



## Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Estd. 1986) Oorgaum, Kolar Gold Fields, Karnataka – 563120

(Affiliated to VTU, Belgaum, Approved by AICTE - New Delhi)

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PRINCIPAL

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## IoT Based Smart parking System

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**Abstract**-Automated object detection algorithm is an important research challenge in intelligent urban surveillance systems for IoT and smart cities applications. In particular, smart vehicle license plate recognition (VLPR) and vehicle detection are recognized as core research issues of these IoT-driven intelligent urban surveillance systems. They are key techniques in most of the traffic related IoT applications, such as road traffic real-time monitoring, security control of restricted areas, automatic parking access control, searching stolen vehicles, etc. In this paper, we propose a novel unified method of automated object detection for urban surveillance systems. We use this novel method to determine and pick out the highest energy frequency areas of the images from the digital camera imaging sensors, that is, either to pick the vehicle license plates or the vehicles out from the images. Our proposed method can not only help to detect object vehicles rapidly and accurately, but also can be used to reduce big data volume needed to be stored in urban surveillance systems.

**Keywords**— Internet of Things; Cloud Computing; Smart Parking; Smart City; Cloud of Things

### I. INTRODUCTION

Smart transportation and urban surveillance systems are important internet of things (IoT) applications for smart cities]. In these smart transportation and urban surveillance applications, cameras/imaging sensors are commonly installed to automatically detect and identify potential vehicles/cars through automated object detection methods. Usually, such automated object detection methods demand high-complexity image/data processing technologies and algorithms. Hence, the design of low-complexity automated object detection algorithms becomes an important topic in urban surveillance systems.

Among these researches, both vehicle license plate recognition (VLPR) and vehicle recognition are hot research topics worldwide, which can be applied to many IoT applications, such as road traffic data collection/monitoring, automatic parking charging and access control, and searching stolen vehicles. It is

known that a license plate number is a unique identification of a vehicle. Specifically, the license plate recognition, i.e. the extraction of a license plate region from an image, is the key module in a VLPR system, which influences the accuracy of the VLPR systems significantly. Different algorithms have been proposed for identifying a vehicle license plate using image processing. One typical way is vertical edge matching. The idea is to first locate the two vertical edges of a license plate, and hence to detect its four corners. In this way, the license plate can be extracted accurately. Using the contrast between the grayscale values, proposed a vertical edge based license plate recognition method.

Furthermore, each method can only be used to recognize a vehicle license plate or a vehicle individually. None of them can be used as a unified method to detect both vehicle license plates and vehicles. In this paper, we propose a novel, simple and unified method to search the objects by filtering out the vehicle and/or license plate images rapidly from the digital camera imaging sensors. We design a simple filter to effectively detect either vehicle license plates or vehicles, motivated by the observation that in the most cases the object is the highest energy frequency part of an image. This process can be easily implemented in any urban surveillance systems in smart cities to pick out comparably important areas from the images captured by any camera/imaging sensors in urban environments, which will be a useful method not only to rapidly detect the important information but also to reduce the large data volume required to be stored because only those selected important (smaller) data will be stored as compared to huge raw data captured/generated from any cameras/imaging sensors 24 hours per day, 7 days a week and 365 days per year.

### II. OBJECTIVE

The smart parking system is considered beneficial for make the car park operators, car park patrons as well as in environment conservation for the car park operators, the information gathered via the implementation of the Smart Parking System can be exploited to predict future parking patterns. Patrons are also able to benefit from smart parking system as parking space are able to be fully utilized with a safer; optimized and more efficient



# A Survey on Privacy and Intrusion Prevention in Cloudlet Based Medical Data Sharin

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**Abstract—** With the advancement of wearable medical devices remote health monitoring and elderly health care has become a popular application. The data collected from patient through wearable devices like heartbeat, blood pressure etc, has to be passed to application running in cloud to implement various services like expert advice, emergency assistance etc. The data of patients when stored in cloud can be attacked by intruders and can be stolen or corrupted. Existing solution are based on encrypting the data and storing in cloud. By these solutions can be attacked and encryption keys can be broken and all data can be still stolen. In this project we propose a cloud let based solution for providing enhanced security to patient health care data.

## I. INTRODUCTION

Body Area Network (BAN) is constructed by a set of communicating wireless sensor nodes. These sensor nodes can be wearable or implanted, which can monitor different vital body data and gather a lot of body parameter information [1]– [3]. The BAN sensor nodes communicate over wireless mechanisms can transmit data from the body to a home base station at where, the information can be forwarded to a service provider in a hospital, clinic, or anywhere in real-time manner. The BAN technology is still in it's novel phase and is being widely investigated. The technology, once accepted and adopted, is expected to be a breakthrough invention in many healthcare applications, leading to concepts like telemedicine and mobile health monitoring. Initial applications of BANs are expected to appear primarily in the healthcare domain, especially for continuous monitoring and logging vital parameters of patients suffering from chronic diseases such as diabetes, asthma and heart attacks, as well as in elder care monitoring. Other emerging applications of this technology include military, firefighters, sports, gaming, social computing, entertainment and security. Extending the technology to new areas could also assist communication by seamless

exchanges of information between individuals, or between individual and machines.

