

A Literature Survey on various Lossless and Lossy Data Compression Techniques

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Abstract: *In the recent years, with the increased usage of digital devices such as computers, smart phones and digital televisions there has been a significant growth in the amount of data being generated, stored and shared. This growth has led to a need for “Data Compression”. In fact, the use of data compression has become universal over the last few decades. However, data compression is very much helpful as it reduces the utilization of expensive resources, such as hard disk space or transmission bandwidth. Data transmission over the Internet is integral in terms of accuracy of data being transmitted at low cost and increased speed. It is also very important to manage the volume of data being produced day by day that ranges from smaller size to large size. Data of smaller size can be manageable with the available bandwidth resources but transmitting large files with existing bandwidth is an unresolved barrier in a distributed environment. However, expanding the bandwidth seems to be a potential solution, the extremely high cost makes this unattractive. Therefore, compression is an essential and effective method for transferring files with feasible and transmittable sizes. There are many techniques to compress a data, but they are broadly divided into two groups namely, Lossy Compression and Lossless Compression schemes. This paper talks about various existing Lossy and Lossless compression approaches. This paper provides a survey on analyzing the types of existing compression methods.*

Keywords: *Data Compression, Data Transmission, Lossy Compression, Lossless Compression.*

I. Introduction

Multimedia is one of the predominant productions of technological evolution. Multimedia finds its boundless existence in many fields such as business, academic, healthcare, communication, and so on. As stated by Curtis [1], multimedia refers to the mixture of media such as the internet, simple text documents, graphics, videos, animations, and audios in an integrated way. Up to early 90's the usage of multimedia was bounded due to lack of resources and restricted availability of expensive resources. However, due to the emerging transformation in the digital technology, multimedia started flourishing [2].

Over the last few decades, it has been observed, a drastic transformation in the way we communicate, and the process is still ongoing plenty of innovations. This transformation is because of persistent and ever-expanding usage of Internet, the tremendous growth of mobile communications, and the intensifying significance of video communication [3]. With the technological advancements and rapid developments of digital information technology exponential quantity of data is being generated frequently. Explosive growth of data in digital world leads to the requirement of efficient technique to store and transmit data. It is primarily important to focus on developing better transmission and storage technologies to store and transmit enormous amount of data. Digital technology requires immense amounts of information to be compressed on small storage devices that can be easily preserved and transported due to limited resources. Thus resource allocation tends to be a fundamental

An Adaptive YOLO Object Detection Model for Autonomous Driving System

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Abstract: Autonomous Driving systems plays a very significant role in the area of computer vision as the moving objects like cyclists; cars and pedestrians are the most crucial and essential factors that impact the maneuvering of the vehicles. In this navigable world, driverless cars require reliable and precise recognition of the surrounding objects as these days transportation systems are prone to large number of accidents. To solve this problem, Intelligent vision-based traffic surveillance systems are required in highway monitoring and road management systems which provide real-time statistical data and alert anomalies like in dangerous driving. In this study, the **YOLO (You Only Look Once)** have been researched to recognize the truncated artefacts or the images, as it is the most powerful object detection method with the inclusion of the new function **Memory Map** based on a Multi-Scale Deep Neural Network. In comparison to other approaches, this proposed method results in much better acceleration as it detects objects not only from a static image, but also from moving images.

Keywords: YOLO, R-CNN, Memory map, Object Detection.

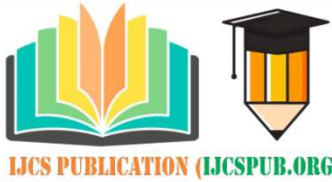
I. INTRODUCTION

For Self automated vehicles, simply the image classification is not good enough. The system should be able to detect, localize and classify the images using surveillance cameras. The action is simply called as the Object Detection. The main objective is to identify and detect the moving vehicles and surrounding objects. Automated cars have to drive and operate in very unpredictable conditions with numerous characters like pedestrians, cyclists and other kind of automobiles. Object recognition for automated vehicles is growing rapidly with the progress in Deep Neural Networks. In recent years, Deep Neural network (DNN) architectures have emerged which are capable of detecting live video feeds by using object detection method like YOLO (You Only Look Once). The higher detection accuracy and improved detection speed can be achieved by YOLO which is able to directly detect the location information. The YOLO divides the

whole image into various grids by predicting the bounding box and class probabilities for every unique grid. Further, from ImageNet dataset, a feature vector is taken, and image approximation is added, which directly regress from the input image to the class score and positions of the object class. The real-time object detection is performed by selecting the intrusion detection model with the detection speed of 30fps. The CNN is tracked and pre-trained on a large dataset throughout training time and turned into a small dataset. Therefore, the future matrix can be extracted from the previous datasets for both optimistic ground truth areas and destructive truth areas and preserving for the next training phase.

Detecting of objects for various classes based on regions are mainly classified by Regions with Convolutional Neural networks (R-CNN). Compared to other strategies at the moment, R-CNN achieves exceptional detection precision. It splits the detection problem into several categories like bounding boxes, class probabilities, CNN pre-training and CNN fine-tuning. The training of the R-CNN pipeline can be accelerated by Fast R-CNN network, where each image is not wrapped to the actual size before being fed to the Convolutional Neural network (CNN) [2], but instead the corresponding images are cropped from the output feature maps of the last convolutional layer. In the fast R-CNN, the region proposals are created by Region Proposal Network (RPN) and the overall process can be trained in an end-to-end manner. Fast R-CNN is equivalent to that of the R-CNN algorithm as well. Here, the input image is fed to the CNN to create a convolutionary feature map instead of feeding the area proposals to the CNN.

The region of solutions from the convolutionary feature vector is defined and wrapped them into maps and redefined them into a fixed size by using a Region Of Interest (ROI) max - pooling so it can be fed into some kind of fully integrated layer [9]. Softmax [11] layer is used from the ROI function



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A SURVEY ON ANTI - KEYLOGGER

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Abstract: An anti-keylogger is a program that specializes in detecting and identifying keystroke logging software which is also capable of fixing or at least immobilizing hidden keystroke logging software. Of late, Cyber crimes have been witnessed as a major threat to the prudence of data owned and maintained by firms. Leveraging keylogger has made it easier to collect information. Depending on the type of keylogger being used, the keystrokes can either be discovered using a software keylogger or by a hardware keylogger. Keylogger software can be detected using some anti-keylogger programs. In some cases, hardware keylogger may not be detectable by software, since they are connected externally to the CPU and don't participate in the CPU's activities. These key loggers may pose a serious threat if not detected in time.

Index Terms - Keylogger, Cybercrimes, Anti-keylogger, Malware

I. INTRODUCTION

The Malware is a software that design to leak private or sensitive information or gaining unauthorized access to system across the globe. Detecting and preventing malware attacks is really important in cyber world [1]. As nobody wants their private and sensitive information to be leaked someone else without their permission. This may cause financial loss, highly classified data can be leaked etc. There are different types of malware that can retrieve user data to hacker or attacker. Such malware are virus, Trojan, worms, spyware, rootkit etc. Defence against keylogger and such malware that can retrieve the sensitive information to others can be done with the help of Anti-keylogger. Anti-keylogger are against of privacy breaching and also anti-keylogger provides to user a free and safe environment from the keylogger and different types of malware attacks that could be done through hacker or attacker. Anti-keylogger is a type of software that is developed in such a manner that can detect any keylogger present on the system that can retrieve our important or sensitive credential to any third parties or to hacker. Therefore, an Anti-keylogger is used against keylogging software or any malware software that can process in background. Anti-keylogger detect keylogger program's or software in our system and then either it can eliminate them or delete data collected by them and it can also immobilized our hidden keystroke logs or will warn us about existence of any keylogging software present on our system. This is used to protect the keylogging activities from taking place on the system and Personal details or sensitive information can be saved from getting leaked with the help of this anti- keylogger software. Anti-keylogger can not differentiate between legal and illegal keystroke program's that present on the system. It is using in so many different IT fields such as large organizations, financial institutions, public computers and even on personal computers system to protect from getting captured keystrokes. There are three different types of process to detect the keylogger or to detect privacy breaching malware present on the system. First one is Signature based detection , second one is Behavioral detection and last one is SandBox detection.

1. Signature based detection

In this process of detection, anti-keylogger detects that particular keylogger that is listed as a keylogger on the sites. It will scan all the files present on the systems and if it will get any keylogger file or any keylogger present on the system then it will show that particular file as a threat file or malicious file. Even it will also provide all the details that why it marked as threat file out of other files. Signature based detection main disadvantage is it will detect those keylogger who all are listed so it can not detect any other keylogger out of given list to it [6].

Drawback is hacker can rename keylogger and can retrieve all the information without the user knowledge.

2. Behavioral detection

It focused on the general problem of detecting malicious files or software behaviour. This process of detection is also known as heuristic analysis that helps to detect any keylogger present on the system with the help of file or any program behaviour. if any software or program is trying to harm system or even any program perform malicious function . it will detect them and terminate that particular program by showing warning to user that particular file or program is harmful for your system. Sometimes it is used to block non-harmful software because it monitors the some different activities of that particular software.



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MORSE CODE SECURITY

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Abstract— Morse code is one of the before time telecommunication which is infrequently used now a days due to the vivid ways of communications. Seeing that utmost of the people in the world face barriers in the field of authentication and security. In this design, real time eye tracing allows people to authenticate themselves using Morse code. Here the Gaze based authentication refers to detecting the eye position using successive frames of images and tracking eye center overtime. The password is authenticated using Morse code where the alphabets, numbers and special symbols are represented by dots and dashes independently. This model provides a real time operation for Gaze-based PIN entry, eye detection and tracking for the identification of the PIN using smart camera.

Index Terms—Authentication System, Eye Blink, Face Recognition, Machine learning, Morsecode, Personal Identification Numbers.

I. INTRODUCTION

The change or development in our life is due to technology advancement we have inculcated in our day-to-day life. Within the boundaries of a sophisticated society, vast gains of technology related revolution have exceeded the other side formation. The huge amount of both unstructured and structured data recognizes the patterns from which the organization gets benefited by expenditure control, managing risk and analyzing various market opportunities which increases the competitive advancement. Holding usability and secrecy to analyze result is the principle of psychological assumptions. The security will be adding a possible matter for the action that the user performs. This project accounts with those factors to gain the output which is easy to reach user interacting systems. As in the present scenario there are no much utilities for the physically challenged, that incorporates with the traditional group. Scaling back the load on the physically challenged people is attained which makes them more unified within the society.

Scope: Tools which can calculate the visual activities.

Physically challenged to be interacting using the eyelids. The scope of the project is to provide a securable process to all the kinds of people be it the young or the old which incorporates the physically disabled.

II. PROBLEM STATEMENT

“To apply a structure that supports the physically challenged that directs them to access devices and accounts in a secured manner”.

- 1.To provide a platform for physically challenged users to make a private account that only they can pierce.
2. Eye Blinking grounded systems provide optimistic system safety and usability solutions.
3. It provides a result that will authorize people with motor disabilities to communicate with bias which includes authentication.
4. Rather than codifying in some authentication law, a bit more is gained.
5. It gives catch phrases and makes lower use of tackle detectors generally used at present.

III. METHODOLOGY

Design is a process that defines the basis of the architecture module, components and the requirements of the data specifications to be satisfied. The description on the software decompositions, arrangements and interfaces between component are verified System design involves the description of the Architectural designs, Logical designs and Physical design. This is foremost important phase of a development. The problem statements, evaluations, plans, and situation detailed analysis provides a knowledge schema. This is identified as a highlighted section in the system development without which the development of the proposed system cannot take place.

Survey Paper on Online Whiteboard – A Web App for online whiteboard sessions

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Abstract: Human connection is more important than ever as the world battles COVID-19. The internet plays an important role in connecting people throughout the world. Many businesses have taken certain measures to connect and collaborate in these unwanted times. This has led to an increase in demand for online collaboration tools for connecting people throughout the world. A tool widely used in such places to collaborate and connect is a whiteboard. In this paper, we develop a tool to increase collaboration without restricting people to any location, any particular OS, or any particular device needed to be used. Our application allows users to interact and collaborate through visual explanations, especially regarding the writing of the text, making diagrams, uploading images and models/sketches interactively that can be shared with all participants connected over the network in real-time. The tool does not require any plug-in to be downloaded, it is easy to use and has no limit on the number of clients. We have implemented this system by using “Insert software we’re going to use to create this”.

Keywords: Online Whiteboard, NodeJS, Sockets, Transfer Control Protocol.

I. INTRODUCTION

It is a free and easy to use web application which allows the users to host an online whiteboard on which the users can collaborate and use it to annotate their ideas, explanations, drawings, presentations without the need of sharing the screen.

Meetings and classrooms demand the presence of the person in the room if he wants to participate. A tool widely used in such places is a whiteboard. A virtual whiteboard is a shared whiteboard application where multiple clients can connect and write, share, and interact with each other in real-time without needing to be in the same physical location.

II. PROBLEM IDENTIFICATION

The main problem here is the inability to express ideas, facts and explanations visually during online meetings. These is also difficulty in collaborating with other parties of the meetings for sharing and expressing their ideas. If the program uses up a lot of memory due to high graphical interphase and other methods, this in turn will cause the system to hang. It needs to have good security measures so that nobody will be able to misuse the features which are available to them.

III. PROBLEM STATEMENT

Online meetings and video conferences have skyrocketed due to Covid-19, many systems cannot handle the high graphic interface of a few websites, our whiteboard consumes very little memory and bandwidth. Our whiteboard has a simple UI/UX which makes it very easy for the user to navigate and use the whiteboard. Another problem is that majority of the whiteboards have features but they need to be purchased to be usable, which makes it difficult for small organizations to afford the board.

IV. GOALS AND OBJECTIVES

The main goal is to provide a secure, reliable and user-friendly web application that enables a user to make host an online whiteboard session and annotate their explanations, facts and ideas to fellow members of the session. To create web app that users can access either via the website or online meeting platforms like MS Teams. Provide sufficient security features like verified joining of members and request and allow permission to annotate along with the meeting host to annotate together.



SURVEY ON DEVELOPING A SECURED E-COMMERCE APPLICATION FOR PURCHASING ELECTRIC VEHICLES

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Abstract : EV- Mart is an e-commerce application that will serve as a central purchasing point for upcoming electric scooters, next-generation electric cars, and accessories. Users will be able to purchase these vehicles from the comfort of their own homes, with a wide range of options available on a single screen. EV-Mart is a business-to-consumer (B2C) e-commerce platform that will serve as a retailer or a conduit between various electric car manufacturers and end users or customers. Consumers will have various alternatives to choose from, regardless of the company's unique products. This year's EV sales surge is expected to continue, signaling that the migration to electric cars is picking up speed. The most significant transition is taking place in the two-wheeler market, where electric two-wheelers have been driving volume increase in recent days. In November 2021, registered electric two-wheeler sales increased by more than five times, to 22,450 units, compared to roughly 4,000 units in November 2020. Electric two-wheelers increased by 17% month over month, according to data from the CEEW (Council on Energy, Environment, and Water). These figures support the necessity for e-commerce in this industry. We will build EV – Mart as a platform or a hub for electric vehicles, assisting customers in making decisions about which EV to buy depending on their needs.

IndexTerms – Electric vehicles , E-commerce ,MVC-architecture, User Experience, Web Design, RSA, Hybrid Filtering.

I. INTRODUCTION

E-commerce aids nations in improving trade efficiency and facilitating emerging countries' entry into the global economy. It enables firms and entrepreneurs to compete on a more level playing field. Many of the restrictions of conventional business were eliminated with this kind of dealing. The existence of virtual marketplaces, routes, and shops that do not take up physical space, enabling access and circulation in these markets for a brief period of time and from anywhere in the globe without leaving home. Select and order things that are advertised on virtual networks and put in virtual shop windows in unidentified regions of the globe, with payment made using electronic services. "The Indian E commerce sector has seen a big upswing as a result of COVID-19, and there is much space for future expansion," said Phil Pomford, managing director of FIS' Asia Pacific Worldpay. According to the analysis, online shopping will fuel India's e-commerce business, which is expected to increase at a rate of 21% annually over the next four years and the most common payment methods online in 2020 were digital wallets (40 percent), credit cards (15 percent), and debit cards (15 percent).

There are 6 basic types of e-commerce:

1. Business-to-Business (B2B)
2. Business-to-Consumer (B2C)
3. Consumer-to-Consumer (C2C)
4. Consumer-to-Business (C2B).
5. Business-to-Administration (B2A)
6. Consumer-to-Administration (C2A)

"E-commerce is no longer restricted to conventional websites, and physical retail has become more integrated with the digital world. Consumers want the same hassle-free and quick shopping experience whether they purchase through an app, through their social feeds, or in person. If merchants prioritize the consumer experience throughout the checkout process, they will be well positioned to succeed. "Those that position themselves with digital payment capabilities will be well-positioned to exploit the next wave of development in India's retail and E-commerce markets," the research said.



BIRD SPECIES IDENTIFICATION - A SURVEY

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Abstract : Birds are regarded as the most valuable aspect of God's creation. Birds contribute to Earth's biodiversity in various ways. They indicate environmental hazards as they are very much sensitive to habitat and climatic changes. They are considered as a driving force in promoting conservation and also contribute to the economy. Birds aid to control rodent populations and are extremely efficient insect pest controllers. Ornithologists who often work on reporting bird activity need some kind of assistance to deal with the reporting. Numerous bird books have been published to assist birdwatchers and ornithologists in order determining the correct species. However, the identification of birds is an impractical piece of work to be done manually. Image-based bird species identification involves various techniques like Open CV, CNNs and few more which are the most important image processing techniques to predict the type of bird species. Few of the applications have been built to counterbalance the usage of bird books. Nevertheless, they have few drawbacks of their own. This paper performs a survey on the existing systems, the techniques adopted and the challenges faced.

Keywords - Bird Identification, Convolutional Neural Networks (CNN), Ornithologists, Deep Learning, Image Recognition.

I. INTRODUCTION

In today's world, most identification systems rely on images to identify species. After being exposed to enough training data, classifiers can correctly identify the trained species. They are trained by using accurately identified datasets. Accurate identification of birds is the basis for all aspects of bird activity reporting and research. Most studies used less than 275 bird species in a dataset. Software for image recognition requires knowledge of Convolutional Neural Network (CNN) which is one of the Deep Learning neural networks. It is quickly becoming the most popular tool. The CNN takes an image as an input and allocates weights to objects based on their importance. Deep Learning enables us to recognize complex relationships among many variables. It can also help you solve complex problems, such as discovering hidden patterns in your data. Bird species identification is considered as one of the confusing issues that often leads to ambiguity. Recognizing birds manually is based on a few characteristics. Due to limitations of birding such as such as location, distance, and equipment, classification according to specific characteristics is often cumbersome. The existing models comprise of four steps: 1. Collecting and bounding the bird dataset 2. Applying CNN architecture 3. Training CNN model 4. Testing the effectiveness of the trained model.

II. EXISTING MODELS

Yo-Ping Huang and Haobijam Basanta developed a model that deals with the recognition of bird species with dataset about 27 bird species endemic to Taiwan. This was achieved with the aid of a mobile application i.e., the Internet of Birds (IoB). This model was implemented using CNN with skip connection. CNNs are studying images of birds to determine their characteristic features. Bounded regions of interest have been created to refine the color and shape of object details. In addition, skip connections were used to linearly combine the outputs of previous and current layers. To enhance the feature extraction skip connections were implemented. To obtain probability distribution a function named softmax was utilized. The output layer outputs: (a) Chunks of the image having birds, (b) type of bird species, and (c) Portion of the input image not containing a bird . The strategy of multiscale sliding window was applied to detect output of images with or without birds. The CNN model will skip connections achieved an accuracy rate of 99.00% whereas CNN without skip connections achieved 93.98% accuracy. SVM achieved an accuracy of 89% [1].



A Survey on Hand Gesture Recognition for Differently Abled People

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ABSTRACT: Hand Gesture is the most basic technique for conversation amongst humans. Today in the time of current day innovation, gesture recognition affects the world in a different way, from physically challenged individuals to robotic control. Human hand gestures provide a natural and effective approach to non-verbal conversation with the computer system. The deaf and mute make use of sign language to communicate which is difficult to interpret by the individuals who are not well-aware of it. There is a need to build a device that can interpret the gestures into text and speech. To tackle this problem, the system created here will use the Deep Learning Model created using Tensorflow to interpret the gestures, capture the image, and finally, use it to give the result of the gesture shown by the user.

Keywords: Hand Gesture, Tensorflow, Deep Learning, Image Processing, Computer vision, Text, Audio.

I. INTRODUCTION

In recent years, the population of deaf-dumb victims has accumulated due to birth defects and different problems. Since a deaf and mute person cannot speak with a standard person they have to be compelled to some quiet communication system. Sign language is very popular among them and they use hand gestures to express themselves. Gestures could be an image of physical behavior or emotional expression. It includes body gestures and hand gestures. It is mainly classified into two parts one is a static gesture and another is a dynamic gesture. For the previous, the posture of the body or the gesture of the hand denotes a symbol. For the latter, the gesture of the hand denotes equivalent messages. Gesture recognition determines the user intent through the popularity of the gesture or movement of the body or body elements. Within the past decades, many researchers have striven to spice up hand gesture recognition technology. Hand gesture recognition has nice value in several applications like language recognition, video games, language interpreters for the disabled, and golem management. The importance of gesture recognition has accrued at a really quick pace owing to the new generation of gesture interface technology. Sign language is especially a

language for the differently-abled(deaf-mute) community that can't use spoken languages to speak with others. Though they will see, the utilization of hand signs to move becomes inconvenient to precise one's feelings without delay if a typical hand language isn't followed. A customary language features an outlined set of signs and their meanings, creating them simple to grasp. The language uses completely different gestures for communication, principally the hand. Sign languages are distinct from spoken languages. The utilization of hand gestures for interaction either with humans or with machines is relatively beyond different body gestures like head and eyes because of the actual fact that hands send additional clearer signals and also the gestures may be created ad-lib. Nowadays, deaf and dumb individuals are getting additional and additional outgoing, and in contrast to the past, don't rely upon anybody for communication. So, for such individuals, it's vital that the public around them should be ready to perceive what they require to inform them of exploitation language. For such individuals, we tend to build the hand gesture recognition system in order that although anyone doesn't grasp the meanings of the signs, they will use this program to recognize the language. Hence, the deaf and dumb individuals don't have any barrier in their communication.

The proposed system is expected to give an accuracy of 90%.

II. LITERATURE SURVEY

[1] Parshwa P. Patil, Maithili J. Phatak, Suharsh S. Kale developed a model for Hand Gesture Recognition for Deaf and Dumb using Adaptive Boosting, Motion Detection, Region of Interest, Thresholding techniques. This model produced decent classification results of 73.68% with a small feature vector size containing 8 features.

[2] Kundan Kumar Dubey, Ajitanshu Jha, Akshay Tiwari, K. Narmatha used OpenCV, Computer Vision, Deep Learning to create a Hand Gesture Movement Recognition System Using Convolution Neural Network Algorithm. Inception v3 was one of the techniques that was used to improve the accuracy of the model. The proposed system is capable of recognising hand gestures from the entire image without the use of any image region selection framework.



SURVEY ON FOOD TRACE USING BLOCKCHAIN

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Abstract: Traceability is now transformed into a fundamental viewpoint in supply chain administration, especially in safety-sensitive businesses like food. Consolidating blockchain innovation into food traceability can move forward supply chain administration, brand notoriety, buyer certainty, quicken item improvement, and diminish obligation dangers. This review employs expressive and substance examination to inspect distributions related to blockchain and internet of things-based supply chains and traditional supply chains. To completely inspect blockchain-based supply chains, four well-designed questions are being proposed and tended to, specifically, the esteem of incorporating blockchain into supply chains, the fascination of researchers to specific supply chain topics, the improvement of inquiring about strategies, and outline sorts in receiving supply chain applications of blockchain, and the sorts of businesses included in supply chains that use blockchain. The review considers points to examine the present-day standing, potential uses, and succeeding proceedings of this technology in supply chain administration. The objective of the study is to give an overview of blockchain-based supply chain investigation, along with an overview of the current state of literature, and highlight the advantages and troubles in incorporating this ideology. Chosen compilations were reviewed to create an abstract of supply chains utilizing smart contracts and blockchain. This paper provides valuable data to assist researchers and professionals to probe the relevant points to quicken the improvement of blockchain-based supply chains.

Index Terms – Blockchain, Food Supply Chain, QR Code, Smart Contracts, Traceability

I. INTRODUCTION

In the last few years, the expansion of investigation, ventures, and dialogs concerning shared ledger technology has progressively pulled in the thought of analysts and professionals. The rationale is the features that it provides, such as upsetting the existing structure of centralized frameworks. It alludes to an uninterrupted record of time-stamped records successively connected using cryptography. This makes it a permanent, secure, and trustful show where exchanges among parties are concerned. A few topics have been in the last few years, the expansion of investigation, ventures, and dialogs concerning shared ledger technology has progressively pulled in the thought of analysts and professionals. The rationale is the features that it provides, such as upsetting the existing structure of centralized frameworks. It alludes to an uninterrupted record of time-stamped records successively connected using cryptography. This makes it a permanent, secure, and trustful show where exchanges among parties are concerned. A few topics have been explored utilizing this concept and supply chain administration is one of the developing applications. In this paper, a study on conventional and blockchain-based systems is done that describes some of the supply chain obstacles. The goals and inspiration in the reviewed publications are distinguished highlighting the results of the system used. To solve many issues regarding the supply chain, information is needed to be unchanging as well as open. Blockchain could be an encouraging innovation having the capability to fulfill numerous supply chain challenges.

Supply Chains include different members and partners and various forms in different stages. Any process in a supply chain consists of a sequence of individual steps, which shall be described by a manageable number of general activities [12]. They have ended up more worldwide, complex, and interconnected over stages. Fig 1. underneath portrays the occasions and substances that take a portion in a commonplace nourishment supply chain.



SURVEY ON INDUSTRIAL AIR QUALITY MANAGEMENT SYSTEM

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Abstract : Air pollution is known to be one of the most important problems of cities all over the world, and industrial emissions play a major role in affecting the air quality. Tracking the pollution levels is the need of the hour, where pollution levels can be analyzed with the help of an index called the Air Quality Index(AQI). However, the existing system that analyzes industrial air pollution data lacks transparency and is prone to tampering which is a hindrance to better decision making. Therefore, a tamper-proof air quality management system is to be designed using blockchain technology. This paper performs a survey on various techniques and challenges in predicting AQI and storing the air quality data in a transparent distributed ledger and also lists some research papers that aid with this issue.

IndexTerms - Air Quality Index(AQI), Distributed Ledger, Blockchain, Machine Learning(ML)

I. INTRODUCTION

Urbanization and industrial expansion has been blamed for the majority of the environmental pollution. Air pollution is a major threat to the environment. Manufacturing and technology advanced after the Industrial Revolution, resulting in an increase in factories and industries. These factories polluted the environment by emitting smoke into the atmosphere. Most industrial townships had unplanned growth, with businesses breaking rules and regulations and harming the environment both with water and air pollution. In some circumstances, air pollution in megacities surpasses the permissible limit, raising concerns.

The government considers the gravity of the content and, through government organizations, regulates the amounts of air pollution at each industrial site. A consignment agency's air pollution measurement test is one of them, and it has a variety of negative implications, including inspection timing, inaccuracy, manipulation, and alteration. With data on air quality, plans and data-driven recommendations can be developed to mitigate the possibly severe implications. These suggestions, on the other hand, are based on the Air Quality Index (AQI) numbers.

However, because sensors may not provide AQI measurements instantly, estimating AQI from sensor values can be difficult. This report presents a method for assessing the quality of air by linking sensor data to an AQI score with the help of prediction models. Machine learning algorithms equip us with tools for forecasting air pollution levels so that people can take preventative efforts to reduce pollution. The use of a blockchain to secure AQI values that may be tampered with for immoral objectives represents the work's uniqueness. The blockchain was utilized to verify that the measured data was immutable and transparent.

We discuss the techniques of the air quality management system widely used today which includes a ML model that predicts the AQI, and the same is stored in a tamper-proof distributed database using blockchain technology. We present a list of research papers that helps in overcoming the challenges of the existing system and finally we present our model that helps to predict air quality accurately and store it on the blockchain. Further the paper is organized as: A literature review of the air quality management system in Section 2. Our model of Tamper-proof air quality management system in Section 3 followed by conclusion and future work in Section 4.



Detection and Segmentation of Corona Virus Infected Region of Lung in CT images by using Deep learning approach

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Abstract: This research presents an application of lung segmentation of an internal organ from computed tomography images using an artificial intelligence development approach. The deep convolutional neural network was used to perform semantic segmentation of an internal organ by training through different computed tomography image slices with a medical dataset that has abnormal physiology. Coronavirus disease infected on the lung datasets were used as a study in this research with adjusted deep fully convolutional neural network compared with an architecture of U-Net model that was used to implement the experimental process. However, this research will aim to develop a deep learning model as an image processing to use with medical image data to reduce the time in a part of treatment planning.

IndexTerms - Deep learning, Image Segmentation, Computational modeling, Computed tomography, Lung, Convolutional neural networks

I. INTRODUCTION

COVID-19 presentation, which began with the reporting of unknown causes of pneumonia has rapidly become a pandemic. The most common test technique currently used for COVID-19 diagnosis is a Real-Time Reverse Transcription-Polymerase Chain Reaction (RT-PCR). We are aiming to design a Non-Contact method and breaking human intervention like swab collection or testing in a short period of time. Chest Radiological Imaging such as Computed Tomography (CT-Scans) have vital roles in early diagnosis and treatment of this disease. Doctors diagnose based on clinical and chest CT results, CT Scan is widely used for COVID-19 detection.

II. LITERATURE REVIEW

[1] Siti Raihanah Abdani ; Mohd Asyraf Zulkifley ; Nuraisyah Hani Zulkifley in the study “ A Lightweight Deep Learning Model for COVID-19 Detection” which was based on 14 layers of CNN with a modified Spatial Pyramid Pooling model. This network allows to identify the covid 19 disease for various severity levels. SPP- Covid -Net achieves the best mean accuracy. The implementation was easy in this paper.

[2] João O. B. Diniz, Darlan B. P. Quintanilha “Segmentation and quantification of COVID-19 infections using pulmonary vessels extraction and deep learning“. In this study the aim was to automatically segment infections caused by covid 19 and provide quantitative measures of these infections to specialists thus serving as a special tool using pulmonary vessel extraction .

[3] Aboul Ella Hassanien, Hassan Aboul-Ella “ Automatic CT COVID-19 Lung Image Classification System based on Multi-Level Thresholding and Support Vector Machine” In this method, The deep studying based methodology was recommended for the detection of covid-19 by multi level thresholding and Support Vector Machine.

[4] Wentao Zhao “ Deep learning for COVID-19 detection based on CT images” In this study, they proposed a screening tool where they use chest CT scans to diagnose the patients for COVID-19 pneumonia. They built a 2D segmentation model using the U-Net architecture, which gives the output by marking out the region of infection.

[5] Rohit Lokwani, Ashrika Gaikwad [5], “Automated Detection of COVID-19 from CT images using Convolutional Neural Networks in this study they proposed a prospective screening tool wherein they use chest CT images to diagnose the patients for COVID-19 pneumonia. They build a 2D segmentation model using the U-Net architecture, which gives the output by marking out the region of infection.



VISUALIZING AND FORECASTING STOCKS USING DASH

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Abstract: In the money world stock exchanging is one of the most significant exercises. Stock exchange forecast is a demonstration of attempting to decide the future estimation of a stock. This paper clarifies the forecast of stock utilizing machine learning. The specialized and major or the time arrangement examination is utilized by the majority of the stockbrokers while making the stock predictions. The programming language is utilized to foresee the financial exchange utilizing AI in Python. Right now, we propose a Machine Learning (ML) approach that will be trained from the accessible stock's information for a precise prediction. Right now, study utilizes an AI procedure called Long Short-Term Memory (LSTM) Algorithm to foresee stock costs

Index Terms - : Stock Market, Machine learning, Predictions, Long Short Term Memory

I. INTRODUCTION

These days, as the associations between overall economics are fixed by globalization; outer aggravations to the money related markets are never again residential. With developing capital markets, an ever-increasing number of information is being made day by day. The inherent estimation of an organization's stock is the worth controlled by assessing the normal future incomes of a stock and limiting them to the present, which is known as the book value. This is different from the market estimation of stock that is controlled by the organization's stock cost.

Investing in the stock market is among the common ways investors attempt to grow their money, but it's also among the riskier investment options available. Understanding the basic concept of the stock market is the first step in becoming an informed investor. While the stock market is an extremely complex system, its basic traits are much simpler.

II. LITERATURE SURVEY

[1] Ashish Sharma, Dinesh Bhuriya, Upendra Singh proposed stock market prediction has become an increasingly important issue in the present time. One of the methods employed is technical analysis, but such methods do not always yield accurate results. So it is important to develop methods for a more accurate predictions that are obtained from the stock price after considering all the factors that might affect it. The technique that was employed that was employed in this instance was a regression. Since financial stock marks generate enormous amounts of data at any given time a great volume of data needs to undergo analysis before a prediction can be made. Each of the techniques listed under regression habits own advantages and limitations over its other counterparts. One of the noteworthy techniques that were mentioned was linear regression. The way linear regression models work is that they may alternatively also be fitted in other ways, such as by diminishing the "lack of fit" in some other norm, or by diminishing a handclapped version of the least square's loss function. Conversely, the least squares approach can be utilized to fit nonlinear model.

[2] K.Hiba Sadia, Aditya Sharma, Adarsh Paul, SarmsthaPadhi proposed a stock prediction using few classifiers includes the Random Forest Classifier, SVM Classifier. The outcome of the paper is to sum it up, the accuracy of the SCM Model to Test Set is 0.787 whereas the Random Forest Classifier is calculated to 0.808.

[3] Ashutosh Sharma, Sanket Modek, Eashwaran Sridhar published the Data Visualization and Stock Market and Prediction paper in IRJET. In the paper they compared the benchmark model- Linear regression to the final improved LSTM Model, Mean Squared Error. Output graph showing the pattern prediction by LSTM model and the actual pattern observed in the dataset of closing price.



