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Department of *Electronics & Communication Engineering*
Presents *Online Mega International Conference On*

**"Smart Modernistic in Electronics and
Communication"** on 2nd & 3rd July, 2021



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Departments of Electronics and Communication Engineering

Online Mega International Conference “Smart Modernistic in Electronics
and Communication” (ICSMEC–21)

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Sri. M. LAXMANREDDY
CHAIRMAN



MESSAGE

I am extremely pleased to know that the Department of Electronics and Communication Engineering of SMEC is organizing Online Mega International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-21) on 2nd and 3rd of July 2021. 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
EXECUTIVE DIRECTOR



MESSAGE

I am pleased to state that the Department of Electronics and Communication Engineering of SMEC is organizing Online Mega International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-21) on 2nd and 3rd of July 2021. 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 paper on 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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G. CHANDRASEKHAR YADAV
Executive Director



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Dr P. SANTOSH KUMAR PATRA
PRINCIPAL



I am delighted to be the Patron & Program Chair for the Online Mega International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-21) organized by the Department of Electronics and Communication Engineering on 2nd and 3rd of July 2021. 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 500 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



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CONVENERS

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 Mega International Conference on “**Smart Modernistic in Electronics and Communication**” (ICSMEC-21) 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 300 papers have been received for presentation during the online conference. After scrutiny by specialist 145 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 Head of Electronics and Communication Engineering of SMEC and with the blessing of the Principal and Management of SMEC.

Dr.B. Harikrishna
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Intelligent Alert Device for Women's Security

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Abstract: Every day, every woman, young girls, mothers and women from all walks of life are struggling to be safe and protect themselves from the roving gaze of the horribly insensitive men who molest, assault and violate the dignity of women on a daily basis. The streets, public transport, public places in particular have become the dominion of the hunters. Due to these atrocities that women are subjected to in the present scenario, a smart security wearable device for women based on Internet of Things is proposed. It is implemented and comprises of Raspberry Pi¹, Raspberry Pi camera and button to activate the services. This device is extremely portable and can be activated by the victim on being assaulted just by the click of a button that will fetch her current location and also capture the image of the attacker via Raspberry Pi camera. The location and the link of the image captured will be sent to predefined emergency contact numbers or police via smart phone of the victim thus preventing the use of additional hardware devices/modules (GPS Module² and GSM Module³) and making the device compact.

Keywords: Raspberry Pi, GPS Module, GSM Module.

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Road Map to 6G:AI Empowered Wireless Network

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Abstract: The recent upsurge of diversified mobile applications, especially those supported by AI, is spurring heated discussions on the future evolution of wireless communications. While 5G is being deployed around the world, efforts from industry and academia have started to look beyond 5G and conceptualize 6G. We envision 6G to undergo an unprecedented transformation that will make it substantially different from the previous generations of wireless cellular systems. In particular, 6G will go beyond mobile Internet and will be required to support ubiquitous AI services from the core to the end devices of the network. Meanwhile, AI will play a critical role in designing and optimizing 6G architectures, protocols, and operations. In this article, we discuss potential technologies for 6G to enable mobile AI applications, as well as AI-enabled methodologies for 6G network design and optimization. Key trends in the evolution to 6G will also be discussed.

Keywords: AI, 5G, 6G.

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IoT Based Toll Booth Manager System

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Abstract: Managing multiple toll booths is a very complicated task. We here propose a smart card-based toll booth system that is monitored over IOT. The Internet server maintains all the data of user accounts and also their balance. All vehicle owners would possess an RFID based card that stores their account number. Our system at toll booths will monitor the cards scanned when a car arrives at the toll booth. The system now connects to the online server to check if the card is valid and if valid what is the balance. If user balance is sufficient, the user balance is deducted online and web system sends signal back to the card scanner system that the user has been billed. On receiving this signal, the system operates a motor to open the toll gate for that car. The system is controlled by a microcontroller to achieve this purpose. The microcontroller uses WiFi connection to connect to the internet through which system interacts with web server to perform the online verification process. Also, system allows to store data of all the vehicles passed at particular time intervals for later reference and surveillance. This system thus automates the entire toll booth collection and monitoring process with ease using RFID plus IOT based system.

Keywords: IoT, RFID, Toll booth

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Implementation of a Setup that used to form a Thin Film on Substrate by using DIP Coating

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Abstract: To manufacture bulk products such as coated fabrics, electronic devices, we use dip coating. Dip coating involves the deposition of a liquid film via the precise and controlled withdrawal of a substrate from a solution. This is typically done by using an instrument known as a 'dip coater'. Dip-coating process includes five stages: immersion, start-up, deposition, evaporation and drainage. The movement is achieved by using stepper motor with constant velocity and speed. The stepper motor is programmed by using Arduino. It is simulated by using proteus circuit simulation software

Keywords: Dip coater, Arduino, Dip Coating, Proteus, Coated Fabrics

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Liquid Level Monitoring System Using Ultrasonic Sensor

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Abstract: This paper deals with Liquid Level Monitoring System Using Ultrasonic Sensor is a very innovative system which will inform the users about the level of liquid and will prevent it from overflowing. To demonstrate this the system makes use of 4 containers. For this the system uses ultrasonic sensors placed over the containers to detect the liquid level and compare it with the container's depth. The system makes use of AVR family microcontroller, LCD screen, WIFI modem for sending data and a buzzer. The LCD screen is used to display the status of the level of liquid in the containers. Whereas a web page is built to show the status to the user monitoring it. The web page gives a graphical view of the containers and highlights the liquid level in color in order to show the level of liquid. The LCD screen shows the status of the liquid level. The system puts on the buzzer when the level of liquid collected crosses the set limit. Thus, this system helps to prevent the wastage of water by informing about the liquid levels of the containers by providing graphical image of the containers via a web page.

Keywords: Ultrasonic Sensors, AVR Microcontroller

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Biometric Attendance System using IOT

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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 WIFI modem to interact with internet based system. We here use IOT Gecko to develop the online attendance display system. Our system allows users/employees/students 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 Gecko using the gecko development API codes. Now the online system stores and displays the required data to users as per online login. Thus our system allows for remote monitoring of biometric based attendance from anywhere over IOT.

Keywords: Fingerprint based biometric, IOT, Microcontroller, API codes, WIFI modem.

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Fully Automated Solar Grass Cutter Robot

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Abstract: The fully automated solar grass cutter is a fully automated grass cutting robotic vehicle powered by solar energy that also avoids obstacles and is capable of fully automated grass cutting without the need of any human interaction. The system uses 6V batteries to power the vehicle movement motors as well as the grass cutter motor. We also use a solar panel to charge the battery so that there is no need of charging it externally. The grass cutter and vehicle motors are interfaced to an Arduino family microcontroller that controls the working of all the motors. It is also interfaced to an ultrasonic sensor for object detection. The microcontroller moves the vehicle motors in forward direction in case no obstacle is detected. On obstacle detection the ultrasonic sensor monitors it and the microcontroller thus stops the grass cutter motor to avoid any damage to the object/human/animal whatever it is. Microcontroller then turns the robotic as long as it gets clear of the object and then moves the grass cutter in forward direction again.

Keywords: L293D, Solar panel, Solar Grass Cutter, microcontroller

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RFID Based Smart Master Card for Bus Train Metro Ticketing

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Abstract: Modern cities of today have developed multiple means of communication including Buses, trains, metros and private vehicles. Now each transport system has their own smart card and it becomes a hectic process for users to manage separate smart cards for every transport medium. Thus, we propose a smart master card approach that integrates all these systems together and allows for a single master card and a centralized system for all transportation mediums. To demonstrate this concept, we use three RFID scanners to demonstrate as bus train and metro train smart card scanners respectively. Now we use three smart cards that work particularly on each of the systems viz one RFID card for bus, one for train and one for metro respectively. Now we also provide one more card that is the master smart card that can work on all three scanners thus making it very easy for the user to use any transport as desired using the same card. The system also allows for source and destination selection and based on that deducts particular amount from the user master card.

Keywords: RFID scanners, smart master card, transport system, Microcontrollers

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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 any one 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

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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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Fingerprint Based Exam Hall Authentication

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Abstract: Here we propose a fingerprint based examination hall authentication system. The system is designed to pass only users verified by their fingerprint scan and block non verified users. Our system consists of a fingerprint scanner connected to a microcontroller circuit. In registration mode the system allows to register up to 20 users and save their identity with respective id numbers in the system memory. After storage the person needs to first scan his finger on the scanner. The microcontroller now checks the persons fingerprint validity. If the fingerprint is authorized the microcontroller now sends a signal to a motor driver. The motor driver now operates a motor to open a gate. This ensures only authorized users are allowed to enter the examination section and unauthorized users are not allowed to enter without any human intervention.

Keyword: Fingerprint Module, LCD, Biometric System

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

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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.

Keyword: Deep learning, CNN

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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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Secure And Robust Digital Image Watermarking Using Coefficient Differencing and Chaotic Encryption

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Abstract: This paper presents a chaotic encryption-based blind digital image watermarking technique applicable to both grayscale and colour images. Discrete cosine transform (DCT) is used before embedding the watermark in the host image. The host image is divided into 8 _ 8 non-overlapping blocks prior to DCT application, and the watermark bit is embedded by modifying difference between DCT coefficients of adjacent blocks. Arnold transform is used in addition to chaotic encryption to add double-layer security to the watermark. Three different variants of the proposed algorithm have been tested and analyzed. The simulation results show that the proposed scheme is robust to most of the image processing operations like joint picture expert group compression, sharpening, cropping, and median filtering. To validate the efficiency of the proposed technique, the simulation results are compared with certain state-of-art techniques. The comparison results illustrate that the proposed scheme performs better in terms of robustness, security, and imperceptibility. Given the merits of the proposed scheme, it can be used in applications like e-healthcare and telemedicine to robustly hide electronic health records in medical images.

Keywords: Discrete cosine transform (DCT), Chaotic encryption, group compression, sharpening, cropping, and median filtering.

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ROAD TRAFFIC VEHICLE DETECTION AND TRACKING USING DEEP LEARNING WITH CUSTOM-COLLECTED AND PUBLIC DATASETS

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Abstract

Intelligent vehicle detection and counting are becoming increasingly important in the field of highway management. However, due to the different sizes of vehicles, their detection remains a challenge that directly affects the accuracy of vehicle counts. To address this issue, we propose a vision-based vehicle detection and counting system. A new high-definition highway vehicle dataset with a total of 57,290 annotated instances in 11,129 images is published in this study. Compared with the existing public datasets, the proposed dataset contains annotated tiny objects in the image, which provides the complete data foundation for vehicle detection based on deep learning. The use of deep convolutional networks (CNNs) has achieved amazing success in the field of vehicle object detection. CNNs have a strong ability to learn image features and can perform multiple related tasks, such as classification and bounding box regression. The detection method can be generally divided into two categories. The two-stage method generates a candidate box of the object via various algorithms and then classifies the object by a convolutional neural network. The one-stage method does not generate a candidate box but directly converts the positioning problem of the object bounding box into a regression problem for processing.

Therefore, this work is focused on implementation of You Only Look Once (YOLO-V4) based DeepSORT model for real time vehicle detection and tracking from video sequences. Deep learning based Simple Real time Tracker (Deep SORT) algorithm is added, which will track actual presence of vehicles from video frame predicted by YOLO-V4 so the false prediction performed by YOLOV4 can be avoided by using DeepSort algorithm. The video will be converted into multiple frames and given as input to YOLO-V4 for vehicle detection. The detected vehicle frame will be further analysed by DeepSort algorithm to track vehicle and if vehicle tracked then DeepSort will put bounding box across tracked vehicle and increment the tracking count. The proposed model is trained with three different datasets such as COCO, Berkeley and Dash Cam dataset, where Dash Cam dataset is the custom collected dataset.

Agricultural Robot

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Abstract: Agricultural Robot or agribot is a robot deployed for agricultural purposes. Fruit picking robots, driver less tractor / sprayer, and sheep shearing robots are designed to replace human labour. In most cases, a lot of factors have to be considered (e.g., the size and colour of the fruit to be picked) before the commencement of a task. Robots can be used for other horticultural tasks such as pruning, weeding, spraying and monitoring. Robots can also be used in livestock applications (livestock robotics) such as automatic milking, washing and castrating. Robots like these have many benefits for the agricultural industry, including a higher quality of fresh produce, lower production costs, and a smaller need for manual labour. Our robotic vehicle is an agricultural machine of a considerable power and great soil clearing capacity. This multipurpose system gives an advanced method to seed sowing, ploughing, watering the crops and harvesting with minimum man power and labour making it an efficient vehicle. The machine will cultivate the farm by considering particular rows and specific columns at fixed distance depending on crop. Moreover the vehicle can be controlled through Bluetooth medium using an Android smart phone.

Keywords: Arduino UNO, L293 Driver, Bluetooth Sensor, ATmega328 Microcontroller, LCD

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GSM Based Industry Protection System

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Abstract: With heavy automation taking place these days, the number of industries as well as number of accidents in those industries have increased substantially. Human errors and manual safety systems lead to increase in industrial accidents. So here we propose a GSM based industrial protection system that detects gas, temperature as well as light to keep track of accidents. The system needs to detect if the temperature of a machine or environment goes above a certain level, if it goes above a level, it is an indication of a malfunction. So here we use temperature sensor to detect a possible accident. Next indication is the malfunction or overloading of machines leading to smoke. We use gas detectors to detect hazardous gas and similarly a light sensor to detect light due to spark or any flash caused due to malfunctions. All these indicators/sensors constantly provide their input to the microcontroller connected to them. The microcontroller constantly processes this data. On encountering a warning signal from any of these sensors the microcontroller now communicates this data to a GSM modem interfaced to it and sends out an SMS message to intended user as a warning.

Keywords: Arduino UNO, GSM Module, Temperature Sensor, Light Sensor, Gas Sensor, LCD, Sprinklers.

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Real Time Vehicle Theft Control System using Engine Temperature Measurement Technique

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Abstract: This paper deals with the design & development of a theft control system for an automobile, which is being used to prevent/control the theft of a vehicle. The developed system makes use of an embedded system based on GSM technology. The designed & developed system is installed in the vehicle. An interfacing mobile is also connected to the microcontroller, which is in turn, connected to the engine. Once the vehicle is being stolen, the information is being used by the vehicle owner for further processing. The information is passed onto the central processing insurance system, where by sitting at a remote place, a particular number is dialed by them to the interfacing mobile that is with the hardware kit which is installed in the vehicle. By reading the signals received by the mobile, one can control the ignition of the engine; say to lock it or to stop the engine immediately. Again, it will come to the normal condition only after entering a secured password. The owner of the vehicle & the central processing system will know this secured password. The main concept in this design is introducing the mobile communications into the embedded system. The designed unit is very simple & low cost. The entire designed unit is on a single chip. When the vehicle is stolen, owner of vehicle may inform to the central processing system, then they will stop the vehicle by just giving a text to that secret number and with the help of SIM tracking knows the location of vehicle and informs to the local police or stops it from further movement. Here temperature sensor is used to know the engine position with help of heat dissipated in it.

Keywords: DSPs: Digital Signal Processors, ASIC: Application Specific Integrated circuit, RISC: Reduced Instruction Set Computer, CISC: Complex Instruction Set Computer

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6G Wireless Communication: Vision and Potential Techniques

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Abstract: The demand for wireless connectivity has grown exponentially over the last few decades. With the fast development of smart terminals and emerging new applications (e.g., real-time and interactive services), wireless data traffic has drastically increased, and current cellular networks (even the forthcoming 5G) cannot completely match the quickly rising technical requirements. To meet the coming challenges, the sixth generation (6G) mobile network is expected to cast the high technical standard of new spectrum and energy-efficient transmission techniques. In this Project, we sketch the potential requirements and present an overview of the latest research on the promising techniques evolving to 6G, which have recently attracted considerable attention. Moreover, we outline a number of key technical challenges as well as the potential solutions associated with 6G, including physical-layer transmission techniques, network designs, security approaches, and testbed developments.

Keywords: Massive MIMO, 5G, signal detection, bit error rate, computational complexity.

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Air and Noise 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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A Hierarchical Image Matting Model for Blood Vessel Segmentation in Fundus Images

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Abstract: The main purpose of a hierarchical image matting model is proposed to extract blood vessels from fundus images. More specifically, a hierarchical strategy utilizing the continuity and extendibility of retinal blood vessels is integrated into the image matting model for blood vessel segmentation. Normally the matting models require the user specified trimap, which separates the input image into three regions manually: the foreground, background and unknown regions. However, since creating a user specified trimap is a tedious and time-consuming task, region features of blood vessels are used to generate the trimap automatically. The proposed model has low computational complexity and outperforms many other state-of-art supervised and unsupervised methods in terms of accuracy, which achieves a vessel segmentation accuracy of 96.0%, 95.7% and 95.1% in an average time of 10.72s, 15.74s and 50.71s on images from three publicly available fundus image datasets DRIVE, STARE, and CHASE DB1, respectively.

Keywords: Image matting, hierarchical strategy, fundus, trimap, region features, segmentation, vessel.