## II. SURVEY

Survey of the current works on machine learning for disease diagnosis in this chapter is done. In the work of Jin sun , the key policy ABE is associated with the broadcast encryption to provide a dual system encryption. With this standard model, the scheme can achieve fixed-size public criterion, force no bound on attribute set size used for encryption. In this work, SSL Authentication Protocol is applied in cloud computing, will become so complicated that users will undergo a bulk point both in computation and communication. It based on the identity-based hierarchical model for cloud computing the authors proposed a dynamic authentication protocol that can support dynamic operations in cloud. This enables only valid users to authenticate in cloud. The authors proposed a dynamic authentication protocol that can support dynamic operations in cloud. This enables only valid users to authenticate in cloud. In this work , qianwang proposed a Merkle hash tree technique to improve the proof of retrievability. A hash tree is a tree of hashes in which the leaves are data blocks hashes in, for instance, a file or set of files. Nodes added up in the tree are the hashes of their corresponding children.

## III. ARCHITECTURE

Figure 1 below shows a top level overview of our proposed Cloudlet-based BAN data collection system. The system is composed of sets of BANs. The BANs are composed of multiple users (each user is equipped with BAN), who are able to transmit the collected data by the BAN to the outside of the body, as described in Section I. A group of BAN users can be The virtually clustered around one cloudlet server that is representing cloud computing capabilities in a small scale which is sufficient to handle a BAN user within the cluster as we



# Design of Cluster Algorithm for Dynamic WSN with Optimized Energy paradigm

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**Abstract**— Lifetime enhancement has always been a crucial issue as most of the wireless sensor networks (WSNs) operate in unattended environment where human access and monitoring are practically infeasible. Clustering is one of the most powerful techniques that can arrange the system operation in associated manner to attend the network scalability, minimize energy consumption, and achieve prolonged network lifetime. To conquer this issue, current researchers have triggered the proposition of many numerous clustering algorithms. However, most of the proposed algorithms overburden the cluster head (CH) during cluster formation. To overcome this problem, many researchers have come up with the idea of fuzzy logic (FL), which is applied in WSN for decision making. These algorithms focus on the efficiency of CH, which could be adoptive, flexible, and intelligent enough to distribute the load among the sensor nodes that can enhance the network lifetime. But unfortunately, most of the algorithms use type-1 FL (T1FL) model. In this paper, we propose a clustering algorithm on the basis of interval type-2 FL model, expecting to handle uncertain level decision better than T1FL model.

**Index terms** : cluster head(CH), fuzzy logic(FL), wireless sensor network(WSN),type 1 fuzzy logic(T1FL),type 2 fuzzy logic(T2FL).

## I. INTRODUCTION

A wireless sensor network (WSN) consists of spatially distributed autonomous sensors to monitor physical or environmental conditions, such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location. The more modern networks are bi-directional, also enabling control of sensor activity. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance; today such networks are used in many industrial and consumer applications, such

as industrial process monitoring and control, machine health monitoring, and so on.

The WSN is built of "nodes" – from a few to several hundreds or even thousands, where each node is connected to one (or sometimes several) sensors. Each such sensor network node has typically several parts: a radio transceiver with an internal antenna or connection to an external antenna, a microcontroller, an electronic circuit for interfacing with the sensors and an energy source, usually a battery or an embedded form of energy harvesting. A sensor node might vary in size from that of a shoebox down to the size of a grain of dust, although functioning "motes" of genuine microscopic dimensions have yet to be created. The cost of sensor nodes is similarly variable, ranging from a few to hundreds of dollars, depending on the complexity of the individual sensor nodes. Size and cost constraints on sensor nodes result in corresponding constraints on resources such as energy, memory, computational speed and communications bandwidth. The topology of the WSNs can vary from a simple star network to an advanced multi-hop wireless mesh network. The propagation technique between the hops of the network can be routing or flooding.

## II. LITERATURE SURVEY

According to (1),Networking together hundreds or thousands of cheap microsensor nodes allows users to accurately monitor a remote environment by intelligently combining the data from the individual nodes. These networks require robust wireless communication protocols that are energy efficient and provide low latency. We develop and analyze low-energy adaptive clustering hierarchy (LEACH), a protocol architecture for micro-sensor networks that combines the ideas of energy-efficient cluster-based routing and media access together with application-specific data aggregation to achieve good performance in terms of system lifetime, latency, and application-



## A Survey Paper on Big Data Challenges

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**ABSTRACT:** With the advent of internet of things(IOT) and web 2.0 technologies ,the amount of data that is travelling across the internet today is not only large but complex as well. Companies,institutions ,healthcare systems etc all of them use files of data which are further used for creating reports in order to ensure continuity regarding the services that they have to offer. This process results as a challenge for software developers and companies that provide IT infrastructure. The challenge is how to manipulate as impressive volume of data that has to be securely delivered through the internet and reach its destination intact. This paper surveys the challenges that Big Data creates.