Face Mask Detection and Alert System

Using Computer Vision and Deep Learning

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Abstract : The COVID-19 pandemic is causing a worldwide emergency in healthcare. This virus mainly spreads through droplets which emerge from a person infected with coronavirus and poses a risk to others. The risk of transmission is highest in public places. One of the best ways to stay safe from getting infected is wearing a face mask in open territories as indicated by the World Health Organization (WHO). In this project, we propose a method which employs TensorFlow and OpenCV to detect face masks on people. A bounding box drawn over the face of the person describes whether the person is wearing a mask or not. If a person's face is stored in the database, it detects the name of the person who is not wearing a face mask and an email will be sent to that person warning them that they are not wearing a mask so that they can take precautions.

IndexTerms – Covid-19, face mask, TensorFlow, OpenCV, database.

I. INTRODUCTION

COVID-19 had a massive impact on human lives. The pandemic led to the loss of millions and affected the lives of billions of people. Its negative impact was felt by almost all commercial establishments, education, economy, religion, transport, tourism, employment, entertainment, food security and other industries. According to WHO (World Health Organization), 55.6 million people were infected with Coronavirus and 1.34 million people died because of it as of November 2020. This stands next to black death which almost took the lives of 60 percent of the population in Europe in the 14th century. After the person gets infected, it takes almost fourteen days for the virus to grow in the body of its host and affect them and in the meantime, it spreads to almost everyone who is in contact with that person. So, it is extremely hard to keep track of the spread of COVID-19. COVID-19 mainly spreads through droplets produced as a result of coughing or sneezing by an infected person. This transfers the virus to any person who is in direct close contact (within one-meter distance) with the person suffering from coronavirus. Because of this, the virus spreads rapidly among the masses. With the nationwide lockdowns being lifted, it has become even harder to track and control the virus.

Face masks are an effective method to control the spread of viruses. It has been found that wearing face masks is 96% effective to stop the spread of viruses. The governments, all over the world, have imposed strict rules that everyone should wear masks while they go out. But still, some people may not wear masks and it is hard to check whether everyone is wearing a mask or not. In such cases, computer vision will be of great help. There are no efficient face mask detection applications to detect whether the person is wearing a face mask or not. This increases the demand for an efficient system for detecting face masks on people for transportation means, densely populated areas, residential districts, large-scale manufacturers and other enterprises to ensure safety. This proposed method uses machine learning classification using OpenCV and Tensorflow to detect face masks on people.

II. RESEARCH METHODOLOGY

Dataset Collection:

The dataset was collected from Kaggle Repository and was split into training and testing data after its analysis. The data consists of three classes – With mask, Without mask and Improper mask. For training purposes, 80% images of each class are used and the rest of the images are utilized for testing purposes.



A NEW IoT GATEWAY FOR SMART AGRICULTURE

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Abstract : Agriculture is India's backbone, supplying a set of domestic product to maintain food security. Farming plays an essential part in the development of the country because it accounts for significant portion of the Indian economy. The project aim is to convert the traditional agriculture methods to smart agriculture by using modern technology and Internet of things(IoT). The major part in the system is the robotic vehicle, it is a powerful agricultural machine with a large soil-clearing capacity. This multifunctional system provides an advanced way for tilling, farm levelling, seed planting and harvesting with minimum amount of manpower and labour, making it an efficient vehicle and most important thing is scaring of birds and animals that enter into the field. Second, this project includes security features for a warehouse, such as temperature control, warehouse theft detection, and storeroom humidity control, as well as a soil moisture detector. Also, the condition of the form is updated to user in the form of SMS through Wi-Fi module on the environmental state of fields. All of these functions are managed by any internet-connected Android phone.

IndexTerms -Raspberry pi, Farming, IoT

I. INTRODUCTION

This project includes developing a warehouse management system using various sensors, as well as designing a robot to perform all agriculture-related operations, scare animals that enter the field, provide irrigation by knowing the soil condition, and design a robot to perform all agriculture related operations. It is critical to mark-up our agriculture industry as technology evolves on a daily basis. In the agricultural industry, several studies are conducted. Many proposals call for the creation of a wireless sensor network that may give different atmospheric aspects by watching atmospheric condition. However, simply studying atmospheric aspects will not boost agricultural production, there are a number of additional variables that might lower crop yield. The solution is to apply automation to boost production by lowering labour and improving work speed in the field by employing robots to execute tasks faster and sensors to safely store grown products. This project aims to transform agriculture into smart agriculture via the use of IoT, and it will be distributed to our country's agriculturalist. Uses virtual network connection and cloud data bases to connect them.

New technologies for monitoring, managing, and coordinating the value cycles of crop and life-cattle production are going to change the agricultural business so thanks to IoT applications. In the agricultural industry, technology plays a critical role in lowering personnel and improving crop yield. Some of the activity is aimed at assisting agriculturists in expanding their business by offering them with a technology based framework. The Internet of Things (IoT) connects machines, gadgets, and their human operators through cable LAN, but it is increasingly adopting wireless technologies, such as 4G-LTE, 5G, Bluetooth, and Wi-Fi. Data captured and delivered from IoT clients is forwarded to a data cloud and stored in a database that is accessible to all network members.

II. LITERATURE SURVEY

In this section we will discuss research papers studying smart agriculture system

In the paper [1] written by Shivangi Vashi, Jyotsnamayee Ram, Janit Modi. The Internet of Things (IoT) is a new technology that uses internet connectivity to connect sensors, vehicles, hospitals, companies, and consumers all around the world. IoT architecture aids in the creation of Smart Cities, Smart Homes, Smart Agriculture, and a Smart World. Because the Internet of Things has a huge number of devices, its architecture is complicated. In the Internet of Things, the most critical parameter is security. Using the example of Smart World, this paper provides an overview of IoT architecture.

In the paper [2] written by Stefano Giordano, Ilias Seitanidis, Mike Ojo, Davide Adami. In our daily lives, technology plays a critical role. There is more demand for IoT in many fields. In the agriculture sector, IoT helps in smart farming, precision making

HUMAN DERMIS CANCER DETECTION

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ABSTRACT: The prevalence of both non-melanoma and melanoma skin cancers has been increasing over the past decades. Skin cancer diagnosis can be a cathartic experience, however a physician can face with many trials and tribulations. The personal burden of skin cancer can be significant, if detected at an early stage, 5-year survival rates are over 90%. Image processing has always the potential to improve the diagnostic accuracy. Recent research in dermatology exemplify that image processing using ML for selected lesions is similar or of higherranking when compared to human experts in image based diagnosis under experimental conditions. This paper defines the best approach to identify/diagnose the cancer at an early stage by distinguishing the Benign from Melanoma skin cancer with CNN algorithm. The performance of this method is experimented on 2000 training samples. Accuracy for this method was encouraged and can reach up to 87%

Keywords: CNN(Convolution Neural Networks), Deep learning, SVM(Support Vector Machine), KNN(K-Nearest Neighbor), ABCD(Asymmetry, Border, Color, Diameter), SVM(Support Vector Machine), Dermoscopic, Pre-processing, Feature Extraction, Segmentation.

INTRODUCTION

This project aims at detecting the cancer and the type of cancer at an early stage. Approximately one in five people develop skin cancer in their lifetime, almost all skin cancer can be cured if found and treated early, there are two major types of skin cancer namely, Melanoma and Benign. Melanoma is the most serious type of skin cancer which develops in the cell and which produce melanin a pigment that gives a color to the skin. Research suggests that melanoma is increasing in the people who are under 40, especially women and can be treated successfully if treated at an early stage. This type of cancer can occur anywhere in the body. It is seen that they mostly develop in the areas that has or had exposure to the sunlight that includes face,

back, legs and arms. However, this does not mean that they don't occur in the areas that don't receive much sun exposure, such as soles of the feet, palms of the hand and fingernail beds. These hidden melanomas are more common in the people with darker skin. Benign refers to a condition or a growth which is not cancerous. This simply means that benign does not spread to other parts of the body. A condition is called as benign to suggest that it is not dangerous or serious. In many cases, benign tumors need almost no treatment. Doctors may simply wait and watch to make sure that they don't cause any serious problems. But a patient needs to undergo a treatment if there are any symptoms or cause any problems. The goal here is to remove the tumor without damaging the surrounding tissues. There are many numerous types of benign tumors and the exact cause of benign is often unknown. In many cases the patients are required to be monitored carefully, sometimes non-cancerous moles can turn into cancer at a later time if not monitored properly.

LITERATURE SURVEY

1. **A novel approach on dermis cancer detection using image processing:** The detection of melanocytes in the epidermal area is an important stage in the diagnosis of skin melanoma using pictures. However, detecting melanocytes in the epidermis is difficult due to the presence of additional keratinocytes that look quite similar to melanocytes. This is a poll. Proposes a new computer-aided technique for segmenting melanocytes in histological pictures of the skin. For the initial segmentation of the image, a mean-shift algorithm is used to decrease the local intensity variation. Based on the domain prior knowledge, a local region recursive segmentation approach is developed to filter out the possible nucleus regions. A new descriptor called local double ellipse descriptor (LDED) was developed to identify melanocytes from other keratinocytes in the epidermis area. Following that, a domain prior knowledgebased local region recursive segmentation approach is presented to filter



Movie Recommendation System using ML

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Abstract : In digital era, we have wide-range of resources such as items, music, books, movies and so on, finding the data based on user's interest becomes unerring, thus recommender systems will play a major role. A recommendation engine is all about suggesting a similar type of content or items by predicting user preferences. Eg: In case of OTT platforms the movies to watch, in the case of e-commerce sites the items to purchase will be suggested using recommender systems. This can be done by using Machine learning (ML) algorithms such as Content-based filtering (CBF), Collaborative filtering (CF), and hybrid filtering approach (HF). CF is classified into model-based approach and memory based approach. HF is a technique which is a combination of both content based and model based CF approach. XG Boost is used for improving the performance of recommendation engine.

IndexTerms - Machine learning (ML), user choice's, Hybrid Filtering (HF), Collaborating filtering (CF), Recommendation, XG Boost

I. INTRODUCTION

Recommender Systems are powerful filtering methods/techniques in the field of business. Google, Aha, YouTube, Netflix are all large business organizations that will use effective Recommender engines in order to grow their business. So there are mostly three types of recommender systems exists. They are content based approach (CBF), collaborative-based filtering (CF), and hybrid filtering technique (HF).

Recommender Engine is one of the facilities given to user. Recommender engines are the most instantaneously identifiable ML technique in today's technology world. We notice many services or platforms which will recommend movies that are based on previous interaction of user with the platform. They attempt to get likeliness and inclinations by ratings given by users and to find unknown movies or data that are not realized but will fascinate or attract user. Due to improvement in recommendation engines all users round-the-clock anticipate for good recommendations, this has generated a large significance in organizations for enhancing their recommender systems. However, the difficulty of the issue seems more compound than it looks. Each user has various inclinations, in addition every single user will have a different preference based upon number of factors, like time, mood of the person or depending upon the user's current work. Building a system like this is quite challenging..

II. LITERATURE SURVEY :

Collaborative filtering (CF) is classified using various approaches like matrix factorization, recommendations based on users and items. By using algorithms such as K-nearest, SVD, Alternating Least Squares (ALS). Movie recommendation systems can be improved by using the Pytorch library, in which the model would be trained to find the latent factors.[1]

Traditional approaches majorly consists of (CF) collaborative filtering, CBF Content based Filtering, The common CF techniques are neighborhood based CF, Hidden/latent factor model based CF, and Graph based CF. KNN model and XGBoost model are combined to form a hybrid collaborative filtering recommendation.[2]

Filtering techniques are rating predictions, ranking fashion supports implicit feedback. Methodology followed are User item sparse data matrix, User-to-user similarity matrix, item-to-item similarity matrix. Major problem identified is the cold start problem.[3]

Different methods used are CF, CBF, Multi - criteria recommender Systems, Risk - aware recommender, Mobile and hybrid recommender system. These are model-based approaches and uses Kernal - mapping and KNN approach. Few hybridization techniques are Weighted, Switching, Feature combination, Feature Augmentation.[4]



LitWit - LEARNING WITH UNDERSTANDING

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Abstract: A growing number of institutions have set up resources on their Web portal as a way to provide users (i.e. Students and Faculties) with information about their services and features. Generally, in colleges things are done manually such as handouts, notice (Internship and Placement updates), notes, etc. This often students find it difficult to access information that they need for managing their learning requirements. They need to have a single portal that caters to all their learning needs which will help them with the following features time-saving, easy access and user friendly, etc. LitWit Portal aims to design web portal-based solutions for institutes where all the facilities will be provided online for various things like E-Learning, E-Notes, E-Resources, etc. This portal helps the students to give ideas about how to build a good resume with the help of the resume maker. It guides the students in their interview preparation. Through the interview experiences of the experienced one those who already faced it themselves. This particular portal helps the students understand their doubts much faster. They can chat with the same peer age group or with an expert faculty either by dropping a message in the comment chatbox or chatting with that particular peer or faculty. This reduces the time for a student to get a clear idea about the solutions.

IndexTerms - E-notes, E-learning, Online Learning, Portal, Student

I. INTRODUCTION

Education plays a vital role in student life, as it results in success. Sometimes students find it very difficult to get accurate solutions for their doubts while studying, as at times there are many resources that are available online. It becomes very difficult and time-consuming to understand which ones suit their needs.

Students would find it almost impossible to wait till the next day to clarify their doubts with their teachers. And even the teacher would also not want the students to waste their time.

Today's education scenario is rapidly changing due to the advancement of technology. With the help of technology, this can be achieved by creating a web portal as portals are increasingly popular nowadays, enabling development and maintenance is very easy. We are designing a web portal LitWit, which will provide students with E-NOTES, E-RESOURCES, E-LEARNING, etc.

This particular portal helps the students understand their doubts much faster. They can chat with the same peer age group or with an expert faculty either by dropping a message in the comment chatbox or chatting with that particular peer or faculty. This reduces the time for a student to get a clear idea about the solutions.

This portal also helps the students to give ideas about how to build a good resume with the help of the resume maker. It guides the students in their interview preparation. Through the interview experiences of the experienced one those who already faced it themselves..

II. LITERATURE SURVEY

[1] Empirical studies on web accessibility



SURVEY ON PERSONAL ASSISTANT FOR VISUALLY IMPAIRED

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Abstract: Loss of vision that occurs due to some accident or disease from birth, is a huge problem faced by many people around the world. Access to information present on the internet or various other sources is essential in this fast paced world. It is quite hard for the non-sighted people to remain connected with the world and keep themselves informed and updated regularly. Hence, we propose a project which is a mobile application specifically designed to help blind or visually impaired people in their everyday lives, just like their human assistant. With this application, the visually impaired can get more autonomy as they can read with their ears and write with their voices. They can interact with the application through their voice as input to perform certain specific operations on their mobile such as make a call, write and send a message/email, capture the surroundings, recognize currency notes or people. This application sends voice output while reading new unread messages/emails, news highlights, current time and weather, or to produce warning of the obstacles. Objects and people present around them can be detected and identified when they instruct the application to capture the scene. The identified objects are given as output in the form of speech. Objects are detected using OpenCv and TensorFlow, and with the ratio of the box and the mainframe, the approximate distance of the object from the person is calculated and if it is too close a warning is produced. Object detection feature is extended to recognize currency notes and people.

Index Terms – Visually Impaired, Assistant, Speech-to-Text, Text-to-Speech, Object Detection, Object Recognition

I. INTRODUCTION

At present, numerous virtual assistants such as Siri in iPhone, Google Assistant, Microsoft Cortana, and so on exist due to the rapid advancement in the field of artificial intelligence. Even after such progression, the visually impaired community face many challenges as very little has been done to implement these technologies specifically to assist them. Certain tasks such as recognizing a person or obstacles or distinguishing objects, are straightforward for common people but can be very difficult for people who are partly or completely blind. Their lives can be made smoother by assisting them to detect what is present in front of them at that instant and also help them to perform essential tasks in their everyday lives.

We aim to develop a system/assistant that will serve to guide a visually impaired person. It listens to the commands provided by the person, performs the respective task and interacts back with the person by speaking through the microphone of their mobile phones. Speech recognition is used to understand the user's words and convert the speech to text. Modules such as Email/message writing are implemented by using speech recognition libraries.

This project applies the concept of Deep learning i.e. Neural networks. The models employed for our project are - Face Detection and Object Detection. The system comprises a camera that acquires images continuously and feeds them as input to the application, where a powerful processor derives information from them and explains them to the user through a distinct audible message. The device will also detect all the faces in front of the person and verify them against all the faces of the people who have been previously taught to the device.

The paper is organized as follows: Section I was the introduction. Section II shall be the overview of the literature review. Section III outlines the problem statement. Section IV describes the implementation methodology of our project. Lastly, Section V concludes the paper.



Research on AI-Based System for COVID-19 Prevention

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Abstract: Since the first report of coronavirus sickness (caused by a novel severe acute respiratory syndrome) in Wuhan in December 2019, it has become a public health issue in China and even around the world. On January 30, 2020, the World Health Organization designated the outbreak as a Public Health Emerging of International Concern. This pandemic is wreaking on societies. The significant number of cases raises concerns about the spread of the pandemic, which may lead to the idea of bringing it to prevent further infection. Taking extreme precautions, on the other hand, may be effective in preventing this pandemic. Therefore, this research paper focuses on implementing a prevention measures like Face Mask and Social Distancing Detection model as an embedded vision system (The pretrained models such as the CNN, and YOLO). And the Arduino Uno Board is used as a microcontroller, in on Temperature sensor and hand sanitizer dispenser.

Index Terms: Mobile net, ResNet classifier and Arduino Uno board.

I. INTRODUCTION

End of 2019, "Coronavirus Disease" first found in Wuhan, and it rapid have emerge as a public health concern in China. This pandemic is taking a toll on societies and economies all around the world, culminating in a worldwide fitness disaster.

[1] it's associates emerging, communicable disease caused by Severe Acute metastasis Syndrome Coronavirus a pair of (SARS-CoV-2)

[2] everywhere the globe, particularly within the third wave, COVID-19 has been a major aid challenge

[3] several shutdowns in several industries are caused by this pandemic. In addition, many sectors akin to infrastructure construction and maintenance comes haven't been suspended owed to their significant result on people's routine life. By now, the virus has apace unfolded to the bulk of the countries worldwide.

[4] The statistics (26/03/2022) provided by the WHO show 480,333,071 confirmed cases, 6,144,279 deaths and 414,641,868 Recovered.

[5] per the centres for unwellness management and bar (CDC), coronavirus infection is transmitted preponderantly by metastasis droplets made once individuals breathe, talk, cough, or sneeze and painfully will increase aerosol emission when human speak and shout (loudly).



E-HIRE

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Abstract-Salesforce is the world's #1 customer relationship management (CRM) platform. It helps in marketing, sales, commerce, service and IT teams work as one from anywhere- so you can keep your customers happy. The main purpose of Einstein bot is to interact with customers quickly and accurately without waiting for a human agent. Einstein bots can send messages, ask questions and perform the actions based on the rules defined or based on the customer input. Einstein Agent chatbots, built natively on the Salesforce Platform, will allow any company to deliver automatic service at scale using Einstein AI technology.

Key Words: NLP (Natural Language processing), NLU (Natural Language Understanding)

1. INTRODUCTION

Salesforce is the Customer Relationship Management (CRM) with a cloud-based platform. It also provides applications based on customer service, marketing, analytics, and application development. The main service is the cloud-computing. Artificial Intelligence (AI) has integrated in our daily lives with creation of intelligent software/hardware, which we call as agents. These agents can do a variety of tasks ranging from labor work to difficult operations which normal humans can't possibly achieve. A chatbot can be considered as a typical example of an AI system. It can also be called as smart bots, digital assistants, interactive agents. Mainly, a chatbot is a computer program that initiates a conversation between the human and the agent through voice commands or text chats. This project aims to build a new technology that help people create better jobs and communities. Salesforce Einstein bots are NLU based technology which trains chatbot to create a learning model which helps for interactions in chat window. The chatbots are now popular because there are many advantages of chatbots for users and developers. Since there is a greater accessibility to this technology, so the chatbots are available on mobile devices.



DEPRESSION ANALYSIS

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Abstract: In this, we set forward a clever methodology for distinguishing the online media posts that are demonstrative of sorrow with the assistance of Long Short-Term Memory and natural Language Processing system, word implanting, tokenization, and factorization to recognize the message that communicates sensation of despondency and its connected opinions. The methodology precisely predicts feeling in the text through Deep Learning, which eliminates bogus up-sides by thinking about the prompt setting of words. The information for this examination has been scratched from public discussions on Reddit-a well know web-based media site. Naming is made prior to breaking down the information, which permits posts about a typical subject to be assembled. Posts from various gatherings examining melancholy and self-hurt are taken as the positive class, while posts from different, arbitrary gatherings are taken as the negative class. Given the variety of the negative class, the dataset might be supposed to be delegate of a true situation. The model created has applications across a wide range of spaces, for example, sent via web-based media and correspondence gatherings regularly visited by youngsters to identify conceivable hurtful inclinations

Index Terms – Natural Language Processing, Machine Learning, Python, Long Short Term-Memory.

I. INTRODUCTION

With the arrival of social-media network as the most chosen platform for inter-person relationships such as content creation, content moderation, news, and even political mobilization has become very essential for social-media organizations. Content moderation is the method for identifying and escalating or removing the most probable or possible destructive or harmful content on social-media platforms, is a very important responsibility taken by the social-media companies or organization's these days.

Through the globe, there are many legal, judicial and legislative cells which are now interrogating the mislead activities which can be considered as the hot yet destructive topics in cybercrime and which is also the negative role of social-media in misleading news, illegal or anti-social activities, etc. One place or field where the content moderation is very essential at this point is to identify and flag social media uploads/tweets/comments/posts which depicts the symptoms of depression(phycological-illness) and self-harm. With the early detection and efficient flagging of such content can save from harm or injury and might be helpful. After the awareness of importance of mental health from the doctors, medical consultants, mental psychologist practitioner's, psychiatrists, celebrities. Depression is the most discussed, debated and essential at this hour. Depression and its symptoms vary from person to person, usually the depressive features are classified as anxiety, presence of sad emotion, feeling empty or alone, feeling left-out or ignored, irritable mood, insomnia or sleep disorder, restlessness, feeling negative for all the conversation, fear of being judged etc.

As the day is getting advanced with the technology everything is getting digitalized and people throughout the globe tend to exchange or discuss about their feelings with the social media posts, tweets, uploads, comments, etc. And people feel secured and they won't be having the fear of being judged, this is because of the like-wise thoughts or likeminded users or people in the groups, or community.

II. RESEARCH METHODOLOGY

1.1 Natural Language Processing

Natural Language Processing also known as NLP is an existing-emerging technology which is a sub domain of Machine Learning ML, again ML is a sub domain from Artificial Intelligence AI. Natural Language Processing is a mixture of algorithmic computations with the use of natural language, the communication between computers and human language (also known as natural language) exactly specifying the way to program computers to the particular process and survey the huge quantity of natural



Airfare PREDICTION USING MACHINE LEARNING

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Abstract: A number of factors influence the cost of an airline ticket, including flight distance, purchasing time, fuel price, and so on. Each carrier has its own set of proprietary rules and algorithms for determining pricing. Recent advancements in Artificial Intelligence (AI) and Machine Learning (ML) allow for the inference of such rules and the modelling of price variation. This paper proposes a novel application based on two public air transportation data sources: the Airline Origin and Destination Survey (DB1B) and the Air Carrier Statistics database.

The proposed framework combines the two databases, as well as macroeconomic data, and employs machine learning algorithms to model the quarterly average ticket price based on various origin and destination pairs, referred to as the market segment. On the testing dataset, the framework achieves a high prediction accuracy of 0.869 adjusted R squared.

Price Prediction, Data Analysis, Random Forest Regressor, Testing, and Training are all index terms

I. INTRODUCTION

Since the airline industry's deregulation, airfare pricing strategy has evolved into a complex structure of sophisticated rules and mathematical models that drive airfare pricing strategies. Despite the fact that these rules are still largely unknown, studies have revealed that they are influenced by a variety of factors. Traditional variables such as distance, while still important, are no longer the sole determinants of pricing strategy. Economic, marketing, and societal trends have all played a growing role in determining airfare prices. Airline Ticket prices for the same flight fluctuate dramatically and significantly from day to day. It is extremely difficult for a customer to purchase an airline ticket at the lowest possible price because the price changes dynamically. Customers can also use septimate analysis (reviews) to help them make decisions about which airlines to fly by analysing the opinions of other customers. The goal of this research is to better understand the factors that influence airfare and to develop and fine-tune models that can predict airfare well in advance. The ultimate goal of the airlines is to make a profit, while the customer seeks the lowest possible cost. Typically, customers try to book their tickets well in advance of the departure date to avoid price increases as the date approaches. But, in reality, that is not the case. The customer can save money by paying more than they should for the same seat.

LITERATURE SURVEY

[1] A survey on machine learning-based flight pricing prediction.

Supriya Rajankar and Neha Sakharkar

The goal of this paper was to find a machine learning model that could more accurately forecast the fare of Indian flights. After experimenting with various models, it was discovered that the Random Forest algorithm predicted the outcome with the highest accuracy. In terms of results, the article outperforms models, and it aspires to improve in the future.

[2] A PROPOSAL FOR INDIAN FLIGHT FARE PREDICTION

Udhhav Arora, Jaywrat Singh Champawat, and Dr. K. Vijaya

Several academics have used various Machine Learning techniques to develop a model that predicts ticket prices more accurately. s Researchers have used a variety of regression models to estimate accurate airline fares, including Support Vector Machines (SVM), Linear Regression (LR), Decision Trees, Random Forests, and others.

[3] Survey on Machine Learning Algorithms for Air Price Prediction

Zubeda A Khan, Abhilash, Ranjana Y, Shilpa S, and Zubeda A Khan are the authors of this paper.

Random Forests are a versatile tool for solving regression and classification problems, including multiclass classification; they provide an internal estimate of generalisation error, removing the need for cross validation. They can be fine-tuned, but with the



SURVEY ON ART GALLERY WITH E-COMMERCE

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Abstract : *In pandemic, we have seen that local artists have suffered a lot, as their talent did not reach many people. So, they are quitting their profession and are moving to secondary businesses, which results in the depletion of our Indian cultural arts like Manjusha Painting, Mysore Painting, Parsi Embroidery, Toda Embroidery, and many more.*

This website helps local vendors and others sell their work from the comfort of their homes through the internet. Here, users can select the aesthetic painting to buy, or they can add it to their Wishlist too. The item in the shopping cart will be presented as an order, and the user can place the order by filling in some basic details like address, phone number, and payment methods.

The user may access a full web interface by logging in, registering, and using it (if new). They may use their accounts to submit and sell their creative work, follow others, and like and bookmark topics. A chatbot will be ready to assist the user. To keep your website safe, we offer security features like two-factor authentication, SSL certificates, and a firewall.

Our proposed model will be proven to be suitable for local vendors and others by providing benefits such as acquiring, selling, and promoting their innovation. This platform guarantees that traditional and cultural arts in India do not become extinct, but rather help to raise and perpetuate the country's ethnicity. Our motto is to make sure that art culture is preserved for future generations and provide credibility to artists who have worked hard to bring out their talent.

IndexTerms - art, culture, e-commerce, selling, purchasing, searching, security, digital payment.

I. INTRODUCTION

India is known for its intangible cultural heritage. Painting, sculpture, pottery, and textile art are among the various genres of Indian art. Indian art has a long history that predates Indian civilization; thus, it's no wonder that Indian art's successes make every Indian proud. That isn't the case. Only a few Indian artists have been recognized as dominating the art market or being sold for a higher price. However, the fact that it is predominantly linked with Indian culture makes it unique, and so does the way of thinking about life and the complexities of nature. This provides the country with optimism as it stands at a fork in the path. A multitude of cultures have inspired Indian art.

India is a democratic country, so every person living in this country has equal importance. So, if we talk in terms of artists and their talents, everyone has a unique talent and equal importance should be given to them. But the case is that only well-known artists are getting paid more, and local artists are not getting paid that much. After the pandemic, local artists' conditions have become worse. Because of the lower income, they are quitting their profession and moving to secondary businesses, which has resulted in the depletion of our Indian art and culture.

Our Paper is an online art gallery platform where artists can share their artistic work and also promote and sell their masterpieces. The following are some of the aspects of our project:

- Promoting traditional art-work.
- Buying and selling of masterpieces.
- Description of art and its origin in each Indian state.
- Locating nearby art shops.

II. PROGRAM BACKGROUND

This paper suggests a strategy for launching an online art gallery with e-commerce. The framework's main purpose is to give a platform for local artists to sell and promote their work while also receiving and credit for their work. This portal also provides knowledge and information about various arts and cultures specific to Indian states. Our platform also promotes **Digital India Movement** by providing an online payment method.



CHROME EXTENSION FOR DROPDOWN CODE EDITOR

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Abstract : Since the IT boom, there has been a surge of software developers. There has been a lot of new projects conducted every day. But not everyone writes their code, we refer to online forums and various websites to get a remedy for our programming problems. We get multiple solutions but don't know which is the correct one or which works with our code better. We need to visit other online editors or download separate IDEs to check our code. In our paper, we have mentioned how we created a dropdown code editor which will help developers to check for outputs for a given code without opening an external IDE or website.

IndexTerms - Extension, Editor, Browser-Based, Multi Programming Language, IDE.

I. INTRODUCTION

Extensions are small bits of software that allow you to customize the look and feel of your browser. HTML, CSS, and JavaScript can be used to customize Chrome's functionality and behaviour. While any application or software can create timetables, to-do lists, and set notifications, Chrome extensions make it easy to keep organized while browsing the web.

Due to COVID-19 spreading to various countries, it has affected many sectors, including education. New challenges arise in universities with study programs related to computer programming, which requires a lot of practice. Difficulties encountered when students should set up the environment needed to carry out programming practices. Also, they should install a text editor called Integrated Development Environment (IDE) to support it.

Also these days people are reluctant to write their code, they usually refer to online forums or various websites to get a remedy for their programming problems and get numerous solutions. They may not know which code is correct or which works better with their program. They need to visit online editors or download external IDEs for verification. The problem with this is that external IDEs require space and sometimes come with ads. Also, there is a risk of installing and exposing your device to malicious software. The same applies to online IDEs. To make this work easy, our idea is to develop a web extension for the Google Chrome browser that will provide users with appropriate services.

II. LITERATURE SURVEY

2.1 On the development of a web extension for text authentication on Google Chrome

In this survey paper, the grammar words used were verified and verification of text authentication is also done by selecting samples from text and verifying it from the database using an extension after doing so, the extension will highlight the selected text and it will scan and check for the authenticity of the text sample. they created a web extension for the Google Chrome browser that allows users to check online texts by simply clicking on an extension button. When you click the button, the extension software's underlying algorithm pulls the texts from the currently shown web page. By comparing the obtained texts to a text database, the messages are verified and authenticated. Texts are highlighted in different colours, according to the comparison.

2.2 Online Compiler as a Cloud Service

In this paper the problem addressed was that there is a need for several compilers to compile programs for different programming languages and instead of downloading different compilers for different programming languages, a programmer/user can refer online cloud-based compiler which can execute or compile different programming languages and it will also assign suitable compiler server automatically by detecting the programming language. The goal of this study is to solve the problem of compiler storage and portability. The user must submit the program into the user interface supplied without needing to install any



BLOCKCHAIN BASED E VOTING SYSTEM

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Abstract : Traditional voting system has failed to maintain integrity, security and transparency of the voters and in present pandemic situation, many voters are afraid to come out stand in long waiting queues to take advantage of their fundamental right (voting). In order to solve this problem, we are using the blockchain technology and smart contracts to build our application for voting which is accessible to all the voters and at their convenience. The application uses smart contracts which run on Ethereum blockchain. Only the election commission have access for writing the smart contracts for different regions and publish the written smart contracts on the opensource platform so that anyone can verify the smart contract written by election commission. This system solves the problem of transparency, security and integrity.

Index Terms - Blockchain, Ethereum, Ganache, Truffle Suite, E-Voting, Decentralized voting.

I. INTRODUCTION

Electronic voting or e-voting is a fundamental component of democracy that enables the general public to have their say in the form of a vote. It has various advantages over paper-based systems. Despite the advantages of e-voting, there are still challenges in achieving widespread adoption. One of these is ensuring that the systems are resilient against potential faults.

The blockchain does not assign all data to a single server, but rather to a distributed database, which is a decentralized method of allocating data. The data is spread across all connected devices via a peer-to-peer network of nodes that communicate with one another. The blockchain is described as a new, decentralized, and distributed technology that has the potential to improve a variety of businesses. Expanding e-voting to include blockchain technology could be the answer to addressing the current issues with the system.

Bitcoin is a first-generation blockchain application. The Ethereum Foundation introduced smart contracts as a use case for second-generation blockchain. Smart contracts are pieces of code that are distributed across all blockchain nodes and only run when a specific condition is met. The blockchain, together with smart contracts, appears to be a promising contender for developing safer, cheaper, more secure, transparent, and easier-to-use electronic voting systems.

An e-voting system must be safe, as it must not allow duplicate votes and must be completely transparent while safeguarding the attendees' privacy.



SURVEY ON CHRONIC KIDNEY DISEASE PREDICTION USING MACHINE LEARNING

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Abstract : Chronic Kidney Disease (CKD) is a condition which results in loss of kidney function gradually over a period of time. Chronic kidney disease develops when the kidneys become damaged and are unable to filter the blood properly. This damage may cause wastes to build up in the body. Because CKD patients are at a higher risk of End Stage Renal Disease (ESRD), It has become a significant public health issue. Dialysis has cost the nation's health-care system billions of dollars in recent years, and the costs are expected to rise further. Most middle and lower-income people in developing countries cannot afford expensive medical treatment. Chronic kidney disease has no signs in its early stages. The severity of kidney disease can be determined by the estimated glomerular filtration rate (GFR) and albumin levels. We will develop a system based on clinical data that will use a machine learning algorithm to predict the disease in its early stages.

IndexTerms - Chronic Kidney Disease, Support Vector Machine, Machine Learning, End-Stage Renal Disease (ESRD).

