) platform have gained widespread acceptance. The creation of a smart healthcare monitoring framework utilizing cloud computing and IoT is presented in this method. The suggested architecture improves the effectiveness of biosensor-based data gathering and aggregation and, in the event of an emergency, informs the relevant doctor. In the situation of any intense conditions, it also results in the development of a real-time efficient decision support system. Giving patients access to appropriate and effective medical facilities is the research's suggested outcome.

**Keywords:** Healthcare, IOT, Biosensor.

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## Innovative Home Locker Safety Security Structure by Arduino UNO Based on Expansion of GSM

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### ABSTRACT

At present the mainstream of the horse confronting issue about how to protect their own effects like adornments, significant records and cash reserved in home because of the burglary in houses, workplaces and in associations too. Henceforth, a large portion of the house individuals are taking chronological registries and protect storage spaces in homes to give security to their noteworthy things. “In any case, even still they worked with manual activity of lock and key framework without giving any data to the client when burglary is occurred by breaking them”. Thus, an endeavor has been made to create propelled ready home security framework with Fingerprint and Password confirmation to open or close the entryway framework and furthermore sending the message if any miss activity will be performed by others utilizing GSM Technology with shrewd versatile. The current framework gives the better security to a wide range of houses and furthermore this framework has exceptionally prudent expense, with the goal that it can moderate to all. The framework effectively created, executed and tried in our research center and we originate that its employed is acceptable.

**Keywords:** Arduino Uno, GSM, Unique mark Sesnor Module, Multi Segments

## Design of Inset Feed Rectangular Microstrip Patch Antenna for Radar Applications

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### ABSTRACT

In this paper of Microstrip Inset feed patch antenna is designed for S-Band various wireless applications. The Antenna is fed by Inset feed feeding technique. The advantage of Inset fees is that it can be easily fabricated and simplicity in modeling as well as impedance matching. The proposed patch antenna is designed and simulated on HFSS simulation software and it is designed to operate in S-band frequency range 2.4GHz. These antennas are designed using dielectric substrate with the permittivity  $\epsilon_r = 4.2$ . In this analysis, we have compared the antenna parameters such as gain, impedance, Radiation Pattern, Polar Plot, VSWR and further the performance of these inset feed techniques discussed. The antenna has been designed for the range 2.4 GHz; hence this antenna is highly suitable for S-band applications such as satellite communication, Radar, Medical applications, and other Wireless systems.

**Keywords:** Patch antenna, HFSS, VSWR, Microstrip antenna

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## Image Processing based Fault Detection in PCB

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### ABSTRACT

The importance of the PCB-Printed Circuit Board inspection process has been magnified by requirements of the modern manufacturing environment where delivery of 100% defect free PCBs is the expectation. To reach such outcomes, identifying various faults and their types becomes the first step. In this PCB inspection system the inspection algorithm mainly focuses on the fault detection using the natural images. Many practical issues like tilt of the images, bad light conditions, height at which images are taken etc. are to be considered to ensure good quality of the image which can then be used for defect detection.

PCB fabrication is a multidisciplinary process, and etching is the most critical part in the PCB manufacturing process. The main objective of Etching process is to remove the exposed unwanted copper other than the required circuit pattern. In order to minimize scrap caused by the wrongly etched PCB panel, inspection has to be done in early stage. However, all of the inspections are done after the etching process where any defective PCB found is no longer useful and is simply thrown away. Since etching process costs 0% of the entire PCB fabrication, it is uneconomical to simply discard the defective PCBs .

In this paper a method to identify the defects in natural PCB images and associated practical issues are addressed using Software tools and some of the major types of single layer PCB defects are Pattern Cut, Pin hole, Pattern Short, Nick etc., Therefore the defects should be identified before the etching process so that the PCB would be reprocessed. In the present approach expected to improve the efficiency of the system in detecting the defects even in low quality images.

**Keywords:** Image Processing, Defect detection, PCB, MATLAB.

## CMOS Multiplexer Layout Design and Simulation by Using Different Technologies

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### ABSTRACT

A multiplexer circuit is a vital device used in numerous branches of Engineering. The goal of VLSI research is to simplify and shrink designs. The goal of this paper is to use CMOS logic to design a 2-to-1 multiplexer, which will result in a simpler and more efficient circuit. This paper utilizes a variety of design methodologies to lessen the multiplexer’s footprint, complexity, and power consumption. The 35nm technology has been analyzed in this work. Finally, we evaluate the design processes themselves and aim to maximize the multiplexer’s effective area.