**KEYWORDS:** Big Data, Data storage, Security, Scalability.

### I. INTRODUCTION

As the current technology enables us to efficiently store and query large datasets, the focus is now on techniques that make use of the complete data set, instead of sampling. This has tremendous implications in areas like pattern recognition, machine learning and classification, to name a few. Therefore, there are a number of requirements for moving beyond standard data mining techniques:

- a robust exploratory establishment to have the capacity to select an adequate method or design ;
- a new algorithm;
- a technology platform and adequate development skills to be able to implement it;
- a genuine ability to understand not only the data structure (and the usability for a given processing method), but also the business value.

As a result, building multi-disciplinary teams of “Data scientists” is often an essential means of gaining a competitive edge. More than ever, intellectual property and patent portfolios are becoming essential assets. One of the obstacles to widespread analytics adoption is a lack of understanding on how to use analytics to improve the business [1].

The term “Big Data” was first introduced to the computing world by Roger Magoulas from O’Reilly media in 2005 in order to define a great amount of data that traditional data management techniques cannot manage and process due to the complexity and size of this data.

A study on the Evolution of Big Data as a Research and Scientific Topic shows that the term “Big Data” was present in research starting with 1970s but has been comprised in publications in 2008.[3]

“Big Data” is a term encompassing the use of techniques to capture, process, analyse and visualize potentially large datasets in a reasonable timeframe not accessible to standard IT technologies. By extension, the platform, tools and software used for this purpose are collectively called “Big Data technologies”.[1]



Fig.1: Sources of Big Data

Figure 1 shows the various sources from where the data is collected. In general, Big Data refers to the collection of large and complex datasets which are difficult to process using traditional database management tools or data processing applications. These are available in structured, semi-structured, and unstructured format in petabytes and beyond. Formally, it is defined from 3Vs to 4Vs. 3Vs refers to volume, velocity, and variety. Volume refers to the huge amount of data that are being generated everyday whereas velocity is the rate of growth and how fast the data are gathered for being analysis. Variety provides information about the types of data such as structured, unstructured, semi structured





## Advanced Smart Attendance Monitoring System Using Cloud for Storing Data and Wifi Module

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**Abstract:** Present attendance monitoring system run manually and on basis of paper. For a Institute every year admit approximately misplacement of attendance sheet, time consuming parents cannot get any information about attendance of their children user control, security, data sharing and many more. In this paper smart class attendance monitoring system above listed draw backs can be eliminated using biometric system with GSM technology biometric system recognize people's unique physiological characteristics. Biometric based attendance terminal are becoming increasingly popular in today's market because they read a person's unique finger print. Iris hand shape or face shape. They ensure that the person can't escape in or face shape. They ensure that the person can't escape in for one another and also preventing the person time theft. More than 500 students. Institute has more than 1400 students every year .Existing institute system is based on paper work and documentation. Current system is traditional system data of more than 1400 students is very difficult to maintain every year as number of students increases. There are many drawbacks of current attendance monitoring system. It has several downsides like misplacement of attendance sheet, time consuming parents cannot get any information about attendance of their children user control, security, data sharing and many more. In this paper smart class attendance monitoring system above listed draw backs can be eliminated using biometric system with Gsm technology biometric system recognize people's unique physiological characteristics. Biometric based attendance terminal are becoming increasingly popular in today's market because they read a person's unique finger print. Iris hand shape or face shape. They ensure that the person can't escape in or face shape. They ensure that the person can't escape in for one another and also preventing the person time theft

**Keywords:** GSM, Arduino, Biometric, system, LED display Cloud wifi model

### INTRODUCTION:

In this paper project entitled student attendance monitoring system is to update student's attendance automatically and sent to the HOD of the corresponding department. It will display the class faculty lecturing the

class and also send the alert message to the corresponding faculty member 10 minutes before the class. Student entering into a class room places his finger on the biometric sensor. The digital output from sensor received by Arduino controller compares with digital data of various students already registered if mismatch occurs it gives invalid finger else the data is stored when all the students thumbs are received then we switch a button on biometric system immediately it will send message to the HOD that the number of students present today it will displace the name of the faculty member delivering the lecture. It alerts the next class faculty member before ten minutes GSM uses an inbuilt sim dual band GSM sim work with 9001/1800 MHz

### II. HARDWARE IMPLEMENTATION

Here a digital pattern generated by the glove is directly given to ARDUINO MEGA 2560 controller. A firmware is inserted in Arduino such that each gesture is assigned a particular character as per the table shown in the methodology chapter. So, as per that code characters corresponding to the gesture are transmitted via RF transceiver

### III. BACKGROUND OF THE SYSTEM

#### Arduino mega 2560

Arduino has been used in thousands of different projects and applications. It is the heart of our project The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build low cost scientific instruments, to prove chemistry and physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example. Arduino is a key tool to learn new things. Anyone - children, hobbyists, artists, programmers - can start tinkering just following the step by step instructions of a kit, or sharing ideas online with other members of the Arduino community.