I. INTRODUCTION

Chronic Kidney Disease (CKD), commonly known as chronic renal failure, is associated with a gradual loss of renal function. In other words, CKD is a disease that affects the proper functioning of the kidneys, meaning that the kidneys are not functioning as expected and blood cannot be filtered properly. The kidneys are a pair of reddish-brown bean shaped organs, each kidney about 4-5 inches long. The kidney's job is to filter waste and excess water from the bloodstream and excrete it from the body through urine. All blood in our body flows through them about 40 times a day. Advanced chronic renal disease can cause the body to store harmful quantities of water, electrolytes, and waste materials. This disease is referred to as "chronic" since the kidney damage occurs progressively over time. As kidney disease advances, it can lead to kidney failure, which necessitates dialysis or kidney transplantation to maintain life.

Chronic kidney disease is identified as one of the world's most serious public health issues. CKD is the tenth biggest cause of death in the world. CKD affects 10% of the world's population. Lack of affordable treatment, killing millions of people each year. Bone disease, anemia, heart disease, high calcium, excessive potassium and fluid retention are all symptoms of kidney disease. Hypertension, High Blood Pressure, Diabetes, Family History and Old Age are considered to be the leading causes of CKD. As the numbers of CKD patients are increasing we require effective predictive measures for early detection of CKD that reduces renal failure and expensive treatment.

Machine learning techniques have recently been widely used for early sign and diagnosis of multiple diseases. Machine Learning (ML) plays an important role in diagnosing illness or disease simply by analyzing existing patient records and training models to predict new patient behavior. Machine learning(ML) is a subset of artificial intelligence in which computing machines learn automatically and thus prediction improves with training.

In a medical examination, 2 medical tests are conducted to determine chronic renal disease. That is, a urine test to look at albumin and a blood test to look at glomerular filtrate. The glomerular filtration rate (GFR) is a test that is used to find out how well our kidneys are performing. It is also the best test for measuring our level of kidney functionality and for determination of chronic kidney disease stages. There are 5 stages of damage severity based on GFR.



Optical Heart Rate Detection Via Webcam

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ABSTRACT

Our primary objective is to show spatialtemporal alterations in human face recordings that are difficult or unfeasible to see with the bare eyes in an expressive manner. Eulerian Video Magnification [EVM] Is the technique developed that accepts a conventional video sequence as input and generates decomposition at spatial level and temporal filtering. Space is known as spatial. The term temporal relates to the passage of time. The resulting signal is subsequently amplified in order to disclose previously unnoticed data. We will be able to interpret the blood flow as it fills the face, as well as enhance and tell tiny motions, using our technology. Our method can be used in real time to depict events that occur at the user-selected temporal frequency.

1. INTRODUCTION

The heart's function is so vital, the heart rate takes precedence. The heart pumps oxygenated and nutrient-rich blood around the body. The heart rate is one of the human body's "crucial indications," or key signals of health. It estimates the number of contractions or beats per minute of the heart. The heart examination is one of the most common tests conducted in health care. Without requiring physical contact, the suggested method will deliver heart rate information. Although the spatio-

temporal sensitivity of the human vision is constrained, numerous signals that fall underneath this criterion are nonetheless detected and can provide useful or fascinating information. The colour of human skin, for example, varies or changes slightly as blood circulates. This fluctuation can be used to bring out pulse rate, even though it is not visible to the naked eye. We calculate accurate motion of the head. To extract heart rate and beat durations from recordings, each time there is a motion in the vessels of our body. Our method involves looking at the color values at each spatial location (pixel) in a time series, magnifying variation in a particular temporal frequency range. We pick a variety of temporal frequencies that spans a reasonable range of human heart rhythms, then add to it intuitively. As blood circulates all over the face, the amplifiers let forth a variety of redness. Temporal filtering aims to remove or lower frequencies that aren't of interest from the raw signal. Filtering that takes place temporally must be utilised to some frequencies that lie on the lower space of the spacial bandwidth, accurate input to climb above noise captures by the motion video. Our method of temporal filtering can reveal low-amplitude motion as well as amplify colour variation. Our method keeps track of characteristics on the head and decomposes related trajectories into an array of component motions using principal component analysis (PCA). The component that very much correlates to pulse is then chosen based on its time related frequency

SURVEY ON ENHANCING THE PERFORMANCE OF ANTIPHISHING MECHANISM USING MACHINE LEARNING

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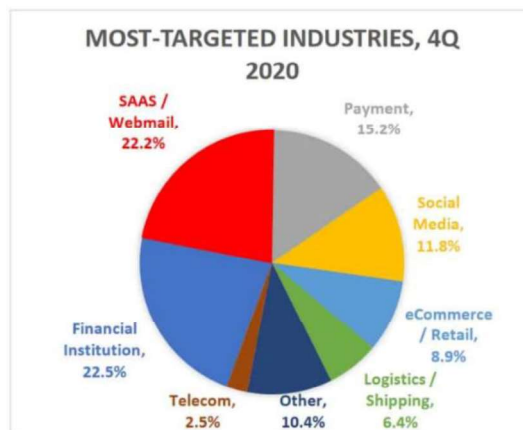
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Abstract: A Phishing is one of the most potentially disruptive actions that can be performed on the Internet. Phishing sends malicious links or attachments through emails that can perform various functions, including capturing the victim's login credentials or account information. It is a form of identity theft, in which criminals build replicas of target websites and lure unsuspecting victims to disclose their sensitive information like passwords, PIN, etc. It is one of the social engineering methods that gathers personal information through malicious websites and deceptive e-mail to canvass personal information from a company or an individual [5]. In terms of website interface and uniform resource locator (URL), most phishing webpages look identical to the actual webpages. Various strategies for detecting phishing websites, such as blacklist, heuristic, Etc., have been suggested. There is a demand for an intelligent technique to protect users from the cyber-attacks. In this study, we are trying to propose a URL detection technique based on Machine learning approaches. Boosting method is employed to detect phishing URL.

Keywords: Anti-phishing, Phishing types, Phishing websites, Phishing detection techniques, Cyber security, Machine learning classifiers.

I. INTRODUCTION

Phishing is considered as one of the malicious use of internet resources where the user are tricked into revealing their personal information, username and password and other personal information to the attacker. Phishing can appear through a variety of communication forms such as instant messaging, SMS, VOIP, online messenger [5]. The fake webpage contains input forms requesting personal critical information such as credit card, social security numbers, mother's maiden name, etc. Although existing spam filtering techniques can be employed to combat phishing emails, these measures are not entirely scalable [2] According to the RSA's online fraud report, the year 2013 has been confirmed to be a record year where many phishing attacks have been launched globally. Additionally, RSA estimates that over USD \$5.9 billion was lost by global organizations due to phishing attacks at the same period. The Internet Security Threat Report 2014 reports that cybercrimes are prevailing and damaging threats from cybercriminals still emerge over businesses and customers [4]. There's been a marked change from previous years, though, with Software as a Service (SaaS) and webmail attacks dropping from 31.4% to 22.2% in a single quarter. As such, financial institutions are now the most common target,



accounting for 22.5%. Meanwhile, attacks on eCommerce platforms and payment platforms have both risen by a few percent. The success of phishing website detection techniques mainly depends on recognizing phishing websites accurately and within an acceptable timescale. The conventional URL detection approach is based on a blacklist (set of malicious URLs) obtained by user reports or manual opinions. However, these techniques are not efficient enough, since



DATASET SHIFT QUANTIFICATION FOR CREDIT CARD FRAUD DETECTION USING MACHINE LEARNING

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Abstract: Electronic commerce technology has advanced tremendously in recent years, and as a result, the use of credit cards has expanded considerably. As mastercard becomes the most widely used method of payment for both online and offline purchases, incidences of fraud involving it are on the rise. We offer the required theory for detecting fraud in mastercard transaction processing using a Hidden Markov Model in this work (HMM). The traditional behaviour of a cardholder is used to teach an HMM at first. An incoming credit card transaction is considered fraudulent if the trained HMM does not accept it with a high enough probability. At the same time, we use an enhancement to ensure that valid transactions are not denied (Hybrid model). In subsequent sections, In further sections we compare different models and methods for fraud detection and prove that why HMM is more preferred method than other methods.

INTRODUCTION

Credit cards are widely accepted around the world today, and organisations of all sizes are storing data in large quantities, in a wide variety of formats, at rapid speeds, and for a high value. This information is acquired from a variety of sources, including user purchase habits and social media followers, likes, and comments. All of this information was analysed and visualised to reveal the hidden data pattern. In the early stages of credit card analysis, general public databases, biometrics, and financial analyses were utilised. Credit cards are an easy and friendly target for fraudsters since a huge number of money may be obtained fast and without risk. In order to perpetrate credit card fraud, fraudsters seek to steal sensitive information such as credit card numbers, bank account numbers, and social security numbers. Because hackers try to make every fraudulent transaction appear legitimate, detecting fraud is challenging. Over 70% of consumers in the United States are vulnerable to fraudulent transactions, according to an increase in credit card transactions. Basically, Because there are usually

Anti-Poaching Detection System For Forests

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Abstract : Trees have been utilised in numerous ways across the world, such as in medications and cosmetic goods, but there are a few valuable trees that contribute a lot of value. Protection of valuable trees around the world has been a failure as poaching has become more rigid. We cannot afford to lose valuable trees, so we propose a system that uses various sensors such as tilt, fire, and vibration sensors to detect damage and communicate via IoT to ensure poaching prevention.

INTRODUCTION:

As we know prevention of poaching and preserving precious trees has been an important task for mankind because forests, our system proposes to use IoT based unit attached to each tree with flame sensor to detect thermal signatures, tilt sensors to study inclination off the tree all the sensors will be connected to Arduino Uno board and other than sensors our system also proposes to use water pump attached to take immediate action on fire accidents, the whole unit will be a part of a large network of nodes in the Blynk server communicate through, so each tree will be capable of detecting fire accidents inclinations and communicate wirelessly and send alerts this will help in the preventions of illegal cutting

RELATED WORKS:

The paper[1] a self-contained IoT infrastructure for forest fire detection and notification Several sensors will be used by the system to identify fire symptoms. After conducting surveys, the sensors will be positioned in appropriate locations. The sensor will be triggered when the ideal locations for installing the sensors have been determined. Sensor data will be relayed to Arduino microcontrollers that will be installed in various locations. The data will then be processed by the microcontroller. At the same moment, the system will send an SMS to a neighbouring fire station using a GSM module, telling them At the same moment, the system will send an SMS to a neighbouring fire station using a GSM module, telling them of the Using the GPS module, the system will also notify the administrator of the fire's position. A variety of sensors will be employed, including temperature sensors, gas sensors, smoke sensors, and flame sensors.

The paper[2] proposes that Wireless sensor networks (WSNs) are one of the fastest-growing wireless network technologies in recent years, according to the author, and they are experiencing increased network traffic. Thousands of small sensor nodes make up wireless sensor networks. The amount of data traffic is growing by 50%. The wireless spectrum is limited, and there is a lot of waste in spectrum resources. With the aid of a technology known as cognitive radio, underutilised frequency bands may be used more efficiently (CR). The phrase "cognitive radio" is derived from the software-defined radio idea.

The paper[3] proposes an implementation of a Forest Monitoring and Alerting System. In this model a sensor node that can be attached to a tree is developed. This sensor node comprises four sensors namely LM393 (Sound Sensor), ADXL345(Accelerometer), DHT11 (Humidity and Temperature Sensor), SW520D (Tilt Sensor), and a controller (NodeMCU) with a Wi-Fi chip ESP8266 (NodeMCU) embedded on it, Using these four sensors ensures that various observations while cutting a tree i.e. chopping sound, a vibration of the trunk, fire, and tilting of the tree, can generate an alarm. The sensors are interfaced with the NodeMCU and all the data from the sensors is collected at the NodeMCU. The NodeMCU then transmits the data to the Raspberry Pi 4 Model B controller at the central station. The Raspberry Pi is placed at the central station due to its high-speed processing and large memory among other benefits. The transmission of data between NodeMCU and Raspberry Pi is done using the MQTT (Message Queue Telemetry Transport) Protocol. This protocol is mostly used for remote area monitoring and provides a guarantee of message delivery. It is also an easily scalable and cost-efficient method. MQTT also ensures security by checking and rechecking the authorization of the subscribers and publishers.

Once the data is processed if any abnormal values are identified from the sensors, then an alert needs to be sent to

Design of a New Language Seeks Literature Survey

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Abstract: In a scientific study, computing is a must-have tool. In general, scientists have various difficulties, requirements, and views when it comes to computation, which need to be addressed by the programming language that they use, this cannot be satisfied by general-purpose languages. Also, researchers need to concentrate on the issue they are working on rather than the optimizations for the calculations, so instead of using a general-purpose language, if there exists a language whose compiler would take care of those optimizations, it would make their work easier and faster. This is a survey of the work undertaken to design the programming language and its compiler. The primary goal of this research is to examine the function of work, implementation strategy, steps taken for improving the performance, the procedure of benchmarking, and finally, the outcome of the papers studied. The survey's main conclusions are that: the most common language mentioned among the papers was Python which appears to be more popular among developers due to its simple syntax and library support for computing. On the other hand, Python lacks performance, to compensate for this performance issue, the community has developed tools like Cython, Numba, Pythran, etc, which can be used to speed up Python. Domain-specific languages such as Wolfram, Seq, and ELI highlighted various methods for overcoming problems. Some languages like Wolfram and ELI moved from interpreter to compiler to get the performance boost. Most of the compilers use LLVM as the backend for optimizations and code generation.

Keywords: scientific computation, compiler, programming language

I. INTRODUCTION

Scientific Computing is a multidisciplinary field that contains many aspects of Computer Science, Applied Mathematics, and Engineering. Scientific Computing has emerged as the "third approach" for addressing fundamental research questions, alongside "theory" and "experiment." Many new researchers have joined in recent decades and are eager to contribute with their ideas. Researchers working in computational science generally encounter a difficulty i.e., primarily they have to concentrate on procedures like implementing, experimenting, and extracting information for solving the problem. At the same time, they have to convert this idea into programs, that include implementation, testing and debugging. While converting their problems into programs they should also concentrate on optimizing the program which is a time-consuming process. This suggests that an optimized high-performance computing language is required to assist researchers. To achieve this, we must first examine previous implementations and the work undertaken by the community to design one.

Before we proceed, let us understand what is a programming language and compiler: A programming language is a means of communicating with computers that consist of a set of grammatical rules (program) for instructing a computer to perform a specific task. The computer does not understand this program because it is written in a 'high-level' language; this is where a 'compiler' comes in. The compiler can convert a user-written program into machine code that computers can understand. In addition to these basic requirements, a good compiler should be able to compile faster to achieve good performance which increases efficiency, provide understandable error messages to aid developers in debugging the code, include runtime libraries, and also perform all necessary optimizations.

Why develop a new language for Scientific Computing? ALGOL, APL, Fortran, MATLAB, R, and other programming languages are used for scientific computation. Although these languages are better suited for computations than other 'General Purpose Languages,' some of them lack features such as readability, ease of understanding, and performance. That being said there is a need for a programming language for numerical and scientific computations with simple, readable syntax and high performance.

In general, developing a new language entails designing the syntax, building a compiler, and adding support for standard libraries. Creating a new language from scratch has fallen out of fashion; instead, the developer community offers a variety of useful tools ranging from parsing to code generation. Let us explore the various tools and methodologies used by different programming languages through this paper. In this context, the purpose of this paper is to facilitate the first step i.e., literature survey in the design of a new language.

Forest Fire Susceptibility Using Neural Network

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Abstract: Forest fires have impacted negatively on ecosystems, cultures, and economies all across the world. Modeling and anticipating the incidence of wild fires are essential to minimize these damages and reducing forest fires because they can help with forest fire prevention strategies. The convolutional neural network (CNN) has emerged as a key state-of-the-art deep learning method in recent years, and its application has enriched a wide range of fields. As a result, we proposed a CNN-based spatial prediction model for forest fire susceptibility. The concept is that this model is used to identify a fire or the beginning of a fire in a forest using (aerial) surveillance data. In the event of a fire, the model might be applied in real time to low-framerate surveillance video or picture and provide a warning. The network will be trained on a dataset that includes images in three categories: 'fire,' 'no fire,' and 'start fire.' The majority of the photographs will be of forests or forest-like situations. Photos labelled 'fire' have visible flames, while images labelled 'start fire' have smoke sensing the beginnings of a fire. Finally, photographs with the title 'no fire' were taken in forests. We will leverage the data augmentation function offered by Keras (Python Deep Learning API) to conduct a series of random transformations on photos before feeding them to the network in order to train a network that generalizes well to new images. Finally, our goal is to create a legible project which handles every aspect of CNN creation and training. Early detection of fire in the forest is very helpful and our biodiversity can be saved.

Keywords: Forest Fire Susceptibility, Convolutional Neural Network Techniques, Machine Learning.

LINTRODUCTION

A forest fire is a phenomenon that can be defined as an accidental fire in a flammable vegetation region. They have the potential to cause plenty of environmental disasters, as well as significant economic and ecological damages. Forest fire surveillance and tracking have become an important method for preventing this, attracting increasing interest throughout the world. Massive forest fires occurred in a number of locations across India's Karnataka state's Bandipur National Park in February 2019. The Indian Space Research Organization's (ISRO) National Remote Sensing Centre conducted an estimate of the total area damaged by the fire. On February 25, 2019, was projected that the burned area had grown to around 10,920 acres in the five days since February 21, 2019. Because regional forest fire susceptibility is typically influenced by a variety of factors and has typical nonlinear and complex properties, developing accurate forest fire prediction models remains a challenge. For predicting forest fire susceptibility, a variety of methodologies have been proposed, ranging from physics-based methodologies to statistical and machine learning (ML) techniques. ML algorithms have demonstrated the capacity to deliver superior results for the geographical forecast of wildfires when compared to standard qualitative and statistical analytic methodologies. Artificial neural networks, random forests (RF), support vector machine (SVM), multilayer perceptron neural network (MLP), kernel logistic regression (KLR), naive Bayes, and gradient descent trees are just a few of the machine learning algorithms that have already been successfully developed and commonly used to create wildfire susceptibility visualizations.

Deep learning (DL) techniques have lately gotten a lot of attention and have had a lot of success. Deep learning techniques are widely used in domains such as object identification and detection, audio recognition, and natural language processing because they aim to uncover numerous representation levels. In recent studies in areas such as disaster damage detection, remotely sensed image classification, and landslide susceptibility mapping, the convolutional neural network (CNN) has been recognized as one of the most effective and commonly used DL algorithms, which has generated major improvements.

The CNN can fully utilize contextual information and identify several layers of representations from input data, making it better suited to the evolution of fire event spatial features. The DL method shows deep characteristics and may differentiate between geographical entities. As a result, examining the use of the CNN algorithm in forest fire susceptibility assessments has some practical value. The likelihood assessment of fire occurrence in a region is characterized as forest fire susceptibility in this article. The major goal of this research is to use contextual-based CNNs with deep architectures to forecast regional forest fire susceptibility spatially. The forest fire susceptibility model is built using a CNN, and the model's hyperparameters were tuned to increase predictive accuracy.

The remaining part of the paper is laid out as follows: Section II is Literature Survey, Section III describes the proposed methodology, Section IV includes conclusion and future enhancement.

Wearable Safety Device for Children

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Abstract: Attacks on children have been on the rise at an unprecedented rate in recent years, with victims finding themselves in perilous situations with little chances of contacting their families. The main goal of this project is to create a smart wearable device for children that uses advanced technology to ensure their safety. As a result, this strategy is perceived as sending an SMS from the children's wearable to their parents or guardians. This project employs cutting-edge technology to protect the youngster through the use of a GSM module, ensuring that the child does not feel abandoned while dealing with such social issues. An Arduino Nano, GSM, GPS, temperature sensor, heartbeat sensor, and a panic button will be included in the wearable. The heartbeat sensor detects the child's heart rate and delivers it to the guardian on a regular basis. If the child falls suddenly, the accelerometer detects it and alerts the parents. As a result, the parent has a sense of security.

Keywords: Wearable, IOT, Arduino Nano, GSM, GPS.

I. INTRODUCTION

Cruel crimes against children have been on the rise in recent years, with victims finding themselves in incredibly perilous situations where using their cellphones to notify their parents or the police is nearly impossible. Despite the fact that technology is constantly evolving, these acts continue to occur in numerous areas.

The major goal of this project is to use modern technology to create a gadget that provides "Smart Child Safety" to protect children, which will be far more effective than current methods in assisting victims.

The device has IoT monitoring and a GSM module that allows the child to be monitored at all times. It also has numerous sensors that are connected to a CPU and are used to detect exact signals such as heart rate, temperature, and other dangers and alert the parents. In the event of a power outage, the wearable serves as a backup. On the device, there is an additional panic button. The purpose of this button is to notify parents and the police of a child's current location whenever they are in a perilous scenario. A GPS module is utilised to access their present location, and a GSM module assists in transmitting the information via SMS to designated contacts. In this approach, the device tries to provide child safety while remaining unobtrusive.

II. RELATED WORKS

The paper [1] offers the design and construction of a wireless heart rate monitoring system based on the Arduino LilyPad, which includes the ability to send SOS messages or make phone calls using the GSM module. If abnormal conditions are detected during monitoring, a call or a message is sent to the designated contacts, depending on the severity of the problem. The data transmission is made wireless with the help of an RF module, which was programmed using the Arduino IDE.

The concept of a smart wearable for tiny children is introduced in the study [2]. The main purpose of this article is to use a GSM module to enable SMS communication between the child's wearable and the parent. Parents can text particular phrases such as "LOCATION," "TEMPERATURE," "SOS," "BUZZ," "UV," and so on, and the wearable device will answer with a text outlining the child's current location, which when pressed will show the child's exact location on Google maps. It also shows the temperature and UV radiation index so that parents can keep an eye on their children's surroundings.

The research [3] proposes the use of an IoT device to supply the server with the patient's precise GPS coordinates. The doctor and hospital personnel can determine the patient's exact location and serve him using a web interface on the server and Google maps. This device can also be useful for animals and transportation services where location is important. Sensors such as the GPS Neo 6m, Arduino, GSM Sim800L, and different programming libraries and APIs are used in this system.

The paper [4] proposes the design and development of a prototype for a practical and easy-to-use pulse oximeter. This prototype will be able to continuously monitor heart rate and plethysmography wave for SPO₂.

The study [5] suggests a device that serves as a stand-in for the victim's protection and safety. This device has a microcontroller, GSM, and GPS module for sending notifications and tracking the victim's present location. This device also has a High Voltage Low Current Electric Shock feature that will shock the opponent for a few seconds.

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Digital video watermarking tools: an overview

H.R. Lakshmi and Surekha Borra

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Abstract

Piracy and copyright infringement is a serious concern with internet connectivity becoming a necessity rather than luxury. Due to this, there is a constant need to come up with new copyright protection algorithms and also new watermarking tools to suit user's needs. This paper provides a survey on various video watermarking tools available in the market. This paper summarises the basic concepts in video watermarking, new attacks and latest applications of video watermarking which are evolving. Each tool has been described highlighting its pros and cons for its applicability. The challenges involved in watermarking of video content have also been detailed.

Keywords

watermarking tools, video watermarking, applications, challenges in watermarking

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Survey on Real Time Fruit Detection and Classification using Image Processing and Convolution Neural Network

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Abstract— Fruit classification is an important task for many industrial applications. Image recognition and classification using Convolution Neural Networks (CNN) are the two popular approaches used in object recognition systems. The advancements in deep learning-based models make it possible to recognize complex images. This paper proposes an efficient CNN based method that performs fruit recognition, Raw-Ripe classification, calorie estimation and provide the count of the fruits from an input image. Machine learning model needs to be trained using data-sets. The data-set used are various image data containing different variety of fruit.

Index Terms: Fruit Classification, Calorie Estimation, Convolution Neural Network (CNN), Deep learning, Raspberry pi, YOLO V4, Image Processing, Image Segmentation.

INTRODUCTION

Artificial intelligence has played a key role in new technologies as it is paving way for the world to be completely automated, with image processing and other emerging technologies object detection is being exploited to its complete potential in almost every computer vision application. This can be seen in food-based industries for fruit recognition and classification. Fruit classification is a complex problem due to all the variations that can be encountered; it opens new opportunities for researchers to address those issues. With reference to those researches, we are proposing a method for fruit detection and classification.

Aim of this paper is to identify the fruit and classify it based on its ripeness i.e., raw or ripe and to obtain the count as well as total calorie estimate of the fruits detected in a single frame. This can be accomplished based on its shape, size, texture and color. To achieve these objectives, we make use of deep learning

techniques like Convolution Neural Networks (CNN) along with image processing.

LITERATURESURVEY

Analysis of visual features and classifiers for Fruit classification problem [1]: In this paper they have analyse the visual features and classifiers that contribute the most while identifying a fruit. As per this paper, mostly used features for fruit classification are color, size, width & height of fruit, texture and shape features. The proposed methodology involves following techniques: Multi-class Support Vector Machine (SVM), K nearest neighbour (KNN), Naïve Bayes Classifier (NB), Decision Trees (DT), Linear Discriminant Analysis (LDA), Feed Forward Back Propagation Neural Network (BPNN).


Advantage: The proposed algorithm is able to classify, with compatible accuracy as compared to the existing methods, a variety of similar fruit classes using color and texture features. Six widely known classifiers are used for classification and results compared. It is observed that the best results are achieved with Back Propagation Neural Network, SVM and K nearest neighbours' classifiers.

Disadvantage: The proposed algorithm is not tested for fruits in cluttered or occluded environment.

Automatic fruit recognition and counting from multiple images[2]:This paper is concerned with automatically detecting and counting any fruit in images of dense pepper plants. In this paper they describe a new method to locate and count green peppers in a cluttered complex image, using a two-step approach. In first step, the fruits are located in a single image and in a second step multiple views are

Review Article | [Published: 23 December 2021](#)

AlexNet Based Pirate Detection System

[Ritu Patil](#) , [N. Vishal Goutham](#), [G. R. Sunil Kumar](#) & [Surekha Borra](#)

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Abstract

Finding the pirate is a crucial job in fighting the piracy-related problems. Factors such as wide option of seating positions, and modern technological advancements in real-time application make this task more difficult to tackle. The use of watermarking

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Crowd Management Framework for Departure Control in Bus Transport Service using Image Processing

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Abstract— Crowd detection is an important aspect of video surveillance. Video surveillance systems are one of the most modern methods for estimating the density of people in a given area for providing facilities and obtaining human statistics. Factors such as severe occlusions, scene perspective distortions in real time application make this task a bit more challenging. Image recognition and classification using Convolution Neural Networks (CNN) are the two popular approaches used in object recognition systems. CNN models are built to evaluate its performance on image recognition and detection datasets. This paper develops a prototype of an intelligent public bus management system based on collecting data from surveillance cameras, processing image frames to estimate crowd density, and sending messages to bus depot as needed. Besides image processing algorithms, model consists of camera, software and WIFI for wireless data transmission at the Bus Depot. This system prevents the overcrowding of passengers, provide security, report passenger density data and thereby organize an effective bus management.

Index Terms: Crowd Estimation, Video Surveillance, Convolution Neural Network (CNN), Occlusions, Image Processing, Image Segmentation.

INTRODUCTION

In recent years, with the rapid development of technologies such as sensing, communication and management, improving the efficiency of traditional transportation systems through advanced technological applications is becoming more feasible. Therefore, intelligent transportation systems have gradually become a focus of transportation development around the world. Currently, many related applications exist in the field of bus information services for example, bus depots can utilize a dynamic information web page or a mobile app to inquire about the numbers of people waiting in

the bus stops and send busses accordingly. If more comprehensive information is provided on existing bus information platforms, the quality of public transport services will be significantly improved. Thus, the number of passengers willing to use public transport will increase. Through intelligent traffic monitoring, bus depot managers can preview the allotment of buses to a particular bus stop in real time and then make a decision based on the additional information and evaluate the waiting time. Furthermore, the bus depots can manage vehicle scheduling based on this information thus, operational costs depending on whether service quality is degraded or not are reduced effectively.

LITERATURE SURVEY

People count system using multi-sensing application [1]: In this paper people count system has been developed using multi-element infrared sensor which is constructed using PbTiO₃ ceramics to set up a non-blocking and non-contact automatic real-time system which gives high accuracy. A pyroelectric array detector using human sensor information is employed to set out people count system for detection of passers and direction in which the people move in a 200cm wide door. A highly sensitive infrared array detector was fabricated using bulk ceramics. This system gives an accuracy of 95%.

Advantages: This system makes use of the infrared motion sensor which can detect motion both in day time and night time reliably. The sensors are smaller in size and affordable. This method is easy to install and maintain and offers good accuracy.

LPG GAS LEAKAGE DETECTOR

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ABSTRACT: As we know, security has been major issue in today's scenario. LPG is main source of all fuel, gas leakage is a major problem in the industrial areas. Home security has become a major issue because of increasing gas leakage. One of the preventive method to prevent accidents associated with the gas leakage is using gas leakage detection kit. The aim of this paper is to introduce and design a gas leakage detection that will automatically detect, alert control the gas leakage. The system is based on a sensor that can detects gas leakage easily.

KEYWORDS: LPG, Buzzer, Sensor, Gas leakage, Microcontroller.

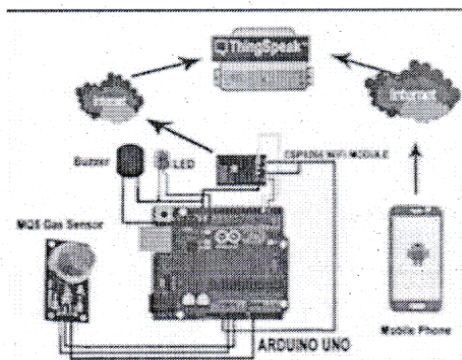
INTRODUCTION:

Gas leakage detection is by Sensors – Gas Leakage detection is the process of identifying potentially hazardous gas leaks by mean of various sensors. These sensor usually employ an auditable alarm to alert people when Dangerous gas has been detected. The total circuit units are arranged on Breadboard. So this project deals with finding the level of gas in the cylinder and sending this information for booking of the new LPG cylinder when the gas level is low and this project also deals with the detection of gas leakage and automatically turning off the gas valve if there is leakage of gas. When there is gas leakage and the gas level in the cylinder goes below the threshold level then the output of the sensor is sent to the microcontroller and the buzzer is turned on and also it will be displayed in the user's phone. We can also turn on and turn off the gas valve through our mobile phones.

CONNECTION WITH IOT:

Steps for creating project:

1. Hardware connection.
2. Configuring thing speak cloud for uploading sensor.
3. Make changes to code and upload.
4. Posting to push bullet via thing speak for Getting push notification on android.



WORKING OF CIRCUIT:

Our idea is to make a very accurate and cheap detector which gives the precise readings, we have interfaced mq135 with Arduino. Module mq135 detects the gas leakage. Along with the Arduino board we have interfaced buzzer. The basic concept is as soon as gas leakage is sensed the buzzer goes on with the sound of beep. If somebody is away from the point of leakage of gas it will alert the person from disastrous. Along with we have interfaced 16*2 LCD with data pins, this LCD is used for displaying the status of gas leakage. This is useful for those who are deaf. Additionally we have connected GSM module for those who are not press on the location it will send an alert message.



SURVEY ON ORADOR SMART COMMUNITY

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Abstract : A Wi-Fi speaker connects wirelessly via your home network with your smartphone or tablet. It is limited to just one device. The speaker needs either a smartphone/tablet/laptop to play music. The Wi-Fi range is 46m indoors and 92m outdoors. There cannot be established a network within the speaker without any external device. Thus we are connecting 3 speakers to one device so that it can be control the speakers through the device. We are making use of Balena Cloud for configuring the multi devices.

INTRODUCTION

The speaker needs either a smartphone/tablet/laptop to play music. The Wi-Fi range is 46m indoors and 92m outdoors. There cannot be established a network within the speaker without any external device. Thus we are connecting 3 speakers to one device so that it can be control the speakers through the device. We are making use of Balena Cloud for configuring the multi devices. A Wi-Fi speaker connects wirelessly via your home network with your smartphone or tablet. It is limited to just one device. In our project we can control multi speakers through one device that can be a smart phone. We can vary the volume, can change the songs to which ever to be played so when the songs are played all speakers would be in a perfect sync irrespective of the speaker place whether it is placed in garden /room/hall etc. Since it's a Wi-Fi-Speaker the audio quality will be good when compared to the Bluetooth speakers.

LITERATURE SURVEY

This paper focuses on the history, tools, standards and implementation of Wi-Fi networks. However the main purpose of this research paper is to understand the various problems associated with the implementation of these WLANs and propose recommendation and measures to solve these problems and mitigate potential risk factors [1]

This explains the technology used for automotive Wireless Communication along with the various automotive applications relying on wireless communication. Automotive Wireless Communication gives drivers a sixth sense to know what's going on around them to help avoid accidents and improve traffic flow. The paper also describes VANETS (vehicular adhoc networks) and real world test network implementation. Finally, the paper is summarized.[2]

Bluetooth is a modern wireless short-range RF technology that is designed to communicate wirelessly between various machines. The popularity of Bluetooth as a technology grows as time flies by and is still growing and is being embraced in today's world. In this paper, we have embraced a way for brief survey on Bluetooth technology that will explain the architecture, issues, and applications.[3]

The ideal use case for this product would involve the ability to have a computer in one room processing music files while multiple speakers throughout the house are actually playing the music. This would be particularly useful in a party setting where one would like to keep a computer safe in a locked room while still being able to use it to play music. Additionally, if a party is there are sets of speakers in multiple rooms, they can all be synced to the same audio source. The major components of the system are the microcontroller receiver module (an ATmega 328p) and the computer program that sends the packetized audio data. This is to create a system that uses Wi-Fi to transmit audio from a source such as a laptop to a speaker system. The final product combines the use of embedded hardware, low level software programming, and the IEEE 802.11 standard protocol for wireless communication (Wi-Fi) to create a polished end device. The hardware and software was developed using a combination of original work as well as open source code and libraries. [4]

Bluetooth is an omnipresent communication technology, available on billions of connected devices today. While it has been traditionally limited to peer-to-peer and star network topology, the recent Bluetooth 5 standard introduces new operating modes to allow for increased reliability and Bluetooth Mesh supports multi-hop networking based on message flooding. In this paper, we present Blue-Flood. It adapts concurrent transmissions, as introduced by Glossy, to Bluetooth. The result is fast and efficient network-wide data dissemination in multi-hop Bluetooth networks. Moreover, we show



STUDY AND LITERATURE SURVEY OF EVIDENCE COLLECTION SYSTEM IN CAR BY EMBEDDED SYSTEM

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Abstract: This demonstration elaborate the collection of the real time data after the detection of collision in an around the vehicle environment and analyze the collected data to have the conclusion regarding the collision while simultaneously transmitting the data over the wireless network. The Evidence Collection System is vehicle based device which collect the data like speed, engine temperature, acceleration, GPS position, wiper movement, date and time. This data can be used to investigate the crime, rescue operation and insurance claims. This data then transmitted to the database server so that web application can be able to access this information at different places like Police station, Insurance Company. In the existing method we can detect the visual information by using sensors and after detecting it rings buzzer to indicate that driver is not paying attention on driving and after buzzer rings driver will come to normal position and he will concentrate on driving. Before driver comes to alert position accident may occur In the existing method the main disadvantage is we are detecting eyes by using sensors but we are not identifying exactly weather the driver paying attention on driving or not.