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Joint Channel Estimation and Impulsive Noise Mitigation Method for OFDM Systems Using Sparse Bayesian Learning

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Abstract: The impulsive noise can deteriorate sharply the performance of orthogonal frequency division multiplexing (OFDM) systems. In this paper, we propose a novel joint channel impulse response estimation and impulsive noise mitigation algorithm based on compressed sensing theory. In this algorithm, both the channel impulse response and the impulsive noise are treated as a joint sparse vector. Then, the sparse Bayesian learning framework is adopted to jointly estimate the channel impulse response, the impulsive noise, and the data symbols, in which the data symbols are regarded as unknown parameters. The Cramer-Rao Bound is derived for the benchmark. Unlike the previous impulsive noise mitigation methods, the proposed algorithm utilizes all subcarriers without any a priori information of the channel and impulsive noise. The simulation results show that the proposed algorithm achieves significant performance improvement on the channel estimation and bit error rate performance.

Keywords: Orthogonal frequency division multiplexing (OFDM), Channel estimation, Impulsive noise mitigation, Sparse Bayesian Learning (SBL), Compressed sensing.

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System for Monitoring the Water Aspect and Leaks

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Abstract: This paper presents an automated water management system for home, workplaces, etc. Existing leakage detection methods are mainly focused on buried pipelines at key points. In order to achieve the better understanding of the system with higher spatial resolution and constant information about the water transmission through IoT by the pH value, pressure, flow, temperature etc. of water, different sensors have been used. To monitor water aspects we have used temperature sensor to track temperature of water, pH sensor to track pH value of water, ultra-sonic sensor for tank level monitoring and leak detection. Flow sensor to track the rate of flow.

Keywords: Arduino, Power Supply Unit, Ultra Sonic Sensor, Flow Sensor, LCD, Wi-Fi module.

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Automatic Power Saving with the help of IoT

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Abstract: Human have been communicating with each other for ages in order to solve problems and do complex work but with the advancement of technology, IoT or Internet of Things promises a great future for the communication between machines that can be implemented to perform many tasks that can benefit the human community. Many problems whether small or big can be solved with the help of IoT. One such problems is saving electricity, which is one of the major responsibilities of everyone yet very few people could actually do so be it carelessness or lack of time. This paper aims to solve the problem of electricity wastage in school and college classrooms by using an automatic electricity control system for a room made by applying IoT sensors and microcontrollers.

Keywords: IoT, Power Saving

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Unpaired Image Denoising

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Abstract: Deep learning approaches in image processing predominantly resort to supervised learning. A majority of methods for image denoising are no exception to this rule and hence demand pairs of noisy and corresponding clean images. Only recently has there been the emergence of methods such as Noise2Void, where a deep neural network learns to denoise solely from noisy images. However, when clean images that do not directly correspond to any of the noisy images are actually available, there is room for improvement as these clean images contain useful information that fully unsupervised methods do not exploit. In this paper, we propose a method for image denoising in this setting. First, we use a flow-based generative model to learn a prior from clean images. We then use it to train a denoising network without the need for any clean targets. We demonstrate the efficacy of our method through extensive experiments and comparisons.

Keywords: MATLAB Software, Personal Computer with Operating System.

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IOT Covid Patient Health Monitor in Quarantine

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Abstract: In times of COVID we have special Covid 19 Quarantine centers setup in order to treat covid patients. Since covid is highly infectious it is very important to quarantine covid patients but at the same time doctors need to monitor health of covid patients too. With the increasing number of cases, it is becoming difficult to keep a track on the health conditions of many quarantined patients. The problems here are Doctors need to regularly monitor patient health, there are increasing number of patients for the doctors to monitor. The doctors are at risk of infection just for monitoring purpose. [1] To Solve this issue, we here design a remote IOT based health monitor system that allows for remotely monitoring of multiple covid patients over the internet. The system monitors patient heartbeat, temperature and blood pressure using a heartbeat sensor, temperature sensor respectively. The system then transmits this data over the internet using wi-fi transmission by connecting to wi-fi internet connection. The data is transmitted and received over IOT-by-IOT Gecko platform to display data of patient remotely. [2] The entire system is run by a microcontroller-based circuitry. If any anomaly is detected in patient health or if the patient presses the emergency help button on IOT device, an alert is sent over IOT remotely. This System allows Doctors to monitor patients remotely without risk of infection. [3] A single doctor over 500 patients at a time. Doctor gets instant alert in case of health fluctuations of emergency. The system is mounted at patient bedside and constantly transmits patient health data over the internet so that doctors can monitor multiple patients remotely and attend the desired patient urgently when needed.

Keywords: IOT, heartbeat sensor, temperature sensor, arduino, UV light, slide switch.

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Automatic Rain Water Sensing Umbrella

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Abstract: During monsoon, sellers with an open shop, neighbors drying clothes outside and many similar situations cause inconveniences in our life. In case of street vegetable sellers, they need to protect the vegetables, fruits and customers from rains in monsoon season. Even the tarpaulins don't prove to be of any use during torrential rains accompanied by a thunderstorm. To overcome such problems and help us live with the inconvenience raining system. this auto rain-sensing umbrella smart system comes up with a solution. This smart rain sensing system can detect the rain and opens up the umbrella. In this smart system, we have a raindrop sensing system, which gives a reading proportional to the amount of rain pouring on it. The smart system consisting of a rack and pinion system, the rack is fixed to umbrella such that when a sensor senses the exceeding value of raindrops, it gives a signal to the pinion attached to a motor. Then the motor starts rotating and the umbrella opens.

Keywords: Transformer, Diodes, Rectifier, Capacitor Filter, voltage regulator, Proteus software, Arduino IDE.

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Broth Culture Acidity Control System on NFT- Based Hydroponic Plants

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Abstract: Nutrient Film Technique (NFT) hydroponic cultivation could be an alternative to overcome the increasing food need. Nutritional needs supply of hydroponic plant are one of parameters that need to be considered. NFT hydroponic nutrient controlling system aims to facilitate farmers to maintain the amount of nutrition according to plant needs. This system uses linear regression method to control the amount of nutrients. The accuracy results obtained from controlling system experiment are 87.84%.

Keyword: NFT, Hydroponic, Linear regression.

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Selection of a Stopping Criterion of Anisotropic Diffusion Filtering in Ultra Sound Images

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Abstract: Ultrasound imaging is a safe and cost-effective diagnostic tool, but the quality of the images is affected by speckle noise and artifacts. Anisotropic diffusion filters can be used to reduce noise and preserve the edges in the image. However, this technique is very sensitive to the number of iterations selected. This paper proposes a stopping criterion for effective noise removal without blurring the edges, based on the relative variance between the estimated denoised image and the original one. Different quality metrics were evaluated in 25 test images. The results suggest that the proposed stopping criterion can be implemented efficiently and aids in the process of automation of the filter. Ultrasound image enhancement, speckle reduction, anisotropic diffusion filtering, stopping criterion.

Keywords: Pre-processing, Image shading shape, Anisotropic diffusion filter, Convert m,n max pixels

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Underwater Image Restoration Using Scene Depth Estimation Technique

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Abstract: Underwater image restoration is a difficult task due to the shortage of reference image and changing underwater environment. The images are distorted by absorption and scattering effect of light. In deep water, light undergoes wavelength-dependent attenuation. Thus, red colour light that has a large wavelength attenuates more than blue light and any other colour. As depth increases, light attenuates most of the red content and image appears in bluish-green colour. These images also have low contrast, colour cast and hazy appearance. Existing methods may need specialized hardware or it may be based on multiple images of the same scene. Thus they cannot be used in real-time or video acquisition task. So, it's better to form an effective method for colour enhancement and image restoration of images. Here depth map estimation along with image blurriness is proposed. As light travels deeper into the water, the image gets blurred and this is used to obtain depth map. The backlight is also obtained. These factors are substituted in the IFM (Image Formation Model) to restore the image.

Keywords: Depth Map Estimation, Image Enhancement

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Studies on Different CNN Algorithms for Face skin Disease Classification Based on Clinical images

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Abstract: Skin problems not only injure physical health but also induce psychological problems, especially for patients whose faces have been damaged or even disfigured. Using smart devices, most of the people are able to obtain convenient clinical images of their face skin condition. On the other hand, the convolutional neural networks (CNNs) have achieved near or even better performance than human beings in the imaging field. Therefore, this paper studied different CNN algorithms for face skin disease classification based on the clinical images. First, from Xiangya–Derm, which is, to the best of our knowledge, China’s largest clinical image dataset of skin diseases, we established a dataset that contains 2656 face images belonging to six common skin diseases [seborrheic keratosis (SK), actinic keratosis (AK), rosacea (ROS), lupus erythematosus (LE), basal cell carcinoma (BCC), and squamous cell carcinoma (SCC)]. We performed studies using five mainstream network algorithms to classify these diseases in the dataset and compared the results. Then, we performed studies using an independent dataset of the same disease types, but from other body parts, to perform transfer learning on our models. Comparing the performances, the models that used transfer learning achieved a higher average precision and recall for almost all structures. In the test dataset, which included 388 facial images, the best model achieved 92.9%, 89.2%, and 84.3% recalls for the LE, BCC, and SK, respectively, and the mean recall and precision reached 77.0% and 70.8%.

Keywords: Deep learning, CNN, facial skin disease, medical image processing.

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Downlink user Selection for Massive MIMO-OFDM-IM Systems Using ZF Precoding

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Abstract: By the use of a large number of M antennas in the base station side, makes it possible to beamform different signals to different users, so the signals add up constructively at the desired user and destructively everywhere else, that is why massive MIMO-OFDM combining with beamforming is a promising technology for next-generation wireless communication network (5G). Indeed, the performance of Massive MIMO systems is systematically dependent on users' selection method especially when the number of users is huge in the cell. In this project, we focus on the performance of such a system in terms of max rate using the zero-forcing precoding method.

Keywords: Matlab, MIMO-OFDM-IM System, Transmitter, Receiver, AWGN Channel,

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Baby Cradle & Health Monitoring Using IoT

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Abstract: Juggling the responsibilities of a job and new born baby may seem challenging for working parents. Infant health safety and security is always a matter of concern for kith and kin by leaving their baby in care centres. At present, female participation in the work force in the industrialized nations has greatly increased, thereby affecting infant care in many families. Both parents are required to work due to the high cost of living. However, they still need to look after their babies, thereby increasing workload and stress, especially of the mother. Working parents cannot always care of their babies. They either send their babies to their parents or hire a baby caregiver while they are working. Some parents worry about the safety of their babies in the care of others. Thus, they go home to check on their babies during their free time. In this paper author has designed an advance cradle system which monitor baby health conditions such as temperature, babycry and wetness. Parents not only monitor but also can control cradle via mobile. The experimental result shows that the designed system works successfully for the infant healthcare and thus can be implemented practically.

Keywords: IoT, Monitoring

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UGC AUTONOMOUS

Application of MIMO-OFDM Technology in UAV Communication Network

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Abstract: With the application of various new mission loads in unmanned aerial vehicle (UAV), how to improve the communication quality of UAV data link has become a widespread concern. With the rapid development of UAV, multi UAVs cooperative self-organizing network can accomplish tasks more reliably, efficiently and economically than a single large UAV. This paper analyses the characteristics of mobile self-organizing network composed of multiple UAVs, and focuses on how to improve the communication quality of UAV network. After analyzing the technical principles and system models of multiple input multiple output (MIMO) and orthogonal frequency division multiplexing (OFDM) technologies, a MIMO-OFDM communication system is constructed. The simulation results show that the application of MIMO-OFDM technology in UAV communication network can effectively improve the data transmission ability.

Keywords-UAV communication network; MIMO; OFDM.

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Automatic Railway Train Safety System

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Abstract: Automatic Railway Safety System can sense the presence of fire and smoke and generate a series of alarm driven events after it. When the fire is detected, it turns on a motor which is depicted in the project as breaking system or chain pulling mechanism. Thus, by this the train can be stopped and the passengers and other payloads can be safeguarded thereafter. Along with breaking, the system sounds a buzzer that would alert nearby people around it so that they can be cautious about the presence of fire in the Train. Also, an SMS is sent to the Railway Authorities which will help them to take quick decisions to take control of the fire and in evacuating the Train. Hence this project offers a very robust mechanism for safety in the Railways which works automatically with the help of microcontrollers and sensors.

Keywords: Safety System, Fire sensors

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UGC AUTONOMOUS

Towards Faster-Than-Nyquist Transmission for Beyond 5G Wireless Communication

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Abstract: Faster-Than-Nyquist (FTN) is a technique that can improve the spectral efficiency of communication systems by making better use of available spectrum resources at the cost of inter-symbol interference (ISI) and inter-carrier interference (ICI). In this paper, we propose a hybrid signaling scheme for a practical application of FTN for MIMO transmission. We propose a new slot structure optimized for the hybrid signaling supporting both FTN signaling and orthogonal frequency division multiplexing (OFDM) signaling. Specifically, in the proposed slot structure, data transmission is based on the FTN signaling and the pilot transmission is based on the OFDM signaling. Numerical results confirm that the proposed signaling scheme has clear benefit over the systems employing only OFDM or FTN signaling.

Keywords: Faster-Than-Nyquist, Inter-Symbol Interference, Inter-Carrier Interference, Orthogonal Frequency Division Multiplexing

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Recursive Block Based Key Point Matching for Copy Move Image Forgery Detection

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Abstract: Images are used as legal proof in areas like forensic investigations. The authenticity of an image intended for investigation may adversely affect the result of such investigations, if the image is a manipulated one. In such fields, the detection of image forgery is very critical and sensitive. Among the prevailing methods, Block based methods divide the images into overlapping regular blocks and finds the match between every block of the whole image. This method is found to be more accurate though computationally expensive. Whereas Keypoint based methods compute the keypoints of an image and find the match between those keypoints. If the image is forged by copy move, there will be highest number of keypoint matches between the corresponding regions. This method is found to be computationally efficient but the accuracy is less. The proposed method utilizes the advantages of both keypoint based and block-based forgery detection methods. We identify meaningful irregular blocks and the similarity of such blocks are measured using the number of matched SIFT keypoints. To identify whether the image is forged or not, an adaptive threshold is employed on the number of keypoint matches and judiciously decide whether to go for block based matching strategy or not for each block. We show that the proposed method achieves better detection rate without compromising the merit on the computational complexity of keypoint based forgery detection

Keywords: Recursive, Forgery detection

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Dam Operation Based on Water Level

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Abstract: We here propose an automatic dam water level monitor and controller system. Our proposed project uses sensors to sense the water level and then opens the dam gate (motor used to demonstrate as dam gate) according to the water level. Our system uses multiple water level sensors (float sensors) for this purpose. The sensors are mounted at three different levels in order to check water level and provide signals accordingly. When water reaches first level it is sensed by it and displayed. When water reaches second level it provides a signal to the microcontroller and it opens the dam gate partially. As soon as the water level reaches the third position, it signals the microcontroller and the microcontroller then signals the motor to run, which is demonstrated as opening the dam gate fully. Thus, our proposed system allows for automatic dam gate opening based on water level sensing.

Keywords: Sensors, Microcontroller, Motor

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UGC AUTONOMOUS

Deep Learning for Face Recognition under Complex Illumination Conditions Based on Log-Gabor and LBP

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Abstract: Complex illumination condition is one of the most critical challenging problems for practical face recognition. In this paper, we propose a novel method based on deep learning to solve the adverse impact imposed by illumination variation in the face recognition process. Firstly, illumination pre-processing is applied to improve the adverse effects of intense illumination changes on face images. Secondly, the Log-Gabor filter is used to obtain the Log-Gabor feature images of different scales and directions, then, LBP (Local Binary Pattern) features of images subblock is extracted. Lastly, texture feature histograms are formed and input into the deep belief network (DBN) visual layer, then face classification and recognition are completed through deep learning in DBN. Experimental results show that superior performance can be obtained in the developed approach by comparisons with some state-of-the-arts.

Keywords: DBN, LBP, Log-Gabor

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An Experimental Comparison of Different Object Tracking Algorithms

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Abstract: This paper reviews and evaluates several state of the-art object tracking algorithms. It compares the various techniques on different parameters by implementing each one of them as it is important to check their performance and robustness. These algorithms are used to recognize, detect and track objects under the influence of different problems like occluded object, background clutter, illumination variations, and deformed objects or in shadowed regions. The tools used were python and its libraries including but not restricting to OpenCV, matplotlib, Numpy and others.

Keywords: Tracking, Open CV

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RFID Based Attendance System with SMS Notification

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Abstract: Now a days due to easy availability of all the information on the internet, students are less motivated to attend the classes, due to which most of the students are unable to maintain minimum attendance. This work is to simplify the attendance recording system by using Radio Frequency Identification (RFID) technology. RFID based Attendance system with SMS notification System is developed to overcome the above stated problem. The system will be developed by using GSM (Global System for Mobile communication) technology and google firebase database and android application support. The information from RFID Database handling System will be used for taking attendance and for sending SMS alerts also. This System interacts with parents by sending messages. Therefore, the system functionality not only record's the student attendance, but also sends alert SMS to their parents when the student is absent.

Keywords: Internet of Things (IoT), Smart Attendance, RFID, GSM, Arduino Software, ESP8266-12F, Android Studio, Android Application and Google Firebase Database.