# Face detection based attendance monitoring system in colleges

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**Abstract**— Students attendance in the classroom is very important task and if taken manually wastes a lot of time. There are many automatic methods available for this purpose i.e. biometric attendance using fingerprint, Swiping cards.

The cost for biometric reader is very high, and it is not effective to recognize the finger print at one go. Swipping cards is subjected to forgery as students can sent their card with friends to mark attendance. In this project we propose a cost effective , highly responsive system for face detection in which forgery is totally avoided.

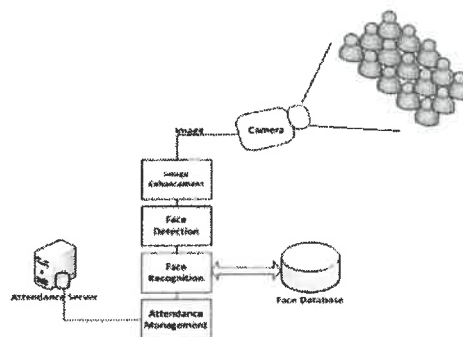
**Keywords**—component; formatting; style; styling; insert (key words)

## I. INTRODUCTION

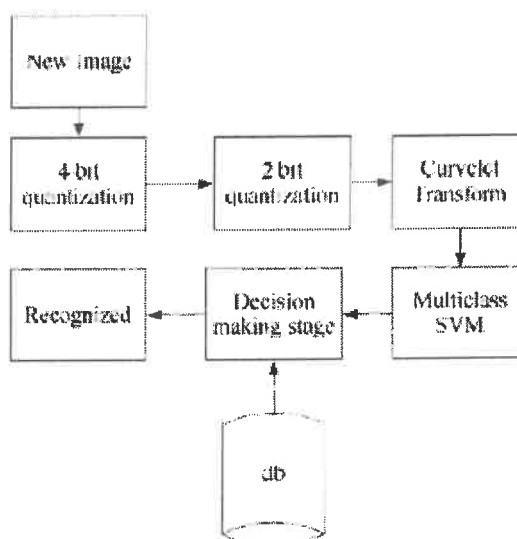
Maintaining the attendance is very important in all the institutes for checking the performance of students. Every institute has its own method in this regard. Some are taking attendance manually using the old paper or file based approach and some have adopted methods of automatic attendance using some biometric techniques. But in these methods students have to wait for long time in making a queue at time they enter the classroom. Many biometric systems are available but the key authentication is same is all the techniques. Every biometric system consists of enrolment process in which unique features of a person is stored in the database and then there are processes of identification and verification. These two processes compare the biometric feature of a person with previously stored template captured at the time of enrollment. Biometric templates can be of many types like Fingerprints, Eye Iris, Face, Hand Geometry, Signature, Gait and voice. Our system uses the face recognition approach for the automatic attendance of students in the classroom environment without students' intervention. Face recognition consists of two steps, in first step faces are detected in the image and then these detected faces are compared with the database for verification.

Direct use of pixel values as features is not possible due to huge dimensionality of the images. One way to

handle huge dimensionality in face recognition problems is to employ dimensionality reduction tools on some kind of transformation domain. Nowadays, multiresolution analysis is often performed as a preprocessing step to dimensionality reduction. The most popular multiresolution analysis tool is the wavelet transform. It has enjoyed a wide-spread popularity in the field of face recognition. In wavelet analysis an image is usually decomposed at different scales or resolutions using a wavelet basis vector.



## 2. Block Diagram of Face Recognition System





IRD India

# Implementation of RSA Algorithm Using Fog Computing

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**Abstract-** Fog computing is a technique which essentially extends cloud computing. Security is the main problem with cloud computing to overcome this problem fog computing technique is developed. Since there were security problems in fog even after getting the encrypted data from cloud. In this paper we implemented the process of encryption using RSA algorithm in order to check how it works for fog computing. RSA algorithm is one of the widely used algorithm which is used for securing data during transmission in order to provide authenticity using key generation, encryption and decryption.

**Keywords-** Fog Computing, RSA algorithm, key generation, encryption, decryption.

## I. INTRODUCTION

Nowadays, most of the organizations from large scale to small scale industries are using cloud computing technology to store data and resources as per their requirements. But in cloud computing number of devices connected to internet is increasing day by day and this might result in problem of storing data as well as retrieving of information[1].