Keywords: Evidence ,Data, Collision, Black box, Car.

I. INTRODUCTION

The vehicle accident is a major public problem in many countries, particularly India. Despite awareness campaign, this problem is still increasing due to rider's poor behavior such as speed driving, drunk driving, riding without sufficient sleep, etc. The numbers of death and disability are very high because of late assistance to people who got the accident .These causes huge social and economic burdens to people involved. Therefore, several research group and major motorcycle manufacturers have developed safety devices to protect riders from accidental injuries. However, good safety device for vehicles is difficult to implement and very expensive .Like Black Box of airplane, Car Black Box (known as Event Data Recorder) is used to record information related to accidents.

Car black box records driving data, visual data, collision data and position data after the accidents so that it can be used to, analyze the accident easily and to settle many disputes related to car accident such as crash litigation, insurance settlements. It can be used to not only reconstruct what happened before an accident by Insurance Agents and police but improve vehicle design, roadway design and emergency medical service by automakers, government and hospital. The basic functions of a black box should include continuous audio/visual recording for both the front and rear of the vehicle. This will be part of the voice and visual recorder.

In addition to the basic function, the car black box equipped with wireless communication system can send accident location information to central emergency and disaster server in real-time. Therefore drivers who want help can receive service quickly by rack car, police and hospital ambulance. Car Black Box detects a crash and records the motion of the vehicle and driver's actions during a predefined time period after the accident. It consists of data collection devices for collecting the information about car's status and the driver's actions, a non-volatile memory device for recording, a microprocessor for controlling the unit and a wireless modem for communication.

II. METHODOLOGY

Alpha numeric LCD (ALCD) is used to display information about project. The LCD used is 16x2, 2 rows and 16 columns. So in each row we can display 16 characters. The 1 byte data line of lcd is connected to the Port 7.0 to Port 7.7 of the microcontroller. The enable pin of lcd is connected to the Port 0.6 of the microcontroller. The RS pin of the lcd is connected to the Port 0.5 of the microcontroller. Pin 1 of lcd is +5V power supply, pin 2 is GND, pin 3 is for contrast



A Literature Survey on Voice Assistance

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Abstract: Artificial Intelligence has been in great use when it comes to day to day life. Computer science defines AI research as the study of brilliant agents. In almost any direction one turns today, some form of computer-based information processing technology intrudes, whether to the individual knowingly or not. Artificial Intelligence (AI) has already changed our lifestyle. AI device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. Input to recommendation algorithm can be a database of user and items and output recklessly will be the recommendations. The user is the input into system by voice or text. This paper presents a new approach for smart search. Overall, in world there are many people who use assistant. The paper presents applications of virtual assistant and also describes provocation of applying virtual assistant technology.

Keywords: Voice Assistance, Python, AI, Review, Text to Speech, Speech to Text, Voice Recognition.

I. INTRODUCTION

Voice assistant is a device, app, or computer program that can respond to commands or questions and perform specific tasks. The aim of this paper is to design a voice assistant that will help the user and visually impaired people to have a hands-free experience on using internet and can also automate our tasks with ease and comfort. So, here is a method to develop a Personal Voice Assistant that has a brilliant power of deduction and capability to interact with the environment just by one of the forms of human interaction i.e., HUMAN VOICE. The Hardware device captures the audio request through microphone and processes the request so that the device can respond to the individual using in-built speaker module. The design methodology of Voice Assistant is done in this paper.

II. LITERATURE SURVEY

In this paper entitled "Study of Voice Controlled Personal Assistant Device" author proposed the famous application of iPhone is "SIRI" which helps the end user to communicate end user mobile with voice and it also responds to the voice commands of the user. Same kind of application is also developed by the Google that is "Google Voice Search" which is used for in Android Phones. But this Application mostly works with Internet Connections. But this Proposed System has capability to work with and without Internet Connectivity. It is named as Personal Assistant with Voice Recognition Intelligence, which takes the user input in form of voice or text and process it and returns the output in various forms like action to be performed or the search result is dictated to the end user. In this paper entitled "AI Based Voice Assistant Using Python" author developed an economically effective and performance wise efficient virtual assistant using Raspberry Pi for home automation based on the concepts of Internet of Things, Speech Recognition, Natural Language Processing and Artificial Intelligence. People who are using it can give voice inputs and the device itself responds through voice commands by itself. It can fetch the date, time, weather, play your favourite music and fetch search results from the internet along with controlling the home appliances. NodeMCU chips are used to control the appliances which receives the command from the Raspberry Pi. In this paper entitled "Virtual Personal Assistant for the Blind" author proposed that there are various communication barriers for people who are blind, and they have to face various challenges. In this paper, we have discussed the implementation of a personal virtual assistant which can take the human voice commands to perform tasks which otherwise would need the dependence on others. It enables user to receive and send emails, know the weather forecast report, maintain a personal diary/Online Blog, recognize image etc., using Speech to Text Engine, Text to speech Engine, OCR (Optical character recognition) using microphone for the input and speakers for the output. In this paper entitled "AI-Smart Assistant" author presented the problem of user while developing a computer program. Developing a computer program is not an easy task it needs hardware resources which user have to handle. While continuous typing the code there may be possibility of injuries to the fingers of the user. To avoid the problems, we are designing a system in which the computer program can developed through the voice. The voice will be recognized by the system and that recognized words or word will be compared with the stored keywords in the database and if they are matched then that will be printed on editor and after this again by recognizing the specific keywords the program will be compiled and executed. This system will be easy to use, it reduces human efforts and the use of hardware resources. It would be surely useful for blind.



Survey on Face Recognition for Automation of Door Lock System

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Abstract: In recent years, it is important to own a reliable security system that can secure our assets as well as to protect our privacy. The traditional security system needs an individual to use a key, identification (ID) card or password to access an area such as home and workplace. However, the present security system has many weaknesses wherever it is simply cast and taken. Most doors are controlled by persons with the employment of keys, security cards, countersign or pattern to open the door. The aim of this paper is to assist users for improvement of the door security of sensitive locations by using face detection and recognition. The proposed system mainly consists of subsystems namely image capture, face detection and recognition, email notification and automatic door access management. Face Recognition supported openCV is brought up because it uses Eigen faces and reduces the scale of face images without losing vital features, facial images for many persons can be stored in the database. The door lock can also be accessed remotely from any part of the world by using Telegram android application. The captured image from pi camera will be sent to the authorized person through email for safety purposes.

Keywords: OpenCV, Raspberry pi, Telegram application, Email

I. INTRODUCTION

Human beings are recognized by their distinctive facial characteristics. In the face recognition approach, a given face is compared with the faces stored in the database in order to identify the person. The aim is to search out a face in the database, which has the highest similarity with the given face. In the field of bio science, face recognition technology is one among the fastest growing fields. The need of face recognition in security systems is attributed to the rise of commercial interest and therefore the development of feasible technologies to support the development of face recognition. Major areas of commercial interest comprises of bio science, law enforcement and surveillance, human computer interaction, multimedia management (for example, automatic tagging of a particular individual within a collection of digital photographs) smart cards, passport check, Criminal investigations, access control management. However, face detection is more challenging because of some irregular characteristics, for example, glasses and beard will results in detecting effectiveness. Moreover, different sorts and angles of lighting will make detecting face generate uneven brightness on the face, which will have influence on the detection and recognition process. To overcome these issues, the system primarily used openCV based face recognition system using Haar classifiers for face. The main processing element is Raspberry pi. The pi camera is employed to capture the image and send it to the authorized person for security purposes. The authorized person can remotely control the lock and unlock mechanism of the door using Telegram android application which is freely available on Google play store. The entry log every person is captured using pi camera and picture is sent to the email address of the prescribed user.

II. LITERATURESURVEY

A. Deep Unified Model For Face Recognition Based On Convolution Neural Network And EDGE Computing

This system proposes a deep unified model for face recognition based on faster region convolution neural network. And design a group-based attendance system based on the proposed deep unified model with an accuracy of 97.9% under different conditions, edge computing have been utilized for processing the data at the edges of the node to reduce the data latency and increases the real time response. The drawback of this system is the challenges like detecting face with increase beard, sunglasses, tilted face, etc.[1]

B. Smart Home Automation using Machine Learning Algorithms

This system is connected to the existing home wireless networks that contain emotion recognition mode where the system will use the connected camera to detect the user facial expression and accordingly will automate the fan and light, here different sensors and devices are interfaced with input/output ports on the raspberry Pi. The drawback of this system is that increase in number of cases (expressions) the accuracy decrease [2].



AUTOMATED CROWD MANAGEMENT AND ENERGY CONSERVATION SYSTEM IN METRO USING IOT

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Abstract: With the ever growing global population, crowding in public transport is becoming an increasing menace. Public transport systems around the world have remained largely the same over the past several decades although the population they serve has burgeoned. This paper aims to demonstrate a low cost IoT based solution to the crowding problem by using smart seats that can detect and display the seat occupancy status in real time over an internet or mobile application.

Keywords: IoT, Crowd management, Blynk App, ThingSpeak.

I. INTRODUCTION

From the different applications mentioned until now, the detection of crowded areas has been chosen as the research topic for this thesis. This decision has been motivated by the fact that there are different researches focused on the creation of systems thought to perform in crowded areas, but they do not specify what is considered "crowded". Due to this fact, an investigation of the existent literature about the detection of crowded spaces was carried out. The findings were that it was limited, and in the existing research, the threshold to distinguish "crowded" and "not crowded" situations were arbitrarily established by the researchers. In consequence, in this project it is desired to create a method that detects if a place is crowded or not, calculating the threshold to split those situations using mobility data.

II. LITERATURE SURVEY

[1] A Low Cost IOT Based Crowd Management System for public Transport: The study presented the management of the crowd using iot method in which the crowd is managed by Mobile application. This paper shows the crowd management system using iot devices like mobile phones. But, which application is developed and how it works for crowd management that is not written in that. It represents crowd management but they can use real time devices to enhance. In a smart transportation system, the smart crowd management component will be demanded for identifying and controlling the congestion that can occur during commutes and routine travel.

[2] Crowd Analysis For Congestion Control Early Warning system On Foot Over Bridge: The proposed congestion control technique exhibits quite significant results on the proposed dataset made from the virtual simulation of FOB (foot over bridge) scenario. This paper proposes a software-oriented approach, Congestion Control Early Warning System (CCEWS), for congestion control with the help of object detection and object tracking technique. Object detection is performed by following the faster R-CNN architecture in which Google inception model is used as a pre-trained CNN model and with the help of proposed object tracking technique the crowd abnormality is analyzed.

[3] Vehicular Crowd Management : An IOT Based Departure Control And Navigation System: Large sport and entertainment events such as soccer games or concerts attract an immense number of fans, most of whom use personal vehicles to get to the event. Such a large number of cars presents a "vehicular crowd" that needs to leave in an organized, timely, and safe manner after the event. This crowd manage through vdc module and navigation system and local cameras. In this Article, The proposed system collects network information from a variety of sensory devices: connected vehicles, smartphones, and traffic cameras. Then, it fuses this data to compute the current state conditions of each road link. Based on these parameters, the VDC module determines the allowable vehicle departure rates, and the navigation module computes the system-optimum routes for drivers to take.



Literature Survey of AI Based Home Automation

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Abstract: In the present scenario the crimes are increasing exponentially, arising a need of security. Security can also be described as a condition so that one can develop and progress freely and with a faith that no harm may be done. Hence we are introducing any automatic door lock security system and home automation for the security purpose. Camera is now enormously being used and with the development of its content that is used in various applications. One of such is automatic door lock security system using camera.

The Internet of Things (IoT) is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure. Typically, IoT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine- to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is expected to user in automation in nearly all fields, while also enabling advanced applications like a Smart Grid. Things, in the IoT, can refer to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, orfield operation devices that assist fire- fighters in search and rescue. Current market examples include thermostat systems and washer/dryers that utilize wifi for remote monitoring.

Interfacing of camera to capture live face images. Create a database of authorized person if they exist. Capturing current image, save it and compare with the database image. Interface GSM module to send alert to authorized person while unlocking the locked door in the form of SMS and CALL. The project can also be used for surveillance. For instance, it can capture the images of unidentified individuals and store it which can later be used to determine the impostors who tried to gain illegitimate access. Interface relay as on output. And additional home automation system is used to control the home appliance like fan and light using mobile application. With help of Wi-Fi connected for the model using TCP/IP.

INTRODUCTION

The “Home Automation” concept has existed for many years. The terms “Smart Home”, “Intelligent Home” followed and has been used to introduce the concept of networking appliances and devices in the house. Home automation Systems (HASs) represents a great research opportunity in creating new fields in engineering, and Computing. HASs includes centralized control of lighting, appliances, security locks of gates and doors and other systems, to provide improved comfort, energy efficiency and security system. HASs becoming popular nowadays and enter quickly in this emerging market. However, end users, especially the disabled and elderly due to their complexity and cost, do not always accept these systems.

Due to the advancement of wireless technology, there are several different of connections are introduced such as GSM, WIFI, and Bluetooth. Each of the connection has their own unique specifications and applications. Among the four popular wireless sections that often implemented in HAS project, WIFI is being chosen with its suitable capability. The capabilities of WIFI are more than enough to be implemented in the design. Also, most of the current laptop/notebook or Smartphone come with built-in WIFI adapter. It will indirectly reduce the cost of this system.

LITERATURE SURVEY

Y. Januzaj [1] proposed real time access control for face recognition using, Raspberry pi instead of GSM services and relay. The limitation of the work was it couldn't control the background light situation and ambient light conditions.

H.Lwin [2] has proposed a door lock access system which consists of three subsystems: to be specific face recognition, face detection, and automated door access control. Face recognition is actualized by using the PCA (Principal Component Analysis). The door will open itself for the known person in command of the microcontroller and caution will ring for the unknown person. Demerit of this system is input images are taken through a web camera continuously until the 'stop camera' button is pressed. Somebody is required at the location to check unauthorized



Electronic Shoes To Assist Visually Challenged

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Abstract: The main objective of this project is to provide an acoustic assistance to the blind people and also to deal with the problems faced by them to walk like the normal human beings. Thus, the project aims to develop a device that would serve as a guiding assistance to them. The paper focuses on designing a device for visual impaired (or blind) people that would help them to travel independently and also with more ease. One of the biggest problems that the visual impaired one's face is while travelling because when they walk in the indoors and outdoors, they are not well aware of information about their location and orientation with respect to traffic and obstacles on their way unlike the normal beings. The technology proposed in the paper serves as a solution for visual impaired people. The project consists of the smart shoes that alerts visually-impaired people over obstacles coming between their ways and could help them in walking with less collision. The main aim of this paper is to address a reliable solution encompassing of shoe that could communicate with the users through voice alert and pre-recorded messages.

Index Terms – visually impaired, smart shoes, voice, message

I. INTRODUCTION

People with visually impaired faced most of the challenges in the environment. The long Hoover Cane used by them is not advantages while walking and travelling. Using smart shoes for visually impaired people need not to be depending on others for mobility India contributes about 21% of the blind people over total population. In a million population, there are around 53 persons that are visually impaired, 46 thousand are having low vision and around 7000 have completely lose the vision

II. LITERATURE SURVEY

The number of research has shown clear signs that gesture controlled technologies are now in the interest of the people. Though there are different aspects and many points to mention from the research, but this survey study has more interest in the following categories, as these are important areas of gesture based user interface. It has been about 30 years of research and researchers have been working continuously on gesture based system. Most of the researches are based on hand gestures. Direct control via hand posture is immediate, but limited in the number of Choices. There are researches about body gesture, finger point movement. In the early stage, researchers used gloves with microcontroller and connected with the device through a wire. Head gesture and gesture with voice were also in the research, but hand gesture was the most dominant part of gesture control system. Users Most of the research of the survey use or target the general users of any age. Initially it was mostly for computer users to work on the objects or presentation. Wheelchair users are also highly considered for accelerometer based gesture controlled system. Most of the last 5 years investigations are focused on elderly and disable people. Researches show that gesture based applications can be used for many different things, entertainment, controlling home appliance, tele-care, tele-health, elderly or disable care. The scope of the application shows us the importance of more researches in a gesture controlled system. Most applications are to replace traditional input devices like keyboard and mouse, accessible application for elderly-disable like accelerometer. . Now people can interact with any media using gesture to control wide range of applications. We have got gesture based commercial products in 2003. Gestures have been captured by using infrared beams, data glove, still camera, wired and many inter-connected technologies like gloves, pendant, infrared signal network server etc in the past. Recent vision technique, video and web cam based gesture recognition has made it possible to capture any intuitive gesture for any ubiquitous devices from the natural environment with 3D visualization.

Survey on Sanitizing Drones

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Abstract: The COVID-19 pandemic has profoundly altered common social and economic patterns. With the clear need to sanitize and disinfect. The drone can effectively disinfect areas without human intervention with remote monitoring. The Quadcopter is Remote controlled which enables remote monitoring to disinfect the required areas. The Quadcopter is designed in such a way that it can carry the required payload up to 12 feet and disinfect the areas without human intervention.

Keywords: Covid-19, Drone, Quadcopter, Sanitizer, ESC, Li-Po Battery, Motors.

1. INTRODUCTION

Covid-19 has led the world to an unprecedented public health crisis. Corona virus outbreak features a significant impact on health, economy and standard of living for the people around the world. To beat the difficulties caused by pandemic, we should evaluate any alternative technique to confront the new coronavirus.

At present world drone technology is incredibly familiar and versatile. Nowadays Drones are employed in long range wars as a weapon and also as a helper of fighter within the war. Drones, because the foremost dynamically developing an element of the aviation industry, are going to be a awfully special tool within the hand of experts fighting against this pandemic. It has been effectively employed within the past for an unlimited number of applications including spraying pesticide in agricultural fields.

Drones could also be effectively accustomed perform the sanitization process. A drone mounted sprayer was developed for application of sanitizer sprays in areas which needs disinfection which reduces human intervention. The device plays a awfully important role in running the drone system, this drone is essentially controlled with the help of a remote controller. Motors are accustomed pump the sanitizer through pipe to sprayed through nozzles and also the desired areas are sanitized. Therefore, the foremost objective of this project is to sanitize areas with less human intervention and help to hunt out good or best sanitization using drones to support the fight against the COVID-19 pandemic.

2. LITERATURE SURVEY

Dwi Mutiara Harfin et al[1]. has proposed a drone or Unmanned Aerial Vehicle (UAV) to spray disinfectant indoors. the use of drones which are easy to manage and will reach various parts of an area in an exceedingly building by only using one controller can reduce human physical contact with places prone to corona virus. This research paper used a quadcopter UAV which consists of 4 propellers, each which is mounted on an 11.1 Volt brushless motor. A 2200 KV BLDC motor is used and controlled by the SP Racing F3 flight controller. The motor functions as a propeller drive and LiPo 3S is used as current source. 200 ml of disinfectant is carried and sprayed. These drones are accustomed monitor high-risk residents, in order that they do not leave their homes, to deliver food to chop back human physical and drones within the delivery of medicines for patients who need medical treatment reception.

Shubham Kishor Patil et al. [2] Proposed health monitoring and sanitizing drone for pandemic. As drones are becoming employed in our standard of living and it's great demand within the market. during this paper they have used Quadcopter because of its durability, and it's good weightlifting capacity which can lift up to a few to 4 kg of weight easily and additionally to this, they have also installed health monitoring system so as that the drone could also be operated from one fixed position. MLX 90614 temperature sensor is utilized during this paper, which provides the upper stability to the drone, it also has receiver which determines information like



Literature Survey on NFC and Coin based stationery vending machine

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Abstract: Portable vending machines are very useful devices for dispensing small, easily available necessary equipment for the use of man. The aim is to construct an automatic vending machine prototype model, which can be installed in schools, colleges, hospitals other public places to dispense pens, pencils, and sanitary napkins during needs with appropriate mechanical designs for item collection. Also, microcontroller circuitry for coin checking, and dispensing for items is to be proposed and implemented in real time

Since their introduction, vending machines have become an increasingly important distribution channel in the private sector. In Educational institutions and office stationery vending machine is of great importance. This System proposes is based vending machine that dispatches A4 sheets once the RFID card is read. The users can select the required item after the card is scanned and collect the item in the output unit. The system is divided into three parts, the first part deals with the scanning of RFID which provides cashless payment. The second one is the programming unit which is implemented using μ C/OSII. The third part is the display unit which displays information and delivers the required item based on the information sent from the microcontroller. An embedded system vending machine is designed to achieve and portable machine that can sell items automatically.

Automatic vending machines are not that common in our country. Hence implementing such a machine in real-time will be of great use for people. The advantage of the machine is it requires no manpower, consumes less power, occupies less space maintenance free simple in operation portable. The objective is to develop a vending machine prototype model for vending the items by credit or transaction. The availability of the items is also checked. It finds its application mainly for students.

Keywords: Vending Machine, pieces of equipment.

INTRODUCTION

A Vending machine is an automatic machine that sells food such as canned soups and packaged sandwiches, snacks such as potato chips, chocolate bars, stationery, and candy); hot drinks (coffee, tea, and hot chocolate); cold drinks (juice, bottled water, soft drinks, and in some cases, milk or chocolate milk); or other items such as newspapers and stationery. The first modern coin-operated vending machines were introduced in London in the United Kingdom in the early 1880s, dispensing postcards. The machine was invented by Percival Everitt in 1883 and soon became a widespread feature at railway stations and post offices, dispensing postcards, and notepaper. The Sweetmeat Automatic Delivery Company was founded in 1887 in England as the first company to deal primarily with the installation and maintenance of vending machines. After paying, a product may become available by the machine releasing it, so that it falls in an open compartment at the bottom, or into a cup, either released first, or put in by the customer, or the unlocking of a door, drawer, or turning of a knob. Some products need to be prepared to become available. For example, tickets are printed or magnetized on the spot, and coffee is freshly concocted. One of the most common forms of vending machine, the snack machine, often uses a metal coil that when ordered rotates to release the product. The main example of a vending machine giving access to all merchandise after paying for one item is a newspaper vending machine (also called vending box) found mainly in the U.S. and Canada. It contains a pile of identical newspapers. After a sale, the door automatically returns to a locked position. A customer could open the box and take all the newspapers or, for the benefit of other customers, leave all of the newspapers outside of the box, slowly return the door to an unlatched position, or block the door from fully closing, each of which is frequently discouraged, sometimes by a security clamp.

LITERATURE SURVEY

In [1] A mobile robot vending machine for beaches based on consumers' preferences and multivariate methods[2014]

The paper illustrates how multivariate statistical techniques, namely factor and clusters analyses, can be used to examine the perceptions and preferences of customers and to support the development of a new energetically independent

Review on Intelligent Packaging Solution for Tamperproof Delivery

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Abstract— E-commerce, also known as electronic commerce, refers to buying and selling various goods and services online. In recent days, the word “eCommerce” has become very familiar due to the internet boom and the kind of comfort (and other services) it provides to its users. Many companies have either established their business or have increased their profits with the help of eCommerce. Many studies show an exponential increase in eCommerce sales and services, and it will reach new heights in the upcoming years. Ecommerce businesses have seen a 265% growth rate, from \$1.3 trillion in 2014 to \$4.9 trillion in 2021, also higher. With such a mass boom in eCommerce, people don't prefer to buy goods offline since they receive more benefits by buying online. But unfortunately, there are a few problems that both the company and its customers face. And gradually, such issues have been increasing, and significant issues were concerning the faulty delivery system. To handle such situations, we propose a solution to avoid any delivery-related problems caused during delivery and stop such problems by ensuring every customer gets the products as it is by the dealer directly without any interference while delivering. This report discusses the part of IoT in secured packaging solutions and the proposed approach.

Index Terms: Intelligent Packaging, Microcontroller, GPS, Sensors, Arduino.

INTRODUCTION

The Intelligent Packaging System solution aims to use electronic packaging to combat the problem of tampering with packages during transit and monitor the product's characteristics and the inner and outer atmosphere of the box. The project IPS aims to use electronic packaging solutions to trigger an alert when a package is opened effectively. Monitoring is done by using many sensors in a failsafe system. The problem with single sensor-based systems is that they do not correlate data from different means. The

proposed method has many sensors like GPS and IR that continuously track physical parameters inside the package during transit to ascertain if the box has been opened or if there has been some rise in temperature (for pharmaceutical and temperature-sensitive products). Once this alert has been sent to the manufacturer, they can take necessary corrective action. If there was no alert and a standard delivery took place, the customer would have received a damaged product. Once the delivery takes place, the customer uses their mobile phone to scan a QR code displayed on the IPS kit; this will result in an OTP received at the customer's mobile, and entering the OTP will open the kit will reset the device. The IPS kit is then removed from the box and given to the delivery executive to be reused again. Internet of Things (IoT) isn't only an exciting research topic and a booming industrial trend. Although the essential idea is to bring things or objects online to be available to all, there are various approaches because an IoT system is very application-oriented. Some problems that arise with the packaging of products are difficulty and inaccuracy in determining appropriate packaging solutions consistent with the type and condition of the merchandise to be packed. The incorrect decision of the packaging option can cause a loss in quality and physical damage to the product. Packed products might get spoilt, especially perishable and time-sensitive products. The magnetic lock could be a more practical and cost-efficient solution, especially for parcel delivery. The functionality is often managed locally. Data security is a significant concern, and thus the system is fully compliant with all data protection standards. Thanks to the enterprise-level cloud-based control system, no resident data is stored locally. With the exponential rise of eCommerce, intelligent packaging solution

Solar and Wind Powered UPS System

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Abstract— As the demand for electricity is rising every single day, this demand would be hard to meet with the regular production of electricity by using non renewable resources of energy. Hence making use of some renewable resources of energy like solar energy and wind energy can be of great help to meet the demand of uninterrupted power supply. The survey conducted focuses on the design of a UPS system which stores the power generated from solar and wind energy and this power can be used for various applications, in this case to drive the water pump installed in fields for irrigation purpose which can be of great help to the farmers.

Index Terms: Renewable resources of energy, Solar energy, UPS system, Wind energy.

I. INTRODUCTION

The electricity provided by the conventional grids is unreliable especially in rural areas where the current supply is not regular and it is needed the most to drive the water pumps for irrigation purpose.

To minimize this issue of unreliable supply of electricity, the proposed design utilizes a UPS system which is charged by the renewable resources of energy like solar and wind energy. But these resources can be unpredictable in nature. So, using only solar energy may not be efficient on cloudy days as it would have been on a sunny day and in the same way using only wind energy may not be much efficient on non windy days.

Perhaps, the integration of these two renewable resources into an optimum combination would be an efficient method to continuously charge the batteries of the ups.

The cost of installation of the solar panels can be expensive hence in this project we also try to design a methodology that can improve the solar panel efficiency by making use of lesser number of solar

panels to get the desired output voltage, which in turn reduces the number of solar panels needed for installation and thereby reducing the installation cost.

II. LITERATURE SURVEY

Nishant Jha et al [1] have proposed a dual energy generation system for integrated grids to prevent the wastage of energy which is harnessed by making use of hybrid systems, which are a combination of solar photovoltaic and wind energy systems. By considering the factors such as wind energy, the tilt angle of PV array optimization, and inverter optimization the reliability and stability of the system has been improved. Based on this an optimal grid system configuration is designed. The cost analysis proved that the installation of the suggested system is much more cost efficient than other systems.

Vignesh M et al [2] have proposed a standalone UPS system which makes use of a solar tracking system to capture the solar energy. The main purpose behind choosing such a UPS system is that it can invert and rectify the electricity so that the solar power can be delivered to the DC part of the system instead of delivering it to an AC grid which in turn might help in avoiding the installation of excessive unnecessary inverters in the system.

Maidi Saputra et al [3] have conducted research on the comparison of the efficiency of the water pump using a battery as energy source with a pump that only uses a charged battery with solar power and wind power. The methodology that has been made used here is the comparison of the flow of water that is obtained by making use of electric pump with battery and by only using battery energy alone.

Bandla Pavan Babu et al [4] have proposed various possibilities of the design and the functionalities of a solar powered UPS which proves to be a fruitful



Literature Survey on Smart Assistance for Visually Impaired People

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Abstract: This paper is about the goal of developing a system that can assist people with disabilities in their daily activities. Visually impaired people have faced many challenges. In most cases, they need ongoing support in all situations, especially in their day-to-day activities. Some of the main challenges include difficulty getting from one place to another without the help of others. On top of that, they have difficulty recognizing people, detecting obstacles, etc. To overcome this example, we have proposed "optical character recognition". This system guides the visually impaired. A camera will take a live image. Optical recognition of characters (OCR) is used to extract text from images. The read data was converted to voices using a text-to-speech synthesizer. The system was implemented using various existing technologies to help visually impaired people. The document discusses challenges in system design and device design.

Keywords: Optical Character Recognition (OCR), GTTS, Camera, Visually Impaired, Human Emotion, Pyttsx3.

I. INTRODUCTION

Many people do not lose their sight, and some are blind from an early age. According to a survey by the World Health Organization in 2015, about 246 million people worldwide have an external disability and 39 million are blind. Various types of investigations have been conducted to address of these issues. Previously, Louis Braille was a French teacher and the inventor of Braille. It is a livery script and users must learn it before understanding it. Today, some technologies are developed based on the latest technology for the blind. Moderators will be introduced, based on OCR, blind hindrance and much more. However, these techniques are not enough to fix all the problems of Blind. People with visual impairment cannot survive in their daily life without any assistance. In many previous development and design of I have noticed disadvantages like using apps, blind sticks, handsets etc, they are inefficient. That's why we introduce new technology based on previous technology which is more efficient and is a low-cost project. With this electronic gadget, will also provide excellent assistance to people with disabilities in the outdoor environment.

The main motivation for this article is that I am very interested in solving problems in the different areas that this will open to carry out this project. I read about blind people getting hit by trains and kids saying "they can't read, so let's use new technology to make books speak" in the Deccan Chronicle. This quote will motivate me to find a new technology. I have searched many IEEE documents and websites for current technologies and found that there are some technologies with minimal equipment. Existing projects are with limitations. They can be manipulated by people if they know current technology like smartphones.

The main objective of this document is to plan and implement smart devices for the blind. This project encourages outwardly individuals to feel comfortable in this world. Here I present obstacle



prevention systems and readers of manuals, posters, and other text readers. With the camera, you can take pictures, convert to text and convert to audio using OCR or TTS. Another purpose is to add storage to these converted files, so that you can preview or restore these files in the future.


II. LITERATURE SURVEY




Kiran Rakshana R, Chitra C et.al [1] Aims in providing a system that allows the visually impaired to hear the contents of the text images. This system enables visually impaired people to hear the information which will be in the printed text format efficiently. This system uses a camera, audio microphone, ultrasonic sensor, Raspberry pi, headphones for voice and vibration motor. This system has three modules as the voice searching module, is implemented by using keyword operation search where the input has a voice of user after this



Image steganography performance analysis using discrete wavelet transform and alpha blending for secure communication

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Abstract

The opportunities to exchange information in the current web era have risen. The increased popularity of the media has posed real challenges to security-related issues. Steganography is a technology for the secure exchange of information. A video, audio, or image intended to raise no suspicion may be the carrier. After concealing the secret information, steganography techniques produce an identical cover image. This will prevent outside observers from noticing the existence of secret information. In the proposed work, alpha is a scaling parameter. Cover and payload images of different types and dimensions, live images from a webcam, and predefined images of other formats have been normalized and preprocessed. A Haar Discrete Wavelet Transformation (DWT) is applied to both the cover and payload images. To generate a stego image, the payload image is encrypted and fused with the cover image. The result parameters such as PSNR, MSE, and Entropy are measured.

 Previous

Next 

Keywords

Cover image; DWT; MSE; Payload image; PSNR; Steganography

Abbreviations

CI, Cover Image; PI, Payload Image; SI, Stego Image; HDWT, Haar Discrete Wavelet Transform; IDWT, Inverse Discrete Wavelet Transform; N1, Entropy of Stego Image; N2, Entropy of Cover Image

Introduction

Literature Survey: Sign Language Translator

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Abstract— Communication is a medium for people to exchange feelings and thoughts. The deaf and mute community are withheld from expressing themselves as they cannot talk or speak in regional languages. Communication is one of the most essential aspects of human life. Communication is how human beings interact to convey messages, and information and express emotions. Language is the medium through which the process of communication takes place. Language in communication can be verbal, i.e. Using words to read, write and speak or non-verbal i.e., using signs, facial expressions or body language. The deaf and mute community can only communicate using non-verbal means. Sign language is one of the major non-verbal communication methods through which the deaf and mute communicate with others. In order for this community to interact with people who are not aware of Sign language, we propose a system that can convert the Sign language fingerspells to their appropriate words in a standard Language which can be easily understood by others. We can also use the reverse process i.e., to convert written/printed words into their corresponding fingerspells.

Index Terms: Sign Language, Human Body Pose, MediaPipe, Machine Learning.