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Drunk and Drive Detection with Ignition Locking

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Abstract: This study proposed an efficient technique for eradicating the upsurge in the number of cases of roads accidents caused by excessive intake of alcohol. This study developed a prototype alcohol detection and engine locking system by using an Arduino Uno microcontroller interfaced with an alcohol sensor along with an LCD screen and a DC motor to demonstrate the concept. The system uses MQ-3 alcohol sensor to continuously monitor the blood alcohol content (BAC) to detect the existence of liquor in the exhalation of a driver. There are many ways in which car locking can be done. The most commonly used security system for car namely steering wheel lock where locks are placed on the steering wheels, but here a simpler method of ignition locking is being used. The existing systems mostly use PIC or AVR microcontrollers for this purpose like Arduino, Raspberry Pi etc.,

Keywords: Arduino UNO, MQ3 Alcohol sensor, Buzzer, LCD, Ignition System, Indication key, DC Motor.

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Finger Impression Based Car Ignition System Utilizing Arduino and RFID

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Abstract: Security has been becoming an important issue everywhere. Every person wants his home, industry; bank etc to be secured Home security is becoming necessary. Now days as the possibilities of intrusion are increasing day by day. Finger print based security system can be used at many places like Industries, Offices, and Colleges or even at our home and vehicles. Fingerprint sensor is the main part of the system. It makes use of Biometric sensor to detect fingerprint. It is also called as Biometric sensor. Fingerprint sensor uses various types of techniques like ultrasonic method, optical method or thermal technique. For more security of systems we can use RFID based system also. Then both RFID and Fingerprint based security is most reliable. Nowadays most of the car comes with keyless entry and push-button ignition system, in which you only need to carry the key in your pocket and just need to put your finger on the capacitive sensor on the door handle to open the car door. Here in this paper, we are adding a few more security features to this system by using RFID and Fingerprint sensor. RFID sensor will validate the license of the user and the fingerprint sensor will only allow an authorized person in the vehicle.

Keywords: Finger print sensor, RFID, Ignition System, Arduino

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Detection of Digital Image Forgery using Fast Fourier Transform and Local Features

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Abstract: Multimedia security is one of the key challenges in today’s world, as dependency on multimedia information is increasing day by day. Easily available image editing software have enabled every common user of a smart phone and computer, to hack into the information of the images and video and alter it to some extent. To authenticate the genuineness of images, detection of image tempering is need of the time. Various techniques have been proposed to use image features for detection of image forgery. The techniques of forgery detection work in two domains of image forgery; copy-move forgery detection (CMFD) and image splicing detection (ISD). This paper presents a comprehensive comparative analysis for the use of local texture descriptors i.e. local binary pattern (LBP) and local ternary pattern (LTP) for forgery detection in an image. The paper also presents a technique to integrate fast fourier transform (FFT) with local texture descriptors for image forgery detection using existing block-based methodology. Performance of the technique(s) and descriptor(s) is tested for benchmarked dataset CASIA v1.0. Results are evaluated by using standard detection metrics detection accuracy and recall. The paper also suggests a relatively better texture descriptor

Keywords: CMFD, LBP, LTP, FFT

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Super-Resolution by Image Enhancement Using Texture Transfer

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Abstract: Recent deep learning approaches in single image super resolution (SISR) can generate high-definition textures for super-resolved (SR) images. However, they tend to hallucinate fake textures and even produce artifacts. An alternative to SISR, reference-based SR (Ref SR) approaches use high resolution (HR) reference (Ref) images to provide HR details that are missing in the low-resolution (LR) input image. We propose a novel framework that leverages existing SISR approaches and enhances them with Ref SR. Specifically, we refine the output of SISR methods using neural texture transfer, where HR features are queried from the Ref images. The query is conducted by computing the similarity of textural and semantic features between the input image and the Ref images. The most similar HR features, patch-wise, to the LR image is used to augment the SR image through an augmentation network. In the case of dissimilar Ref images from the LR input image, we prevent performance degradation by including the similarity scores in the input features of the network. Furthermore, we use random texture patches during the training to condition our augmentation network to not always trust the queried texture features. Different from past Ref SR approaches, our method can use arbitrary Ref images and its lower-bound performance is based on the SR image. We showcase that our method drastically improves the performance of the base SISR approach

Keywords: Super Resolution, SISR, HR Feature

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IoT Based Game Scoreboard like Cricket using Arduino to Display Live Score

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Abstract: India being a sports-loving country likes to watch sports during a group where the entire neighbourhood comes and enjoys the sports together, be it cricket or football. But doing so, one among the issues we face is that the scoreboard on rock bottom of our television screen becomes very small and hard to read. So, today we are getting to build an IoT and Arduino-based cricket Scoreboard using NodeMCU and P10 display Module, which can be large enough to display the live score and it'll be very easy and straightforward to form. Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform. Arduino was born at the Ivrea Interaction Design Institute as a simple tool for fast prototyping, aimed toward students without a background in electronics and programming. As soon because it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to create them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it's growing through the contributions of users worldwide.

Keywords: Node Micro Controller Unit (Node MCU), Internet of Things (IoT), Light-Emitting Diode (LED), Application programming interface (API).

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Alcohol Detection and Health Monitoring System Using IOT

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Abstract— Factories, Offices, Hospitals, Military and other such industries need to monitor their staff/personnel follow all work ethics that include, not coming to premises under the influence of alcohol or under bad health conditions. This ensures proper work ethics are followed. So, our proposed system allows for alcohol & health monitoring plus reporting system that monitors this and reports it to concerned personnel remotely over internet. Our system consists of an IOT based circuit system that uses a microcontroller-based circuit system. The system has alcohol as well as blood pressure monitoring sensors to check for alcohol consumption as well as inappropriate blood pressure monitoring. This ensures no occurrences of accidents due to alcohol influence or bad health conditions.

Keywords: Arduino UNO, MQ3 Alcohol sensor, WIFI module, Blood pressure sensor, LCD, IoT, Buzzer.

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Information Hiding in Image Enhancement

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Abstract: This paper proposes an information hiding method to embed data while executing image enhancement steps. The 2D Median Filter is adapted and re-engineered to demonstrate the feasibility of this concept. In particular, the filtering embedding steps are performed for each pixel in a sliding window manner. Pixels enclosed within the predefined window (neighborhood) are gathered, linearized and sorted. Then, the linearized pixels are divided into partitions, in which each partition is assigned to represent a certain sequence of bits. The performance of the proposed method is evaluated by using the BSD300 dataset for various settings. The embedding capacity, image quality, data extraction error rate are reported and analyzed. Besides, the robustness of the proposed method against brute force attack is also discussed. In the best case scenario, when the window size is 7×7 , ~ 0.97 BPP is achieved with acceptable image quality while having $\sim 3.5\%$ data extraction error rate.

Keywords: Median filter, data embedding, hiding capacity, image quality, data extraction error rate

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UGC AUTONOMOUS

Breast Cancer Detection from Histopathological Images Using Deep Learning

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Abstract: Cancer is the most dangerous diseases in the world, its mainly effective for women. So, the focus on technological development is to find ways for curing the cancer through scientific investigation and early detection of cancer. Early detection of cancer can be helpful for removing the cancer completely without further major complications. We are using deep learning technology for diagnosing breast cancer, because deep learning techniques are used for high task objectives like Computer Vision, Image Processing, Medical Diagnosis and Neural Language Processing. We harnessing the same power through applying deep learning technology to detect Breast cancer and we have seen that is very beneficial in diagnosis with an efficiency to detect breast cancer with accuracy 98%.

Keyword: Breast Cancer, CNN

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UGC AUTONOMOUS

Few-Class Learning for Image-Classification-Aware Denoising

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Abstract: The accuracy of image classification networks decreases substantially in noisy situations such as low light environments. A simple solution to this problem is to integrate an image denoising network as a pre-processing operation before classification and then to retrain the classifier to improve the classification accuracy. However, this straightforward approach suffers from excessive training time because the denoising network requires the entire dataset to conduct end-to-end training. In this paper, instead of using classification accuracy as a loss function, we propose using the difference of the outputs of the hidden layer of the image classification network. This loss function, known as feature loss or perceptual loss, allows us to train the denoising network using only limited images containing extremely few classes from the dataset. The experimental results show that the proposed method dramatically improves the classification accuracy, when we use only a few classes (from 2.5% to 10% of the original dataset) for training. This approach is effective on previously unseen classes even when the image classifier network has been changed by fine-tuning.

Keywords: Denoising

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UGC AUTONOMOUS

IOT Based Antenna Positioning System

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Abstract: IOT is one of the latest and emerging technology. the importance of this IOT technology in communication systems has very great impact on antennas. To achieve effective wireless communication proper positioning of antennas is necessary according to satellites or transmitters. So here we propose an IOT based antenna positioning system. Here we use sensor based system with motor on each antenna. These Sensors will be mounted on the antenna to detect the proper direction and the interesting thing is the motors using IOT concept. It will change the direction from anywhere across the world. Using antenna to check its facing direction that is transmitted over IOT. If the direction of a satellite or transmitting station changes over time, the antenna direction must also be changed accordingly. The receiving antennas may be placed far apart from each other across the globe. So our system allows for antenna positioning over very long distances. The antenna positions are visible over internet to controlling operator on the IOT GUI. We here use IOT Gecko to develop the antenna monitoring GUI system. Our system allows for monitoring antenna direction as well as transmitting new coordinates to position the antenna and motor appropriately positions the antenna accordingly. IOT refer to a wide range of devices such as heart monitoring implants, remotely handling home appliances, biochip transponders used on animal farms, cameras that are streaming live feeds of wild animals etc.

Keywords: satellite, position , antenna , transmitter, sensor, monitoring ,motor.

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Greenhouse Monitoring and Control System Using IOT

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Abstract: A Greenhouse is a place where plants such as flowers and vegetables are grown. Greenhouse warms up during the day when sun penetrates through it, which heats the plant, soil and structure. Greenhouses act as a shield from extreme climatic conditions and protects the crop from many diseases. Numerous farmers fail to get good profits from the greenhouse crops for the reason that they can't manage essential factors, which determines the plant growth. Temperature of the greenhouse should not go below a certain degree, high humidity can result to crop transpiration, condensation of water vapor on various greenhouse surfaces, and water evaporation from the humid soil. To overcome such challenges, the greenhouse monitoring and control system comes to rescue. To project demonstrates the design and implementation of various sensors for greenhouse environment monitoring and controlling. This greenhouse control system is powered by Atmega328 microcontroller and it consists of temperature sensor, light sensor, soil moisture sensor, LDR sensor, LCD display module, 12V DC fan, bulb and pump. Temperature sensor senses the level of temperature. If it goes high DC fan gets on and when temperature is low the DC fan gets off. Soil moisture sensor, senses the water level as the water level decreases the pump gets on. In the absence of light, LDR sensor senses and the bulb starts glowing. IoT stores the data and processes it and sends the information to the user. By this way it becomes easy to monitor and control the system.

Keywords: Microcontroller, Greenhouse, Sensors.

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Minimum Time Delay and More Efficient Image Filtering Brain Tumor Detection with the help of MATLAB

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Abstract: Brain tumor detection is one of the intriguing task in the medical field still now. Earlier the technologies pneumoencephalography and cerebral angiography were used but they had drawbacks. The next technologies such as CT and MRI scan techniques with the help of surgeons came into use to provide a higher quality result in image processing. However it is difficult in distinguishing between brain tumor tissue and normal tissue because it they are similar in colour. Hence Brain tumor must be analysed more precisely in order to cure it. In this paper Tumor Detection with help of MATLAB image processing catches three stages Pre-processing, Processing and Postprocessing in morphological detection. After the getting MRI report first stage is pre-processing which is converting the original RGB image to gray-scale image and then using a Gaussian high pass filter for noise reduction. In the second stage processing for pixel enhancement we use Median filter and in third stage i.e. the post-processing where different filters such as Entropy Filter., Standard Deviation Filter(SDF), Weiner Filter, Gradient Magnitude, Regional Maxima are used for various different-different results. In this post processing which is followed by algorithm not only creates the report automatically, but has very less delay time and gives the output more efficiently.

Keywords: Processing stages, Filtering techniques, Pixel enhancement.

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UGC AUTONOMOUS

A Low Complexity Hybrid Sub Block Segmentation PTS Scheme for Reduction in MIMO-OFDMA

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Abstract: Multiple input and multiple outputs Orthogonal Frequency Division Multiplexing (MIMO-OFDM) is used to improve the performance and capacity of wireless communication system. OFDM is an efficient and promising modulation technique or wireless transmission due to its high spectral efficiency and robustness to frequency selective fading channels. However, it has high peak to average ratio (PAPR) which is a main disadvantage. Partial transmit sequence (PTS) is one of the most widely used techniques that gives a better performance in PAPR reduction in MIMO-OFDM system. However the computational complexity of traditional PTS method is tremendous. In this paper, A Low-Complexity Hybrid Sub block Segmentation PTS Scheme for PAPR Reduction in MIMO-OFDM System is proposed. For analytic purposes, we derive computational complexity expressions for the proposed segmentation method and analyze the computational complexity of the proposed segmentation method compared with that of the random segmentation method which has the best Peak to Average Power Ratio (PAPR) reduction performance. The simulation results show that the PAPR reduction performance is degraded only slightly compared with random segmentation Method.

Keywords: MIMO, OFDM, PAPR, PTS, Segmentation.

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UGC AUTONOMOUS

Underground Cable Fault Detector Using IOT

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Abstract: Underground cables are prone to a wide variety of faults due to underground conditions, wear and tear, rodents etc. Also detecting fault source is difficult and entire line is to be dug in order to check entire line and fix faults. So here we propose an cable fault detection through IoT that detects the exact fault position over IoT that makes repairing work very easy. The repairmen know exactly which part has fault and only that area is to be dug to detect the fault source. This saves a lot of time, money and efforts and also allows to service underground cables faster. We use IOT technology that allows the authorities to monitor and check faults over internet. The system detects fault with the help of potential divider network laid across the cable. Whenever a fault gets created at a point shorting two lines together, a specific voltage gets generated as per the resistors network combination. This voltage is sensed by the microcontroller and is updated to the user. The information conveyed to the user is the distance to which that voltage corresponds to. The microcontroller retrieves the fault line data and displays over LCD display, also it transfers this data over internet to display online.

Keywords: Arduino UNO, Wi-Fi Module (ESP8266), Switches, LCD Display, Relay, Load.

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UGC AUTONOMOUS

Design & Implementation of Smart Mitten for Deaf and Dumb People

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Abstract: Communication is the only way by which we are able to express our thoughts among the peoples. Normal people can convey their thoughts effectively by establishing the conversation between them. But in our society there are lot of people who are physically disable that means (deaf and dumb) are not able to communicate effectively. Because of this their disability they are not able to stand in race with the normal people. Some of the people have problem regarding hearing and some are not able to talk so they lag behind the normal people. Generally, this people uses the sign language for the communication but they find some problem in communication with those are not able to understand sign language. So their is problem between normal people and physically disable people. This system has main purpose to reduce the communication gap between two communities. The main aim of our proposed project is to developed the cost effective system where disable people can communicate with normal people by using hand glove. This means that communication is not barrier between two communities by using smart glove. So disable can also able to grow in their respective field. Using such system by disable people can make nation grow.

Keywords: Deaf and Dumb, Smart Mitten, Communication

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UGC AUTONOMOUS

Quadcopter Drone

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Abstract: A quad copter can achieve vertical flight in a stable manner and be used to monitor or collect data in a specific region such as mapping terrains. Technologies advances have reduced the cost and increase the performance of the low power microcontrollers that allowed the general public to develop their own quad copter kit to obtain stable flight, gather and store GPS data, and perform auto-commands, such as auto-landing. The project used an Aero quad quad copter kit that included a frame, motors, electronic speed controllers. Arduino Mega development board, and sensor boards and used with the provided. Arduo pilot software Batteries, a transmitter, a receiver, a GPS module, and a micro SD card adopter were interfaced with the kit. The arduo pilot software was modified to properly interface the components with the quad copter kit. Individual components were tested and verified to work properly. Calibration was done to obtain proper stabilization on each axis using MISSION PLANAR. Currently, the quadcopter can properly stabilize itself, determine its GPS location and store log data.

Keywords: Drone, Aero Quad Copter Kit

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UGC AUTONOMOUS

Image Contrast Enhancement in Automatic Mode by Nonlinear Stretching

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Abstract: The problem of image enhancement in automatic mode is considered. A new method of contrast enhancement by adaptive nonlinear stretching using piecewise linear transformation of the brightness scale is proposed at which the average value of the brightness of transformed image is closest to the middle of the brightness range. The research of the effectiveness of the proposed and known methods of nonlinear stretching of monochrome images using the known no-reference metrics of integral contrast of image is carried out.

Keywords: Image processing, contrast enhancement, automatic mode, nonlinear stretching.

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Robotic Vehicle Controlled by Hand Gesture Using Arduino

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Abstract: Robotic vehicle controlled by the hand movement mainly benefits the disabled person, as those person with the hand gesture moves to the direction they Want to go without pressing any Axis. Here too, the robot is divided into two parts, transmitter and receiver. The receiver circuit is the same as that of the old post and there is only a slight change in the transmitter circuit, here we need to program the transmitter circuit. So I will be using an Arduino as the programming platform. To recognize the gestures made I will be using an accelerometer sensor. This system includes a glove which has a receiver circuit which will be mounted on the top with Atmega microcontroller interfaced to the accelerometer and it is supposed to be worn by the user while using this machine. The circuit on the vehicle includes WIFI(esp8266) and Driver IC to operate the motors. The commands that are received by the IC on the circuit are sent to the RF transmitter which forwards the command to the local network application. The command from application wifi then gets transmitted to the Arduino microcontroller which decodes the command and makes the vehicle move in the direction specified by the user.