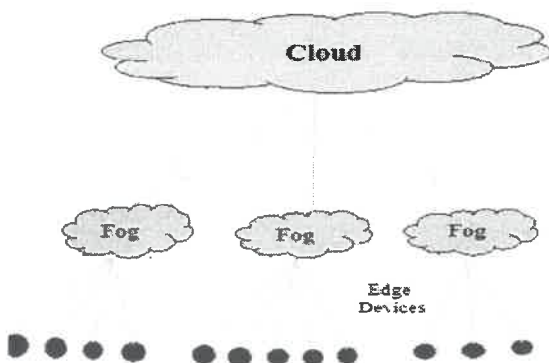


Fig.1 Fog computing architecture

In order to overcome this problem fog computing concept has been introduced. Even in fog computing there are some security problems after getting the encrypted data from cloud. To overcome this problem RSA algorithm is used to check how it works with fog computing.

RSA algorithm is one of the widely used algorithm for securing the data during transmission in order to provide authenticity using key generation, encryption and decryption.

RSA is mainly based on cryptography[2]. Cryptography is a process of protecting confidential information by encoding or decoding. Encoding is conversion of information into cipher text. Decoding is conversion of information from cipher text to plain text. Hence key generation, encryption and decryption is implemented.

## II. LITERATURE SURVEY

This section involves work done by various researchers in the field of fog computing and cryptography.

[1] Akilesh Vishwanath, Ramya Peruri, Jing(Selena) He, proposed an approach of two level security for data in fog computing through encryption using edge device.

[2] Shikha Mathur, Deepika Gupta, Vishal Goar, Manoj Kuri, proposed a modified approach which is an enhancement over traditional RSA algorithm by including exponential powers, n prime numbers, multiple public keys, and K-NN algorithm.

[3] Yunguo Guan, Jun Shao, Guiyi Wei, Mandle Xie, they proposed design issues for data security and privacy in fog computing. Specially they presented the unique data security and privacy design challenges presented by the fog layer.

[4] Neha Shrikant Dhande, proposed the review of privacy and security issues in fog computing that extends cloud computing and also proposed security and privacy issues in fog computing.

## III. PROBLEM DESCRIPTION

Security is one of the prime factor for data during transmission. The data must be protected from the attackers to ensure that the data is not modified during transmission. Hence to provide the security to the data in fog computing we are using the concept of second level of security within the fog.

### A. EXISTING FOG SECURITY SYSTEM

At present Decoy system is the security model in fog. Initially in Decoy system user has to sign up and he

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## IOT Based Futuristic Trolley for Intelligent Billing with Amalgamation of RFID AND ArmLPC2148.

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**Abstract-** Shopping mall is a place where people get their daily necessities. There has an emerging demand for quick and easy payment of bills in shopping malls. Quite often, When Shopping in a supermarket shopper are frustrated at locating the items on the shopping list and no assistance is available. So, we designed the mobile application and also provides a centralized and automated billing system using RFID. Each product of shopping cart is implemented with a product Identification Device(PID) that contains Microcontroller, LCD, an RFID reader. Purchasing product information will be read through a RFID reader on shopping cart and it is displayed in LCD which is interfaced to the controller. At the billing counter, the total bill will be transferred to mobile app by Wi-Fi. And we also introduced smart payment in the trolley.

**Keywords-** Radio Frequency Identification (RFID), Internet of things (IoT), Liquid Crystal Display (LCD), ARM LPC 2148, Wi-Fi module, Embedded C

### I. INTRODUCTION

Shopping is an agility carried out by most of the people either on a daily or weekly basis to fulfil their necessities ranging from groceries, apparels, household cleaners, pharmacy products to electrical appliances, and others. To meet the need of people, numbers of self-service shops such as shopping malls and supermarkets keep on increasing over the years throughout the globe. The ideology is to provide customer a hassle-free shopping experience by introducing RFID Based Smart Shopping and Billing System. The project aims to develop a modern futuristic electronic product that can be attached to any trolley or bag and communicates with the billing counter wirelessly using IoT, making the whole affair of shopping comfortable and efficient. The smart trolley will not only help shorten the checkout lines but also help customers to keep track on their budget. . The work aims to develop a modern futuristic electronic product that can be attached to any trolley or bag and communicates with the billing counter wirelessly using IoT (Internet of Things), making the whole affair of shopping comfortable and efficient. The

smart trolley will not only help shorten the checkout customers to keep track on their budget. Every product in the shopping centre can be tracked with a unique RFID tag. The device comprises a RFID reader with a LCD display on the shopping trolley. Also, ARM memory to store the details of the items purchased, that can be easily accessed by the cashier at the counter on pressing the toggle switch. Each trolley will consist of a similar type of hardware with unique trolley address. The customers would be able to scan products themselves and the LCD screen on the cart will keep updating the total. This makes it easier for the billing counter to keep a count on products in the bag. This will be very beneficial for retail stores as more people will enjoy a effortless shopping experience and come more often to shop.