I. INTRODUCTION

Sign language is a basic means of communication for those with hearing and vocal disabilities. Those disadvantaged face difficulty in their day to day lives to communicate with others. We are aiming to develop a system that would eradicate this barrier in communication with the deaf and mute. Sign language consists of making movements with our hands with certain facial cues. A recognition system would thus have to identify the hand movements, facial expressions and even body pose of the Signer. American Sign Language is a predominant sign language as it uses a Single hand and most of the fingerspells are static while Indian Sign Language

and other languages use two hands and Dynamic Fingerspells. Since the only disability Deaf and Mute people have been communication-related and they cannot use Spoken Languages, hence the only way for them to communicate is through Sign Language. Communication is the process of exchange of thoughts and messages in various ways such as Speech, Signals, Behavior and Visuals, Deaf and mute people make use of their hands to express different gestures to express their ideas to other people. Gestures (Dynamic Fingerspells) are the non-verbally exchanged messages and these gestures are understood with Vision. This non-verbal communication between deaf and mute people is called Sign Language. The Deaf and Mute People face a lot of difficulty in their day to day lives. It becomes, even more, harder for them to travel to places with different native languages. Normally all the Sign Languages are based on the English Alphabet and hence it becomes more challenging for the Deaf and Mute to communicate with the natives as they might not be knowing English

We propose a system that runs on Raspberry Pi and can act as a stand-alone device. We use the Raspberry camera module to capture the fingerspells of the signer and the generated text/sentence is converted to audio with the help of a speaker module that is connected to the 3.5mm audio jack of the Raspberry Pi.

The video captured from the camera module will be processed using OpenCV, and the coordinates of the signer's hand and facial cues are extracted as data points using the MediaPipe library. We will be using these data points to train a deep learning model.

II. PAPER REVIEW

In a previous survey paper, we compared the various techniques used for real-time Sign Language

Real-Time Traffic Monitoring

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Abstract: As the population increases day by day vehicular travel is also increasing which leads to congestion problem. Traffic congestion causes many critical problems and challenges in the most populated cities. The increased traffic leads to more waiting time and fuel wastages. People miss opportunities, loose time and get frustrated. Traffic load is highly dependent on unpredictable situations such as accidents or constructional activities. These problems can be solved by a traffic control system by continuously sensing and adjusting traffic lights timing according to the actual traffic load which is called an Intelligent Traffic control System. The Intelligent Traffic Control Systems reduces congestion, operational costs, provides alternate routes to travelers and increases capacity of infrastructure.

Keywords: Traffic, Intelligent, Control, System, Alternate Route.

1. INTRODUCTION

Traffic investigate main aim is to optimize traffic flow of goods and citizens which causes lots of trouble especially when there are emergency case sat traffic light intersection which is always busy with lots of vehicles. However there are some restrictions in handling intelligent traffic control systems. The Density Based Signal executive in Traffic System is to solve traffic congestion difficulty which many people face and is a big problem in many cities. The system proposed here increases road safety even during the absence of traffic police and brings their attention to those who break the law. Traffic is coordinated in a circular loop that takes in the inputs in real time basics. NODE MCU with ESP Wi-Fi module is used to transfer and collect all the data from the sensors. All the data are made available at our local servers that are setup which will receive the data from the NODE MCU. The signals help at increasing the traffic-handling capacity at most intersections. They can function without any help from timers, connect to a computer controlled system which operates at few intersections.

2. LITERATURE SURVEY

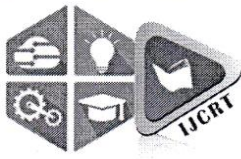
W. Wen et al. [1] this paper proposed a framework for a dynamic and automatic traffic light control system and developed a simulation model to help design the system. The model adopts average departure times and arrival times which are physically observed at each intersection. Here by controlling light duration and speed limit, traffic congestion in a large city can be solved. Traffic congestion has been causing many challenges in most cities of modern countries. To a traveller, congestion means lost

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time, missed opportunities, and frustration and to an employer it means lost worker productivity, trade opportunities, delivery delays, and increased costs. By solving congestion problems it is feasible not only for physically constructing new facilities and policies but also by building information technology transportation management systems. Traffic congestion problems cannot be solved by expanding the road infrastructure. In fact, building new roads can actually compound congestion, in some cases, by inducing greater demand for vehicle travel.

K.R. Shruthi et al. [2] the proposed system efficiently utilizes and manages traffic light controllers. An adaptive traffic control system based on a new traffic infrastructure using Wireless Sensor Network (WSN). They are dynamically adaptive to traffic conditions on both single and multiple intersections. In this project an intelligent traffic light controller system with a new method for vehicle detection and dynamic traffic signal time manipulation is used. The project also controls traffic over multiple intersections and follows international standards for traffic light operations. A central monitoring station is used to monitor all the access nodes.

Yousaf Saeed et al. [3] proposed a work which presents an application of fuzzy logic for multi-agent based autonomous traffic lights control system using wireless sensors to overcome problems like speed, traffic irregularity, accidents and congestion. This agent based approach can provide a solution by minimizing the vehicle waiting time especially the emergency vehicles using fuzzy logic control under situations of emergency that normally occur. Two traffic junctions information is taken to calculate effectiveness of this system.



SURVEY ON SMART MANHOLE MANAGEMENT SYSTEM

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Abstract: A smart megacity is the unborn thing to have cleaner and better amenities for the society. Smart underground structure is an important point to be considered while enforcing a smart megacity. Drainage system monitoring plays a vital part in keeping the megacity clean and healthy. Since homemade monitoring is unskillful, this leads to slow running of problems in drainage and consumes further time to break. To alleviate all these issues, the system using a wireless detector network, conforming of detector bumps is designed. The proposed system is low cost, low conservation, IoT grounded real time which cautions the managing station through an dispatch when any manhole crosses its threshold values. This system reduces the death threat of homemade scavengers who clean the underground drainage and also benefits the public.

Index Terms – Smart megacity, Drainage system, IoT.

I. INTRODUCTION

An integral part of any system is that the access points into it when it involves cleaning, clearing, and examination, Metropolitan metropolises have espoused underground system and therefore the megacity's external pot must maintain its cleanliness. However, spring water gets defiled causing contagious conditions, If the sewage conservation isn't proper. Blockages in rainspouts during thunderstorm season, causes problems within the routine of the general public. Hence, there should be a installation within the megacity's pot, which cautions the officers about blockages in seamsters, their exact position and also if the manhole lid is open automatically. Underground drainage consists of facility, gas channel network, water channels, and manholes. Temperature detectors are accustomed cover electrical power lines that are installed underground. Pressure detectors are stationed to avoid manhole explosions thanks to chemical release and power. So, the most focus of this design is to convey a system which monitors water position, atmospheric temperature, water inflow and poisonous gases. However, manhole lid opens, it's tasted by the detectors and this data is transferred to the corresponding managing station via transmitter located in this area, If drainage gets blocked and sewage water overflows. Conservation of manholes manually is tedious and dangerous thanks to the poor environmental conditions outside. It is, thus dangerous to travel inside the manholes for examination of its current state. to interrupt all the issues associated with underground sanitation, a distant device is important for transmitting data collected by the detectors set inside the manhole to the managing station. This design uses Wireless Sensor Networks (WSN) to use this method. These bumps are composed of regulator, memory, transceiver and battery to produce power.

II. LITERATURE SURVEY

A Smart City is a vicinity peopled with electronic detectors which provides data that helps to manage means and coffers effectively. it's the results of faster development of the new age information technology. Smart metropolises incorporate information and communication technology (ICT) and detectors together with Internet of Effects (IoT) at its core (1). Electronic services and operations of informatics has come a relief way of life and commerce between individualities and government. The blending of technology with mortal coffers has led to the emergence of a wise life moving, at an accelerated pace and fluently within the design and form, that characterized by the convenience, speed and delicacy within the delivery of public services and do business. This paper presents the most operations of smart live that starting from diggings, workplaces and also the way people are transported, living and learning within metropolises. (1) Also enhances quality and effectiveness of external services. Smart metropolises help the authority to connect with the city services and to review the circumstances within city and thus the way it's evolving. The proposed Smart City design helps to boost the standard of water. It helps produce more effective and cost-effective external services and keeps citizens informed. Polluted water bodies are a vital asset of metropolises. With the growing population in metropolises, it's ineluctable that wastewater will grow and water sources will get defiled.

The Internet of Effects (IoT) is defined as a paradigm during which objects equipped with detectors, selectors, and processors communicate with each other to serve a meaningful purpose. during this paper, we survey state-of-the- art styles, protocols, and operations during this new arising area. This check paper proposes a completely unique taxonomy for IoT technologies, highlights variety of the foremost important technologies, and biographies some operations that have the eventuality to produce a striking difference in mortal life, especially for the else abled and therefore the senior. As compared to analogous check papers within the area, this paper is much further comprehensive in its content and completely covers utmost major technologies gauging from detectors to operations. (2) Smart City design performs real- time water quality monitoring. Adverse goods of the pollution are frequently



Literature Survey on Attendance monitoring and access control system

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Abstract: Many organizations and institutions waste a lot of time and effort on a daily basis recording of attendance and providing access to each individual. The use of an attendance tracking and access control system is vital in providing high security to places like educational institutions. Physical access control system is a key for the protection of infrastructure systems, where timely access, maintenance of attendance and the security of sensitive areas are essential.

This project deals with few effective strategies. The proposed work will recommend an appropriate, accessible, dependable, efficient, and cost-effective attendance system as well as access control system. The proposed idea consists of two different methods for attendance monitoring and access control based on the level of security. For the applications with primary level of security, RFID tags are used and for the applications with intermediate level of security, fingerprint based biometric is used. RFID tags are used to provide authenticated access and timely database storage of the user details who access it. Biometric is mainly used for attendance monitoring of students and the data is maintained using IoT. One can look into user access and attendance details from any place at any time.

Keywords: Access control, Attendance monitoring, Biometric, IoT, RFID tags.

INTRODUCTION

With the continuous growth of the digital world, we are becoming increasingly dependent on a huge range of digital applications. The main concern in many instances is that access to these applications should be secure and authenticated. Monitoring attendance and granting access to authorized users is very important in educational institutions and there is an immense increase in the development of such systems.

It is necessary that only authorized users have access to a certain location or area to which they are granted access. Because of the linked issues of impersonation, spoofing, proxy, phishing, and information theft, accurate person-verification and authentication techniques are becoming increasingly critical, in addition to access attendance monitoring.

Biometric technology, which uses fingerprint verification of an individual, is the most practical and reliable technology for big groups of employees or pupils for recording attendance and granting access. Fingerprint verification is the highly accepted, recognized and emerging biometric technology followed by RFID cards, which is another promising technology prioritized after biometrics.

LITERATURE SURVEY

In [1] IOT Based Cloud Integrated Smart Classroom and Sustainable Campus [2021]

This paper proposed an idea of recording attendance using face recognition technique and storing the data using IoT. In this method arduino uno is used as a microcontroller. Cameras are used to detect the face of an individual or group of pupils. Based on the information that is stored in prior, the faces are recognized and the attendance is recorded and the database is obtained. This method provides better results in short span of time but fails to produce most accurate results. There are some chances of some errors.

In [2] Attendance Management System through Fingerprint [2018]

This paper proposed an idea of recording attendance using biometrics (fingerprint) for tracking attendance and storing the data using LAN. This paper provides a brief description about the usage, accessibility, accuracy, affordability and acceptance of biometric (fingerprint verification) system. In this system the data is fetched from the individual in the form of fingerprint and then it is verified with the data that was stored in prior and marks the attendance of an individual. Finally the database is also obtained. This method provides high accuracy results and consumes less time but it is not cost-effective.



Experimental Studies on Oscillating Heat Pipe using conventional and Nano Fluids

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ABSTRACT

Oscillating heat pipe (OHP) cooling is the new and emerging technique in the field of thermal management of electronics. In the present work, transient and steady state experiments are conducted on a multi turn closed loop OHP. Evaporator and condenser wall temperatures are measured. Copper is used as the capillary tube material in the evaporator and condenser sections with inner diameter of 1.5 mm and outer diameter of 3 mm. The total length of the closed loop pulsating heat pipe is 2040mm. The experiments are conducted in vertical orientation for different heat loads varying from 20 W to 40 W in steps of 5W. The OHP is tested with different working fluids viz. Acetone, water, SWCNT and Graphene. The performance parameters such as temperature difference between evaporator and condenser, thermal resistance and the overall heat transfer coefficient are evaluated. The experimental results demonstrate that SWCNT& Graphene particle based Nano fluid is the better working fluid among the working fluids considered in terms of lower thermal resistance and higher heat transfer coefficient. The multi loop OHP is found to perform better for all heat loads & working fluids considered.

Keywords: Nano fluids, oscillating heat pipe, experimental studies, thermal performance

I. INTRODUCTION

Thermal management is the challenge of the day in electronic product development. Presently, the chip heat flux level ranges between 40 to 120 W/cm². It is expected to increase to 200 W/cm² in the next few decades. Several cooling methods are employed to cool the electronic devices. Heat Pipe is being explored for electronic cooling devices with promising results. Even though the conventional heat pipes are excellent heat transfer devices their application is mainly confined to transferring small amount of heat over relatively short distances.

Oscillating heat pipe (OHP) is a passive two-phase heat transfer device, which is a special category of wickless heat pipes. It has been invented by Akachi [1-3], it exhibits self-sustained oscillation of the working fluid and phase change phenomenon leading to enhanced heat transfer. Due to its simple design, light weight, low fabrication cost and very fast response at higher heat loads, OHPs have been considered as one of the compact heat transfer devices for various cooling applications such as electronics cooling, heat exchanger and space application, etc. Since the last two decades, many researchers have investigated its thermal performance experimentally and theoretically. These experiments reveal that the Closed Loop Oscillating Heat Pipe (CLOHP) performance is strongly affected by many parameters including geometrical, physical and operational parameters. Furthermore, it is mentioned that the problem of two phase flow oscillation in closed loop Oscillating heat pipe is very complicated because of many unstable variables and complexity of thermo-hydrodynamic operational characteristics. In the meantime, some visual studies have been performed using glass tube to understand the operational behaviour and considerable progress has been also achieved in these Attempts [4]. In recent years, improving thermal performance of CLOHP has become a demanding challenge and hot research topic due to rapidly increasing heat load and miniaturization of electronic devices. Based on existing experimental results the working fluid is the most important parameter in the CLOHP. At the same time, Nano fluids are viewed as advanced heat transfer fluids in heat transfer devices. In general, the nanoparticles suspended in the base fluid forming the Nano fluid are of size about less than 100 nm. The heat transfer performance of the base fluid is significantly improved due to increased surface area. In 1995, this concept was first proposed by Choi Since then, some researchers have focused on the heat transfer characteristics of Nano fluids such as thermal conductivity and viscosity in single-phase flow and also flow with phase change.

In recent years, the nanofluid, employed as a working fluid in the heat transfer device, is an emerging topic. In 2004, Tsai et al. [5] found application of nanofluids in the Conventional heat pipes using gold nanoparticle solution and there was a significant reduction noted in thermal resistance of heat pipe with nanofluid as compared to the one with DI water. In 2006, Ma et al. [6] conducted experiments under various operating temperatures and heat powers using water based diamond nanofluid in the CLOHP.

They reported that the nanofluid could effectively enhance heat transfer due to occurrence of strong oscillatory motion of flow. Lin et al. [7] observed thermal enhancement of the heat pipe with water based silver nanofluid at very low mass concentration. Visualization

Experiments are carried out on two phase flows of the CLOHP using DI water and Nano fluid [8, 9]. Ji et al. [10] found improvement in the start-up performance of CLOHP due to alumina nanofluid. Jian Qu et al. [11] pointed out improvement or deterioration of the CLOHP performance due to different nanoparticle deposition behaviour with different nanofluids. A similar deterioration of heat pipe (thermosyphon) was found by Khandekar et al.

[12]. It is noticed from relevant literatures [5–12] that the improvement/deterioration of boiling performance in the heat pipes is due to the change in surface property. The small amount of the nanoparticle suspended on the base fluid cannot largely increase the thermal conductivity of the working fluid. However, the oscillating motion of the particles in the working fluids might have additional contribution to improvement of thermal performance of the CLOHP [6]. From the literatures [13–15], it is felt that the study of Nano fluids is still

promising and the overall understanding of two phase flow heat transfer with the CLOHP is at the beginning stage. Hence, exploratory researches in both fundamental and engineering systems are needed.

Further, it is noted that very little amount of work has been carried out with use of metal nanoparticles in the CLOHP. Therefore, the present study aims at experimentally investigating the thermal performance of the device using SWCNT & Graphene Nano particle based Nano fluid, Results of the present study are expected to help us understand and design more efficient Nano fluid-charged CLPHPs operational behaviour

II. EXPERIMENTATION

2.1 Material Selection & Fabrication

The basic components used in OHP are copper tubes, glass tubes, silicon rubber tubes, a non-return valve, a Mica heater and thermocouples. Copper is used as the tube material since it is an excellent conductor of heat. The tube is bent into a multi loop U turn with a radius of 35mm. The glass tube attached between the U turn copper tubes acts as the adiabatic section and provides the flow visualisation. The glass tube is made of borosilicate, which can resist temperature up to 1200°C. Silicon tubes are used as the connectors between glass and copper tubes. They can resist temperatures up to 400° C. In order to maintain unidirectional fluid flow, a non-return valve is used. Eight 'K-type' thermocouples are used for temperature measurement. Four thermocouples each are connected in the evaporator and condenser sections at equal distances. An Eight - channel digital temperature indicator is used to record the temperatures at different locations. A coil wound heater attached to evaporator section acts as the source of heat input. The experimental setup is worked with four working fluids viz., water, acetone, SWCNT and Graphene based Nano fluids. The Working fluid is injected into the heat pipe using a syringe

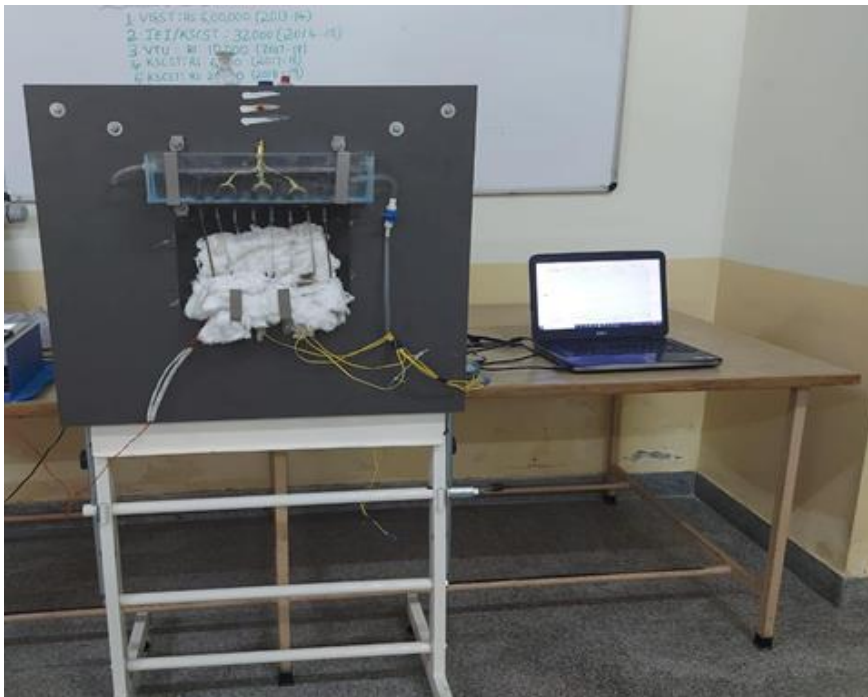


Figure. 1 OHP experimental setup

2.2 Experimental Procedure

Before conducting the experiment, it is ensured that there is no fluid inside the tubes. The required amount of working fluid is then filled through a syringe by opening one end of the non-return valve such that the fluid directly enters the evaporator section. Now the air is filled through the projection provided on the copper tube using another syringe. This is done to ensure simultaneous formation of liquid slug and vapour plug. The display unit is switched ON and the required wattage is set. A fan arrangement is used for cooling the fluid in the condenser section. The transient experiments are conducted and the various temperatures are recorded from the digital temperature indicator. The experiments are continued till SteadyState is reached.

The colloidal solution of SWCNT particle Nano fluids is prepared by using water as base fluid & graphene particle based Nano fluid is prepared by using acetone as base fluid and experimentation is carried out by varying the fill ratio as well as by varying the heat load input. The obtained values will be plotted against the graph through which the values of thermal resistance and heat transfer coefficient. The heat input and the variation of the temperature is noted with the aid of temperature data logger. The output of the temperature data logger with the help of the software is monitored in the computer. A typical output from the data acquisition system is as shown below,



Figure 2 Output of the Data Acquisition System

III. RESULTS AND DISCUSSION

Transient experiments have been conducted with different working fluids i.e., acetone, water, SWCNT and Graphene Nano particle based Nano fluid and variations of temperature with time are recorded. The experiments are continued till steady state is reached.

Fig 3 shows the variation of temperature difference between evaporator and condenser with time at different heat inputs for water at a fill ratio of 50%. It is observed that the temperature difference between evaporator and condenser is considerably less at lower heat input of 25 W

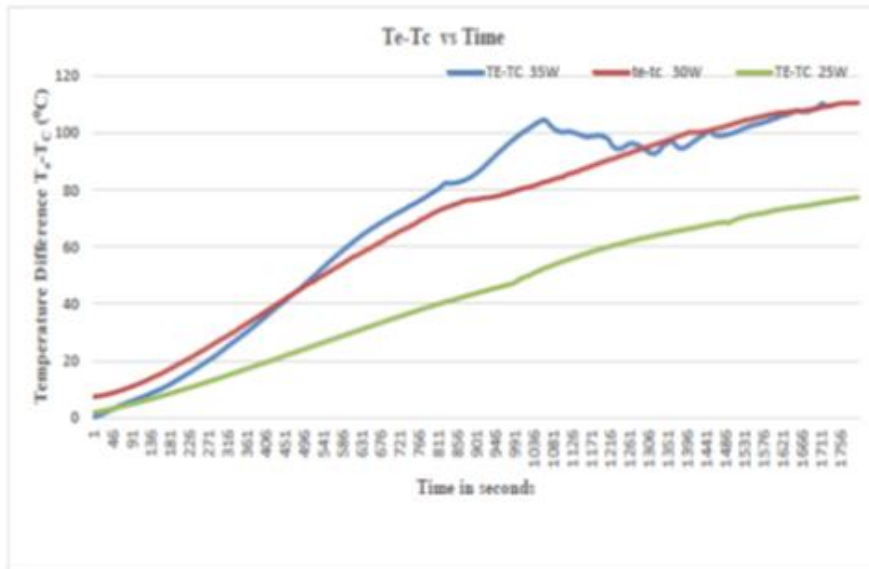


Figure 3 .Temperature Difference (Te -TC) Plot for water

Fig 4 shows the variation of temperature difference between evaporator and condenser with time at different heat inputs for SWCNT at a fill ratio of 50%. It is observed that the temperature difference between evaporator and condenser is considerably less at lower heat input of 25 W

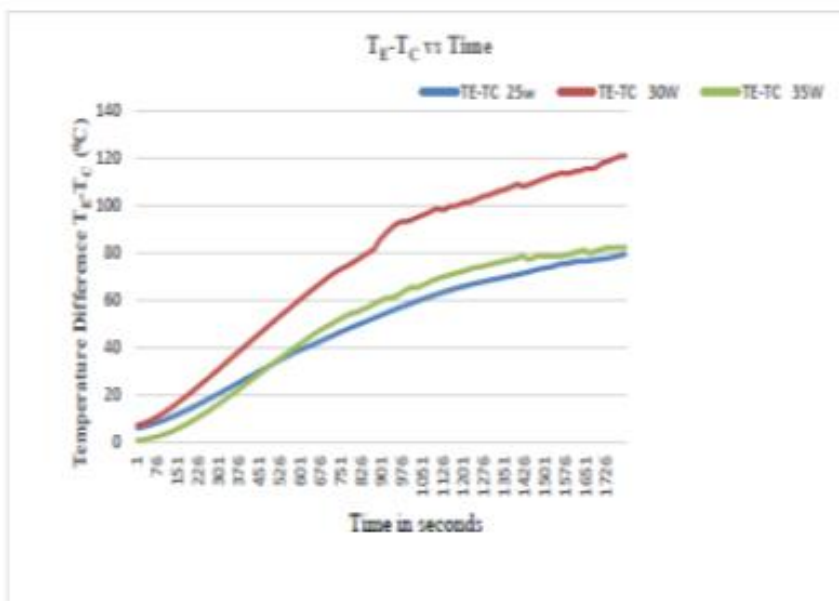


Figure 4. Temperature Difference (Te -TC) Plot for SWCNT

Fig 5 shows the variation of temperature difference between evaporator and condenser with time at different heat inputs for Graphene at a fill ratio of 50%. It is observed that the temperature difference between evaporator and condenser is considerably less at lower heat input of 25 W

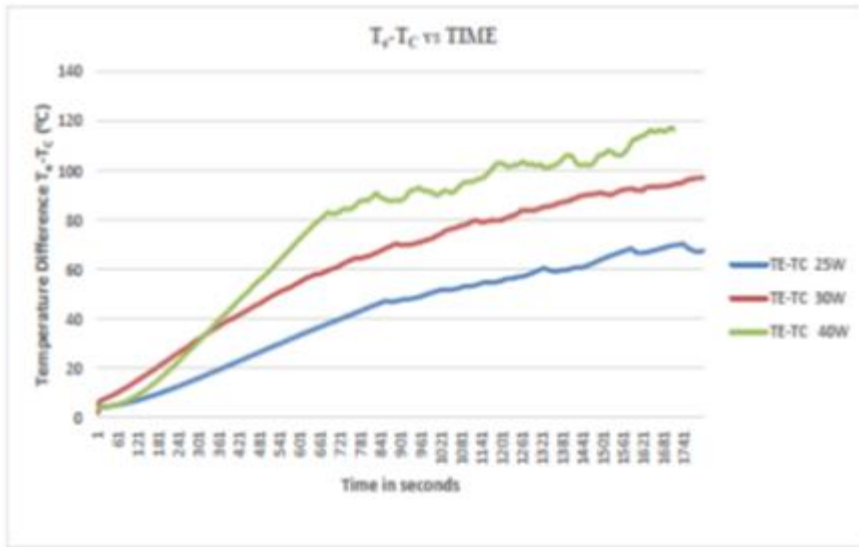


Figure 5. Temperature Difference (Te –TC Plot for Graphene

Fig 6 shows the variation of temperature difference between evaporator and condenser with time at different heat inputs for Graphene at a fill ratio of 50%. It is observed that the temperature difference between evaporator and condenser is considerably less at lower heat input of 25 W

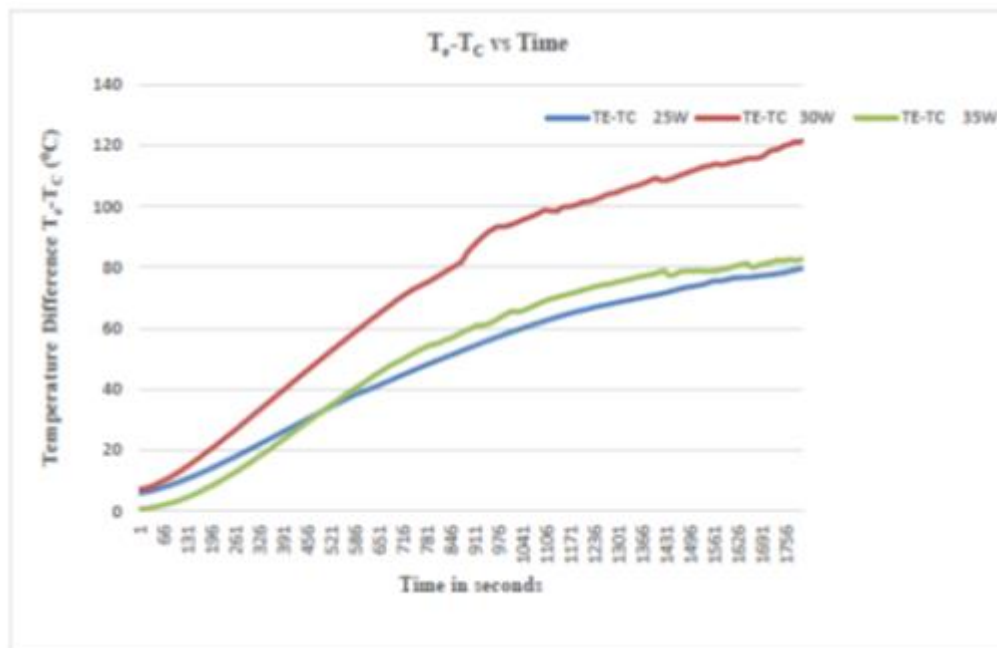


Figure 6. Temperature Difference (Te -TC) Plot for Acetone

Finally the effectiveness of the heat pipe is indirectly brought in terms of thermal resistance and convective heat transferco-efficient.

The thermal resistance is computed as,

$$R_{th} = \frac{T_e - T_c}{Q} \text{ } ^\circ\text{C/W} \text{ } \text{-----(1)}$$

Convective heat transfer co-efficient is given by

$$h = \frac{Q}{A_s (T_e - T_c)} \text{ } \text{W/m}^2\text{C} \text{ } \text{----- (2)}$$

Where T_e = Evaporator temperature in $^\circ\text{C}$

T_c = condenser temperature in $^\circ\text{C}$

A_s = surface area of the condenser section of heat pipe in m^2

h = Heat transfer coefficient $\text{W/m}^2\text{C}$

R_{th} = Thermal resistance $^\circ\text{C/W}$

Fig.7 &8 shows the variation of thermal resistance and heat Transfer coefficient with heat load at steady state for Water and SWCNT at a fill ratio of 50%. It is observed that the thermal resistance decreases with increase in heat load & heat Transfer coefficient increases with increase in heat load for both Water and SWCNT. However, it is clear that the magnitude of thermal resistance is lower for SWCNT compared to Water. As the temperature difference between evaporator and condenser is less for SWCNT, the thermal resistance is also

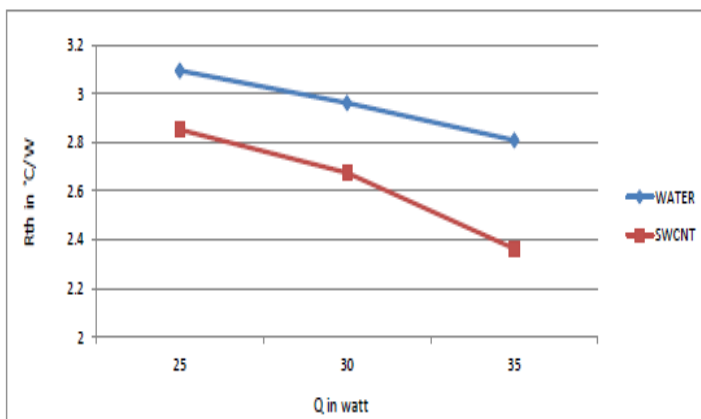


Figure 7. Thermal Resistance vs heat input

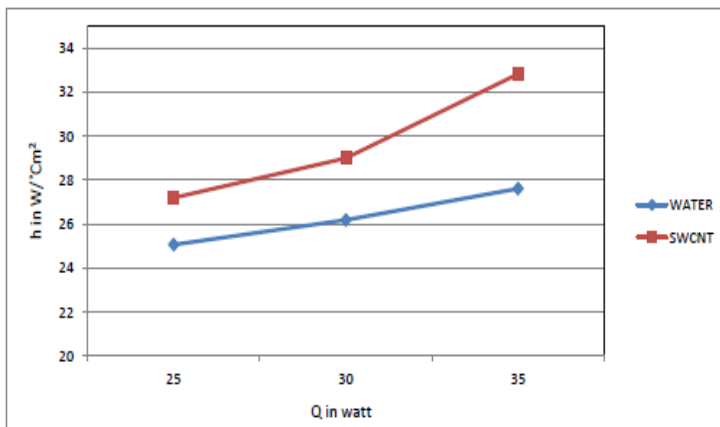


Figure 8. Heat transfer coefficient vs heat input

Fig.9 & 10 shows the variation of thermal resistance and heat Transfer coefficient with heat load at steady state for Acetone and Graphene at a fill ratio of 50%. It is observed that the thermal resistance decreases with increase in heat load & heat Transfer coefficient increases with increase in heat load for both Acetone and Graphene. However, it is clear that the magnitude of thermal resistance is lower for Graphene compared to Acetone. As the temperature difference between evaporator and condenser is less for Graphene, the thermal resistance is also less.