Keywords: Arduino, Gesture , Accelerometer Sensor, Atmega Microcontroller, Wifi, Driver IC.

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UGC AUTONOMOUS

Weather Forecasting using a Arduino Based Balloon Cube-Sat

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ABSTRACT: A Cube-Sat is a compact miniaturized satellite that is made up of cubic modules which can be launched into different orbits of Earth according to their desired function. By designing an autonomous Cube-Sat which can provide weather reports at various altitudes of the earth and at various orbital periods it can be very useful in forecasting weather. A practical functioning Cube-Sat can be developed using COTS and can be released into the atmosphere with the help of a high altitude balloon (HAB) to a destined altitude and can be communicated through radio comms for continuous weather report.

Keywords: Cube-Sat, Weather Forecasting, Balloon-Sat, Arduino

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UGC AUTONOMOUS

Soldier Health & Position Tracking System

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Abstract: The soldier Health and Position Tracking System allows military to track the current GPS position of soldier and also checks the health status including body temperature and heartbeats of soldier. The System also consists extra feature with the help of that soldier can ask for help manually or send a distress signal to military if he is in need. The GPS modem sends the latitude and longitude position with link pattern with the help of that military can track the current position of the soldier. The system is very helpful for getting health status information of soldier and providing them instant help.

Keywords—Arduino UNO, 12v Battery, Temperature Sensor, Heartbeat Sensor, GSM, GPS, Buzzer, LCD.

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Performance Evaluation for 5G NR based Uplink Millimeter-wave MIMO Systems under Urban Micro Cell

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Abstract: In next generation mobile communication environment, a huge number of smart devices will require a large amount of data traffic. To accommodate these, 5G mobile communication systems using millimeter-wave bands are being studied, and the new radio access is standardized by 3rd Generation Partnership Project (3GPP). This paper investigates a 5G NR based uplink millimeter-wave massive multiple-input multiple-output (MIMO) system. The spectral efficiency is analyzed in a 3GPP spatial channel model scenario, urban micro cell.

Keywords: 5G; Massive MIMO; Millimeter-wave; New Radio access; Spectral efficiency

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UGC AUTONOMOUS

Automatic License Plate Recognition with Character Classification using Deep Learning Model

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Abstract

Automatic license plate recognition [ALPR] using character classification with deep learning model is used to detect the license plate with the help of CNN. Convolutional neural network is a kind of network architecture for deep learning algorithms and is specifically used for image recognition and tasks that involve the processing of pixel data.

In this work we take an image with license plate and by applying various operations like histogram equalization, contour extraction and others, we detect the number of vehicles. The main operation is contour extraction.

The main use of ALPD is in highway monitoring, parking management, and neighborhood law enforcement security. In India there is one death in every four minutes with most of them occurring due to over speeding. ALPD is used to monitor the vehicles' average speed and can identify the vehicles that exceed the speed limit. In this case, a fine ticket can be automatically generated by calculating the distance between two cameras. This helps to maintain law and order which, in turn, can minimize the number of road casualties.

Histogram Equalization-Based Techniques for Contrast Enhancement of MRI Brain Glioma Tumor Images: Comparative Study

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Abstract: In Magnetic Resonance Imaging (MRI), the poor images quality, particularly the artifacts inherent to this type of images as well as the low contrast between tissues and interindividual variability, could make difficult the image analysis and affect the accuracy of clinical diagnosis. Therefore, the need for image enhancement techniques arise to improve the relevant image contents through reducing the noise while preserving the actual details features. Various MRI images denoising techniques have been proposed in literature where each technique has its advantages and limitations. Among them, the Histogram modifications-based approaches arise as the most employed, by many researchers, for MRI contrast enhancement. This project presents a comparative study of the most histogram-based techniques, mainly AHE, CLAHE, BPDHE and AIR-AHE techniques, dealing with denoising and contrast enhancement MRI images. Experimental study, using real-world databases, is performed based on evaluation of quality measurement metrics: absolute mean brightness error (AMBE), peak signal to noise ratio (PSNR) and Entropy.

Keywords: Brain MRI, medical image processing, enhancement, sorting technique, rgb to gray, dot processing

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Arduino based System to Measure Solar Power Using IoT

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Abstract: The designed project measures different solar cell parameters like light intensity, voltage, current and temperature by using multiple sensor data acquisition. The project uses a solar panel to monitor sunlight and Arduino board which as AT mega family microcontroller attached to it. The project requires an LDR sensor for measuring light intensity, a voltage divider to measure voltage and a temperature sensor to measure the temperature. These measurements are then displayed by the microcontroller to a LCD screen. The system allows user to effectively monitor solar parameters using this system.

Keyword: Solar Power

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Bramsit: A Database for Brain Tumor Detection and Diagnosis

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Abstract: MRI is the most frequently used imaging technique to detect brain tumour. The brain is composed of nerve cells and supportive tissues such as glial cells and meninges. A brain tumour is a collection, or mass, of the brain in abnormal cells. Primary brain tumours can be either malignant or benign. A primary brain tumour is a tumour located in the brain tissue. New technologies in supplement to existing imaging modalities improve brain tumour screening. Most brain tumour databases are not publicly available. BRAMSIT is a resource for possible use by the MRI image analysis research community. The projected MRI database is termed BRAMSIT, characterized by an attempt to offer a group of normal and malignant brain tumour images. The details such as age, and the MRI axial position (i.e., trans-axial, coronal and sagittal) of the patient are interpreted in the database. Brain tumour is a life-threatening disease. Brain tumours can be malignant or benign. When TUMOUR cells grow it cause pressure inside the skull, this leads to brain damage. Two types of Brain tumour namely Primary and secondary. Primary brain tumours are benign and that are originates in brain. Secondary brain tumours occur when cancer cells spread over the brain from other organ such as lung or breast. It is also called as metastatic brain tumour. brain tumour can be occurred in any ages. If brain tumour detected early stage it is treatable. brain tumour cause more death in children and adults under the age of 40 than any other cancer. In India the tumours ranges from 5 to 10 per 100,000 populations with an increasing trend.

Keywords: Brain tumour, Database, Malignant, Benign

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Monitoring Restaurant in Real Time

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Abstract: This article describes monitoring system on an Android smartphone. Using the commands through Bluetooth module installed in the circuit and is sent over Bluetooth to the smart phone from controller. An Android application is used in the smartphone to display data of loads that is in ON/OFF condition. The system provides easy monitoring of process data on a smartphone. You can connect the smartphone wirelessly with the system and monitor the process variable, when desired. The system can easily be customized to monitor other process variables also. The receiver side consists of the smartphone. A screenshot of the Android app.

Keywords: Arduino UNO, MCU, Bluetooth Module-HC-05, Android app.

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Wireless Black Box for Cars Using Sensors & 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 project which helps in accomplishing the output.

Keywords: Arduino, Temperature sensor, Vibration sensor, GPS, GSM Modem, SMS

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Finger Print Based Device Switcher

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Abstract: User Based Device control using fingerprint sensing. We come across areas where we need to switch no device for a particular user as soon as he enters. The device could be his Pc, fan, lights etc. For this purpose we suggest a fingerprint based device switcher project. The system switches on device for a particular user automatically on sensing him through his fingerprint scan. For this we use a fingerprint scanner interfaced to a microcontroller-based circuit. As soon as a person enters, he/she is allowed to scan his/her finger on the scanner. On scanning the data is sent to the microcontroller, based on this data the scanned copy is now verified for authentication. If the user is verified the microcontroller switches on a device (light) to indicate as the users verification.

Keywords: Device Switching, Finger print, Scanning

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UGC AUTONOMOUS

Power Optimization Using Spectrum Sharing for Next Generation Cellular Networks

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Abstract: The rapid increase in the number of subscribers demanding high data rate applications have resulted in maturing of the 4G networks. The next generation (5G) wireless communication networks (WCN's) are required to fulfil these rising requirements, hence aiming to utilize the available spectrum as efficiently as possible. Also, this is leading to a detrimental effect on the ecological balance of the environment as the transmit power levels increase correspondingly in the atmosphere. Hence power optimization has also become a major concern. Various technologies such as massive MIMO, spectrum sharing, device to device communication (D2D), GREEN communication have gained significant attention in aiding spectrum utilization along with power optimization. This proposal intends to optimize power using spectrum sharing for the NGNs to achieve high spectrum and energy efficiency for both the primary and secondary system without introduction of a secondary transmitter. The performance of the proposed model has been compared with the opportunistic spectrum sharing model and other popular resource allocation algorithms. The results obtained confirm the efficiency of the proposed scheme for increased performance of the system.

Keywords: 5G, MIMO, D2D communication

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Ultrasonic Navigation Stick for The Blind Using Arduino

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Abstract: The aim of this project is to investigate the development of a navigation aid for blind and visually impaired People. It is based on a microcontroller with synthetic speech output. This aid is portable and gives information to the user about urban walking routes to point out what decisions to make. On the other hand, and in order to reduce navigation difficulties of the blind, an obstacle detection system using ultrasounds added to this device. The main objective of this project is to help blind people to walk with ease and to be warned whenever their walking path is obstructed with other objects, people or other similar odds. As a warning signal, a buzzer is connected in the circuit, whose frequency of beep changes according to the distance of object. The closer the distance of obstruction, the more will be the buzzer beep frequency. We can say that the beep frequency is inversely proportional to the distance

Keywords: Arduino UNO, LCD Display, APR9600, Speaker, Buzzer and Ultrasonic sensor.

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UGC AUTONOMOUS

IoT Based Sewage Level Monitoring System

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Abstract: This article focuses on newly available technology to monitor septic systems. A Cloud integrated IoT-based Sewage Level Monitoring System is developed. The need to develop such a system is that there is a requirement to monitor sludge and liquid levels continuously. As a part of this product development, an interface is created with digital outputs, and the communication medium is the Internet. Having a simple yet optimized software-hardware interface and minimal hardware components, this system is not only very cost-effective but also very efficient with respect to the existing sewage level monitoring models. As technology continues to evolve and costs come down, these tools will provide more in-depth information and should be considered by designers, regulators, installers, and service providers. Sensors can be installed in septic tanks, pump tanks, and drain fields. The sensors are connected to a hub that uses the internet service in the home or business. Data from the sensors can be viewed in real-time from any internet-connected device, and all historical data is accessible for maintenance, decision-making, or time-of-property-transfer inspections. Warnings and critical alert notifications can be notified to the septic professional, system owner, regulator, or any other interested stakeholders.

Keywords: Sewage, Monitoring

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A Shared Representation for Object Tracking and Classification Using Siamese Networks

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Abstract: Siamese neural networks have been employed to build several high performance object trackers capable of operating in real time. To further improve the tracking performance, one can train one network on the tracking task and another network on the task of object classification. This approach, however, has the downside that two networks have to be evaluated instead of one, resulting in runtime degradation. Since our approach does not depend on two separate networks though, it allows one to improve the performance of a Siamese network tracker without any runtime penalty. There is a broad range of real world applications where it is necessary to track objects over several video frames. For example, in traffic surveillance scenarios it is crucial to track the movements of vehicles or pedestrians in order to estimate velocities or to detect traffic violations. When devising a tracking algorithm, one has to take into account the possibilities of out-of-plane rotations, illumination changes, occlusions and deformations of objects. One kind of deep learning tracking architecture are Siamese networks. These networks attempt to find a feature representation which is robust. One can then use a similarity measure in feature space to locate an object in subsequent frames

Keywords: Siamese, Object tracking

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UGC AUTONOMOUS

Alcohol Sensing Display with Alarm

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Abstract: This is an important sensor based project implemented using microcontroller. In this project, we have interfaced MQ series gas sensor with ARDUINO. The 8051 microcontroller recognizes only digital input. The best and the low cost solution for this is to connect a comparator between gas sensor and Microcontroller. Comparator contains an operational amplifier comparator has two inputs. One input is from the sensor and another is from the Potentiometer. Whenever the sensor value crosses threshold limit then the comparator output goes high In this way microcontroller comes to know that the alcohol percentage is more than the threshold limit. Potentiometer can be used to vary the trigger level or the threshold limit. LCD display shows two messages. Whenever you turn on the project, LCD shows project title. And whenever alcohol is detected, system shows message as Alcohol sensor crossed limit We have provided a piezoelectric buzzer in this project. This Buzzer will be turned on whenever this project detects the. This Buzzer helps to alert the people that the person undergoing the test for alcohol detection has consumed alcohol

Keywords: Alcohol, LCD

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UGC AUTONOMOUS

Women Safety Patrolling Robot Using IoT

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Abstract: Nowadays Women Safety is the biggest concern in many parts of the world. So here we propose a security patrolling robot using Arduino. The robotic vehicle moves at particular path and is equipped with sound sensors. It uses a predefined line to follow its path while patrolling. It stops at particular points and moves to next points if sound is detected. It monitors each area to detect any problems and alerts. It has the ability to monitor sound in the premises. Robot hears any sound after area is quite and it starts moving towards the sound on its predefined path. Here we use IOT for receiving the alert sounds. Thus we put forward a fully autonomous security robot that operates tirelessly and patrols large areas on its own to secure the facility.

Keyword: Patrolling, Robot

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TECHNOLOGY FOR PROSPERITY

UGC AUTONOMOUS

ZIGBEE Based Secure Wireless Communication Using AES

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Abstract: The role of communication in day to day life is very important. Communication can be of two types which are wireless or wired. Basically wireless communication is mostly preferred over wired. But sometimes we need a secured wireless communication in case of industries, companies etc. This paper helps in enabling the user for transmitting data wirelessly through ZigBee with encrypting data to provide security. In the paper it consists of two sections they are transmitter and receiver. The data can be sent to microcontroller through pc by using software called hyper terminal, this software is used for serial communication. The microcontroller after receiving the data it forwards the data to the ZigBee transmitter which is connected to the microcontroller. The data is encrypted and then transmitted to receiver. The Zigbee based secured wireless communication using AES encryption allows us to communicate wirelessly with security feature. The data transfer during communication between two systems is encrypted using 128 bit AES encryption which is highly secure. The data can be decrypted with correct key only; otherwise it returns some garbage value. This is two way communication systems where we can transmit as well as receive at both ends. We used At mega microcontroller interfaced with xbee along with LCD display to send message and key, also have USB keyboards connected to each system and powered by 12V supply. After starting system, we will able to enter message on system. The maximum limit of message is 32 characters. After that system asks for key, the key limit is 16character it can be number or alphabet. Entering key will send the encrypted message to other system.

Keywords: Advanced Encryption Standard, Zonal Intercommunication Global-standard, Universal Serial Bus

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IOT Based Liquid Level Monitoring System

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Abstract: This project IOT Liquid Level Monitoring system is a very innovative system which will inform the users about the level of liquid and will prevent it from overflowing. To demonstrate this, the system makes use of 4 containers. For this the system uses ultrasonic sensors placed over the containers to detect the liquid level and compare it with the container's depth. The system makes use of AVR family microcontroller, LCD screen, Wifi modem for sending data and a buzzer. The system is powered by a 12V transformer. The LCD screen is used to display the status of the level of liquid in the containers. Whereas a web page is built to show the status to the user monitoring. The web page gives a graphical view of the containers and highlights the liquid level in color in order to show the level of liquid. The LCD screen shows the status of the liquid level. The system puts on the buzzer when the level of liquid collected crosses the set limit. Thus, this system helps to prevent the wastage of water by informing about the liquid levels of the containers by providing graphical image of the containers via a web page.

Keywords: Arduino, Wifi Module, Power Supply Unit, Ultra Sonic Sensor, Lcd.

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UGC AUTONOMOUS

Satellite Image Enhancement for Small Particle Observation Using De-correlation Stretcher

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Abstract: In this research work, we have improved the image visual appearance using image decorrelation stretcher techniques. Landsat 8 images are used in this research work to show the improved visual presentation for the images. Landsat 8 images contain 11 different spectrum bands. The visual appearance of the images produces some specific details in terms of appearance, which were not present in the original image. Through the image decorrelation stretcher technique, the image quality is improved and enhanced. The earth is associate aquatic planet and the maximum amount as eightieth of its surface is roofed by water.. Moreover, there is a strong interest in knowing what lies in underwater. Present days, an image of deep waters has a scope to large investigation to explore the underwater for sea floor expedition and navigation. Enthusiasm of underwater imaging includes the inspection of plants, seabed exploration, the search for wrecks up and to the exploration of natural resources.