### II. EXISTING SYSTEM

Traditional Billing currently involves the use of barcodes. Products must be scanned through the barcode scanner by the cashier which gives us the total bill, as represented in Figure 2.1. But this becomes a monotonous which, when lots of products are to be scanned will result in long queues, making the billing process slow and time consuming. While doing a survey, we found that most of the people prefer to leave the shopping mall instead of waiting in long queues to buy a few products. Recent years have seen the advent of several modern technologies for hypermarket assistance. All such solutions share similar objectives: save consumers time, money and help the retailers to win loyal clients.

### III. PROPOSED SYSTEM

The electronic product is made to display information about the products that are scanned i.e. name and price. Whenever a customer adds a product/item into the trolley, the RFID reader scans the tag and the item's unique product code. The scanned product details will be passed to the microcontroller for further processing which includes retrieving the product details of the scanned item from the existing database. The microcontroller upon receiving the data, displays the name and price of the product on the LCD display



# Lightweight Three-Factor Authentication for Internet-Integrated Wireless Sensor Networks

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**Abstract—** Wireless sensor networks are special networks with variety of applications at the same time it suffers from many hazards. There are certain solutions but authentication gives the best result among them.

Authentication is the way towards perceiving a client's identity. Two Factor Authentication is also called 2FA is a two stage check with additional layer of security that requires a secret key and username which client has on them. The loop holes of 2FA are, factors can get lost. There is no certainty that your authentication factors will be available when you need them. False security. Two-factor authentication provides a level of security, but it's typically exaggerated. It can be turned against users.

This paper deals with Three-factor Authentication (3FA) which is a layered level of security comprising of three separate components keeping in mind the end goal to give an uplifted level of insurance. These three components include giving verification of your identity, what you know, and including something you have with you. Using a Three Factor Authentication process we can bring down the quantity of instances of data fraud on the Internet, and also phishing by means of email, on the grounds that the criminal would require something other than the clients name and password.

**Keywords—** Authentication, Two-factor-authentication, Three-factor-authentication, Wireless Sensor Networks, privacy.

## 1. INTRODUCTION

One visualization of future Internet is that things with sensing and actuating capabilities will be connected and integrated making up the Internet of Things (IoTs). As Wireless Sensor Network (WSN) is one of the major technologies supporting the sensing capabilities required by future applications, the incorporation of WSN with the Internet will have a dynamic role in the progression of the design of future Internet [1][2]. As illustrated in

Fig. 1, sensor nodes (SNs) can be linked by low rate and low power

Wireless technologies and hence sensors will be globally addressable by any entity connected to the Internet thereby enabling the remote access of sensor data. Despite of the great potential of this amalgamation, it also brings new threats, such as the exposure of sensor nodes to attacks originating from the Internet.

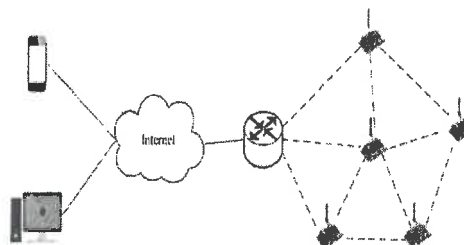


Fig 1: Architecture of internet wireless sensor networks

The sensor data which is being transmitted must be protected by an end-to-end secure channel connecting the SN and the unit outside the WSN. The establishment of such a channel requires authentication and key agreement techniques that allow two remote units to mutually validate and negotiate secret keys which are used to protect the sensor data against diverse types of active and passive attacks [3]WSN itself has security measures at a lower layer such as the link layer security services defined by IEEE 802.15.4, the openness of the Internet still requires authentication and key agreement protocols for establishing the E2E secure channel between the two communicating units[3][4].

## 2. LITERATURE SURVEY

- [1] S. Hong et al., "SNAIL: An IP-based wireless sensor network approach to the Internet of Things," IEEE Wireless Commun., vol. 17, no. 6, pp. 34-42, Dec. 2010.



# Minimizing Electricity Theft by Internet of Things

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**Abstract**— IOT use things to things connection to access the internet of things, allow data to store and access services. Services over internet of things development according to need of person to person and thing to person, machine to machine interaction without human interaction. As there is limited non-renewable resources are present in our daily life, Electricity is one of them which utilized in every country that results abundant losses due to electricity larceny. Power theft is going to be the key challenges. A smart energy meter is used to minimize the electricity larceny. Basically energy meter is a device that calculates the cost of electricity consumed by homes, business, or an electrical device. It reduces the theft of electricity. In this paper a government person can find the dishonest user by showing the status of energy meter at the back end of electricity office. To attain this, energy meter communicate with raspberry pi through GPIO pins. GPIO pins fetch the effective data from energy meter and it send effective data to the raspberry pi and connect raspberry pi with the internet. At the backend, government person can see the status of energy meter in the form of graphs.