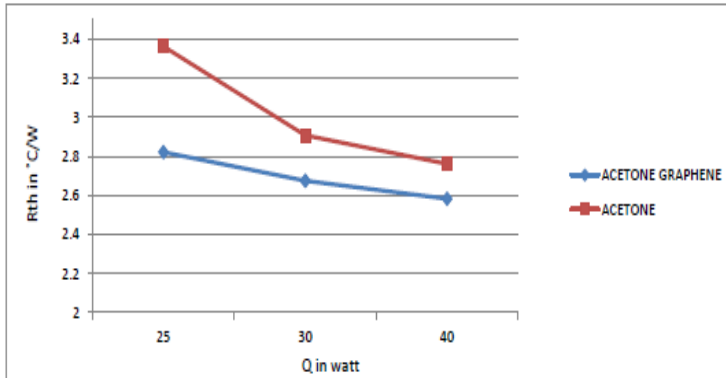


Figure 9. Thermal Resistance vs Heat input

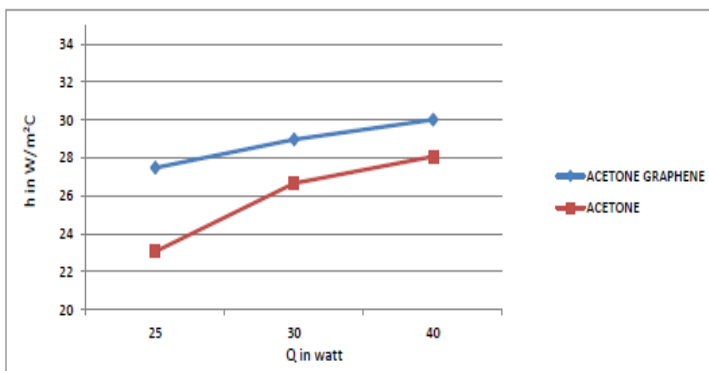


Figure10. Heat transfer coefficient vs Heat input

Figure 11. Shows the variation of thermal resistance with heat input for different working fluids at 50% fill ratio. The figure indicates that the thermal resistance decreases with increase in heat input in case of both the working fluids considered. Further it is seen that SWCNT exhibits lower values of thermal resistance compared to Water and Graphene. This is due to lower value of temperature difference between evaporator and condenser in case of SWCNT. The lower values of thermal resistance of SWCNT indicate that SWCNT has better heat Transport capability compared to Water and Graphene

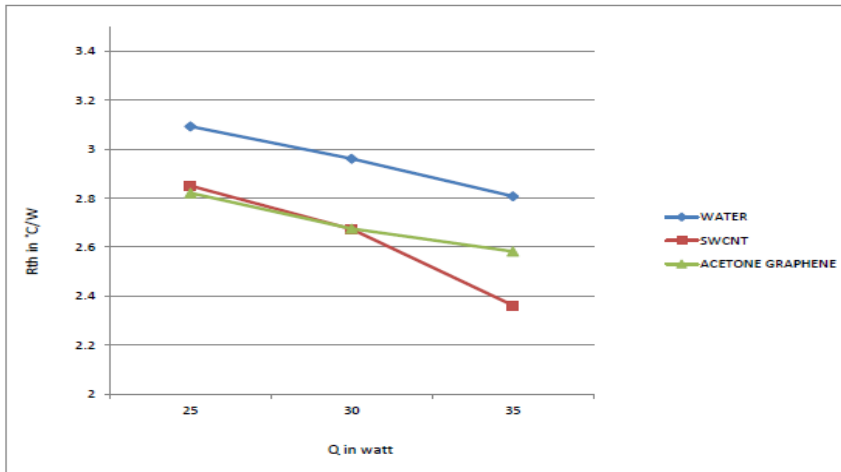


Figure 11. Thermal resistance plot for different fluids

The variation of Heat transfer coefficient with respect to heat input for different working fluids at a fill ratio of 50% is shown in Fig.12. It is seen that the Heat transfer coefficient increases with increase in heat input for the working fluids considered. SWCNT shows higher heat transfer coefficient values compared to water & Graphene. This is due to the lower values of temperature difference between evaporator and condenser for SWCNT.

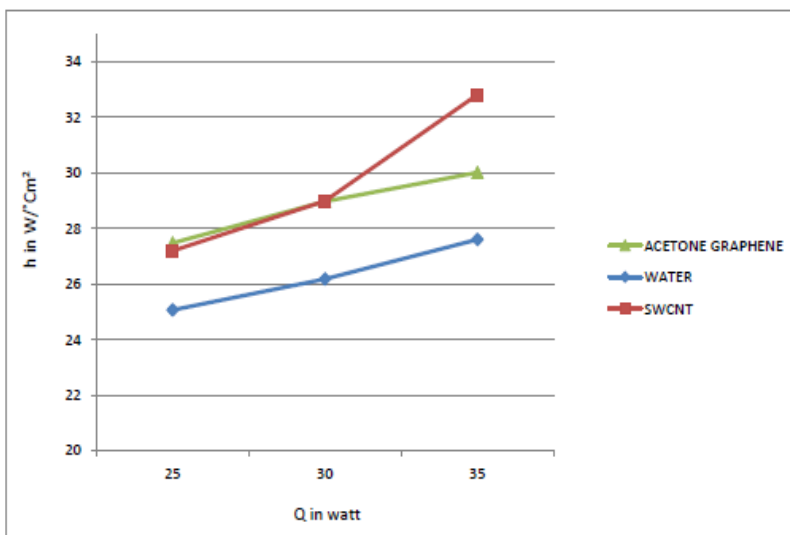


Figure 12. Heat transfer coefficient plot for different fluids

IV. CONCLUSION

In the present work, the experimental investigations are carried out on a multi turn loop OHP. The effects of heat input, working fluid and fill ratio on the performance of OHP are studied.

Following conclusions are drawn from the present experimentation:

1. The variation of temperature difference between evaporator and condenser wall with time is found to be periodic.

2. The temperature difference between evaporator and condenser at steady state is found to be less for SWCNT compared to water & Graphene.
3. SWCNT and Graphene are observed to be more suitable working fluid for OHP operation under different operating conditions.
4. The results indicate that SWCNT can transfer more heat with less temperature difference and less thermal resistance. Thus SWCNT can be considered as more suitable working fluid for OHP operation.

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Study Of Combination of After Treatment Devices into Existing Diesel Engine Fueled by Nanoparticles

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Abstract: Internal combustion engine are established as the main power source for automobile vehicles. At present emission norms because strict for any I.C Engine. The main pollutant are CO, HC, NO_x, PM, soot etc. the aim of this work is to inject inject nanoparticle to reduce the emission norms like CO, HC, NO_x, PM, soot and by using after treatment devices. Cerium oxide being oxygen buffering capability, especially in the nanosized form, hence when used as an additive in the diesel fuel it leads to simultaneous reduction and oxidation of nitrogen dioxide and hydrocarbon emissions, respectively from diesel engine. However, the work investigates the effect of ceriumoxide nanoparticles on emissions of diesel engine.

Keywords: Internal combustion engine, Nanoparticles, Nitrogen dioxide, Catalytic converter

I. INTRODUCTION

As we all know that diesel engine Diesel engine is an internal combustion engine in which ignition of the fuel is caused by the elevated temperature of the air in the cylinder due to the mechanical compression. This increases the air temperature inside the cylinder to such a high degree that atomized diesel fuel injected into the combustion chamber ignites spontaneously. However diesel engines are one of the major contributors to the emissions such as hydrocarbons, particulates, nitrogen oxides, and sulphur oxides. These emissions are very harmful to human beings and also responsible for acid rain and photochemical contamination and hence subject to strict environmental legislation. Thus wide use of diesel engines leads to harmful threat of nitrogen oxide and hydrocarbon emissions. Improvement in the performance of diesel engines is an important challenge to be addressed, in the current era due to the fast depletion of fossil fuel resources as well as due to the harmful hydrocarbon and nitrogen oxide emissions. The nanoparticle as additive in diesel has emerged as a new promising fuel additive for utmost improvement in the performance and level best reduction of exhaust emission, there are few nanoparticle which are used in internal combustion like cerium oxide nanoparticle, aluminum nanoparticle, cobalt oxide and magnesium-aluminum nanoparticle and many more nanoparticles additives for diesel fuels. Among these oxides, cerium oxide is the most abundant element in rare earth family with good thermal stability as well as cross-over efficiency which will undergo redox cycling between the trivalent and tetravalent oxidation states. Cerium oxide, when used in the nanoparticles form exhibits a high catalytic activity because of its high surface-to-volume ratio leading to improvement in the fuel efficiency and reduction in the emissions, By the addition of after treatment devices like DPF, DOC & new device which help in better combustion of fuel & also reduces these harmful gases in the emission. DPF, DOC are the devices that physically capture diesel particulate matter in the exhaust pipe to prevent the release to the atmosphere, In order to cope with the strict emission standards, diesel engine which reduces exhaust emission should be developed, The present experimental study aims at the investigation of the effect of cerium oxide (CeO₂) in the form of nanoparticles, as an additive in diesel. Single cylinder water-cooled direct injection diesel engine was used for conducting the performance tests. Engine performance and emission characteristics were obtained and analyzed. The experimental investigations were carried out by varying the dosing levels of CeO₂ nanoparticles in the fuel (from 5 to 35 ppm). The study of the stability of the nanofluid also has been carried out, with the addition of surfactants in the diesel, in the present work.

II. NANOPARTICLE

As the new emissions norms are being strict there is a need to identify new options to reduce emissions and some of the nanoparticles have been proved to reduce certain amount of poisons gases. Nanoparticles like aluminum oxide, cerium oxide, graphene oxide and many more. In this paper cerium oxide has been considered as an additive to pure diesel. The cerium oxide nanoparticle has been obtained by sol-gel method where the size of the particles is 30-50 nm, with the colour grey, containing a surface specific area of 15-25 m²/g, Also the density was found to be 7.1 g/cm³.



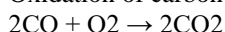
Nanoparticles have a relatively large surface-area-to-volume ratio, making them ideal catalysts. The nanoparticles disperse throughout the fuel and encourage better air-to-fuel mixing and enhance chemical reactivity during combustion, leading to better performance, combustion, and quality of emissions. The cerium nanoparticle present in the fuel longer and more complete combustion as compared to the base fuel, as cerium oxide acts as an oxygen buffer releasing and storing oxygen depending upon the partial pressure of oxygen, The catalyst also donates oxygen molecules during the combustion to extend the burn, which chemically alters the timing of a diesel engine to burn a more significant percentage of the fuel during the Power stroke. Another advantage of a shorter ignition time keeps the engine temperatures low to prevent the formation of NOx. Normally, about 20 to 25% of the fuel injected into diesel engines are not burnt, which demands the production of enough oxygen during the combustion process with the usage of these nanoparticles this demand would be partially reduced.

III.CATALYTIC CONVERTER

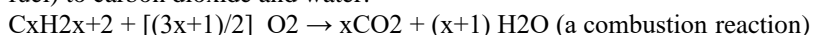
As emission regulations have tightened, the complexity of the catalytic converter system has increased. Meeting the demands of tightening legislation may require increased converter volume, translating into the use of multiple catalytic converter elements within a vehicle exhaust system.

Components used in this work consisted of Cordierite flow-through monoliths wash coated with alumina and platinum catalyst as well as Pt/Pd which provides low temperature T50 values for CO and HC, But in the case of underfloor catalytic converter, which is widely used for many years because of convince of packaging as its catalyst LOT has 200 to 300s. In order to reduce this delay, and to increase the efficiency of the catalyst at low temperature, the improvement in washcoat formulation is introduced with the help of new precious metals such as Pt/Pd

Oxidation of carbon monoxide to carbon dioxide:



Oxidation of hydrocarbons (unburned and partially burned fuel) to carbon dioxide and water:



IV.PREPARATION OF TEST FUELS

In this research work, commercially available diesel fuel are employed. The fuel properties for all the test fuels are verified before they are subjected for the engine experimental investigations. Nanoparticle such as Cerium oxide were purchased from a comsny called ultrananotech respectivelty. Now the dispersion of nanoparticles with fuels is prepared by using an apparatus called ultrasonicator where the solution was sonicated for about 45 min to prepare the homogenous tests fuel. The prepared test fuel was subjected to the stability investigation: kept in a 100 ml graduated scale glass test tube under static condition and was found stable. The physicochemical properties for the diesel test fuels are tested as per ASTM standards

| Properties | ASTM standards | Diesel |
|------------------------------|----------------|--------|
| Density (kg/m ³) | D1298 | 816 |
| Kinematic viscosity | D88 | 2.20 |
| Flash point | D 93 | 48 |
| Fire point | D 93 | 55 |
| Calorific value (MJ/kg) | D240 | 45.66 |
| Pour point | D97 | -9 |
| Total acidity (mg of KOH/g) | D664 | 0.38 |

V.CONCLUSION

This paper shows that the emissions can be reduced by the implementation of nanoparticles such as CeO₂, AlO₂. mixed with diesel and using a catalytic converter. Considering cerium oxide nanoparticle as the study point, synthesis of the cerium oxide nanoparticles and investigation on the effect of nanoparticles on various physicochemical properties of diesel and engine performance and emissions. Also significant improvement in brake thermal efficiency is observed for nanoparticles dispersed in the diesel fuel and the NO_x emissions were reduced for about 30% as compared to base fuels. The flash point and fire point was also increased. By the use of catalytic converter there was a significant reduction in HC, CO, NO_x, PM.



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A REVIEW ON STUDY AND USAGE OF COMBINING AFTER TREATMENT DEVICES INTO EXISTING DIESEL ENGINE

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Abstract -In this study, were the diesel engines produces lot of harmful pollutants to the atmosphere, the emission control method is used to prevent and reduce the emission of harmful gases. In order efficiently reduce the polluting emissions of engines by exhaust after treatment systems, We tried to control the reduction of emission implementation of post combustion techniques like Diesel particulate filter (DPF), Diesel oxidation catalyst (DOC), Selective catalytic reduction (SCR) are adopted for existing diesel engine to reduce the emissions and induce significant gain in emission reduction were tried. The paper summarizes developments in diesel emissions regarding regulations, engines, Particulate matter (PM) reduction, and hydrocarbon (HC), and CO oxidation.

Keywords- DOC, DPF, SCR, Diesel engine, New Catalytic converter.

I. INTRODUCTION

The usage of diesel engines are useful for the transportation services and other useful works, it produces lot of harmful pollutants which effects living organisms. Urban air pollution is mainly caused by automobiles which significantly contribute toward pollutants like hydrocarbons (HCs), carbon monoxide (CO), and oxides of nitrogen (NO_x) in urban shed. These air pollutants have high impacts on human beings, other living creatures and environment. Exposing to HCs, beyond certain limits can damage our respiratory system and CO is harmful for human vascular system. Emissions of NO_x are responsible for the acid rain, greenhouse effect, and visible impairment. NO and CO are identified as precursors of photochemical smog and other secondary pollutants. These consequences of the pollutants have historically lead toward implementation of more and more stringent vehicular emission control regulations. To overcome with these regulations, one of the most widely used options by vehicle manufacturers today is catalytic converter. Diesel engine, like other internal combustion engines, converts chemical energy contained in the fuel into mechanical power. Diesel fuel is a mixture of hydrocarbons which during an ideal combustion process would produce only carbon dioxide (CO₂) and water vapour (H₂O). Indeed diesel exhaust gases are primarily composed of CO₂, H₂O and the unused portion of engines charge air. Most of the pollutants originate from variant non-ideal processes during combustions, such as incomplete combustion of fuel, reactions between mixture components under high temperature and pressure, combustion of engine lubricating oil and oil additives as well as combustion of non-hydrocarbons components of diesel fuel. There are other sources that can contribute to pollutant emissions from internal combustion engines-usually in small concentrations, but in some cases containing material of high toxicity. These additional emissions can include metals and other components from engine wear or components emitted from emission control catalysts.

DIESEL PARTICULATE FILTER (DPF)

It is an exhaust after treatment device that traps particulate matter such as soot and ash. A DPF typically uses a subtracted made of a ceramic material that is formed into a honeycomb structure. When the particulate matter (or) soot which is exhausted through outlet value of the engine it passes to the DPF cylinder, were the soot is collected on the side walls of the honeycomb structure and the exhaust sir is released to atmosphere which leads to less emission of particulate matter (PM). In this cylinder oxidation of particles doesn't takes place, so the carbon monoxide (CO) doesn't react with the ceramic materials and they release (CO), But the hydro carbon (HC) and other particles are captured and controlled in cylinder.

| Particulate emission control technologies | | | | |
|---|----------------------|--------------------|--|--|
| | | Removal efficiency | Example uses | Considerations |
| Cyclones | Centrifugal force | >90% | Fluid catalytic crackers (refineries) | Collection efficiency falls off for smaller particle sizes |
| Filters | Impaction | >99.9% | Coal-fired boilers | High back pressures, making this technique impractical for many operations |
| Electrostatic precipitators | Electrostatic force | >99.9% | Power generation, petroleum refinery, waste incinerators | Electricity consumption for operation |
| Wet gas scrubbers | Nucleation/impaction | >90% | Petroleum refineries, pulverized coal combustors | Waste solvent is contaminated with wet dust; requires disposal |

DIESEL OXIDATION CATALYST (DOC)

It is specifically designed to reduce the emission rate of carbon monoxide (CO) before releasing it to atmosphere. The oxidation takes place in the catalytic converter by the material coated in ceramic honey comb structure. When materials like hydro carbons (HC), particulate matter (PM), Carbon monoxide (CO) and Soluble organic fraction (SOF) gets reacts to the material and converted into carbon dioxide (CO₂) and water (H₂O). Basically the diesel engines works normally using more air than fuel, so therefore they operates as an oxidation catalyst cutting CO and HC emissions by more than 90%.

- $\text{CO} + \frac{1}{2} \text{O}_2 \rightarrow \text{CO}_2$
- $[\text{HC}] + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

The ceramic honey comb structure use material coated with metals such as platinum (or) palladium.

| Emission Legislation | PM Limit | DOC Application |
|----------------------------|----------------------|--|
| Light-Duty Vehicles | | |
| Euro (1996) | PM = 0.08 g/km | DOCs introduced on larger size diesel cars. |
| Euro 3-4 (2000-2005) | PM = 0.05-0.025 g/km | The main after treatment strategy, used on most diesel passenger cars and light trucks. Many cars could meet Euro 5a using a DOC, but DPFs became adopted in some markets (e.g., Germany) for political reasons. |
| Euro 5a (2009.09) | PM = 0.005 g/km | Many cars could meet Euro 5a using a DOC, but DPFs became adopted in some markets (e.g., Germany) for political reasons. |
| Heavy-Duty Engines | | |

| | | |
|--|--------------------|--|
| US 1994 | PM = 0.10 g/bhp-hr | DOC introduced on many light and medium heavy-duty engine models, most with mechanical fuel injection systems. DOCs widely used on urban bus engines due to a more stringent PM limit of 0.07-0.05 g/bhp-hr. |
| US 1998 | PM = 0.10 g/bhp-hr | DOC remained common in many light and medium heavy-duty engine models. In some cases, a DOC was no longer required as in-cylinder control was enabled by the replacement of remaining mechanical fuel injection systems with electronically controlled systems required for the lower NOx limits. Urban bus engines continued to rely heavily on DOCs. |
| US 2004 | PM = 0.10 g/bhp-hr | The DOC continued to remain popular for light and medium heavy-duty engine models using EGR to comply with NOx limits. Used for all on-highway engines that did not use external EGR (e.g. Caterpillar ACERT engines). Continued to be used on urban bus engines. |
| Euro IV/V (2005/2008) | PM = 0.02 g/kWh | DOC technology used on some truck engines with EGR (without urea-SCR). |
| Nonroad Tier 4i/Stage IIIB (2011-2012) | PM = 0.02 g/kWh | DOC technology introduced on selected nonroad engine models (mostly those using EGR for NOx control). |

CATALYTIC CONVERTER

Catalyst is simply a chemical that makes a chemical reaction go faster without itself changing in the process. Normally catalyst consists of two-way pipes of opposite direction, one is input pipe where they allow the emission gas from engine outlet to ceramic structure. Other pipe leads the gas from catalytic cylinder to the atmosphere with less harmful gas emission. Ceramic structure inside the cylinder normally uses palladium, platinum and rhodium by varying the usage ratio of these metals the emission of gas is controlled. By through various researches the catalytic converter uses various ratios of metals inside. Normally when carbon monoxide released to atmosphere it gets into carbon dioxide, so using the catalytic converter to reduce the carbon monoxide (CO) make the process easier for atmosphere and makes less harmful than compare to No catalytic converter.

II. PROPOSED WORK

Combination of after treatment devices makes the emission control very effective having the value of emission lesser than compare to every catalytic converter like DPF, DOC and SCR. When the emission of exhaust gas passes through every catalyst the gas passing from one catalytic to another makes the chemical reaction between the gas and ceramic honey comb structure easier, emission level is decreased. The catalysts are connected in the order Diesel particulate filter (DPF) next Diesel oxidation catalyst (DOC) and finally new catalytic converter so that the emission of exhaust gas is decreased at maximum level and released to the atmosphere.

III. CONCLUSION

This paper shows that the emission can be reduced by the implementation of combination of after treatment devices into existing diesel engine. Considering a catalytic converter as the study point and investigation on combination of DPF,

DOC and catalytic converter to the diesel engine. By using the filter method in DPF catalyst we can reduce the emission up to 99%. According to the research the emission level in DOC get reduced in euro from 0.08 to 0.005 g/km and in US reduced from 0.10 to 0.02 g/kWh, so we took the advanced researches and made a cost and eco-friendly catalyst to reduce the emission level

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Comparing the effect of injecting urea, NaCl and distilled water on emissions of diesel engine with after treatment devices

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ABSTRACT

KEYWORDS

Diesel Engine,
Urea Solution,
Sodium Chloride,
Diesel Particulate Filters,
Diesel Oxidation Catalyst.

The experimental investigations on existing diesel engine adopted with two after treatment devices viz; Diesel particulate filters, Diesel oxidation catalyst with injection of fluids at the exhaust pipe were carried out. In the first part of the experimentation, only DPF and DOC were fixed; performance and emissions were measured at all the loads. Injecting fluid viz; urea solution, sodium chloride and distilled water separately at the exhaust pipe was second part of the experimentation keeping same DPF and DOC. From all the emission values, the optimum condition leading to least emission value is engine having both DPF and DOC and injecting urea solution at the exhaust pipe. Running the existing diesel engine with this suggested optimum condition would lead decremental of 79.3% in smoke, 41.1% in CO and 30.3% in NO_x emissions.

1. Introduction

The post combustion techniques for diesel engine to reduce emissions includes usage of after treatment devices viz; SCR, DPF, NO_x trap, DOC etc. Daniel Hayes et al., reveals excellent in-service daily NO_x conversion, averaging at 96% over this period. The SCR catalyst temperature remains high throughout the two-month monitoring period, averaging at 300°C. The SCR system performance drops on a few occasions over this monitoring period. These occur during vehicle idling which reduces the exhaust gas temperature (Hayes, 2019). Kair et al. (2006) claimed that DOC, SCR is not enough to reduce NO_x, but additional Clean up catalyst (CUC) which used NH₃ is needed to meet NO_x level norms. The arrangement should be in the order such that exhaust from engine passes through DOC, DPF, SCR and CUC before leaving to atmosphere (Kair et al., 2006). Matias Bastman et al., study has concentrated on the regeneration of diesel particulate filter, emission reduction of two different after treatment systems: Set B (DOC, DPF and SCR) and DOC+SCR. As a physical filter, DPF needs to be regenerated with heat and NO₂ or O₂. Again, emission standards have helped DPF to become

the main reduction method of particulate matter (PM) and after EURO VI standard, the use of DPF was basically forced on to the industry (Bastman, 2017). After treatment DPF accumulates soot during engine operation. Soot is oxidised during regeneration creating ash. Ash accumulates in the DPF over service life of unit. When ash load reaches full value, the DPF needs to be disassembled and ash is removed by special cleaning process (National Institute of Automotive Service Excellence [ASE], 2020).

Dallmann et al. (2018) suggested the total cost of emission control technologies is proportional to engine rated power. For some engine rating categories, the incremental cost is insignificant, as can be observed for engines rated below 19 kW. The most popular agricultural tractors in India are fitted with engines rated between 19 and 37 kW; for this particular segment, the incremental cost to reach Tier 4f from Tier 3 is estimated to be less than \$785 and reaching Stage V would require around \$1,000 (Dallmann et al. 2018). Jun (2020) stated, diesel vehicles that use of a diesel particulate filter (DPF) generally require periodic active regeneration. While operating active regeneration by in-cylinder post injection, the fuel impinging on the cylinder wall would become the cause of oil dilution. Study tested engine overrun by overflowing

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engine oil diluted with fuel on various engine operating conditions and clarify the engine control factors effect on engine stalling or unintended acceleration using regression analysis (Jun, 2020). Johnson (2011) review as engines become more efficient and regulators get more concerned about low-load NOx emissions, better low temperature SCR system performance will be required. Currently good performance is limited by urea injection issues (evaporation and hydrolysis, evaporation) at temperatures <200°C. Improved mixers allow urea injections at temperatures as low as 180°C and thus drops NOx ~30% over the US cold HD transient cycle relative to no mixer (Johnson, 2011). Soltic et al. (2019) remarks was that while the NOx and CO emissions of an engine can be efficiently reduced using known after treatment technologies such as SCR, the methane emission are a problem which is not yet solved. An efficient lean methane reduction technology which works at a comparably low temperature level has to be developed before such a combustion concept can be transferred to on-road use (Soltic et al., 2019).

Yang et al. (2019) view was unlike the application to fuel injection systems for IC engine operation, DEF dosing does not require the same frequency as the operating engine, but an average dosing rate. Under the appropriate condition of the dosing rate range (mL/h or g/s), the dosing unit can keep the same mass discharge rate per cycle and adjust the dosing frequency to meet the dosing rate requirement for higher metering precision and less complicated control (Yang et al., 2019). Guo et al. (2015) stated that main challenges for marine SCR applications are sulfur resistance and low temperature activation. SCR catalyst mainly relies on V2O5–WO3–TiO2, but V2O5 is a kind of highly poisonous material and the active temperature is above 300°C. The size of NH3-SCR system in use is also a problem, urea is usually used to instead of NH3 because of the difficulty to store (Guo et al., 2015). Dunnuck (2019) in the tasks of meeting ‘Near-Zero’ emissions, emissions from 25 Tier 4 final machines equivalent to just one Tier 1 machine. Dramatic reduction of 98% in mass, 90 to 99% reduction in ultrafine particles and substantial reduction in carbon particles (Dunnuck, 2019). Trevisan (2016) told low soot combustion means: 6 to 9 mg/kWh soot on cycle. SCR and DPF thermal management is required. SCR can be used thanks to the high NOx/Soot ratio and the mainly passive regeneration with reduced risk of thermal

deactivation (Trevisan, 2016). Trivedi and Ram Prasad (2018) utilized the four-way catalytic (FWC) system integrates all the separate control systems into a single compact unit. FWC technique using a combination of oxidation–reduction catalysts under various strategies has been investigated to simultaneously remove CO, HC, PM and NOx emitted from diesel engines. An oxidation catalyst (La0.6K0.4CoO3) was prepared by two different methods (sol–gel and co-precipitation). The reduction catalysts: Ag/Al2O3 and Cu-ZSM5 were synthesized by impregnation and ion-exchange method, respectively (Trivedi and Ram Prasad, 2018). Chan (2019) done test runs and stated that tuning is required to make engine operate after removal of EGR, filters and catalysts. It prevent OBD from activating the check engine light and/or limp mode. Even with EGR, filters and catalysts intact, tuning can substantially increase tailpipe emissions of NOx (Chan, 2019).

2. Experimental Setup

Experiments were conducted on a four-stroke single-cylinder, water-cooled compression ignition engine. The bore and diameter of engine is 80 mm and 110 mm respectively. The specifications of the diesel engine are shown in the Table 1. The measuring of fuel consumption (For diesel), speed and emissions has been recorded manually. All tests are conducted at different loads viz, no load, 4kg and 6kg load. The engine speed is maintained at 1380 rpm. After every load, the engine is allowed to attain steady state for duration of about 15 minutes. The specification of DPF and DOC has been in Table 2 and 3 respectively. The properties of Diesel exhaust fluid have been shown in Table 4. The photograph of DPF and DOC has been shown in Figure 2 and 3 respectively. Figure 4 & 5 shows Diesel exhaust Fluid used for injecting at the exhaust pipe of a Diesel Engine.

Table 1
Specifications of diesel engine.

| | |
|-------------------|----------------|
| Type of Ignition | CI |
| No. of Cylinders | 1 |
| Rated Power | 3.68 KW |
| Rated Speed | 1500 rpm |
| Bore x Stroke | 80 mm x 110 mm |
| Compression ratio | 16 |

Table 2
Specifications of diesel particulate filter.

| | |
|------------------------------|--|
| DPF core | 150mm X 150mm |
| Volume | 2 Liter |
| Cell Density | 100 cpsi |
| Material | Cordierite |
| Chemical Composition | Al ₂ O ₃ 35.2 ±1.5% SiO ₂ 50.9±1.5% MgO 13.9±1.5% |
| Compressive Strength | ≥ 10 Mpa |
| Porosity | ≥45% |
| Maximum Use Temperature | ≥1200°C |
| The average of pore diameter | 7-10µm |
| Can thickness | 1.2 mm |
| Total Length | 400 mm |
| PGM | 15g/ft Pt/Pd=3/1 |
| PGM loading | 15gm/ft ³ |



Fig. 1. Diesel engine with DPF, DOC and injecting diesel exhaust fluid.



Fig. 2. Diesel particulate filter.

Table 3
Specifications of diesel oxidation catalyst.

| | |
|--------------|------------|
| Cell Density | 400cpsl |
| Material | Cordierite |
| Total Length | 320 mm |
| Volume | 2 Liter |

Table 4
Properties of urea solution.

| | |
|-----------------------|----------------------------------|
| Odour | Slight ammonia scent |
| Density | 1.33 g/cm ³ |
| Specific gravity | 1.33 at 25°C 1.225 at 132.7°C |
| Viscosity | 2.58 cp at 132.7°C |
| Melting point | 132.70C |
| Specific heat at 25°C | 0.321 Kcal/ Kg°C |



Fig. 3. Diesel oxidation catalyst.

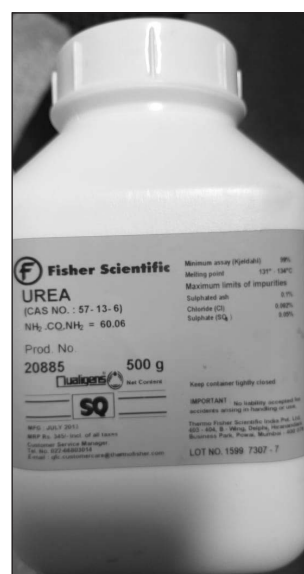


Fig. 4. Photograph of urea solution used for injecting at the exhaust pipe.

3. Results and Discussions

This section explains the emissions of the diesel engine equipped with DPF and/or DOC. Also the emissions measured when urea solution, NaCl and distilled water are injected separately at the exhaust pipe. Finally, the optimum condition is decided by using the NO_x- smoke tradeoff graph plotted with emission values measured during all the test runs.

3.1 Comparing the effect of injecting urea, NaCl and distilled water on emissions

- **Smoke emission**

Smoke emission of engine when urea solution, NaCl and water injected separately at exhaust pipe fixed with DPF and DOC are shown in Figure 6. Smoke value decreased with DPF and increased slightly when DOC is used. Adopting both DPF and DOC, the least smoke emission was found when urea solution is injected. Smoke emission reduced from 97 HSU to 20 HSU when DPF, DOC and injecting urea solution. However, smoke emissions values were 20 and 24 HSU for NaCl and distilled water.

- **HC emissions**

HC emissions for two loads when the engine is fuelled with diesel engine adopted with DPF, DOC and injecting the fluids in exhaust pipe as

shown in Figure 7. As per reading recorded on engine at both the loads, HC emission increased while using DPF by 12% and decreased with DOC further by 11% in the absence of any fluid injection. Meanwhile, when urea solution, NaCl and distilled separately injected along with DPF and DOC, the further reduced marginally by 4%, 8.5% and 12% respectively. With all the test runs, it is suggested that utilizing only DPF is not advisable and combination of both DPF, DOC and fluid injection is essential. The lowest value of HC was found to 41 ppm when distilled water is injected in exhaust pipe, which is having DPF and DOC.

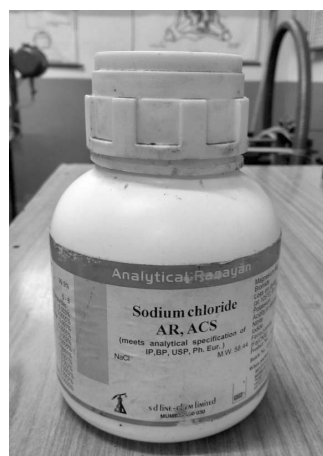


Fig. 5. Photograph of NaCl solution used for injecting at the exhaust pipe.

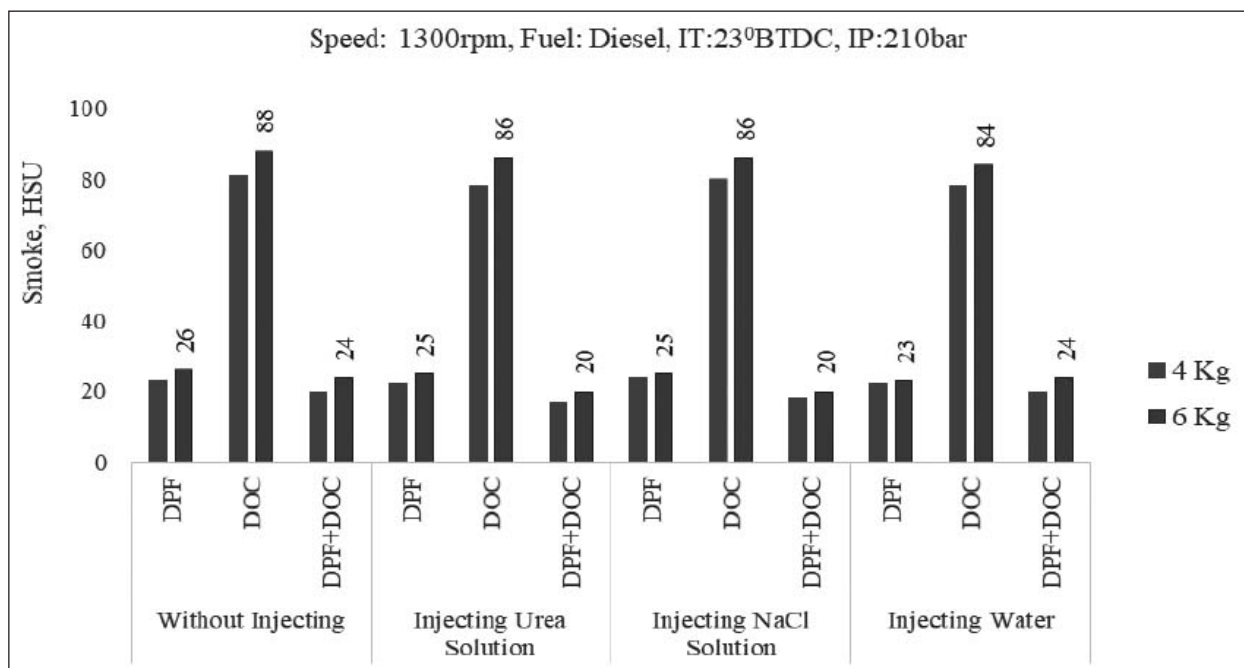


Fig. 6. Smoke values when urea, NaCl and distilled water is injected at exhaust pipe.