Keywords: De-correlation, Image Enhancement

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UGC AUTONOMOUS

IoT Based Monitoring System for Comatose Patient Using Arduino

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Abstract: With an improvement in technology and miniaturization of sensors, there have been attempts to utilize the new technology in various areas to improve the quality of human life. One main area of research that has seen an adoption of the technology is the healthcare sector. The people in need of healthcare services find it very expensive this is particularly true in developing countries. As a result, this project is an attempt to solve a healthcare problem currently society is facing. The main objective of the project was to design a remote healthcare system. It's comprised of three main parts. The first part being, detection of patient's vitals using sensors, second for sending data to cloud storage and the last part was providing the detected data for remote viewing. Remote viewing of the data enables a doctor or guardian to monitor a patient's health progress away from hospital premises. The Internet of Things (IoT) concepts have been widely used to interconnect the available medical resources and offer smart, reliable, and effective healthcare service to the patients. Health monitoring for active and assisted living is one of the paradigms that can use the IoT advantages to improve the patient's lifestyle. In this project, I have presented an IoT architecture customized for healthcare applications. The aim of the project was to come up with a Remote Health Monitoring System that can be made with locally available sensors with a view to making it affordable if it were to be mass produced. Here we are using the sensors like Blood pressure sensor, Temperature sensor, ultrasonic sensor, PIR sensor in order to calculate the health parameters of a coma patient. Hence the proposed architecture collects the sensor data through Arduino microcontroller and relays it to the cloud where it is processed and analysed for remote viewing. Here we are using the sensors like Blood pressure sensor, Temperature sensor, ultrasonic sensor, PIR sensor in order to calculate the health parameters of a coma patient. Hence the proposed architecture collects the sensor data through Arduino microcontroller and relays it to the cloud where it is processed and analyzed for remote viewing.

Keywords: Internet of Things, passive infrared sensor

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Solar Powered Automated Multitasking Agricultural Robot Using IoT

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Abstract: Agriculture plays a vital role in socio-economic development of India. Agriculture is the cultivation of animals, plants, fungi, and other life forms for food, fiber, biofuel, medicinal and other products used to sustain and enhance human life. Agriculture is the most essential and foremost economic activity of all times. Until the Industrial Revolution, the vast majority of the human population laboured in agriculture. Pre-industrial agriculture was typically subsistence agriculture/self-sufficiency in which farmers raised most of their crops for their own consumption instead of cash crops for trade. But now, agriculture is undergoing a structural change leading to a crisis situation. The growth rate of agricultural output is gradually declining in the recent years due to labour scarcity and more expensive. Seed and chemical prices are rising too, creating the need for their efficient use. The recent survey shows that the world should double their agriculture productivity to feed the entire booming population by 2050. At that time with efficient management of natural resources will meet increasing demand by adopting modern technology in farming to improve agricultural productivity. Hence, as the farmers are struggle with higher seed and chemical prices, the prospect of labour shortages and growing world demand for food will drive to think an innovative and more efficient farming method. These problems in agriculture led us to propose an automated design “Agriculture robot” which can perform most of the farming activities. Here the robot is controlling by wireless communication using HC-05(BT) module and controlling grass cutting as multi tasking in agriculture.

Keywords: Arduino UNO, Solar Panel, Bluetooth (HC-05) , Soil sensor , Submersible Motor , LCD, Grass cutting Motor.

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Plant Soil Moisture & pH Sensing Alarm

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Abstract: Plants need water as well as good soil (pH rich) to ensure proper plant growth. It becomes difficult to monitor these things manually each time to ensure proper growth and any ignorance may lead to bad plant health or plant decay/death. Here we propose an Arduino microcontroller base system that makes use of soil moisture sensor along with pH value sensor to constantly check for these values. The system microcontroller ensures the plant gets proper moisture and pH by continuously monitoring for it. It also displays this on a display screen for user to monitor. Also the system is equipped with an alarm which sounds a buzz in case the values fall below a certain limit which may be bad for plant health. Thus the system ensures proper plant health using soil moisture and pH sensing.

Keywords: Soil Moisture, pH

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UGC AUTONOMOUS

IoT Energy Meter with Current, Voltage and Cost Monitoring System

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Abstract: Observing and monitoring your power utilization for verification is a not a easy task today since regularly checking the meter room is very tedious task Well, it is very important to know whether you are charged likewise so the need is very sure. Well, we have made a system that allows users to monitor energy meter readings over IOT. Our proposed system utilizes energy meter with microcontroller system to monitor energy utilization a meter. The meter is used to monitor units consumed, estimated cost, line voltage and current consumed. Simple web application named mobile TELNET shows the live output of these reading over the IOT. This enables user to effortlessly check the units consumed, estimated cost, Line Voltage and current consumed Live from anywhere through the site. In this way the energy meter observing framework enables client to adequately screen power meter readings and check the bill on the application effortlessly.

Keyword: Arduino UNO, Current Sensor, IoT, TELNET, Electric Meter

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Fingerprint Based Security System

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Abstract : Here we demonstrate fingerprint-based security system to authenticate users from entering particular premises. The system is useful for secure sites to provide access only to authorized users automatically. This ensures safety and security at secure sites/premises like military, navy, government as well as corporate premises. For this purpose we here use a Atmega 32 microcontroller circuit. The circuit consists of atmega microcontroller that is interfaced to fingerprint sensor, LCD display and motors to operate a door. Users are allowed to register into the system first. After registration/enrolment the system allows to start monitoring. In monitoring mode, the system monitors for fingerprints. Now if a fingerprint is detected, the system scans the fingerprint against stored ones. If a match is found, the system operates the motors to open the door for those users; else the system does not open the door. Thus we ensure a secure fingerprint authorized security system.

Keywords: Atmega328 microcontroller, Fingerprint sensor, LCD, DC Motor

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Triplet Markov Chain in Images Segmentation

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Abstract: Over the last years, image segmentation has evolved from a sub-discipline of computer science to a technique widely used in medical imaging, automated object recognition, and remote sensing. In this work, we present a recently Markovian model of image segmentation called Triplet Markov Chain with Independent Noise (TMC-IN), in this model, it assumes that its hidden process X is non-stationary. TMC-IN is used in this to segment some textured grey level and color images. To estimate the parameters, we use the iterative algorithm EM (Expectation Maximization) and we apply MPM (Marginal Posteriori Mode) algorithm to estimate the result segmented image. In addition, we compare the obtained results by this model with those obtained by the stationary Hidden Markov Chain with Independent Noise (HMC-IN) model. Experimental results show that TMC-IN outperforms HMC-IN in all experiments.

Keywords: Hidden Markov Chain with Independent Noise, Triplet Markov Chain with Independent Noise

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UGC AUTONOMOUS

Advanced Railway Track Fault Detection and Reporting Over Internet of Things

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Abstract: This project concern to a process for monitoring the condition of train tracks and more specifically has the object of the identification of defects detected by monitoring equipment on the tracks to be examined to allow maintenance crews to subsequently find these defects. When the supply is given to the device, the DC motor gets start through relay driver circuit. Two IR sensors are fixed in front of the train which is used to find out the crack on the track. Each sensor will produce the signal related to the position with the rail. If the track position is normal both the sensor gives the constant sensed output. If any sensor misses their output condition to fail then there is defect on that side. The sensor will inform this by giving alarm and sends information to the smart phone android app in IOT based via WIFI Module. Ultrasonic sensor is used to detect the obstacle in the track if any obstacle detected means the Arduino automatically transmits the message to nearby station via IOT using WIFI module. The location of this rail will automatically send to each station via IOT.

Keywords: Internet of Things, Wireless Fidelity

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A Preliminary Study on Projection De-noising For Low-Dose CT Imaging

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Abstract: It in recent decades, computed tomography (CT) has been widely used in the diagnosis and intervention tasks of modern hospitals and clinics. Given the potential radiation risk of CT scans, there is growing concern about the harm caused by radiation dose to humans. In order to reduce the radiation dose received by patients and the risk of related diseases, low-dose CT has gradually become the focus of researchers in the field of CT imaging. There are two main ways to reduce the radiation dose. A) Time reduction in CT scans. B) Lower the operating current of the X-ray source tube. Its shown that high lung images could be obtained with less radiation doses due to limitations of hardware and software the images quality are not completely meeting the requirements of clinical diagnosis at the moment. Fortunately the development of science and technology laid solid foundation for all kinds of low dose CT technology and more and more radiologists and researchers have applied themselves at low dose CT imaging.

Keywords: Computed Tomography, X-ray, De-noising, Radiation, Matlab

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UGC AUTONOMOUS

IOT Car Parking System

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Abstract: Car parking is a major issues in modern congested cities of today. There simply are too many vehicles on the road and not enough parking space. This has led to the need for efficient parking management systems. Thus we demonstrate the use of IOT based parking management system that allows for efficient parking space utilization using IOT technology. To demonstrate the concept we use IR sensors for sensing parking slot occupancy along with a dc motors to simulate as gate opener motors. We now use a WIFI modem for internet connectivity and an AVR microcontroller for operating the system. We use IOTGecko for online connectivity and IOT management GUI design. The system detects if parking slots are occupied using IR sensors. Also it uses IR technology to sense if a vehicle has arrived on gate for automated gate opening. The system reads the number of parking slots available and updates data with the cloud server to allow for checking parking slot availability online. This allows users to check for available parking spaces online from anywhere and avail hassle free parking. Thus the system solves the parking issue for cities and get users an efficient IOT based parking management system.

Keywords: Arduino UNO, IR sensors, LCD, WIFI modem, AVR microcontroller, DC Motor.

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UGC AUTONOMOUS

Design And Analysis of Microstrip Rectangular Patch Antenna

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Abstract: In this paper, a reduced mutual coupling 1 x 2 rectangular feed rectangular patch antenna is presented. The antenna elements are separated by a distance of $\lambda_0/4$ exhibiting excellent isolation of -35 dB at 8.6 GHz band and 10.4 GHz. To improve the isolation between closely placed antennas, a compact planar meander line based electronic Band gap structure (EBG) behaves like a double negative (DNG) material is placed between them. The proposed EBG structure is implemented on the MIMO antenna with continuous as well as discontinuous ground plane. It is found that the EBG structure with discontinuous ground plane improves at least 6 dB isolation between antenna elements than continuous ground. The proposed antenna structures are fabricated showing good agreement between simulated and measured results.

Keywords: Electronic Band gap (EBG), MIMO antenna, wideband antenna.

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Particle Swarm Optimization Applied to EEG Source Localization of Somatosensory Evoked Potentials

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Abstract: One of the most important steps in presurgical diagnosis of medically intractable epilepsy is to find the precise location of the epileptogenic foci. Electroencephalography (EEG) is a non invasive tool commonly used at epilepsy surgery centers for presurgical diagnosis. In this paper, a modified particle swarm optimization (MPSO) method is used to solve the EEG source localization problem. The method is applied to non invasive EEG recording of somatosensory evoked potentials (SEPs) for a healthy subject. A 1 mm hexahedra finite element volume conductor model of the subject's head was generated using T1-weighted magnetic resonance imaging data. Special consideration was made to accurately model the skull and cerebrospinal fluid. An exhaustive search pattern and the MPSO method were then applied to the peak of the averaged SEP data and both identified the same region of the somatosensory cortex as the location of the SEP source. A clinical expert independently identified the expected source location, further corroborating the source analysis methods. The MPSO converged to the global minima with significantly lower computational complexity compared to the exhaustive search method that required almost 3700 times more evaluations.

Keywords: EEG, MPSO

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Key Management on Wireless Mesh Network

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Abstract: Wireless Mesh Network has the ability to provide broadband access dynamically to anyone anywhere in the world by setting up nodes in the network. It provides the wide scale connectivity with less cost than the wired network. In addition to the cost advantage, wireless mesh networks (WMNs) are easy to sustain, robust and provide reliable service coverage. Wireless mesh networks (WMN) are multi-hop networks with the capability of sending packets between wireless routers. In this paper the architecture, features and applications of distinct wireless mesh networks, Diffie-Hellman key management, Steps of Diffie-Hellman, has been described. Number of issues and challenges are raised in WMN because of its performance. This paper, we have specify on key management, the challenges and issues in this emerging technology that have to be solved in order to have an efficient and reliable communication. According to the previous researcher's.

Keywords: Key management, Elliptic curve Diffie-Hellman, Authentication, Wireless mesh network, Elliptic Curve Cryptography.

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Mobile Charging on Coin Insertion

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Abstract: This is the smart coin based mobile charging system that charges your mobile for particular amount of time on inserting a coin. The system is to be used by shop owners, public places like railway stations to provide mobile charging facility. So the system consists of a coin recognition module that recognizes valid coins and then signals the microcontroller for further action. If a valid coin is found it signals the microcontroller and microcontroller then starts the mobile charging mechanism providing a 5V supply through a power supply section to the mobile phone, now system also needs to monitor the amount of charging to be provided. So the microcontroller starts a reverse countdown timer to display the charging time for that mobile phone. Now if the user inserts another coin in that time, the microcontroller adds the time to currently remaining charging time and starts the reverse countdown. So the system can be used for smart mobile charging at public places.

Keywords: Mobile, Microcontroller

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UGC AUTONOMOUS

Gesture Vocalizer

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Abstract: The gesture vocalizer consists of straightforward hand gloves fitted with flex sensors which are getting used for monitoring the quantity of bend on the fingers. Flex means to bend, the sensors that change the resistance while bending strip. Data from the sensors is transmitted to the control unit that is Arduino UNO i.e., the analog signals from the sensors are digitally converted and compared with the stored value for the particular sign then the respective output is displayed as text on the 16x2 LCD. Further, the text output is wirelessly transmitted to a telephone or a PC which consists of a text to speech conversion software. Currently, we are working on a simple prototype that may convert the essential Alphabets and numeric which can be further extended for recognition of words using an accelerometer, based on the motion of the hands.

Keywords: Flex sensors, resistance, Arduino UNO, 16x2 LCD.

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IoT Based Traffic Control Based on Density

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Abstract: With the rapid development of road infrastructure, the volume of vehicle on the road network increases which leads to traffic Congestion. Traffic congestions are among the top list of the problems faced in cities. This is mainly caused due to the rapid up rise in the number of vehicles in a short span of time. To overcome such impact of traffic congestions, it is required to develop an IoT Based traffic control system. In this proposed system involves a density-based traffic control system which uses Arduino UNO, IR sensors and LEDs for the effective signal handling and vehicle density control at the junction.

Keywords: Arduino UNO, IR Sensors, Power Supply Unit, ESP8266 Wi-fi Module, LCD, Traffic Lights.

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UGC AUTONOMOUS

Vehicle Theft Detection and Intimation Based on GSM and GPS

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Abstract: Nowadays the crime rate in India is increasing rapidly. As the number of vehicles are increasing, theft for vehicles has been increasing so security for the vehicles is extremely essential. Vehicle Theft Detection and Intimation System is placed in the vehicle so that it tracks the vehicle location and notifies the owner. The project uses wireless technology to alert the authorized person that the vehicle is being theft. This is achieved by sending an SMS to the owner and the owner can stop the vehicle by sending an SMS back. when someone tries to start the vehicle then Arduino receives signals and commands the GSM modem to send SMS to the owner. When the theft is identified the owner sends an SMS back through GSM to stop the vehicle and the doors of the vehicle will be automatically closed. To restart the vehicle the owner must enter the password.

Keywords: Arduino, GSM Modem, GPS.

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UGC AUTONOMOUS

Remote Monitoring of Food Spoilage Using Smart Technology

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Abstract: Food protection performs an essential function in nations' economy and human health. The included IoT- primarily based online tracking method where the use of clever logistics can meet a need of the essential wishes of decreasing food wastage, growing transportation efficiency, and monitoring food contamination. The majority of purchasers handiest be aware of the components used and their dietary value. The parameters like humidity, ethylene content in the food, bacteria, and temperature are the main factors on which the rate of decomposition of food depends. So in this IoT Project, a food Monitoring tool is carried out to find the real-time values of the temperature, humidity, and ethylene content, which can be the top measures in the food quality, and will be measured and displayed. If the values attain essential values, the person will get a notification via the Blynk application.

Keywords: Food Wastage, Humidity, Temperature, Ethylene Gas Content, Food Monitoring, Blynk Application.

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Gesture Supervise and Voice Recognition Machine

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Abstract: Nowadays people are on the verge of making innovative and highly sophisticated devices in order to make their lifestyle much simpler. A gesture supervise machine is a typical machine that is made with the help of ultrasonic sensors attached to a personal computer. Arduino is used to controlling the ultrasonic sonic waves and counting the distance between the obstacle and the sensor. Python IDE is used to perform various tasks that users want to achieve with the help of PC using different python inbuilt modules. Based on the obstacle distance calculated by ultrasonics, a certain required command transfer from Arduino to python IDE with a certain baud rate. Using python modules, the particular commands, tasks will be completed. Thus, this paper presents how we can achieve different tasks innovatively using ultrasonics and user voice.

Keywords: Gesture recognition, python automation modules, AI voice assistant, SMTP, PYTTX3, Serial communication with Arduino.

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Real Time Color Detection and Tracking Using Color Feature

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Abstract: The foremost stage in many of the image processing applications is Color detection. It is significantly used in applications such as self-driving cars, object detection, traffic signal detection, skin tone detection and object tracing. While tracing an object in motion, color is constant than any other attributes. This paper gives an approach to detect the label of the color by placing the cursor and double clicking at that position of the image and tracks the red, green and blue color objects using bounding box property. By examining the RGB values of every pixel in the image, the color of the pixels is recognized. All the objects of interest in the video are detected and tracked by a rectangular bounding box using HSV color model. The results of this implementation can be used in self-driving cars to detect traffic signal, in some industrial robots to perform pick-and-place task in separating colored objects and as a tool in various drawing and image editing applications.

Keywords: RGB, HSV, pixel, object detection, object tracing, bounding box.