**Keywords**— IOT (Internet of Things), Electric Energy, Energy Meter, Raspberry pi.

## I. INTRODUCTION

With the Increasing of internet connectivity in home environment electronic gadget used to create home network services. IOT use things to things connection to access the internet of things, allow data to store and access services, such as remote home sensor [1]. Services over internet of things development according to need of person to person and thing to person , machine to machine interaction without human interaction . Technology used in this system is radio frequency identification. Transmission and delivery of electricity is smartness from the utilize of renewable energies and advanced measurement and latest communication technologies as well utilities grow to be smart. So with smart utility latest measurement and energy sources and load efficiently manage.[2].The key element of such a measurement and control network

could be a smart meter. A smart energy meter is used to minimize the electricity larceny. Basically

energy meter is a device that calculates the cost of electricity consumed by homes, business, or an electrical device. It reduces the theft of electricity. Electronic energy meter measures current in both Phase and Neutral lines and calculate power consumption.

## II. SOFTWARE AND HARDWARE USED

### A. IOT

With the increasing of internet connectivity in home environment electronic gadget used to create home network services. IOT use things to things connection to access the internet of things, allow data to store and access services, such as remote home sensor [1]. Moreover lights will automatically shut off when leaving a room or apartment when exiting for work. In addition, the room temperature can be reduced when leaving for work and increased in advance of coming home. Other functions that can be controlled away from home include determining whether or not the apartment windows are closed or the coffee maker is shut off. An energy provider can read the energy consumption for a day, week, or month. Services over internet of things development according to need of person to person and thing to person, machine to machine interaction without human interaction. Technology used in this system is radio frequency identification. The operation of buildings and/or homes will be more simple, safe, reliable, environmentally friendly, and cost effective by using smart devices in conjunction with IOT.

### B. ELECTRIC ENERGY

Electric Energy is a necessary resource in everyday life and a backbone of the industry. Its limited, so proper use and measurement is very important. Before utilization of electricity it passes some phases. It is first Generated (G) then Transmitted (T) over long distances and finally Distributed (D) to consumers. In this process of GTD energy losses take place. Energy loss is defined as the difference between energy generated and consumption.



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# OPTIMAL CONFIGURATION SOLUTION FOR PROFIT MAXIMIZATION IN CLOUD COMPUTING

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**Abstract**—Alongside the improvement of distributed computing, an expanding number of undertakings begin to receive cloud benefit, which advances the rise of numerous cloud specialist cooperation's. For cloud specialist organizations, how to arrange their cloud benefit stages to acquire the greatest benefit turns out to be progressively the concentration that they focus on.

So we bring consumer loyalty into thought to address this issue. Consumer loyalty influences the benefit of cloud specialist organisations in two ways. On one hand , the cloud begin influences the nature of admin which is a critical factor influencing consumer loyalty. Then again, the consumer loyalty influences the demand landing rate of a cloud specialist organization. In any case, few existing works take consumer loyalty into thought in tackling benefits augmentation issue or the current works considering consumer loyalty don't give a legitimate formalized definition for it. Subsequently, we right off the meaning of consumer loyalty in financial matters and build up a recipe for estimating consumer loyalty in distributed computing. And afterword, an examination in given in detail on how the consumer loyalty influences the benefit. Ultimately, contemplating consumer loyalty, benefit level assertion, leasing value, vitality utilization thus forward, a benefit amplification issue is detailed and settled to get a ideal arrangement with the end goal that the benefit is augmented.

## 1. INTRODUCTION

Cloud computing is the delivery of resources and computing as a service rather than a product over the inter-net, such that accesses to shared hardware, software, databases, information, and all resources are provided to consumers on-demand [1].

Cloud computing provides services over the internet, by centralizing the resources and services such that accesses to shared hardware, software, databases, information, and these resources are provided to consumers on-demand . Cloud computing turns information technology into ordinary commodities and

utilities by using the pay-per-use pricing model [2].however, cloud computing will never be free [3], and understanding the economics of cloud computing becomes critically important.

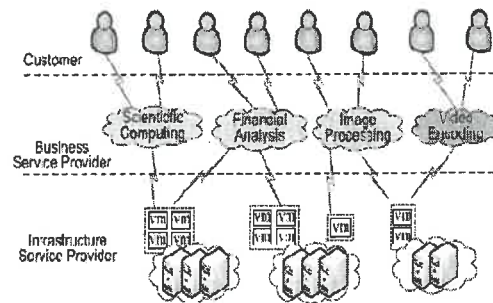


Fig 1: Three tier structure

As shown in Fig. 1, the cloud service providers rent resources from infrastructure providers to configure the service platforms and provide paid services to customers to make profits. For cloud service providers, now the task is to obtain the maximal profit through cloud service platforms.