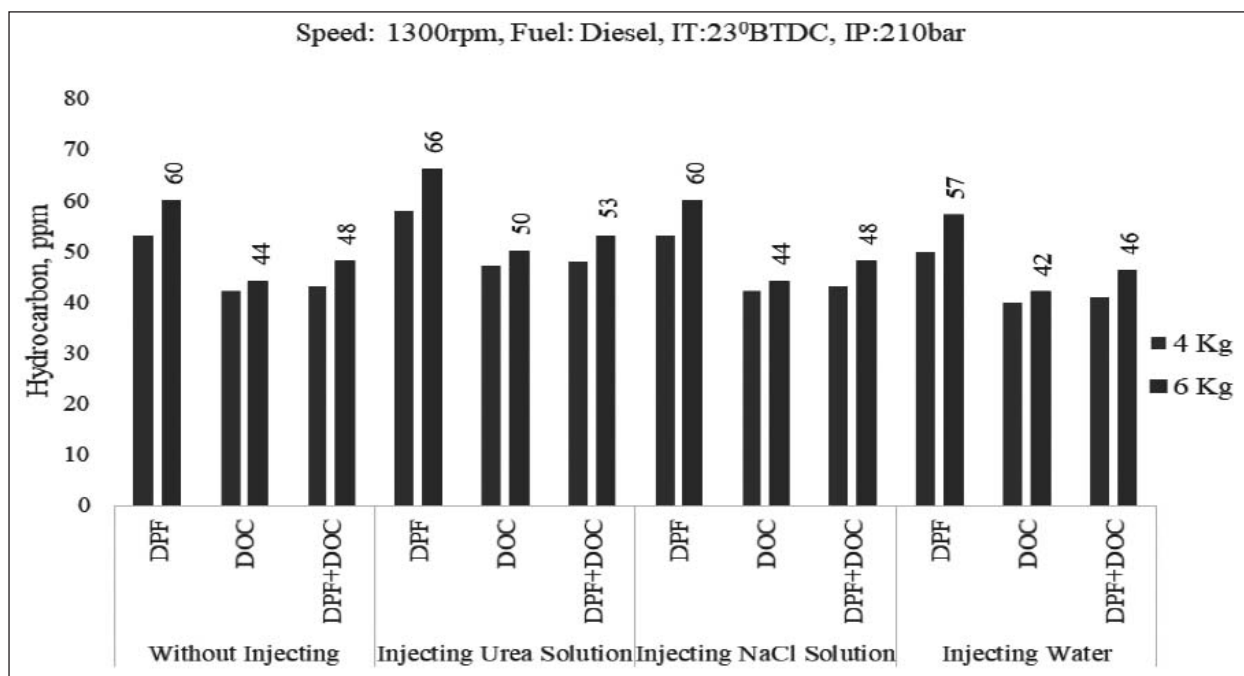


Fig. 7. HC Emission when urea, NaCl and distilled water is injected at exhaust pipe.

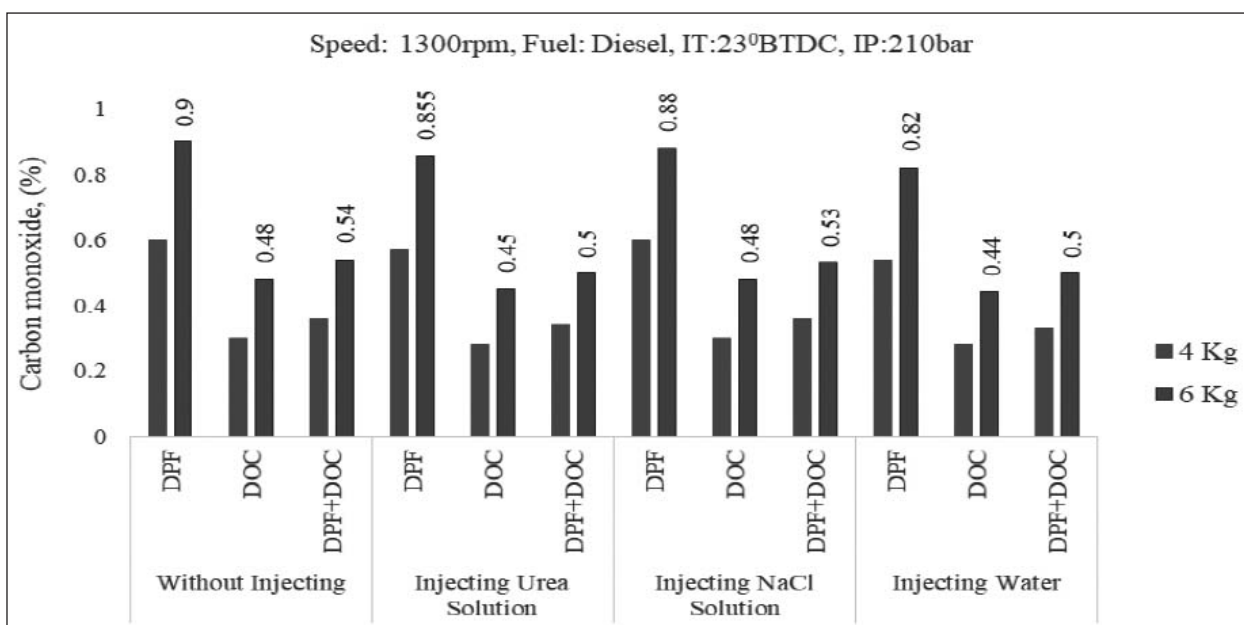


Fig. 8. CO Emission when urea, NaCl and distilled water is injected at exhaust pipe.

• **CO emissions**

CO emission of engine when urea solution, NaCl and water injected separately at exhaust pipe fixed with DPF and DOC are shown in figure 8. CO emission of existing engine was found to be 0.85%, the value reduced when DPF and DOC is adopted. The value reduced further to 0.5%, 0.53% and 0.5% respectively for injection of urea solution, NaCl and distilled water at exhaust pipe.

Comparing to all the injected fluids, the urea solution resulted in lowest value of CO.

• **NO_x emissions**

NO_x emissions for two loads when the engine is fuelled with diesel engine adopted with DPF, DOC and injecting the fluids in exhaust pipe as shown in figure 9. NO_x emission was found to reduce slightly using DPF and DOC for all the

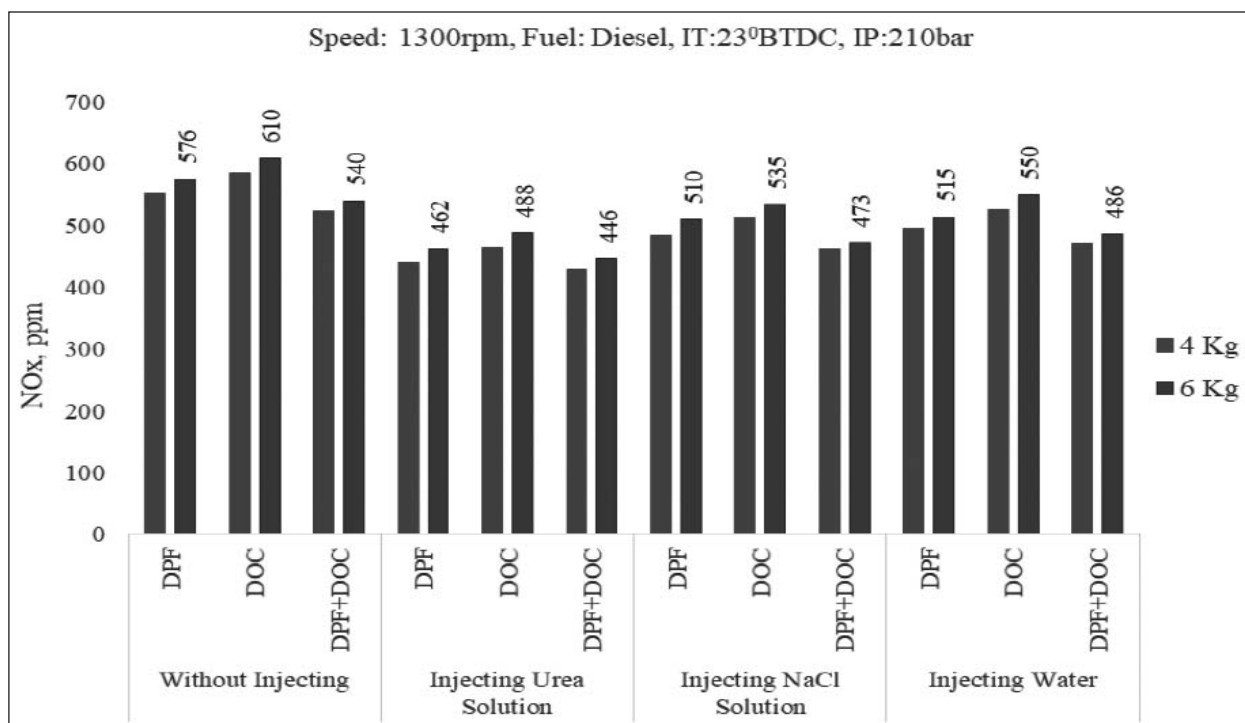


Fig. 9. NOx Emission when urea, NaCl and distilled water is injected at exhaust pipe.

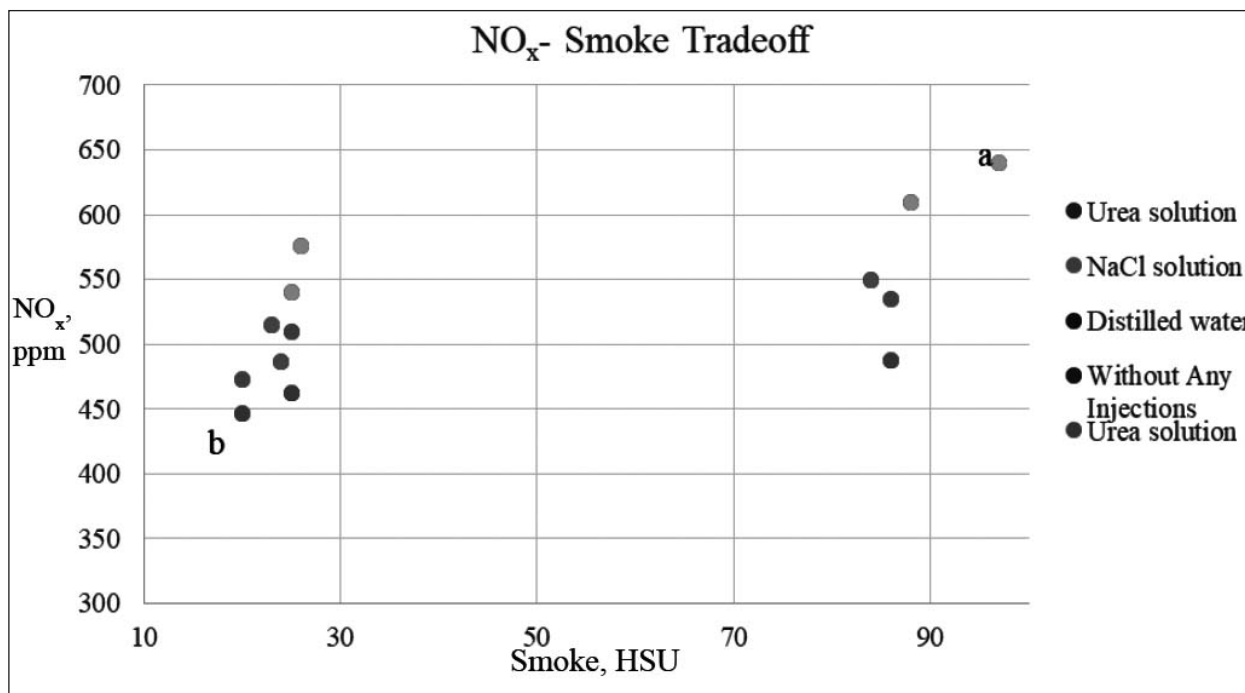


Fig. 10. NOx and Smoke emission at certain stage in all test runs.

loads. NOx emission was found to 525 ppm when engine is equipped with both DPF and DOC. At this condition, when urea solution is injected, the value reduced to 428 ppm. Comparatively, NOx emission reduced to 462 ppm and 470 ppm respectively for NaCl and distilled water. Hence, it suggested that urea solution is better fluid compared to NaCl and distilled water.

3.2 NO_x – Smoke Tradeoff

The NOx and smoke emissions of engine for all the test runs under various operating conditions were plotted in figure 10. The values are reading recording when engine is without after treatment device, with only DPF, with only DOC and with both DPF and DOC. With these

Table 5
Performance and emission values.

| | |
|-----------------------------------|---------|
| Load | 6 Kg |
| Brake Power | 4.16 kW |
| Brake thermal efficiency | 21.45 % |
| Smoke emissions | 20 HSU |
| Hydrocarbon emissions (HC) | 53 ppm |
| Carbon monoxide emissions (CO) | 0.5 % |
| Nitrogen oxide (NO _x) | 446 ppm |

same conditions, the values are plotted on the graph for fluid injection of urea, NaCl and distilled water. The point ‘a’ represents, the existing diesel engine emission values, which are NO_x is 640ppm and Smoke is 97 HSU. The point ‘b’ is the closest point toward the origin, hence this is considered as optimal condition leading to least emissions among all the test runs. The optimum condition is adopting both DPF and DOC and injecting urea solution at the exhaust pipe.

4. Conclusions

Overall the optimum condition was found to be the Diesel engine adopting both Diesel Particulate Filter and Diesel Oxidation Catalyst and urea solution injection at the exhaust pipe. This is the best combination of after treatment devices and fluid injection for existing diesel engine leading to least emissions. The performance and emission values at this condition are mentioned in Table 5.

As compared to the performance and emission of existing diesel engine, running the diesel engine with this suggested optimum condition would lead decremental of 79.3% in smoke, 41.1% in CO and 30.3% in NO_x emissions.

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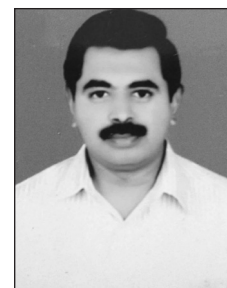
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Effect of Injecting Bio-Diesel from the Used Cooking Oil and Graphene Nano Platelets on Performance, Combustion and Emission Characteristics of Diesel Engine

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ABSTRACT

This comprehensive study mainly focuses on the production Bio-Diesel from the Used Cooking Oil (BD) by Trans-Esterification process and its usage with Graphene nano platelets(GNP) into diesel engine. Graphene Nano Platelets were chosen as the best possible nano addition for a 20% Bio-Diesel and 80% Pure-Diesel blend and various concentrations of graphene such as 25,50,75 mg/L were subjected to a constant speed engine testing at GKVK Bioenergy Research and Quality Assurance Laboratory at various Engine loads on a computerized “Variable Compression Ratio Multi Fuel Engine Test Rig” along with a top of the line computerized “AVL MDS-450 Emission Testing Equipment” with an effort to use the blend as an substitute to Pure-Diesel. The performance, combustion and emission characteristics were compared when engine is injected with various blend ratios. The results showed that BD20-75GNP had 11.5% increases in break thermal efficiency than 20BD-80D blend at 8Kg load. Also 36% of decrease in ignition delay was observed in BD20-25GNP fuel blend and 13.1% increase in peak pressure in BD20-75GNP; 55% and 51% reduction in CO and HC emission 20BD-75GNP fuel; 34% reduction in NO_x emission in 20BD-25GNP fuel. Considering the various optimization factors, the recommended GNP concentration to achieve the most significant enhancement in engine performance is 75 mg/L with BD20.

Keywords: Diesel Engine, Graphene nano platelets, Ignition Delay, Nitrogen Oxide emissions.

I. INTRODUCTION

Diesel engines have low specific fuel consumption and high thermal efficiency owing to their high compression ratio, low pumping work, and lean fuel air operating conditions. In addition, they have high reliability and low

operating and maintenance cost, enhancing their benefits in different sectors such as electricity generation, automobile sector, and agricultural machinery. However, compression ignition engines emit large quantity of emissions (NO_x, soot, CO, UHC, and particulate matter) causing serious health hazards and environmental degradation. Additionally, petroleum-derived fuels are declining and are predicted to provide our energy requirements until the middle of the 21st century because of the significant increase in energy demand and population. There are several techniques to reduce diesel exhaust emissions. These include engine design modification, combustion enhancement, and use of treatment devices for exhaust systems. The enhancement of engine combustion is the most recommended approach because it requires only few modifications of engine systems compared to the use of new designs or additional systems. This technique is achieved by adjusting the fuel properties, enhancing fuel injection, and using fuel additives.

One approach is by utilizing biodiesel as an oxygenated fuel, which is a promising alternative to the conventional diesel fuel [1]. Biodiesel is gaining more acceptance as a promising alternative energy resource because of the global fossil fuel shortage and emission issues. It is considered as an excellent choice for diesel engines because it is biodegradable, oxygenated, non-toxic, and environmentally friendly. However, graphene nanoplatelets (GNPs) can be an environmentally friendly fuel additive for promoting the combustion process of diesel biodiesel blended fuels efficiently owing to its low toxicity, high energy density, and high thermal conductivity. The ultra-thin and layered nanostructure of GNPs and the existence of different oxygen functional groups in GNPs provide a large surface area to volume ratios and chemically energetic sites for enhancing complete combustion[2,3].

Saxena and Khalife et al (2016) stated that the influence of adding nano-particle additives with diesel, biodiesel and diesel-biodiesel blends on a diesel engine performance and emission parameters was comprehensively surveyed. They concluded that the metallic-based additives and multi walled carbon nano-tubes additive have been demonstrated promising in terms of their impacts on engine performance and emission characteristics[4].

Harish Kumar Patel et al (2017) project's focussed to improve the performance of CI engine using diesel and bio-diesel by adding appropriate amount of nano-aluminium oxide (n-Al₂O₃). An experimental investigation was carried out to find out the performance of Single cylinder, 4 stroke diesel engine using Jatropha oil bio diesel and n-Al₂O₃ mixed diesel. It had been found the better results while using n-Al₂O₃ nano particle as an additive[5].

Ahmed I. EL et al (2019) paper tells about the experimental study which aims at investigating the impact of adding graphene oxide nanoparticles (GO) to neat Jatropha Methyl Ester (JME) on a single cylinder air cooled direct injection four stroke diesel engine. The nano-fuels have been prepared from 25, 50, 75 and 100 mg/l concentrations of graphene oxide with neat Jatropha biodiesel through ultrasonication process. The results indicate that the diesel engine operated by JME-GO nano-fuels enhanced the brake thermal efficiency by 17% compared to neat JME fuel. Furthermore, the peak cylinder pressure, the highest rate of pressure rise, and maximum heat release rate were also increased by 8%, 6%, and 6%, respectively. The CO and UHC emissions were decreased significantly by 60% and 50%, respectively, for JME-GO blends compared to pure JME fuel[6].

H. Suresh Babu Rao et al (2018) stated that Injection timing (IT) is a vital factor among different injection parameters which governs the emissions and performance factors of the engine. This work portrays the effect of IT on cerium oxide nanoparticle doped Waste Cooking Palm Oil biodiesel and diesel blends. The doping is

made at 30, 60 and 90 ppm. The modified fuels are introduced in reducing IT of 19°, 21° and 23°bTDC. 1500 rpm engine is made use in this study. Results revealed a significant reduction in emissions [7].

II. EXPERIMENTAL SETUP AND EXPERIMENTATION

A computerized variable compression Ratio Multi-Fuel Engine Test rig was used for the performance analysis, with technical specifications presented in Table 1. The diesel engine test rig is coupled with eddy current dynamometer as shown in figure 1. Figure 2 shows the photograph of diesel engine test rig.

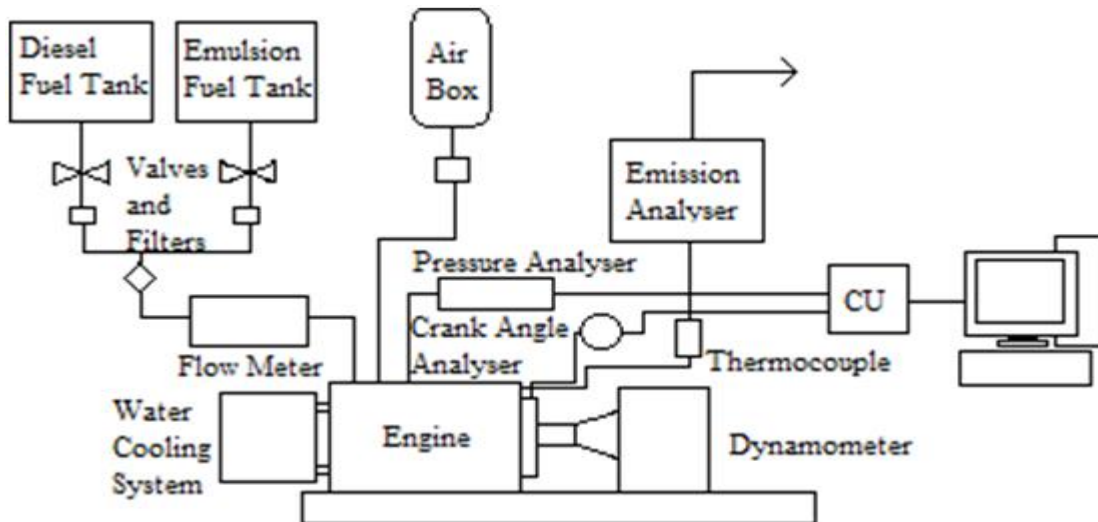


Figure 1: Diesel engine test rig



Figure 2: Photograph of Diesel engine test rig

TABLE I SPECIFICATIONS OF THE ENGINE

| Engine Parameter | Specifications |
|-------------------------------|--|
| Engine model | Computerized Variable Compression Ratio Multi fuel Engine Test Rig |
| Number of cylinders | 1 |
| Bore, mm | 80 |
| Stroke, mm | 110 |
| Displacement, cm ³ | 553 |
| Compression ratio | 5:1 to 20:1 |
| Idle speed, rpm | 1400-1500 |
| Type of injection | Direct |
| Type of cooling | Water cooled |
| Starting up | Electric Start |
| Dynamometer | Type: EddyCurrent Capacity: 5HP |
| Combustion pressure sensor | Piezo-electric 0-100 bar |

The exhaust gas analyser, Model “AVL-MDS 450” was utilized to measure the engine emissions of CO, UHC, NO_x, and O₂. The technical specifications of the exhaust gas analyser are presented in Table 2

TABLE III SPECIFICATIONS OF EXHAUST GAS ANALYSER

| Gas | Measuring Range | Resolution | Accuracy |
|-----------------|-----------------|---------------|-------------------|
| CO | 0-4000 ppm | 1 ppm | ±10 ppm |
| CO ₂ | 0-20% by vol. | 0.1% by vol. | 0.5% of reading |
| UHC | 0-10% by vol. | 0.1% vol. | ± 0.3% of reading |
| O ₂ | 0-20.9% by vol. | 0.01% by vol. | ± 0.3% |
| NO _x | 0-4000 ppm | 1 ppm | ± 5ppm |

Fuels used

The extracted UCO Bio-Diesel was blended with Pure-Diesel in the ratio of 80:20 by volume, then various quality test was carried on the extracted bio on the Blend in “Bio-Energy Research and Quality Assurance Laboratory” in Gandhi Krishi Vignan Kendra, Bangalore (GKVK), Diesel Blend was subjected to various quality testing process before its used on Engine, mainly done to protect various components of engine from any residue which may be left behind during the bio-diesel extraction process. All the properties of fuels, were measured according to ASTM standards. The values are shown in table 3. Blend’s density was measured using a “Anton Paar- DMATM 35”, it is portable specific gravity measuring kit with very high accuracy. Both pure-Diesel and Blend were subjected to Calorific value test in “Oxygen bomb calorimeter C3000 isoperibol”. The samples were tested by the Pensky-Martens Closed cup technique on a “Opti Flash - Pensky Martens Herzog” following these standards “ASTM D93 Methods A,B & C, ISO 2719 A, B & C, EN ISO 2719 A, B & C, IP 34 A,B & C, JIS K 2265 and GB/T261”.

TABLE IIIII PROPERTY OF FUELS USED

| Property | Pure-Diesel | 20BD80D |
|------------------------------|-------------|---------|
| Density (g/cm ³) | 0.8159 | 0.8352 |
| Calorific Value (J/gm) | 46272 | 44291 |
| Flash point (°C) | 41 | 46 |

GNPs-20BD80D Mixture Preparations

The GNPs-JB20 blended fuels were prepared according to the method mentioned. In, the mechanical disperser (LABSONIC M, the ultrasonic homogenizer, Volume range: 50 mL-30 L, speed range: 0 to 23,000 rpm) was used to prepare the homogeneous fuel mixtures of GNPs20BD80D and dismantle the agglomeration of nanoparticles. GNP-20BD80D blends were subjected to probe sonication for 20 mins at 30Khz thrice to enhance the stability of fuel blend. The GNPs were dispersed into the biodiesel blend using an ultrasonication pulsating frequency technique to avoid nanoparticle agglomeration in the fuel blend. The GNPs of mean outer diameter less than 2 mm, thickness of 6 to 8 nm, and width of 5 μ m were prepared for testing. The Physical properties of Graphene Nano Platelets used is shown in table 4.

TABLE IV PHYSICAL PROPERTIES OF GRAPHENE NANO PLATELETS

| Parameters | Measured values |
|------------------------------------|------------------------|
| Graphene nanoplatelets nano-powder | ~99% purity |
| Average particle size | 6-8 nm thick, 5 mm |
| Appearance | Black |
| Bulk Density | 0.45 g/cm ³ |
| Thermal conductivity | 3000 W/m-K |

The values indicates that the thermal conductivity of GNPs at room temperature is over 2000 times greater than that of pure JB20 blends. Therefore, GNPs-20BD80D blends have a higher thermal conductivity compared to pure 20BD80D blends. As a result, the evaporation rate of fuel droplets increases, yielding a shorter ignition delay. Moreover, the surface area to volume ratio of GNPs is higher than that of diesel biodiesel blends. Consequently, GNPs-20BD80D fuels will have higher heat transfer rates compared to diesel biodiesel blends.

III. RESULTS AND DISCUSSION

This section explains the performance of the diesel engine operated on diesel engine at different load by 20% biodiesel and varying the percentage of concentrations of graphene as 25,50,75 mg/L respectively.

Brake thermal Efficiency

Figure 3 shows the Break thermal efficiency against load. The thermal efficiencies at 8kg load are 22.19 %, 21.64%, 22.8%, 24.73% for 20BD80BD, 25, 50 and BD2075GNP fuels respectively. The highest of 11.5% increase in break thermal efficiency observed for 20BD80D blend compared to BD2075GNP.

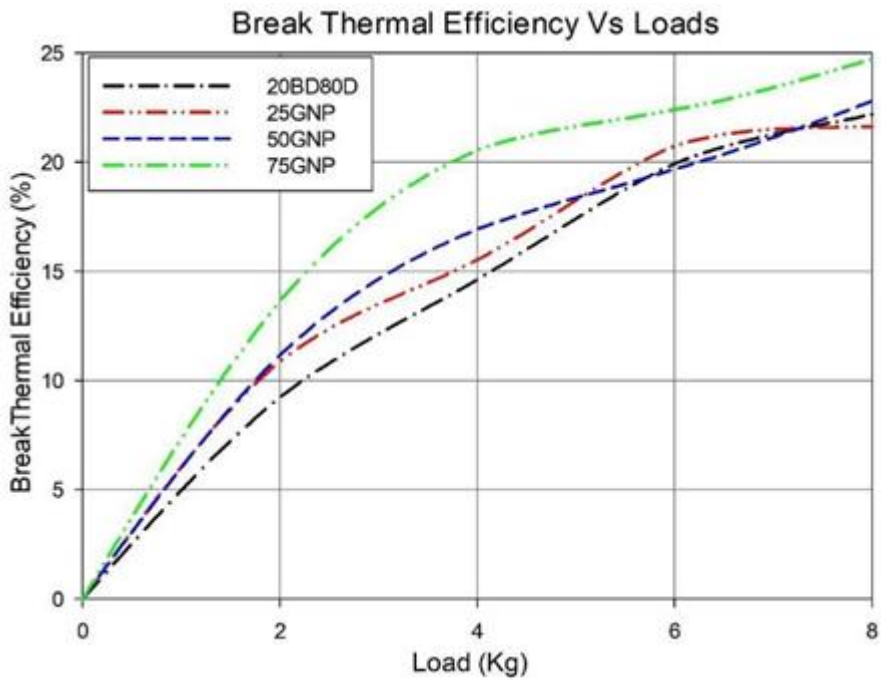


Figure 3: Effect of graphene nano platelets on Brake thermal efficiency

Combustion Characteristics

Peak pressure and Ignition delay

The P – θ history was acquired for fifty cycles and the averaged pressure v/s crank angle at when diesel injected with different graphene nano platelets is shown in Figure 6. Peak pressures were 52.55, 55.25, 55.7, 59.46 bar for 20BD80BD, 25, 50 and BD2075GNP fuels, respectively and 23.84, 15.24, 15.32 and 20.58 °CA were the respective Ignition delays of the corresponding fuel samples. Hence 36% of decrease in ignition delay was observed in BD2025GNP fuel blend and 13.1% increase in peak pressure in BD2075GNP; both at 8Kg engine loads.

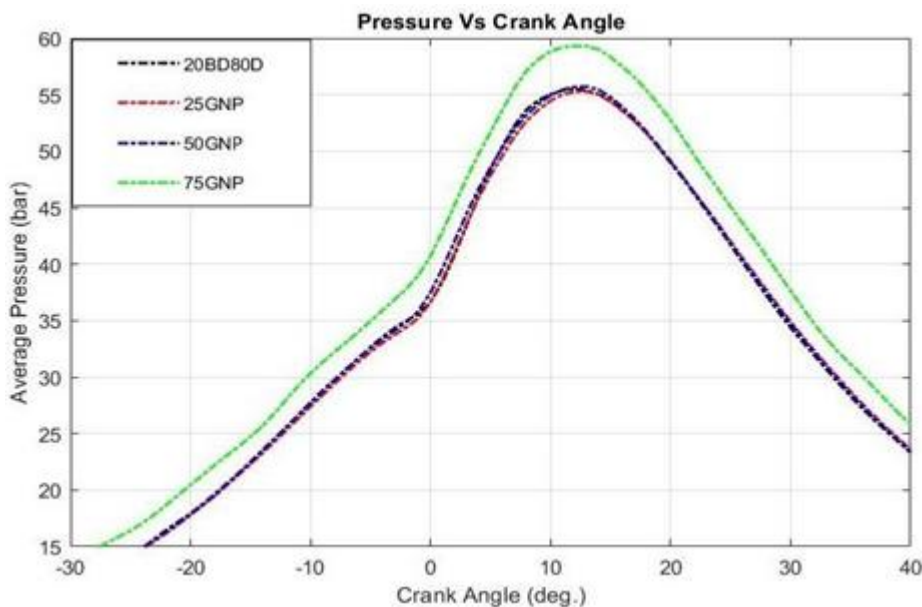


Figure 4: Variation of pressure with crank angle for graphene nano platelets

Emissions Characteristics

HC and CO emissions.

The addition of GNPs into BD20 has a significant positive effect on CO and UHC emissions. The reason for this may be due to the shortened ignition delay and the enhanced ignition characteristics of GNPs. Moreover, the high catalytic activity of GNPs is due to their higher surface area to volume ratio, which improved the fuel air mixing in the combustion process[12,13]. From figure 5 and figure 6 there has been 55% and 51% reduction in CO and HC emission at 8Kg load in 20BD75GNP fuel.

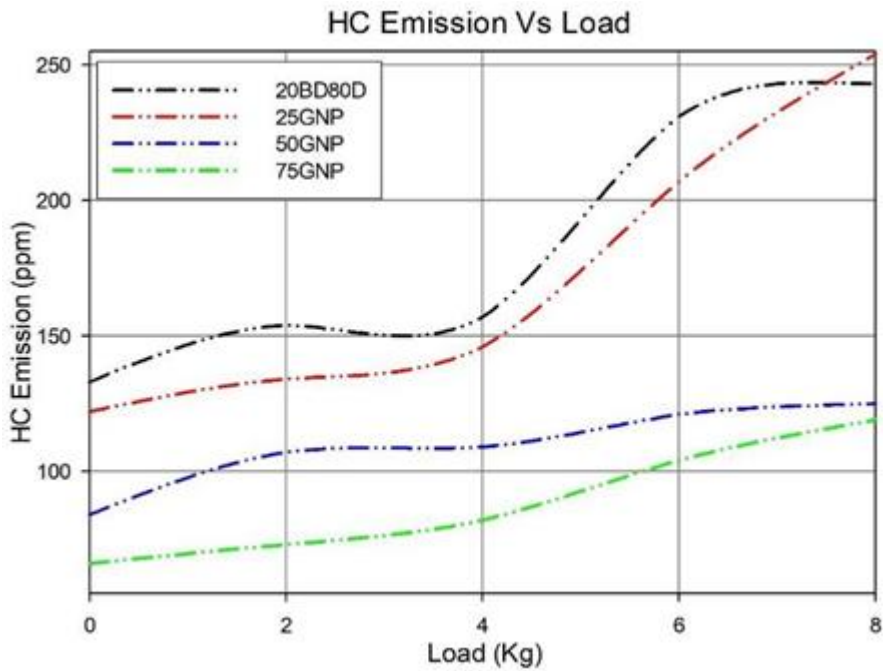


Figure 5: Effect of graphene nano platelets on HC emissions

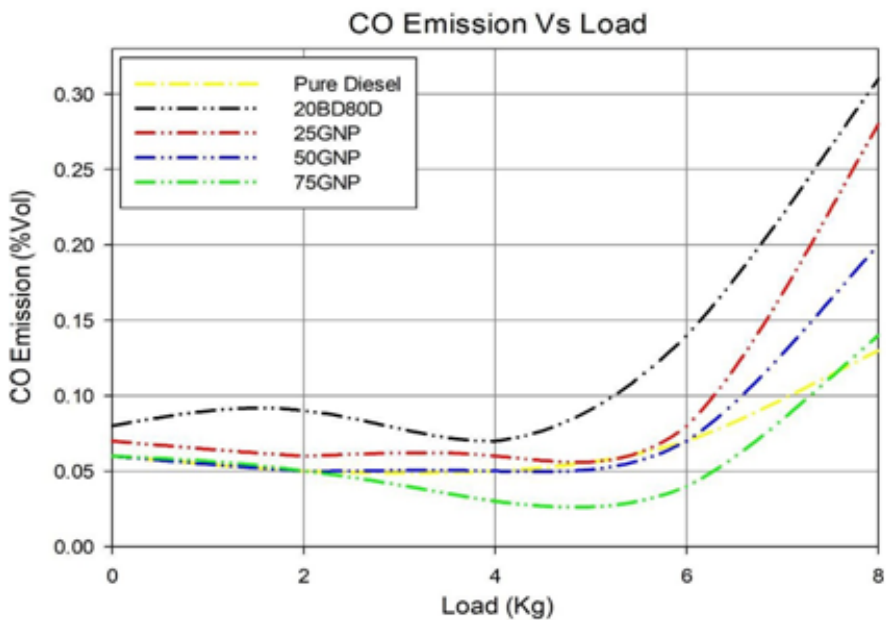


Figure 6: Effect of graphene nano platelets on CO emissions

NO_x emissions

Figure 7 shows the NO_x against load. NO_x emission reduced due to increasing the ignition delay[11] and as stated before with huge reduction in ignition delays in the 20BD25GNP and it is evident in Figure 7, it observed that 34% reduction in NO_x emission at 8kg load in 20BD25GNP fuel.