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Bounded Setup for Heavy Hyper Sonic Acoustic System

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Abstract: A new Acoustic setup is being introduced to bound the sound waves produced by the heavy sound systems make directional. The sound waves are created using a directional sound system having sharp directivity and gain. Due to the non-linearity of air; don't need any demodulator; itself acts as a demodulator. The main disadvantage of Ultrasound technology is even it means a small piece of paper blocks the sound waves. In this paper, this disadvantage is used to reduce the problem of heavy sound systems in function halls, occasional parties and pubs. Acoustic foam can be replaced with papers and make a fence around the area that confine the sound. The directive speaker array fires the sound directly either to the people or to the acoustic foam. After multiple reflections, sound-absorbing foam absorbs the maximum amount of sound and avoids reflections beyond the desired region. Heavy sounds will bound to a particular space and keep surroundings pollution-free; after installed the proposed device.

Keywords: Ultrasound, directive sound system, sound-absorbing foams, Heavy sounds, parametric grid.

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UGC AUTONOMOUS

An Intelligent LoRaWAN Gateway-IoT based Disease Diagnosis Healthcare System

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Abstract: Modern health services are the greatest problem in developing countries in particular, where remote regions are not supplied with good quality medicine and hospitals. IoT is a major player in medical treatment to provide people with better clinical services, which also facilitates physicians and hospitals. In this paper, we are presenting a novel and smart healthcare system focused on advanced techniques such as IoT (i) which offer a platform to LoRaWAN Gateway IoT-enabled health-related disease diagnostics. (ii) The implementation of a server-side health diagnosis device for Patient Diagnosis outcome (PDO). (iii) Monitor the severity of the disease by implementing a mechanism for alarm generation. This device is smart enough for a clinical decision support system to detect and analyses patient data. This machine is a suitable alternative for people living in rural areas; it can determine if they have a major health problem and to cure this by approaching nearby hospitals. We also developed a state-of-the-art IoT Process Management Tool that delivers operating states and facilitates improved preparation and efficient use of resources and physical resources in the healthcare process. Overall the system developed consists of NodeMCU as a controller that has been equipped with blood pressure sensor, Sensor MAX30100 as a pulse detector and DS18B20 sensor as a body temperature detector.

Keyword: LoRaWAN, PDO

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Tensor Flow-Based Subspace Analysis of Deep Learning Algorithms

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Abstract: Low dimensional linear spaces can viably demonstrate the image varieties of numerous objects (human faces specifically) under factor lighting. The standard linear subspace learning algorithms incorporate Principal Component Analysis (PCA), Linear Discriminant Analysis (LDA), and Locality Preserving Projection (LPP). These techniques consider an $n_1 \times n_2$ picture as a high dimensional vector in $R^{n_1 \times n_2}$, while a picture spoke to in the plane is inherently a matrix. In this paper, we propose another algorithm called Tensor Subspace Analysis (TSA). TSA thinks about a picture as the second request tensor in $R^{n_1} R^{n_2}$, where R^{n_1} and R^{n_2} are two vector spaces. TSA can generally describe the connection between the segment vectors of the picture matrix and the column vectors. TSA identifies the genetic neighborhood mathematical structure of the tensor space by learning a lower-dimensional tensor subspace. We contrast our proposed approach and PCA, LDA, and LPP techniques on two standard databases. Experimental results show that TSA accomplishes a better recognition rate while being considerably more effective.

Keywords: Principal Component Analysis (PCA), Tensor Subspace, Fisherface, Eigenface

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Raspberry Pi Based Automatic Turnstile Controller to allow persons with face mask Using, Open CV, Keras/TensorFlow and Deep Learning

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Abstract: In this paper a Raspberry Pi implementation of Automatic Turnstile Controller to allow persons with face mask as a precautionary measure against covid19 has been proposed. To implement this we used Python Programming with OpenCV Library and TensorFlow (An end-to-end open source machine learning platform). The main Idea of this design is to allow the persons in to our office or workplace only if he or she wears a Face mask. This system consists of a camera which provides the video streaming, an input to Raspberry Pi for applying mask detection algorithm. In input video stream each frame is analysed to detect and recognize human faces with and without mask using image processing algorithms. It shall categorize the persons with mask and provide an access to the office by unlocking the turnstile. We'll use Python script to train a face mask detector and unlocking the Turnstile. The system can serve as a security as well as a surveillance system in public places like Malls, Universities and Airports.

Keywords: turnstile, COVID-19, Face mask detection, face recognition, raspberry Pi, Python, OpenCV, TensorFlow.

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Implementation And Design of FIR Filters Using Verilog HDL

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Abstract: The processing of image or signal on a FPGA is the very difficult process, filters plays important role in any DSP application, the filter architecture contains the many components in that the multipliers plays an vital role ,the filter performance is mainly depends on the multiplier circuit and its performance if the multiplier circuit is complex it requires more area, more power consumption and lesser speed but the VLSI design mainly concentrates on less area, less power consumption and more speed, so to get the best solution for this problem we have choose this proposed method. This project mainly represents the Performance analysis of a novel FIR filter for the image processing application using different multipliers and adders. The different types adders like Ripple carry adder (RCA), carry select adder (CSLA), full adder and half adder are design using Verilog code. The FIR filter is designed using array multiplier and 8-bit Ripple Carry adder and Synthesized on Xilinx 14.7 and the same simulates on Model sim. Project will be developed using Verilog HDL. Xilinx ISE tool is used to perform the Simulation and Synthesis.

Keywords: FIR FILTERS, Verilog HDL, Xilinx ISE

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Warrior Health and Position Tracking System

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Abstract: The safety and security are the main concern now-a-days. Wars are being battled for land, water and getting the situation of most impressive country. A nation's arm power is comprised of three formally dressed administrations: the military, the naval force, and the flying corps. Warriors being the foundation of any equipped power typically lose their lives because of absence of clinical assistance when they are in crisis, likewise troopers who are associated with missions or in extraordinary tasks get strayed on war fields and lose contact with the specialists. To overcome these difficulties we had assembled this venture which utilizes remote body region sensor organization (RBRSO) like temperature sensor, heartbeat sensor and screens the wellbeing status of the warrior at whatever point required. Additionally utilizing GPS we can follow the trooper's definite area at whatever point required. Utilizing oxygen level sensor we can likewise screen the ecological condition, so specialists can give fundamental guides. The correspondence is set up between the fighters and authorities through GSM. Any irregularities in the readings of remote body region sensor organization (RBRSO) is considered as a trigger for GSM to set up the association between the officer and base unit and send current area and wellbeing status to the recipient. By utilizing these types of gear we had attempted to carry out the fundamental guarding framework for the warrior in minimal expense, light weighted, compact and exact gadget.

Keywords: Barometric pressure sensor, GPS, GSM, WBASNs, ZigBee

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UGC AUTONOMOUS

Design of Elevator controller Using Verilog HDL

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Abstract: The aim of the project is to design and implement an Elevator/Lift Controller using Verilog hardware descriptive language (HDL). The Elevator Controller is a device used to control a lift motion and to indicate the direction of motion, and the present floor level, etc. The device controls the lift motion by means of accepting the floor level as input and generate control signals (for control the lift motion) as output. In the FSM technology there is a change from one state to another state likewise in the elevator there will be a change from one floor to another.

Keywords: FSM Technology, Verilog hardware

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Forest Fire Detection System with IOT

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Abstract: Forest fires are one of the problems that threaten sustainability of the forest. Early prevention system for indications of forest fires is absolutely necessary. The extent of the forest to be one of the problems encountered in the forest condition monitoring. To overcome the problems of forest extent, designed a system of forest fire detection system by adopting the Wireless Sensor Network (WSN) using multiple sensor nodes. Each sensor node has a microcontroller, IoT module, water pump and three sensors. Measurement method is performed by measuring the temperature, flame and gas level and alert through cloud communication using IoT module. In this system we go for detection and Monitoring of forest fires through several sensors and send to IoT cloud Depending upon the sensor values in the cloud if it is greater than the preset values it will send mail to the user. Continuous monitoring and uploading values to cayenne cloud can be achieved

Keywords: Internet of Things, Node MCU, Relay, Fire Detection.

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An Efficient method of UEP OLS codes to Detect more than Two Errors

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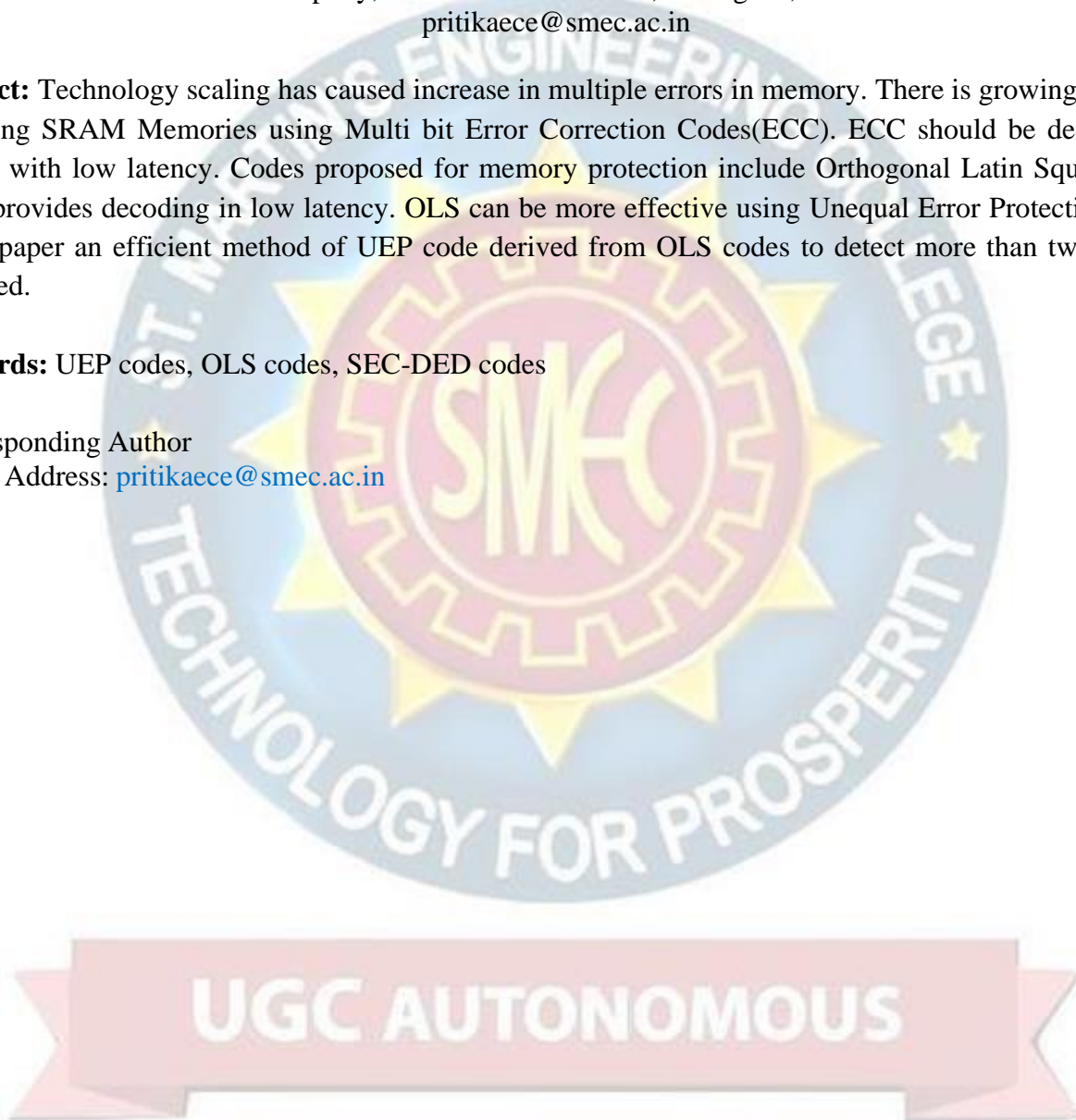
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Abstract: Technology scaling has caused increase in multiple errors in memory. There is growing interest in protecting SRAM Memories using Multi bit Error Correction Codes(ECC). ECC should be decodable in parallel with low latency. Codes proposed for memory protection include Orthogonal Latin Square (OLS) which provides decoding in low latency. OLS can be more effective using Unequal Error Protection (UEP). In this paper an efficient method of UEP code derived from OLS codes to detect more than two errors is presented.

Keywords: UEP codes, OLS codes, SEC-DED codes

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VIDISAT High Dimensional Sparsifying Transform Learning for online Video Denoising

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Abstract: Image Techniques exploiting the sparsifying of images in a transform domain are effective for various applications in image processing. In particular transform learning methods involve cheap computations and have been demonstrated to perform well in applications such as image Denoising and any image reconstruction recently, we proposed methods for sparsifying Transform from streaming image, which enjoy good convergence guarantees and involve lower computational cost than online synthesis dictionary learning. In this paper we are applying transform learning for. Image Denoising nothing but to convert number frames and optimize lucky frame and applying image Denoising. After completion of image Denoising video Denoising is also. Possible because video is moving frames. we present a novel frame work for image Denoising based on high dimensional sparsifying learning for spatio temporal patches. The patches are constructed either from corresponding patches in successive frames. Numerical experiments evaluate the performance of the proposed image denoising algorithms in multiple image and video data sets.

Keywords: Denoising, VIDISAT

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Performance Evaluation of Hierarchical Routing Protocol to Increase life time of the Wireless Sensor Networks

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Abstract: Wireless sensor networks major challenging issue is energy because sensors have limited energy source. The wireless sensor nodes must have effective utilization of energy resources requires energy efficient routing protocol. In wireless sensor networks cluster based routing protocols are suitable in terms of energy efficiency. Wireless sensor networks (WSNs) consist of small nodes with sensing, computation and communications capabilities. Recent advances in wireless sensor networks have led to many new routing protocols specifically designed for sensor networks where energy awareness is an essential design issue. Most of the attention has been given to the routing protocols since they might differ depending on the application and network architecture. In this paper to evaluate the performance of two hierarchical routing protocols Low-Energy Adaptive Clustering Hierarchy (LEACH) and Power-Efficient Gathering in Sensor Information System (PEGASIS) in terms of system lifetime, energy consumption and alive nodes. The simulation result has been carried out using ns 2.34 network simulator.

Keywords: LEACH, PEGASIS and Wireless Sensor Networks

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UGC AUTONOMOUS

Low Power ALU Design Using Ancient Mathematics

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Abstract: Juggling the responsibilities of a job and new born baby may seem challenging for working parents. Infant health safety and security is always a matter of concern for kith and kin by leaving their baby in care centres. At present, female participation in the work force in the industrialized nations has greatly increased, thereby affecting infant care in many families. Both parents are required to work due to the high cost of living. However, they still need to look after their babies, thereby increasing workload and stress, especially of the mother. Working parents cannot always care of their babies. They either send their babies to their parents or hire a baby caregiver while they are working. Some parents worry about the safety of their babies in the care of others. Thus, they go home to check on their babies during their free time. In this paper author has designed an advance cradle system which monitor baby health conditions such as temperature, baby cry and wetness. Parents not only monitor but also can control cradle via mobile. The experimental result shows that the designed system works successfully for the infant healthcare and thus can be implemented practically.

Keywords: ALU, Cradle System

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Real Time Monitoring of Restaurants

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Abstract: Smart grid is a modified form of electrical grid where generation, transmission, distribution and customers are not only connected electrically but also through strong communication network with each other as well as with market, operation and service provider. For achieving good communication link among them, it is very necessary to find suitable protocol. In this paper, we discuss different hardware techniques for power monitoring, power project requires an LDR sensor for and remote power controlling at restaurant and transmission side and also discuss the suitability of ZigBee for required communication link. Zigbee has major role in monitoring and direct load controlling for efficient power utilization. It covers enough area needed for communication and it works on low data rate of 20Kbps to 250Kbps with minimum power consumption. This project describes the user-friendly monitoring restaurant appliances, power on/off by passing the commands through PC

Keywords: ZIGBEE, LDR

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Improved Logic Encryption of Combinational Circuits

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Abstract: Logic encryption for combinational circuits are proposed in this paper. Logic encryption is achieved by using key gate transistors in the circuit schematic of subtractors and adders. In this work, two logic encrypted full adder and subtractor circuits and half adder and half subtractor circuits using logic encrypted gates are designed and proposed. Of the two proposed circuits for adders and subtractors, one is strong logic encrypted than the other. All the encrypted adders and subtractors are compared with conventional adders and subtractors for logic encryption level and various other parameters like area and power. The results show improvement in area and power. The proposed half adder has 42% more area and 26.02% more power and half subtractor has 50% more area and 24.4% more power than the existing circuits. The proposed full adder has 25% less area (transistor count) and 33% less power consumption and the proposed full subtractor is also better in terms of area and power consumption with 30% and 24% lesser. Even strong logic encrypted full adder and full subtractor are proposed in this work. Full adder and subtractor have 22% increase in area each and on an average 2.3% increase in power each respectively.

Keywords: Logic Encryption, Key gate transistor, Full Adder and Full Subtractor.