**Key Words:** MUX, Pseudo NMOS logic Low Power, Static CMOS logic, Low Power.

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## Research Challenges and Future Applications in Internet of Things

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### ABSTRACT

With the Internet of Things (IoT) gradually evolving as the subsequent phase of the evolution of the Internet, it becomes crucial to recognize the various potential domains for application of IoT, and the research challenges that are associated with these applications. Ranging from smart cities, to health care, smart agriculture, logistics and retail, to even smart living and smart environments IoT is expected to infiltrate into virtually all aspects of daily life. Even though the current IoT enabling technologies have greatly improved in the recent years, there are still numerous problems that require attention. Since the IoT concept ensues from heterogeneous technologies, many research challenges are bound to arise. The fact that IoT is so expansive and affects practically all areas of our lives, makes it a significant research topic for studies in various related fields such as information technology and computer science. Thus, IoT is paving the way for new dimensions of research to be carried out. This paper presents the recent development of IoT technologies and discusses future applications and research challenges.

**Keywords:** Internet of Things; IoT applications; IoT challenges; future technologies; smart cities; smart environment; smart agriculture; smart living

## IoT Based Flood Avoidance

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### ABSTRACT

Flood is a common problem not only in India but worldwide and most of the water bodies are easily accessible to common people. At times it may happen that the weather conditions may change suddenly and the water bodies may become violent, resulting in a flood which can lead to loss of lives as well as livestock. Therefore, a rapid flood detection system that can reach a wide area such as the internet is necessary to minimize the effects of disasters. So, this paper proposes a flood detection system with the help of the Internet of Things (IoT). IoT is a smart technology that has the capability to send data in realtime. The system is powered using Arduino and has 3 sensors to detect 5 different parameters. Firstly, to measure temperature and humidity we have DHT-11 Digital Temperature and Humidity Sensor. Then we have the Water Flow sensor to check the flow of water. And lastly, to measure the distance and water level we have HC-SR04-Ultrasonic Range Finder and Distance Sensor. Finally, the collected information is transmitted to LCD to display the information. The system continuously keeps checking any changes in the weather condition and updates the live data over IoT. In case the parameters reach a dangerous level the system immediately alerts the people.

**Keywords:** Flood detection, IoT, real time, Sensors, DHT11, HC-SR04



## Copyright Protection and Security to Digital Image Against Different Attacks

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### ABSTRACT

As we know it, digital data is in various formats such as text, audio, video, image, graphics, and message or in animated format. When transmitting digital data through a channel, digital data requires security and copyright protection. In this paper, a 2-D digital image is used for experimental purposes. There are a variety of strategies and algorithms that can provide services to protect and protect patents. The combination of the DWT and DCT digital signal path is used to provide a patent protection service and security services can be provided through the AES process using a key of 256 bits. The combination of digital watermarking image and AES process provides authentication, copyright protection, and digital image protection against different attacks such as Dissolution, Gaussian, Salt and pepper noise, JPEG compression.

**Keywords:** Gaussian noise, Salt and pepper noise, Median filtering, digital watermarking, AES technique, JPEG compression

UGC AUTONOMOUS

## Reduced Mutual Coupling Multiband MIMO patch antenna with Swastik type EBG

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### ABSTRACT

This paper presents a reduced mutual coupling 1x2 rectangular patch antenna. The major disadvantage of the MIMO is mutual coupling. When two antennas are placed nearby mutual coupling occurs. When mutual coupling occurs decrease the channel capacity. Hence the propose system which resonates at first 2.5GHz, second is resonates at 5.4GHz. Two closely spaced antenna elements are separated by a distance of  $\lambda_{max}/8$ . Here Swastik type EBG is introduced. EBG is placed between the two antennas. When EBG is placed between the two antennas good coupling reduction is obtained

**Keywords:** MIMO, Rectangular Patch Aantenna, Swastik EBG.

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## Ventilator using Arduino with Blood Oxygen Sensor for COVID Patients

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### ABSTRACT

Respiration is accomplished by using the lungs of a human being. The inhalation and exhalation processes of each breath include the utilization of a push mechanism. The purpose of the Smart-ventilator that we are developing here is to assist people during the COVID epidemic. It is quite reasonably priced and accessible. During a patient's severe condition, this may be helpful in cases when the patient has problems with their lungs or their respiration. In order to provide a significant amount of oxygen to the lungs, a dc motor mechanism is used. When low breathing pulse level detected. When the breathing pulse level is normal ventilator pump run with normal speed then the normal level of oxygen sends to these lungs. The LCD screen is used to display the breathing pulse levels. A buzzer is also included in the system in the event that a patient is in a serious state or is having trouble breathing. This buzzer will sound an alarm as soon as any anomalies are identified. Aside from this, the ventilator has to be able to monitor the patient's pulse oxygen level as well as the pressure in their exhaled lungs in order to prevent both too much and too little air pressure at the same time. All of these needs have been included into the Smart-ventilator that we are designing and developing here at this location using Arduino. Our goal is to create a dependable device that is also affordable so that it may be used in times of pandemic.