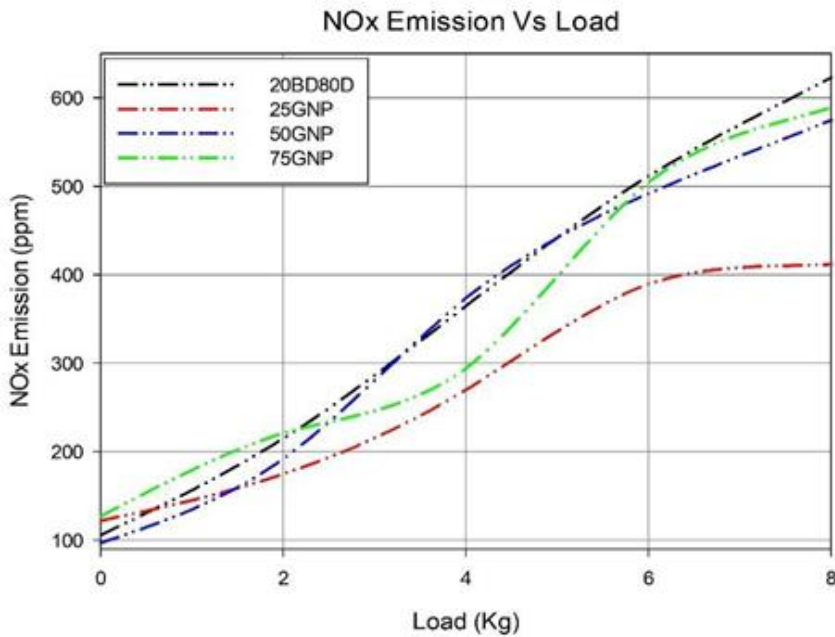


Figure 7: Effect of graphene nano platelets on NO_x emissions

Optimized Condition

In order to choose the best fuel as a substitute for Pure-Diesel, an optimization technique is used by plotting results of various Emission gasses against Brake Thermal Efficiencies at 8 kg load as shown in figure 8. It is observed that point closest to Pure-Diesel is 20BD75GNP Data points suggesting the fact that it has the best or the closest Thermal Efficiency as Pure-Diesel and least emission compared to all other fuels.

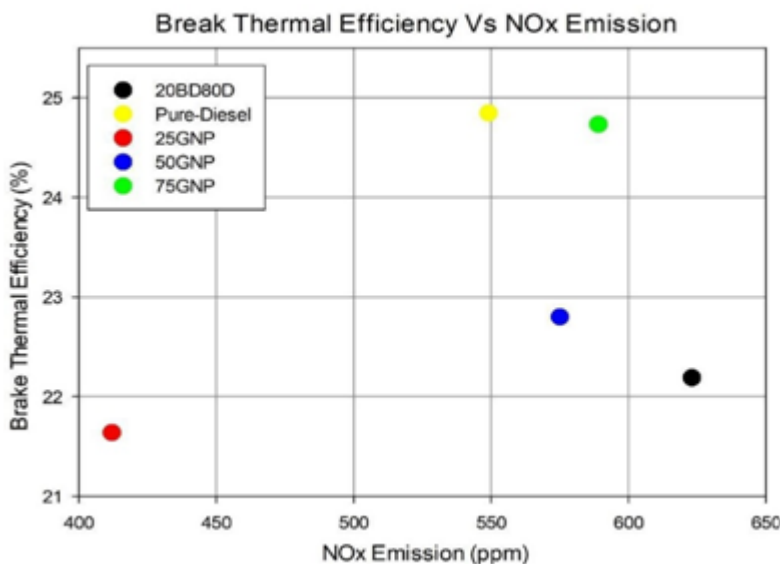


Figure 8: Brake thermal efficiency –NO_x emissions trade-off

IV. CONCLUSION

In the present experimental work, the engine was operated on diesel, 20BD80D Blend and 20BD80D emulsified with 25, 50, 75 mg/L blend at 1500 RPM Engine speed at various loads (from 0-8kg loads). BTE of BD2075GNP was higher than Pure-Diesel at 6kg Load and almost same as Pure- Diesel at 8kg Engine Load. Peak pressure of 20BD75GNP fuel was found to be 10% more than that of peak pressure of Pure-Diesel throughout various loads. 2% of reduction in Ignition Delay compared to Pure-Diesel was found when engine was operating on BD2025GNP fuel. 25% of Reduction NO_x emission was found at various engine load compared to Pure- Diesel while using BD2025GNP fuel. 7% less CO and 30% less HC emissions we recorded during BD2075GNP compared to that of Pure-Diesel at various loads. Considering the various Optimization factors considered in previous chapter of the report, The recommended GNP concentration to achieve the most significant enhancement in engine overall performance is 75 mg/L, which had the better performance and emission characteristics than that of Pure-Diesel.

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IOT BASED SMART MIRROR

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Abstract: In this era of modernization, we've all been exposed to several things that cause the event of the country. Usually, for an individual it becomes difficult to find enough time in the day to accomplish all the tasks that are part of life, so multitasking becomes necessary. Thus, smart devices are used which makes life simpler and easier. Internet of Things offers limitless opportunities to reinforce communication between devices and data sharing but this same feature makes it highly vulnerable from the purpose of view of security. The term Internet of Things (IoT) is said with the connection of physical devices through Internet. The 'thing' in IoT might be anything that has the power to gather and transfer the info over a network with none human's assistance. The devices are embedded with technology so that they can be controlled and monitored remotely. Our project aims at including IOT technology in a mirror, because in general people spend a considerable amount of time in front of a mirror. Smart mirror is a wall mounted mirror which displays weather, time, calendar, latest news headlines, events and other basic information related to our needs. IoT is a larger part of home automation which controls almost all the devices used for domestic purpose remotely through internet.

Keywords: Smart mirror, IOT, security, raspberry pi

I. INTRODUCTION

Nowadays in this world, technologies are advancing day by day. For this reason, maximum devices need to be updated with smart technology. We got many smart devices like smart TV's, watches, phones etc. which have various applications. The smart systems are organized by artificial intelligence (AI) and build smart equipment that makes the devices more interactive with the user. A mirror is one of the most used items in homes on a daily basis. Everyone is highly busy with their daily work and thus it is quite difficult for them to check daily necessary information including the latest news, To-do list, social media newsfeed, traffic jam update, weather forecast and so on. This project helps user to get all these information on a smart mirror and it gets updated automatically time to time. In addition, smart mirror is used for security purpose where camera is placed behind mirror. An AI-based face detection method is introduced that detects the unknown person and immediately sends notification to registered mail ID. Google voice assistant is included which is used to interact with the mirror, user can watch YouTube videos, listen to music, etc. Besides, this system will also offer the opportunity for users to check their health status. It will measure the user's heart rate, body temperature and oxygen level. All these values will be displayed automatically on the mirror and if these values are not in normal range, then it will alert the user.

PROBLEM STATEMENT

The major problem of any existing mirror is displaying just the object in front of it or just the human face without having to interact with them. People would often spend more time in front of mirror. Here This mirror which is used is Time saving. Nowadays for the aged people or handicapped it is not difficult to visit the hospital every time since the pandemic and other problems. Now in all important places CCTV cameras are installed for security. In houses it is visible to all so anyone who comes for robbery would easily destroy this camera. Sometimes we have controlled all the appliances manually so we might get irritated and also nowadays we can control all the appliances through the voice command.

II. LITERATURE SURVEY

This Focuses on gathering a correct and consistent set of requirements. This process lends particular strength to build the quality software by means of ongoing clarification of existing requirements [1]. The advantages are running the system, it configures PI and sound. The disadvantages are Could not configure voice Control lights and allow enabling motion detection is difficult.

The prototype built here is mainly focused on the command language understanding so that no need to remember the commands. It recognizes the speech through the natural language and extracts the information from that and then converts the text to speech and answers with required output with natural language [2]. The advantages are Smooth screen display is used. Two-way glass is used. The disadvantages are the technically augmented interaction device could recognize properly and process according to that.



Wildlife Animal Tracking and Monitoring System

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Abstract: Animals form a big part of the ecosystem. Their existence is very important for the balance of the ecosystem. But nowadays, more and more animals are getting endangered and are on the verge of extinction. To save animals from extinction, humans reserved forest areas (Sanctuaries and national parks) for their safety. However, some animals died due to bad health which couldn't get any attention either. To avoid such casualties, an animal location tracking system with a health monitoring system is used. Proposed system uses a pulse rate and temperature sensor to keep track of the animal's health and also track the exact location of the animal. In the proposed system two main applications have been installed: location tracking, health monitoring.

Keywords: Health monitoring, Location Tracking, GPS, Wi-Fi.

I. INTRODUCTION

As per nature's rule, every living creature on this earth is important and has an important role in the ecosystem. Since the human race, or human society is growing, the wildlife is in danger. Endangered animal and wildlife, they live in the protected forest or national park where are in big area and when we need to know about the number of the special wild animals such as tiger or leopard, they become very hard to track or count them because they live in the big forest where there is no infrastructure for data communication. Hence, in order to track the location Global Positioning System receiver and Global System for Mobile communication is used. In this project a Node MUC helps to get the coordinates of the location. This modem requires a minimum of 4 satellites. The Node MCU microcontroller receives location parameters like latitude and longitude from the satellite. We have also used a GSM modem which sends these parameters to particular mobile numbers through SMS. This information is used to locate the current location using Google maps.

The proposed work consist of a temperature sensor and a pulse rate sensor. If the animal has fever or if there are some wounds on the animal body and because of wounds temperature of the animal rises and sometimes there are some fluctuations in the heart rate, then it sends an SMS to the forest officer, he can give immediate attention.

II. PROBLEM STATEMENT

1. In the present arena, wildlife and forest departments are facing the problem of movement of animals from forest areas to residential areas.
2. If any accident happens to them in the zoo, physical injury or any disease may even cause death of animals in the zoo. In such situations we cannot find out the exact location of animals in such a large area.
3. Many animals also die due to lack of monitoring of their health, so it is necessary to monitor the variation in the body temperature and heartbeat of the animals.

The system proposed is more and more adopted in a wide range of applicative scenarios. To track the health of an animal, sensors such as the temperature sensor, heart rate and pulse rate sensor are used. This report proposes a system for tracking and alarming the protection of Wildlife Animals. It combines Wireless Sensor Network (WSN) Node MCU technologies to solve the above-mentioned problem.

III. LITERATURE SURVEY

IoT Based Animal Tracking And Monitoring System In Zoo [1]. The goal of this project is to track the location of animals in zoos or national parks. To monitor this, we are using a temperature sensor. It continuously monitors the animal's temperature. If there is any variation in the temperature, it will be displayed on the LCD. The PIR sensor is used to monitor the human presence in restricted areas or near the animal boundaries. When the human presence is detected, the voice processor will give alert to the people through the pre-recorded voice. it will give complete information to the website on pc or laptop.



Agro bot

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Abstract— Agriculture plays an important role in economic status in India. Agro-Technology is the process of applying technology in agriculture sector, which improves the efficiency of the crop produced. Compared to traditional methods this process has various advantages in sowing the seeds. Seed sowing robot is regulated and hand-operated. It slashes the exercise of farmers and increases the potential of seed sowing compared to normal planting. The proposed system is a boon which combines the robotics with agriculture. It is capable of moving around the field and sowing the seeds. It increases the planting efficiency and accuracy rate. Seed sowing robots have been built earlier but the robot which we have built can be used for small agricultural lands, backyards and large terrace farming. It is designed using low-cost equipment. It can be easily available for small scale farmers thus making it user friendly.

Keywords— Soil-Moisture, Bluetooth-controlled, obstacle-detection, Seed sowing.

I. INTRODUCTION

Automation in the agriculture is still in the developing stage due to lack of technical knowledge, advanced technology and machinery. A few years ago conventional methods such as bullock carts were used for agriculture. Later machinery such as tractors, tillers etc. came into existence. But the problem with the tractor is it causes a lot of pollution and consumes large power. As few years passed by and technology started progressing robotics came into existence helping the farmers to reduce their physical labor. Hence using the new technology in farming activity provides greater support to the common people. Seed plantation in day-to-day life is done by tractors in farms. It requires more time and the problem with man power is seen. In present scenario domestic farming is the most common problem people are facing. When compared to large agricultural fields we can use huge tractors, big robots for farming activity. For domestic purpose such as farming in small grasslands, backyards and also large terrace farming big machinery cannot be used. So we require small robots that make the job easier. Controlling of the robot mainly require some means of communication. One of the communication means is the wireless Bluetooth connectivity. The Agro-bot developed performs seed sowing process powered by external power supply and operated with the help of android application.

II. PROBLEM DEFINITION

Considering small areas such as backyards, small grasslands or even large terrace farming, we can neither use conventional method of farming nor can we use skilled farmers. The main problem of farming is seed sowing. Proper seed sowing is very necessary on which the process of plant growth is dependent. Our robot is an obstacle detecting, seed sowing robot which can detect if any obstacle present and if no obstacle is present it will move further thus by sowing the seed. Thus the robot which we have built can be used for domestic purpose but

it can be modified in such a way that it can be used in agriculture fields also. Thus we have a real time solution for a real time problem.

III. LITERATURE SURVEY

It is capable of digging the soil, seeds from the hopper are dropped into the field, and water is pumped from the tank using Arduino Mega [1]. The advantages are It is operating all control systems like ploughing, seed sowing and water sprinkling through an automated seed sowing robot. The disadvantages are Leakage in the water tank causes short circuit. Use of rechargeable battery consumes more energy.

The Bluetooth HC-05 module is fixed on to the robot which receives signals from the Bluetooth electronics app and sends these signals to the microcontroller for processing of operations [2]. The advantages are Temperature and humidity sensors measure temperature and humidity respectively. Soil moisture sensor is used to measure moisture content of the soil. The disadvantages are since a LCD display is used, the values have to be checked every time by the robot itself.

Two pairs of heterogenous sensors were employed to detect obstacles along the trail of the mobile Robot using Arduino Uno [3]. The advantages are the evaluation on the autonomous system shows that it is capable of avoiding obstacles,

DETECTION OF REAL AND FAKE IMAGE USING DEEP LEARNING ALGORITHM

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ABSTRACT

In the present generation, social media is a big advantage for an individual to grow. On the other hand, we can't neglect the fact that it's a huge platform for negativity too. With the rapid progress of recent years, techniques that generate and manipulate multimedia content can now provide a very advanced level of realism. The boundary between real and synthetic media has become very thin. On the one hand, this opens the door to a series of exciting applications in different fields such as creative arts, advertising, film production, video games. On the other hand, it poses enormous security threats. Software packages freely available on the web allow any individual, without special skills, to create very realistic fake images and videos. These techniques can be used to manipulate public opinion regarding anything and create chaos. In this paper, we would like to overview few major facts and figures regarding exceeding image forgery techniques that exists and propose a better way on how to detect these forgeries and fakes.

Keywords: GAN, ELA, Deep Learning, Convolutional Neural Networks, Fake Colorized Image Detection.

I. INTRODUCTION

Fake images have become a central problem in the last few years, especially after the advent of the so-called deep fakes, i.e., fake images manipulated with the help of powerful and easy-to-use deep learning tools, like auto encoders (AE) or generative adversarial networks (GAN). With this technology, creating realistic manipulated media assets may be very easy, provided one can access large amounts of data. The very same technology, however, can also be used for malicious purposes, like creating fake porn images to blackmail people, or building fake-news campaigns to manipulate the public opinion.

These editing of images can be easily done with taking care that it is not so obvious to tell that it is a fake image by using powerful editing apps like adobe photoshop or GIMP etc. Using such conventional editing app methods, images can be easily modified, obtaining realistic results that can fool even a careful observer. An example of skillfully manipulated images that have been disseminated on the Internet in recent years to spread false news are shown in figure below.

Now a days the trust on digital image is less but now in order to gain the trust of the digital image there are few techniques to detect the tampering of the image. The first method can be explained as the Watermark Method i.e., Digital watermarking has been proposed as a means by which an image can be authenticated [1]. The drawback of this approach is that a watermark must be inserted at the time of recording, which means that every camera doesn't come equipped with watermark. So, in order to overcome the disadvantage Pixel based method is useful and that can be explained as mentioned below. Pixel Based in these there are three methods to detect tampering which maybe a direct method or an indirect method and they (1) Cloning (2) Resampling (3) Splicing. The Cloning method is image manipulations is to clone (copy and paste) portions of the image to conceal a person or object in the scene. When this is done with care, it can be difficult to detect cloning visually. And since the cloned regions can be of any shape and location, it is computationally impossible to search all possible image locations and sizes. Two computationally efficient algorithms have been developed to detect cloned image regions. So according to the first author first apply a block discrete cosine transform (DCT). Duplicated regions are detected by lexicographically sorting the DCT block coefficients and grouping similar blocks with the same spatial offset in the image then according to the second author apply a principal component analysis (PCA) on small fixed size image blocks to yield a reduced-dimension representation.

According to the detection of tampering of image this watermark method is useful to detect the medical information security like integrity, authenticity [2]. So, in this watermark method there is a secret key between the transmitter and the receiver. So, whenever the information is exchanged between them then they

Human Authentication using Face, Voice and Fingerprint Biometrics

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Abstract— Multimodal biometric approaches are growing in importance for personal verification and identification, since they provide better recognition results and hence improve security compared to biometrics based on a single modality. In this project, we present a multimodal biometric system that is based on the fusion of face, voice and fingerprint biometrics. For face recognition, we employ Haar Cascade Algorithm, while minutiae extraction is used for fingerprint recognition and we will be having a stored code word for the voice authentication, if any of these two authentication becomes true, the system consider the person as authorized person. Fusion at matching score level is then applied to enhance recognition performance. In particular, we employ the product rule in our investigation. The final identification is then performed using a nearest neighbour classifier which is fast and effective. Experimental results confirm that our approach achieves excellent recognition performance, and that the fusion approach outperforms biometric identification based on single modalities.

Keywords— Fingerprint, Authentication, Multimodal Biometrics, Register, PIN, LBP.

I. INTRODUCTION

In recent years, identity authentication has become increasingly important. People are required to be verified or identified as a valid claimed individual to be able to access ATMs, airports, labs, buildings, files, etc. Traditionally, authentication knowledge-based (e.g. password or personal identification number (PIN)) and token-based (e.g. ID card or key) methods are commonly used. However, these traditional methods are of high risk for many critical security applications, since a password may be forgotten or hacked, or an ID card may be lost or stolen. Biometrics enable an identity-based method which can provide sufficient security for these applications. Biometric recognition refers to the automatic identification of an individual based on physiological and/or behavioral characteristics. Currently, biometric systems make use of fingerprints, voiceprints, face characteristics, facial thermo grams, iris features, retina images, hand geometry, palm prints, signature, etc. Biometrics cannot be forgotten, borrowed, stolen and forging is practically impossible. Authentication systems operate either in identification mode or verification mode. In identification mode, a potentially very large database is searched and the individual corresponding to the top match score returned.

For verification, the match must be sufficiently high when the test input is matched to the claimed identity. Despite recent advances, biometric systems still have problems in many real world applications. Some biometrics may be non-universal (e.g. about 2-4% of the population do not have adequate quality fingerprints for authentication but this percentage differs according to databases), while some modalities are fragile or weak (e.g. a voiceprint in a noisy environment or a face image under illumination and pose variations). An approach to overcome these problems is to perform authentication using several biometrics to provide a more robust system. This is known as multimodal biometrics, which combine multiple sources of information to establish identity. Multimodal biometric systems can integrate information at various levels. Most often, multimodal biometric fusion is performed at matching- score level. This can be achieved through a variety of methods, e.g. simple sum, weighted sum, min / max rules, etc. Fingerprints and faces are widely used in biometrics research studies as well as in commercial applications, due to the easy data acquisition and relatively low costs. Many researchers have used these biometrics, with some considering the quality score of the fingerprint when fusing results.

II. LITERATURE REVIEW

With respect to the paper [1] Biometrics manages the computerized acknowledgment of people dependent on natural and social attributes. The example acknowledgment framework perceives an individual by deciding the credibility of a particular conduct normal for person. The primary rule of biometric framework is recognizable proof and check. A biometric confirmation framework use fingerprints, face, hand geometry, iris, and voice, mark, and keystroke elements of a person to recognize an individual or to check a guaranteed character. Biometrics authentication is a form of identification and access control process which identify individuals in packs that are under reconnaissance. Biometric security system increase in the overall security and individuals no longer have to deal with lost ID Cards or forgotten passwords. It helps much organization to see everyone is at a certain time when something might have happened that needs reviewed. The current issues in biometric system with individuals and many organization facing are personal privacy, expensive, data's may be stolen.

According to the paper [2] This paper presents a reliable and secure authentication system. It deals with voice, face & fingerprint recognition algorithms to achieve better performance. This means that this system will optimize the security performance. A 3 tier architecture is proposed and implemented with the help of biometric modalities. The security is provided by the combination of voice, face & fingerprint authentication



Non-Invasive Health Monitoring System For Diabetes Patients

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Abstract: The growth of the digital era has paved the way for the development of numerous applications. Increasing the number of the population has also seen an increase in the number of people suffering from numerous diseases. Diabetes is one of the prominent diseases which is likely to occur commonly to most of the people in the world. It is necessary to check the level of glucose in the body for them by making use of many invasive methods. These methods bring a lot of pain to the patients using it. In order to get rid of these methods. The paper aims to study non-invasive detection methods for diabetes patients. Glucometry and pulse oximetry are two methods that are based on the absorption of light in tissues. Pulse oximetry-detecting blood glucose we will use the same method. Glucose can also be found in haemoglobin, according to the latest studies. It is especially useful when there is a suspicion of diabetes or prediabetes or to monitor long-term, in the case of diabetics. So we also measure other parameters which are basic for diabetes patients. The reading from Arduino is shared to the database via Wi-Fi Module and can be accessed by the patients or registered doctors. This research is significant where patients can independently monitor their diabetic health and the IoT system can be alerted directly to medial officers in the hospitals.

Index Terms - Health monitoring, Non-invasive, Arduino, Diabetic, Glucose

I. INTRODUCTION

Diabetes is one of the most challenging disease in 21st century healthy field due to number of patients increasing complication is very important in nowadays. Early detection of diabetes complication is very important in nowadays. The non-invasive glucose sensor is employed to detect the quantity of sugar levels in the body. Also presents the microcontroller to pre-process the sensor data and pre-processed data is updated to IOT. The creation of a non- invasive and reliable system for diabetic patients who are required to use this invasive procedure are going to be sigh of relief. The Internet of Things (IoT) is a paradigm in which different devices used on a day-to-day basis have the ability to communicate with other devices, whether or not they are of the same type, with the aim of providing services through the internet. These devices can be household objects (lamps or appliances), street objects, or embedded devices especially created for particular applications; they are all called "things". Things not only acquire information from the environment and interact with the physical world, but also they can be equipped with identification, measurement, and process capabilities to provide context-aware services for achieving specific goals for information analytics, communications and final applications. Hyperglycemia and Hypoglycemia refer to medical conditions that exhibit abnormally high or low blood glucose/sugar levels. Diabetes is a condition in which the pancreas of the body ceases to produce insulin, which controls blood glucose levels. The causes of diabetes in humans are not yet fully understood, but the widely accepted hypothesis is that it may be genetic and may be caused by high sugar intake as part of a daily meal serving. Once diabetes is diagnosed, the blood sugar level needs to be continuously monitored in order to facilitate medicinal insulin intake. Patients with hyperglycemia, in which continuously high blood glucose levels are exhibited, may require Continuous blood glucose monitoring.

II. LITERATURE SURVEY

Blood Glucose Monitoring (BGM) is much necessary to be aware of complex situations due to variations in glucose levels in diabetic patients. To develop a portable and creative Non-Invasive monitoring device of blood glucose level for diabetics to measure the blood glucose concentration as and when needed [1]. Laser light-based sensors have demonstrated a superior potential for BGM. Existing Near-infrared (NIR) based BGM techniques have shortcomings such as the absorption of light in human tissue, higher signal to noise ratio (SNR) and lower accuracy, these disadvantages have prevented NIR techniques from being employee for commercial BGM applications. A simple, compact and cost-effective non-invasive device using visible red laser light of wavelength 650 nm for BGM (RL-BGM) is implemented in this paper [2]. Photoacoustic technique is employed to determinate the concentration of blood glucose non-invasively due to its advantage of avoiding the disturbance of optical scattering. But until now there is still no breakthrough on non-invasive blood glucose



ELECTRIC VEHICLE CHARGING SYSTEM

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Abstract: Technological advancements always played a major role in transforming the automobiles; From hand-pulled carts to autonomous cars. The fuel powered vehicles are one of the greatest inventions the world has ever seen, but the negative impact caused by them on the environment has laid a new path for the invention of Electric Vehicles. The electric vehicles are emission less vehicles that are powered and run-on electricity solely. Like fuel pumps, these EV's require charging stations. This work provides infrastructure and maintenance of charging station. Charging stations have been installed in various parts of the world till date. Level 1, Level 2 and fast EV charging stations have been installed in various places respectively. Detailed infrastructure report on installation and maintenance is required. Maintenance is required for any EV charging station to run efficiently. The various factors which effect the efficiency of charging stations are frequency of usage, climatic conditions, exposure of charging unit to atmosphere. This work provides detailed overview of various power options, technologies, energy management techniques and maintained of charging stations that are optimal for the Indian market.

Keywords: Arduino UNO, Fast charging, RFID, Relays

I. INTRODUCTION

Electric vehicles are attracting the attention of consumers in various countries as this technology is advancing. It is envisaged a large-scale adoption of non-combustion engine vehicles to address the CO₂ emissions and environmental concerns. These vehicles are either pure electric vehicles (EV), plug-in hybrid electric vehicles (PHEV), or extended-range electric vehicles (EREV). With the growth in electric vehicle industry, the need for the design and implementation of secure and reliable charging stations for public use is necessary. A smart electric vehicle charging station is considered a critical infrastructure that functions like a fuel station for a combustion engine vehicle and smart grid. These smart stations are computerized and connected through interoperable network systems which this trait places them in the vulnerable subset category with data privacy and security implications. Same as a smart grid with a great technological revolution, multiple threats can allow a malicious factor to elevate privilege. These threats are including, but not limited to harming the confidentiality, integrity, and availability of user and system information. These activities can be achieved maliciously through the actual physical interfaces connecting the electric vehicle to the charging station or wireless communication link for either billing or metering systems.

II. PROBLEM STATEMENT

The previously proposed systems prove to be effective and yet lack in several factors. In India, most of the electric vehicle charging systems are Level 1 and level 2, which consumes a lot of time and lacks user-friendly necessities in few factors. This proof of model is proposed, which provisions comparatively faster charging, facilitating the user for a less wait-time and a secure system. This includes the minimization of total costs associated with EV charging stations to be planned, including the investment costs, operation costs, maintenance costs, and network loss costs in the planning period.

III. LITERATURE SURVEY

The optimal planning of EV charging stations is becoming a big problem to be resolved. EVs cannot only increase energy utilization and reduce pollution emission, but also smooth the load curve by peak load shaving and, hence, enhance the safety and economics of the facility system concerned by coordinating with intermittent renewable energies, like wind power. However, inappropriate siting and sizing of EV charging stations could have negative effects on the event of EVs, the layout of the traffic network during a city concerned, and therefore the convenience of EV drivers. It could also cause a rise in network losses and degradation in voltage profiles at some nodes. [1]

EV charging stations is split into 3 stages (i.e., the demonstration stage, public promotional stage, and business utilization stage). Then, associate degree improvement model for the planning of EV charging stations is planned with the interval distance magnitude relation, charging capability redundancy, and charging power redundancy thought the



Electronic Smart Jacket For the navigation of deaf-blind people

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Abstract: Evolution of technology has always been endeavored with making daily life simple. One of them is the visually impaired who have to rely on others for travelling and other activities. This paper aims at providing one such theoretical model which incorporates the latest technologies to provide efficient and smart electronic aid in the jacket and stick to the blind. We have used ultrasonic range finder circuit for detection. Panic situations will be sent as an SMS alert to registered mobile numbers. The basic objective of the system is to provide a convenient and easy navigation aid for unsighted which helps in artificial vision by providing information about the environmental scenario of static and dynamic objects around them. According to World Health Organization (WHO) study, 90% of the info to the human brain is sent through eyes alone. In this paper, we proposed an efficient, reliable and low-cost wearable jacket for the people suffering from visual impaired. A smart jacket is designed by embedding the sensor on the jacket that enables the user to detect an obstacle and safely navigate. The smart jacket requires low power hence can be used for real time navigation for visually impaired people.

Keywords: Smart jacket, SMS, Navigate, Obstacle, Sensor

I. INTRODUCTION

Vision is one of the most important senses of as most of the information humans gets from the environment is via sight. WHO reported that in august 2014, about 285 million people suffer from lack of vision. It is estimated worldwide: 39 million are blind and 246 million have less vision. Around 90% of the visually impaired live in low income conditions. 82% of people living with blindness are around 50 and above. The number of people visually impaired from infectious diseases has reduced in the last 20 years according to global estimates work. 80% of the visual impairments can be prevented or cured. The basic problem which every blind person faces is with regard to commutation and navigation in daily life. The most basic tools for them are walking cane and guide dogs and also on kindness of fellow commuters. The most commonly used tool is still the blind stick. It suffers from drawbacks like lots of practice, range of motion, less reliability in terms of dynamic hurdles and also range detection. We will try to modify this cane with electronic components and sensors. In addition we have used ultrasonic which help in obstacle detection and on hurdle recognition will ring the speaker for different durations to indicate different distances. We wish at presenting an inexpensive and light weight and accurate model which helps in effortless navigation for the blind. But still there are many people who are not able to see what is around. With around 35 million people having impaired vision, 15 million are alone from India. These blind people are constantly dependent on an assistive device like white cane, guide dogs or other individual to navigate from one location to other. The problem increases when moving from one location to another. Thus we propose an aid for the blind which will help them to carry out daily chores with ease without depending on other individual. This will be a promising aid for support and encouragement to the blind as they struggle for an independent life. This aid is used to help the blind to move as confidently as sighted people. This microcontroller does all the work of detecting signals from different sensors. An ultrasonic sensor is used to detect the solid obstacle. The obstacle within a range of 90cm will be detected. This sensor sends input waves, these waves fall on the surface of solid obstacle and is reflected back to ultrasonic sensor and thus the obstacle is detected. The person can avoid the obstacle by sensing the vibration. Thus this Jacket allows the blind person to travel independently without any help. The jacket also allows the blind person to identify the water. The system also allows the blind person to travel from one source to a destination avoiding all the obstacles.



Electrochemical determination of paracetamol by SWCNT-modified carbon paste electrode: a cyclic voltammetric study

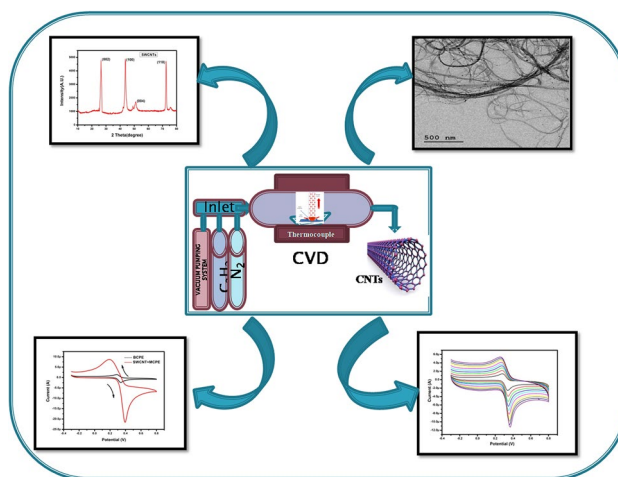
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Abstract

The central theme of this work is the synthesis of single-walled carbon nanotubes (SWCNTs) through the chemical vapor deposition method (CVD). Single-walled carbon nanotubes are synthesized using catalyst-chemical vapor deposition of acetylene at 750 °C temperature. X-ray diffraction study gives a characteristic peak (002) at 26.55° corresponding to the existence of carbon nanotube confirms that the particles are crystalline in nature and hexagonal phase. An SEM and HR-TEM outcome gives surface morphology of SWCNTs. The elemental composition was confirmed by EDAX. The ideal concentration of single-walled carbon nanotubes was used to design a novel electrochemical sensor for determining paracetamol (PA) using cyclic voltammetry. Electrochemical determination of paracetamol is described using a single-walled carbon nanotube modified carbon paste electrode (SWCNT/MCPE). The SWCNT/MCPE was used in this study to detect paracetamol electrochemically at pH 7.2 in a 0.2 M PBS with a scan rate of 50 mV s⁻¹. A single-walled nanotube modified carbon paste electrode was used to develop a sensitive and selective electrochemical technique for the detection of PA. The SWCNT/MCPE showed excellent electrocatalytic activity towards the oxidation of paracetamol in phosphate buffer solution. Therefore, with increased oxidation currents, the voltammetric responses of paracetamol at the bare carbon paste electrode are organized within cyclic voltammetric peaks.

Graphical abstract



Keywords Electrochemical sensor · Single-walled carbon nanotube · Paracetamol · Modified electrode · Chemical vapor deposition method

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Extended author information available on the last page of the article