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Robust Visual Tracking Via Smooth Manifold Kernel Sparse Learning

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Abstract: Various sparse representation-based tracking methods have been proposed to tackle visual tracking problems, and most of them use simple intensity feature as the observation of target object. Moreover, most of them only take into account either global or local image representation and only exploit the underlying relationship among target candidates in a single frame. All of these may make their appearance models less robust to deal with complex scenes. To overcome these problems, we propose a smooth manifold kernel sparse tracker under the framework of particle filter. The proposed method characterizes targets and candidates with region covariance matrix descriptors, and constructs object tracking as a kernel sparse learning model based on Symmetric Positive Definite (SPD) manifolds. The spatial-temporal interdependencies among candidates and global-local representations of candidates are jointly considered and unified via the kernel sparse learning model. Moreover, in order to make the model more robust, the detection of outlier tasks is also taken into account. To handle the variation of object appearance, we develop a robust and efficient online dictionary learning algorithm on SPD manifolds. Extensive experiments on multiple benchmark datasets demonstrate that our tracker performs favourably against state-of-the-art trackers.

Keywords: Online dictionary learning, Symmetric Positive Definite manifolds, sparse representation, spatial-temporal correlation, visual tracking.

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VLSI Implementation Strategy for Multiuser Detection by Greedy Iterative Algorithm

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Abstract: Multiuser detection (MUD) strategies have the potential to significantly increase the capacity of wireless communications systems, except for these to be useful they need to even be practical for implementation in VLSI circuits that deal with world situations and process data in real time. The appliance of the optimal Maximum Likelihood (ML) solution is restricted by its exponential computational complexity. Current near-ML algorithms like the spherical detector offer significantly reduced complexity, but are still likely to be impractical for larger problems. Simpler MUD algorithms, like the interference canceller (IC), are more practical but offer poor performance in some cases of interest.

In this paper, we present a singular algorithm that shares aspects of those documented techniques, but offers higher performance than the simpler methods, while remaining practical. Our approach involves a series of iterations that gently converge to a choice, by choosing the estimates that produce lower values for our ML cost function. While this is often more complex than well known methods, it offers higher bit error rate performance and is lower in complexity than other methods with comparable performance. We also show the way to further reduce the complexity to make our algorithm suitable for VLSI implementation.

Keywords: Multiuser Detection, VLSI, IC, Iterative Optimization, Greedy, ASIC Implementation.

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Deep Recurrent Neural Network for Singer Identification and Classification

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Abstract

In this Paper work, we are utilizing a deep recurrent neural network technique called LSTM (long short-term memory) to be able to determine the name of the performer and their gender based on a study of the audio voice component. The author of the work being suggested is currently working on constructing two LSTM models. One of these models is used to predict singer gender or gender identification, while the other model is used to predict or classify singer name. Both models will be used in the proposed work. The accuracy of the LSTM model will be compared with that of two current approaches, namely the SMV and the MLP, as part of the research project that we have proposed. In order to carry out this project, we will be utilizing the MIR-1K dataset. This dataset contains signers' own audio recordings that they made at the time of signing. We are going to train several different algorithms, including LSTM, SVM, and MLP, using this dataset. LSTM is the new approach that we propose, and SVM and MLP are the algorithms that are already in use. When measured against the most recent developments in the field, the proposed approach displays significantly better performance.

Keywords: LSTM, Support Vector Machines (SVM), Multi-Layer Perceptrons (MLP).

Implementation of College Faculty Dashboard 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 students 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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Deep Blind Image Quality Predictor

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Abstract: Color image segmentation is a very emerging research topic in the area of Color image analysis and pattern recognition. Many state-of-the-art algorithms have been developed for this purpose. But, often the segmentation results of these algorithms seem to be suffering from miss classifications and over-segmentation. The reasons behind these are the degradation of image quality during the acquisition, transmission and Color space conversion. So, here arises the need of an efficient image enhancement technique which can remove the redundant pixels or noises from the Color image before proceeding for final segmentation. In this paper, an effort has been made to study and analyze different image enhancement techniques and thereby finding out the better one for Color image segmentation. Also, this comparative study is done on two well-known Color spaces HSV and RGB separately to find out which Color space supports segmentation task more efficiently with respect to those enhancement techniques.

Keywords: Color Image Segmentation, K Means, HSV, Satellite Color Image Segmentation

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Segmentation of Telugu Text Line through Computation of Horizontal Projection Profile Technique

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Abstract: Text line segmentation is an important task of Optical Character Recognition. The proposal discusses a novel technique for Segmentation of Lines for the text document written in Telugu Language. The algorithm imbibes the approach of finding the Horizontal Projection Profile. Preprocessing steps such as correction of skewness due to improper scanning as well as removal of noise is assumed to have been performed on the data. Our technique of line segmentation addresses the key complexity issue of variations in the gaps between and across lines as well as curly and skew character text of document. The purpose of this paper is to segment line by connecting the centroids Horizontal Projection Profile. The method has been tested on unconstrained Telugu scripts. An experimental result obtained by executing the proposed method of line segmentation has achieved high degree of accuracy and high performance.

Keywords: Horizontal Projection Profile, Document Image Processing, Optical Character Recognition, Text Line Segmentation

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A Study of Complex Classifications of Sensor based Medical Data Using Multi Agent Systems

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Abstract: Electronics gadgets and medical devices collect data from patients continuously. Handling this data and gaining from it is a test for information researchers as this sort of information comes in unpredictable and huge amounts, settling on the choice of what sort of calculations to apply for the best outcomes difficult and tedious. In this paper we propose a Multi-agent System that empowers self-governing choice and use of AI techniques for informational indexes having a place with clinical frameworks, by applying hereditary calculations to specialists.

Keywords: Evolutionary Multi-agent System, Ambient Intelligence, Smart Hospital, Genetic Algorithms, Machine Learning.

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Determination and Classification of Blood Types using Image Processing Techniques

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Abstract: Blood grouping is that the initial and foremost importance for several of the main medical procedures. Blood is one amongst the foremost vital component of the flesh that works as a significant animal tissue and keeps the circulation of the many essential ingredient like O and numerous nutrients. It's extraordinarily necessary for numerous medical procedures to be legendary regarding blood group and alternative options of blood like the RBC count and blood profile. The standard technique of sleuthing the people is typically the plate look at and also the tube takes a look at. each of that square measure done by underneath complete analog procedures with human observation. In the era of digitization, it's not associate degree economical thanks to handle such a basic however essential process during a full analog atmosphere. ancient ways in which of sleuthing people have remained analogue during this era of digitization and square measure thus liable to human unreliability. thus, it'd be terribly economical and arguably a rescue approach if the method of sleuthing blood may be completed with success during a value effective method with the technologies at hand and while not the credibility of synthetic error. This proposition is anticipated to gauge the Rh factor moreover because the cluster of a sample blood with its computed image. the total method excludes a significant likelihood of human error whereas sleuthing the agglutination from the standard technique associate degree it'd get the task done at intervals an insignificant quantity of your time.

Keyword: Rh Factor, Blood Classification

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Detecting Linguistic Cues for Identification and Detection of Mental Health Disorders from Social Media Analytics Using Deep Learning Models

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Abstract: Mental health is not limited to a particular country but it is global issue, mental disorders may transform to suicidal ideation without successful therapy. To save the lives of people, early detection of mental disorder and suicidal ideation should be tackled. Due to widespread use of internet on small phones and the availability of cheap data packs, most of the youth are easily accessing the social media sites and post their feelings there. This data can be used to access the mental risks of the people and provide early insights to help them to come out from the illness and save their lives. The language used by suicide persons and mentally ill persons is quite similar hence makes it difficult to classify them. In this work we focus to use a complex architecture to classify suicidal ideation and mental disorders. We propose to use lexicon-based sentiment scores and latent topics to increase text representation. We also use Long State Term memory (LSTM) combined with relation net and attention. The features generated from different word embedding techniques are optimized using nature inspired algorithms like Firefly. The efficient relation net mechanism when tested on the reddit dataset outperform all the other baseline models.

Keywords: Firefly algorithm, Mental Health, Relation net. Suicide ideation,

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Assistive Interface Stick for Visually Disabled People

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Abstract: Visually disabled persons find it more challenging to move out independently. There are millions of blind people in this world who are always in need of helping hands. The smart walking stick that we have designed will help the blind society by providing more convenient means of life and to move around independently. The stick consists of one ultrasonic sensor, soil moisture sensor, temperature and humidity sensor, camera and earphones. The ultrasonic sensor is used for obstacle detection. The temperature and humidity sensor are used to measure the humidity and temperature. The soil moisture sensor is used to measure the volumetric water content in soil. The camera is used for text and object recognition. Thus, it works as a virtual eye for blind people. The output will be from an earpiece.

Keywords: Blind Stick, Ultrasonic Sensor

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Investigation of Up-Link Spectral Efficiency of Massive MIMO System in Different Fading Scenario

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Abstract: We considered spatially correlated Rician and Rayleigh fading scenario for Massive MIMO system. The model of Rician fading channel is more close to the practical spatial correlated channel fading scenario than Rayleigh fading channel model, because Rician faded propagation consists of deterministic LoS (direct without reflection) component and a probabilistic NLoS (indirect with reflection) component in its modeling, whereas model of Rayleigh fading channel considers only a probabilistic NLoS component. We have utilized the statistical MMSE (Minimum Means Square Error), EW-MMSE (Element Wise MMSE), and LS (Least Square Error) estimation methods in both models. UL (Up Link) rigorously achievable closed form SE (Spectral Efficiency) expressions using above mentioned estimators for MR (Maximum Ratio combining) are used. Obtained results reflect that MMSE estimator gives higher UL SE than the other estimators and increment of antenna number at base station can increase it more. UL SE is higher in Rician fading scenario than Rayleigh fading in both spatially correlation and uncorrelation cases.

Keywords—Massive MIMO system, spatial correlation, Rician fading, spectral efficiency, channel estimation

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Social Recommendation Using Deep Autoencoder

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Abstract: Social media greatly influence in the human life and reviews or ratings given by the user is used as the social data. This social data is used for recommendation system. The customers are inspired by the way and this means of their friends. The techniques which are used to collect the data and improves the overall execution of recommender framework. The previous works in which the methods influences every pair of customers independently and forget about the interactions among. An autoencoder model is proposed to learn social relationships between users for recommender framework. Usually every social recommendation system depends on the trust network only so in the work where the similarity between each user is also considered. The Social information and matrix factorization for ratings are combined into a unique recommender framework. This framework is then evaluated using mean absolute error. The Epinions is the dataset used.

Keywords: Recommender system, Collaborative filtering, SSDAE Autoencoder, Matrix factorization

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Self-Immunity Technique to Improve Register File Integrity against Soft Errors

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Abstract: Continuous shrinking in feature size, increasing power density etc, increases the vulnerability of microprocessors against soft errors even in terrestrial applications. The register file is one of the essential architectural components where soft errors can be very mischievous because errors may rapidly spread from there throughout the whole system. Thus, register files are recognized as one of the major concerns when it comes to reliability. The paper introduces Self-Immunity, a technique that improves the integrity of the register file with respect to soft errors. Based on the observation that a certain number of register bits are not always used to represent a value stored in a register. The paper deals with the difficulty to exploit this obvious observation to enhance the register file integrity against soft errors. We show that our technique can reduce the vulnerability of the register file considerably while exhibiting smaller overhead in terms of area and power consumption compared to state-of-the-art in register file protection. For embedded systems under stringent cost constraints, where area, performance, power and reliability cannot be simply compromised, we propose a soft error mitigation technique for register files.

Keywords: self immunity, errors, register file, vulnerability, reliability

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Design of a 32-Bit Harvard Structure RISC Processor in Cadence Technology

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Abstract: The architecture of a MIPS (Microprocessor without Interlocked Pipeline Stages) based RISC or Reduced Instruction Set of Computers is a type of microprocessor which was designed by Harvard type data path structure to execute high speed using a small set of Instructions. This project explains the design and implementation of a 4-stage pipelining based low power processor. This feature leads to increase the reliability and speed of the system. The pipelining includes fetch, decode, execute and memory read/write operations. Low power was obtained by using clock gating technique. Clock gating is used to eliminate the unwanted clock usage when the module is not used. The main aim of the project is to design a 4-stage pipelined RISC processor starting from RTL to GDSII (Physical Design). The processor was coded by Verilog HDL language and implemented in Cadence Encounter Compiler tool. Calculated area, power, delay and clock gating using Cadence RTL compiler using slow and fast libraries of 45nm technology.

Keywords: RISC, MIPS, RTL (Register Transfer Logic), GDSII (Graphic Design System for Information Interchange a Gerber File), Cadence Encounter Compiler, Innovus, 4-stage Pipeline, Physical Design.

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Smart Way of Controlling Traffic Using IoT Technology

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Abstract: With the rapid development of road infrastructure, the volume of the vehicle on the road network increases which leads to the problem of traffic Congestion. The exact situation exists in the Indian cities. This is mainly caused due to the rapid increase in the number of vehicles in a short period. To overcome such an impact of traffic congestions, it is required to develop an IoT Based traffic control system. The proposed system would be based on the measurement of the actual traffic density on the road. This would be achieved using real-time video and by image processing techniques. Wherein the images captured and are stored in the server, which will be compared with the real-time image captured via camera to identify the density. The main theme is to control the traffic finally by determining the traffic density on each side of the four roads and enabling a option of a traffic signal to the user for controlling traffic through a software application.

Keywords: Traffic Control, IoT

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Accident Control Info System Using Internet of Things

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Abstract: IoT based traffic congestion control unit design increases Careful investigation is done to develop a work-flow process for a real time traffic monitoring unit. The consequence of road accidents that involves a motorcycle is far more fatal for the rider than the other drivers. Traffic congestion is emerging as a major problem for everyone within a city. The reasons for this problem are increasing populations of vehicles in the city, poor management of roads. The increasing adult populations is also a big cause for congestion as they want to use their private vehicle rather than using public transportation. Our projected framework will distinguish driver laziness and gives cautioning in type of alert. As the number of cars increases, congestion in city also increases. That is why, the smaller towns and villages are unheard this problem, car accident data framework will ceaselessly screen the good ways from vehicle which remains finished by the ultrasonic sensor In this paper, we will speak to the structural way to deal with build up the android stage based request and IoT based equipment, which is propelled item identified with driver security on the streets utilizing mix of versatile figuring and advanced picture handling and controller.

Keywords: GSM, GPS, IoT, Security system alert.

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Modeling and Simulation of Multi-Operation Microcode-based Built-In Self Test (BIST) for Memory Fault Detection and Repair

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Abstract: As embedded memory area on-chip is increasing and memory density is growing, problem of faults is growing exponentially. Newer test algorithms are developed for detecting these new faults. These new March algorithms have much more number of operations than the March algorithms existing earlier. An architecture implementing these new algorithms is presented here. This is illustrated by implementing the newly defined March SS algorithm. Along with the fault diagnosis a word-oriented memory Built-in Self Repair methodology, which supports on-the-fly memory repair, is employed to repair the faulty locations indicated by the MBIST controller presented.

Keywords: Built-In Self Test (BIST); Built-In Self, Repair (BISR); Defect-Per Million (DPM); Memory Built-in Self Test (MBIST); Micro coded MBIST; Memory Built-In, Self Repair (MBISR).

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Human Detection and Activity Recognition using Deep Fusion Network (DFNet)

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Abstract: Human activity recognition and identification in entire image sequences have made significant progress in recent years. Detecting and anticipating human activity early in a real-time video, on the other hand, remains a difficult task. Further-more, dynamical events like as lighting changes, camera jitter, and object size variations make them extremely vulnerable. The proposed feature learning algorithms, on the other hand, are less expensive and easier to implement since highly abstract and discriminative features may be generated automatically without the requirement for expert knowledge. In this paper, i propose human detection based on HOG features and a human activity detection system based on Deep Fusion Network (DFNet). The human descriptors for training images are obtained using a histogram of square blocks of fixed size, while the Deep Fusion Network is made up of an InceptionV3 base network and the Multi-Scale Attention Guided Module is used to classify activities. Finally, we put our method to the test on the publicly available KTH dataset, demonstrating its superior performance and accuracy. The suggested model’s efficiency in activity recognition on a typical benchmark collective activity dataset is demonstrated by experimental findings.

Keywords: DFNet, InceptionV3, HOG.

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Study of Future Generation Communication System and Quantifying the AI Based Massive MIMO System

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Abstract: Wireless communication systems have experienced substantial revolutionary progress over the past few years. The global bandwidth shortage in the wireless communication sector has imparted the race to study and design efficient wireless technology. This access technology is widely known as Massive Multiple-Input Multiple-Output (MIMO). We know that MIMO is a technology that utilizes multiple antennas at transmitter/receiver to improve the throughput, capacity and coverage of wireless system. Massive MIMO has benefits of enhanced capacity, spectral and energy efficiency and it can be built by using low cost and low power components. Massive MIMO is the best possible technology for next-generation networks, which provides systematic design of antennas at both transmitter and the receiver to maintain high spectral and energy efficiency using relatively simple processing. This paper studies fundamental Massive MIMO technologies for wireless communication and efficient design structure required for 5G and 6G networks by the help of new technologies in massive MIMO systems. Various recent trends such as ultra-massive MIMO (UM-MIMO), visible light communication (VLC), Machine learning, and Artificial Intelligence for massive MIMO systems has been. studied

Keywords: 5G, massive MIMO, signal detection, Machine learning, Artificial Intelligence, terahertz spectrum.