**Keywords:** ARDUINO, Internet of Things.

## Real Time Monitoring of Water Quality in IoT Environment

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### ABSTRACT

Water pollution is one of the major causes for various types of water-borne diseases, so the quality of the drinking water needs to be measured in real time. This project is performed by real time water quality measuring system at low cost using Internet of Things (IoT). In order to perform this, we need to compute the physical parameters of the water such as temperature, pH, turbidity. Water contamination is likely the best dread for the green globalization. The ATMEGA328 model can be utilized as a center controller. The Microcontroller is programmed using embedded ‘C’ language.

**Keywords:** Water quality, Internet of Things, Arduino Microcontroller.

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## Medical Remote Monitoring of Multiple Physiological Parameters Based on Wireless Embedded Internet

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### ABSTRACT

The advancement and application of wireless body area networks (WBANs) are considered key areas for improving healthcare quality. Pervasive healthcare monitoring provides rich contextual information to handle the odd conditions of chronically ill patients. Constant monitoring and an early medical response not only increase the life quality of elderly and chronically ill people but also families and parents by providing high quality health care to their young babies and paralyzed children. The importance of the WBANs cannot be very promising as many applications and prototypes are already in progress. For example, some WBANs are dedicated to continuous observation of cognitive diseases such as Alzheimer’s, epilepsy and Parkinson’s disease. Another significant advancement in WBANs is the formation of tiny sensors implanted in the human body or integrated into fabric. While the importance of WBANs in healthcare is indubitable, the amount of data generated by these sensors is huge and demands more resources in terms of computation, memory, communication power, massive storage infrastructure, energy efficient performance for processing, real time monitoring and data analysis.

This system will update the health parameter readings of a patient to a third party server where doctor can view if any parameter is about to cross its limit. So that he can take an immediate action towards the patient.

**Keywords:** Raspberry Pi, Heartbeat Sensor, Temperature Sensor, 16x2 LCD, IOT.

## A Deep Prediction of Chronic Kidney Disease by Employing Machine Learning Method

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### ABSTRACT

In recent years, people worldwide have been suffering from various types of kidney diseases indescribably, among which chronic kidney disease (CKD) has exacerbated the situation. Early diagnosis of CKD is the only way to hinder the advancement of kidney disease in its initial stage. However, presently doctors can use machine learning classifier algorithms to identify the disease earlier than any other existing method. Here, this research work presents a method by using eight different machine learning (ML) algorithms that can promptly detect the infection of CKD considering the health condition dataset information of the patient. A dataset is used of nearly two months of that period delivered by the hospital to identify the plausibility of chronic kidney disease. This research study has used the Extra Tree Classifier (EXT), AdaBoost (ADB), K-Nearest Neighbors (KNN), Gradient Boosting (GB), Extreme Gradient Boosting (XGB), Decision Tree (DT), Gaussian Naïve Bayes (GNB) and Random Forest (RF) to obtain an optimum result of prediction. After preprocessing the data, this research work has applied the ML algorithms and compared their performances, and eventually, the precise outcome has been obtained. The performance is analyzed by using the F1-score, precision, accuracy, recall, and AUC score. According to the analysis results, K-Nearest Neighbors and Extra Tree Classifier have performed better than other algorithms for achieving an accuracy of 99% preceding the Gradient Boost, which stands at 98%

**Keywords:** Chronic Kidney Disease (CKD), Machine Learning, Extra Tree Classifier (EXT), AdaBoost (ADB), K-Nearest Neighbors (KNN), Gradient Boosting (GB), Decision Tree (DT), Gaussian Naïve Bayes (GNB), Random Forest (RF).

## INTELLIGENT COURIER TRACKING SYSTEM

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### ABSTRACT

This paper describes a device which is capable of identifying the arrival of the courier and forward the same to the receiver. The idea behind this project is to employ an RFID tag to the courier and send the identity number to the user. The user feeds the identity number in the microcontroller using GSM. On the receiver side there is a letterbox which has a RFID reader, GSM module and LCD screen. The courier person scans the RFID tag on the courier using the RFID Reader present at the letterbox. If the identity number matches with the identity number fed by the user, the RFID reader sends a command to the microcontroller to open the gate of the letterbox. The Microcontroller is connected to the DC motor which rotates resulting in the opening of gate. The Microcontroller is programmed in such a manner that after the opening of the gate it automatically closes after 15 seconds. In the event of mismatch of identity number an error message is displayed on the LCD screen. In this system each courier or post will be assigned a unique RFID card, whenever a courier/post arrives the mail box, then the RFID reader present in the mail box will read the RFID card and the information in the card like the address and to from details. The same information is sent through a GSM modem to the authorized person to whom the post box belongs. Thus he can take necessary action depending on the urgency of the arrived courier or post. This is a smart way which reduces the mundane task of repeatedly checking for the incoming posts. An LCD is also interfaced in the project which displays the status of the system. This project uses regulated 5V, 500mA power supply. Unregulated 12V DC is used for relay. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Keywords: RFID, LCD

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