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Wireless Hand Motion Control Robotic Gripper Arm

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Abstract: In many industries wireless operations are necessary especially in dangerous or hazards areas. In some of the industries it is necessary to handle few jobs with very high temperature which is not possible by human hand in such cases wireless operations are more efficient. This project focuses on design of hand gesture controlled robotic arm using microcontroller with the help of X-bee and wireless sensor networks. It consists of two parts which are interconnected by the wireless sensor communication systems. The X-bee will be acting as the transmitter and the receiver device system. The first part consists of gloves which were occupied by Li-ion battery, microcontroller and flex sensors. The second part consists of motor, microcontroller and robotic fingers through which the mechanical action takes place. Robotic Arm is the most commonly used in robotics community. It is widely used for multiple industrial applications like welding, material handling, thermal spraying and much more. In this project a robotic arm is designed which simply follows the hand movements and moves accordingly. This robotic arm can be used in industries where it requires human intelligence as well as machines help. The work done by our hand at one time can be followed by hundreds of robotic arms hence we can save time and efforts and also can perform numerous tasks at one time. This robotic system consists of an assembly of mounts and parts designed to hold motors in place in order to achieve desired movement. The movement of parts of this servo motor is done by servo motor, which can rotate up to 190 degrees approximately. Flex sensor is mounted on the gloves worn by user.

Keywords: Robotic Arm, Flex Sensor

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Implementation of High Speed Low Power Full Adder using Reversible Logic Gate

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Abstract: In current scenario, the reversible logic design attracting more interest due to its low power consumption. Reversible logic is very important in low power circuit design. The important reversible gates used for reversible logic synthesis are Feynman Gate, Fredkin gate, toffoli gate, New Gate sayem gate and peres gate etc. This project presents a basic reversible gate to build more complicated circuits which can be implemented in ALU, some sequential circuits as well as in some combinational circuits. It also gives brief idea to build adder circuits using the basic reversible gate like peres gate and TSG gate. Reversible logic has presented itself as a prominent technology which plays an imperative role in Quantum Computing. Quantum computing devices theoretically operate at ultra-high speed and consume infinitesimally less power. Research done in this paper aims to utilize the idea of reversible logic to break the conventional speed-power trade-off, thereby getting a step closer to realize Quantum computing devices. To authenticate this research, various combinational and sequential circuits are implemented such as a 4-bit Ripple-carry Adder, (8-bit X 8-bit) Multiplier, and the Control Unit of an 8-bit GCD processor using Reversible gates. The power and speed parameters for the circuits have been indicated, and compared with their conventional non-reversible counterparts. The comparative statistical study proves that circuits employing Reversible logic thus are faster and power efficient. The designs presented in this project were simulated using Xilinx 14.7 software.

Keywords: Reversible Logic Gate, low power, high speed, Quantum computing.

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UGC AUTONOMOUS

Extensive Capacity Simulations of Massive MIMO Channels for 5G Mobile Communication System

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Abstract: In this work, an analytic extension of massive MIMO capacity for 5G mobile communication systems is firstly developed. Then, the capacity limit and multiplexing gain are investigated in simulations for different massive MIMO configurations. Furthermore, the two calculated metrics are performed as a function of SNR taking into account the transceiver impairments. On the one hand, an analytic expression of the capacity under uncorrelated Rayleigh fading channel is developed as a function of SNR and OFDM subcarriers number. On the other hand, simulation results are carried out based on the deterministic and uncorrelated fading Rayleigh channel showing that the capacity limit is up bounded by [50-57] bit/s/Hz for a multiplexing gain equal to 256. Finally, three metrics are used to characterize the massive MIMO for the uncorrelated fading channel with a multiplexing gain of (4,4), (16,16), (64,64), (128,128) and (256,256), respectively. Likewise, a trade-off is observed between the capacity limit and the tolerable SNR value for massive MIMO transmission while increasing the multiplexing gain.

Keywords: Massive MIMO;OFDM;5G;Mobile Communication.

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UGC AUTONOMOUS

Masked Face Recognition in Realtime Using CNN

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Abstract: Coronavirus has intensely impacted the planet and has now infected more than 169 million people worldwide. In this pandemic situation, wearing a mask and following interpersonal distance are two of the safety protocols to be followed to avoid the escalation of the virus. In this scenario wearing masks everywhere was mandatory and becomes challenging to identify a person with a mask. So, we came up with the idea of "Masked Face Recognition" to create a safe environment that contributes to public safety. In this paper, we propose a reliable method to detect masked faces in real-time based on FaceNet, Convolution Neural Network, and deep learning techniques in python.

Keywords: Masked Face Recognition, FaceNet, Convolution Neural Network, Deep learning

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Image Forensic for Digital Image Copy Move Forgery Detection Submitted in partial

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Abstract: In recent years, digital image forgery detection has become an active research area due to the advancement of photo editing software. This project focuses on passive forgery detection on images tampered using copy move technique, better known as Copy Move Forgery Detection (CMFD). A CMFD technique consisting of oriented Features from Accelerated Segment Test and rotated Binary Robust Independent Elementary Features (Oriented FAST and rotated BRIEF) as the feature extraction method and 2 Nearest neighbour with Hierarchical Agglomerative Clustering (HAC) as the feature matching method is proposed. Evaluation of the proposed CMFD technique was performed on images that underwent various geometrical attacks. With the proposed technique, an overall accuracy rate of 84.33% and 82.79% are obtained for evaluation carried out with images from the MICC-F600 and MICC-F2000 databases. Forgery detection achieved True Positive Rate of more than 91% for tampered images with object translation, different degree of rotation and enlargement.

Keywords: Passive image, Copy move forgery detection

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UGC AUTONOMOUS

Reduction of Effect of Multiple Hardware Trojans in Cryptoprocessor

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Abstract: Outsourcing IC design and fabrication is one of the effective solution to reduce the design cost but it may cause severe security risks. A hardware trojan is a form of malicious circuitry that damages the function or and trustworthiness of an electronic system. The payload of an hardware trojan is the entire activity that the trojan executes when it is triggered. Malicious trojans try to bypass or disable security fence of a system. It is important to provide security against hardware trojan attacks in electronic systems. Thus, by providing security against these attacks the confidential information can't be accessed by hackers. With the help of our proposed model, we can detect and prevent multiple hardware trojans.

Keywords: Hardware Trojan, Cryptography, IC security, Blowfish Encryption Algorithm, Character Encryption

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Performance analysis of Polar code concatenation of Low Density Parity Check codes

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Abstract: The Low-density parity-check (LDPC) codes are proven it’s near to channel capacity. But still, there is the scope for improving its performance with the low error floor region of LDPC. The Polar codes are well known nowadays with channel coding technologies. Polar code can be used as the main channel coding or else with the concatenation of existing channel codes, both will result in better error rate performance and encoding efficiency. This paper analyses the merits of LDPC and Polar code concatenation performance. This concatenation will reduce errors in the Log-likelihood ratio (LLR) calculation. Moreover, its low error floor is also reduced with the minimum complexity. This approach is easy to implement as architecture with optimum utilization. The simulation results are supporting the improved performance of the LDPC.

Keywords: Polar codes, Low-density parity-check codes, Log-likelihood ratio, error floor region, coding efficiency.

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TECHNOLOGY FOR PROSPERITY

UGC AUTONOMOUS

Partitioning of SOC Parameters Development and Analysis

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Abstract: Soc is used to attain high efficiency and effective resource utilization. But achieving such an objective is a challenging and time-consuming one, development challenge owing to partitioning decisions. Based on decision taken during partition, connectivity between blocks of the SoC must always be configured in such a way that the total performance, for both processing and communication, is fast. Connectivity depends on the SOC Key Performance Indicators (KPIs) like pin assignment, channel estimation between blocks and Feedthrough information. Synopsys ICC2 compiler is used to execute and analyze script. Many command shells in Synopsys use Tool Command Language (TCL) as a scripting tool to automate the design process. (GUI) provides tools for visualizing design data and analyzing results.

Keywords: KPI, GUI, Synopsys ICC2 Compiler, SOC

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UGC AUTONOMOUS

Analysis of High Frequency Signal Transmission Over FSO Link in Dusty Weather Conditions Using BPSK Modulation

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Abstract: FSO may be a communication system wherever free area acts as medium between transceivers which they need to be in LOS for triple-crown transmission of optical signal. Medium may be air, outer space, or vacuum. The modulation of BPSK is finished employing a balance modulator, which multiplies the 2 signals applied at the input. The output sine wave of the modulator will be the direct input carrier or the inverted 180-degree phase shifted input carrier, which is a function of the data signal. In existing method, the visibility range is up to 50m by using Quadrature Amplitude Modulation. Here we will give visibility range from 100 to 200m by using BPSK modulation. The results calculated are SNR, BER, Eye diagram.

Keywords: FSO, BPSK

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Simple and Secure Image Steganography using LSB and Triple XOR Operation on MSB

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Abstract: Least Significant Bit (LSB) is a very popular method in the spatial domain of steganographic images. This method is widely used and continues to be developed to date, because of its advantages in steganographic image quality. However, the traditional LSB method is very simple and predictable. It needs a way to improve the security of hidden messages in this way. This research proposes a simple and safe way to hide messages in LSB techniques. Three times the XOR operation is done to encrypt the message before it is embedded on the LSB. To facilitate the process of encryption and decryption of messages, three MSB bits are used as keys in XOR operations. The results of this study prove that this method provides security to messages with very simple operation. The imperceptibility quality of the stego image is also excellent with a PSNR value above 50 dB.

Keywords: Cover Image, Hidden Image, Stegeo-key, Encoding, Decoding

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Speech Assistive Device for Visually Impaired People

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Abstract: There are millions of people in the world who are visually impaired. Reading is one of the major requirements for them. They face a lot of problems in their daily life with accessing printed text. As the technologies are improving and emerging from time to time, it is necessary to take a measure to help visually impaired people, so they can lead an easy life in this modern world. In this paper, we propose an assistive device for visually impaired people which help them to break this hurdle. This project is developed using Raspberry Pi and the camera module is connected to Raspberry Pi by using the python code. Webcam is used to capture the image and the captured image is converted into text using Optical Character Recognition (OCR) and this text will be then converted to speech using eSpeak. This device enables blind people to read without the help of others.

Keywords: Raspberry Pi, Optical Character Recognition (OCR).

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Millimeter Wave Rectangular -Patch Antenna for Future 5G Applications

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Abstract: One of the challenging factors affecting wireless communication industries today is insufficient frequency resources available for their customers and the ever increasing demand for efficient wireless services continuous as well. In order to solve these problem a simple rectangular patch antenna operating in the unlicensed millimeter wave band is presented. The proposed antenna resonates at 28GHz with the corresponding return loss of -31dB, covering about 5GHz bandwidth which makes it a suitable candidate for the next generation (5G) wireless communication devices. The total profile of the designed structure is 5×4×0.64mm³; other parameters such as VSWR, gain, and radiation pattern are also discussed

Keywords: MM-wave, wideband, K-band, Ku-band, gain-bandwidth

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Clock Power Reduction Using Non-Default Rule Routing

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Abstract: The new headway in nanotechnology over an alternate extent of enterprises and an extended microelectronics market interest for low force, elite and intricacy on System on Chip (SoC) have made Electronic Design Automation (EDA) groups to examine and improve at all stages associated with the plan advancement strategy. Large scale manufacturing of ICs at lower innovation hubs have been presented by certain foundries and have guided numerous ventures to utilize this technology for their forthcoming gadgets. This sort of innovation has purchased numerous difficulties for EDA merchants, Physical planners because of the actual imperatives and configuration manages to meet the foundry prerequisites. Non Default Rule (NDR) directing is a method applied during check steering to decrease the Clock power and consequently the general force dissemination of the subsystem. Essentially Clock Tree in a plan is worked to lessen the slant and the idleness, so in this interaction of decreasing slant and inactivity the device adds Buffers/Inverters. By applying NDR procedure the instrument add lesser number of Buffer/Inverters to keep up with slant and latency. Before performing clock directing Floorplan, Placement and Clock Tree Synthesis (CTS) is performed on the plan. The execution of the Subsystem plan to which NDR is to be applied is done in Place and Route Synopsis instrument.

Keywords: System on chip, Non Default rule, Clock Tree Synthesis, ICs, Clock Power, ED, Electromigration, Resistance, Coupling Capacitance, Node, Slew, Skew, Latency, Power

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IoT Covid Patient Health Monitor in Quarantine

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Abstract: Coal mining is the process of extracting coal from the ground. Steel and cement industries use coal as a fuel for extraction of iron from iron ore and for cement production. Underground mining industry comes to the category, where each and every parameter such as methane gas, high temperature, fire accidents and so on has to be monitored regularly. Safe production level of coal mine is still low, disasters in coal mine occur frequently, which lead to great loss of possession and life. The disasters happening in coal mine are due to the complexity of mine environment and the variety of work carried out in coal mine, so it is very necessary to monitor the working environment of coal mine. To get over this problem, projects has proposed a wireless sensor network’s application in coal mining safety system. In this wireless sensor network’s application system there will, be master controllers and slave controllers. Slave controllers will detect the danger and give alert through RF to master controller and it will raise the alarm in all tunnels and also raise message on IOT, which will help to take action as soon as possible. This monitoring and alerting system is powered by Atmega328 microcontroller for master controller and rollers for slave controller and consists of temperature sensor, water sensor, methane and carbon dioxide sensor and RF transmitter which collects temperature, humidity and methane values underground of coal mine.

Keywords: IOT, Temperature Sensor, Water level sensor, Arduino Uno, Wi-Fi Module, RF Module, Buzzer

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UGC AUTONOMOUS

Use of Counting Bloom Filters in Error Detection & Correction

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Abstract: The Counting Bloom Filter (CBF) is useful for real time applications where the time and space efficiency is the main consideration in performing a set membership tests. The CBF estimates whether an element is present in a large array or not. In this paper CBF architecture is analyzed and has been implemented. The CBF is used in many applications like Communication & Networking. The problem with the existing project is, element cannot be removed, and it takes more time for search, and does not produce the result accurately. So, counting bloom filter is designed to reduce the time and it is more accurate. In counting Bloom filters the array of ‘m’ bits is replaced with an removal integers of ‘b’ bits and the operation performed here is insertion, query, removal. Here Counting bloom filter is designed by using hash functions.

Keywords: Bloom filter, Counting bloom filter, Hash function, False positive, False negative.

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UGC AUTONOMOUS

Build, Own Virtual Assistant

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Abstract: Adoption of social network sites and use of smart phones with number of sensors in them has digitized user's activities in real-time. Smart phone applications such as calendar, email, and notes contain lot of user information and may other provide a view into user's activities, while sensors such as GPS sensor can be used to passively find information about the user. In addition to this user and device data, these devices have access to the Internet that can be leveraged to build powerful applications like Siri, Cortana. Goal of this project is to design personal assistant software that understands the semantics of the task. Voice based intelligent assistants need an invoking word or wake word to activate the listener. It is designed and developed using python (version 3.6) with the help of pycharms community interface.

Keywords: voice command, python, wake-word

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Quadriplegics Wheelchair Control by Head Motion Using Accelerometer

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Abstract: The problems faced by paralyzed and handicapped people are many among which they can't move any of their body parts except head. Quadriplegics are persons who are not able to move any of the body parts. This may be due to age, stroke, arthritis, high blood pressure, paralysis and birth defects. The patients with such disabilities are not able to perform their everyday actions such as feeding, toilette usage and movement through space. The patients with such serious incapacities can't play out their ordinary activities, for example, taking care of, and development through space. This robotic wheelchair project aims at designing a wheelchair that will work crucial one is independent mobility. They need external help from other people to execute and perform their daily activities. Electric and advanced wheelchairs are manufactured and designed with an aim to aid paraplegics. But such electric wheelchairs cannot run by patients having high range of impairment like persons who cannot on the basis of head movement of the patient. For normal movement of wheelchair we use hand force. In this project we are using head movement for controlling the wheelchair motion. In this project 2 DC motors used for moving forward, backward and left and right. They are placed on the frame. According to head movement the wheelchair will move as per directions given by user.

Keywords: Quadriplegics

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Implementation of Intelligent Traffic Control System for Congestion Control, Ambulance Clearance and Stolen Vehicle Detection

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Abstract: Each individual vehicle is equipped with special radio frequency identification (RFID) tag (placed at a strategic location), which makes it impossible to remove or destroy. We use RFID reader and ARM7 system-on-chip to read the RFID tags attached to the vehicle. It counts number of vehicles that passes on a particular path during a specified duration. It also determines the network congestion, and hence the green light duration for that path. If the RFID-tag-read belongs to the stolen vehicle, then a message is sent using GSM SIM300 to the police control room. In addition, when an ambulance is approaching the junction, it will communicate to the traffic controller in the junction to turn ON the green light.

Keywords: IOT (Internet of Things), IR sensor, Wifi module, RFID reader, GSM SIM300

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ABOUT CONFERENCE

Online Mega International conference on “Smart Modernistic in Electronics and Communication” (ICSMEC-21) will be organized by St. Martin's Engineering College, Secunderabad, Telangana, India during 2nd & 3rd July, 2021. ICSMEC-21 will serve as a colloquy for sharing the proficiency among academicians, researchers, scientist and industrial personnel from all over the world in the areas of engineering and technology for estimation and prevention of complex situation. All contributions should be of high quality, original but not published elsewhere or submitted for publication. All papers will be reviewed by eminent researchers and all accepted papers will be sent to journal publication. All the abstracts will be published in conference proceedings with ISBN. Participants will present papers online.

Governor Award(thrice)



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