The optimal configuration problem with profit maximization of cloud service providers has been researched in our previous researches [4], [5 ] which assumed that the cloud service demand is known in advance and not affected by external factors.

Cloud computing environment is composite of a three-tier structure, which consists of infrastructure provider , service providers and consumers.

- 1) Infrastructure providers uploads basic hardware and software facilities.
- 2) A service provider rents resources from the infrastructure provider, builds proper multiserver systems, and provides various services to users.
- 3) A consumer submits a service request to a service provider, receives the desired output from the service provider with certain service-level agreement,



# Image processing technique for Automatic control of power supply in class room

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**Abstract :** An existence without power can never be envisioned in this world, so it's each human obligation to spare power. Yet, because of the bustling timetable existing nowadays, frequently a large number of us neglect to turn off lights and fans which increment wastage of power. Regularly we discover lights and fans in the classroom will be on however the classroom is empty which builds the power charge. This is the major issue in most of the educational institutions. Over the previous decade, there has been huge headway and developments in the field of customer hardware by utilizing new innovations that can computerize the control of principle control supply gave to the classroom which essentially decreases the power utilization. Automation gives a type of programmed control to the electrical machines present in the building. This paper exhibits discovery of movement of articles as a parameter to choose whether to switch on/off the power supply. Image processing strategy is utilized to identify the movement and in view of the outcome whether to turn on/the power supply to the classroom.

Keywords—Background subtraction, Image Processing, Raspberry Pi, Relay

## INTRODUCTION

Lighting automation isn't another thing for us. The current frameworks are worked physically and it is a repetitive activity to switch on/off the light every time understudies enter/leave the classroom. The accessible items in the market are expensive and are not exact. Indeed, even the use of IR sensors has an issue related with it. Infrared sensors can keep check of various individuals going into/leaving the room however can't distinguish if the room is involved or not and even infrared radiations are hurtful.

In spite of the fact that there are a ton of items accessible in the market which will turn on/off lights in view of the human nearness or nonappearance separately. In any case, the issue is that accessible innovation requires a major framework (For instance existing switchboards must be supplanted with new ones). But we will utilize the current switchboards and CCTV cameras, which are preinstalled in a large portion of the instructive

organizations. In light of the review led in the grounds, we understood that there is an awesome requirement for the programmed framework for exchanging on/off of mains in view of human nearness/nonattendance. Relatively every ground needs such a gadget as it is an issue which is generally found in each ground. So everybody can use this development without much substitution in the current framework. So we need to build up an exact and practical gadget which will precisely recognize a man and take an appropriate choice of turning on/off of light, which will be totally programmed. Our paper introduces a straightforward and capable idea wherein, We are utilizing picture handling procedure to identify the movement and in view of the outcome whether to kill on/the power supply to the classroom. At this point when the raspberry pi boots up the content which incorporates the way of the proposed calculation begins executing and identifying the movement of items by looking at the reference picture and the present picture caught by the camera. On the off chance that there is any movement identified then the calculation sends raspberry pi a message that there is somebody exhibit in the classroom and it needs to turn on the instated GPIO stick which thus triggers the hand-off and turns on the fundamental power supply. On the off chance that there is no movement distinguished then the GPIO stick isn't turned on as is the fundamental power supply gave to the classroom.

### A. Problem Statement

Design a smart automated device which controls the switching of Power supply in the classroom based on presence/absence of a human.

### B. Proposed Work

There is no compelling reason to switch primary supply on and off physically. When some individual is available in the classroom the mains consequently switches ON. At the point when no human is available in the classroom, at that point mains gets turned OFF. The exactness depends on the determination of camera and calculation utilized. In our task, we have utilized a 5V 10A Relay (electromagnetic switch) at the yield that triggers exchanging ON/OFF of the principle control supply. We chose to execute this framework utilizing





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# PROGUARD: AN EFFICIENT SYSTEM TO DETECT MALICIOUS ACCOUNTS IN SOCIAL-NETWORK-BASED ONLINE PROMOTIONS

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**Abstract :** Online social networks (OSNs) usage as been increased widely and also coordinate money related abilities by empowering the utilization of genuine and virtual cash. They fill in as new stages to have an assortment of business exercises, for example, online promotion event, where clients can get virtual cash as prizes by taking an interest in such occasions. Both OSNs and business accomplices are essentially concerned when aggressors instrument an arrangement of records to gather virtual cash from these occasions, which make these occasions insufficient and result in noteworthy money related misfortune. It happens to extraordinary significance to proactively recognizing these noxious records previously the online advancement exercises and consequently diminishes their need to be remunerated. In this paper, we propose a novel framework, in particular ProGuard, to achieve this target by efficiently incorporating highlights that describe accounts from three points of view including their general practices, their reviving examples, and the use of their money. Experimental results have demonstrated that our system can accomplish a high detection rate of 96.67% at a very low false positive rate of 0.3%.

**Keywords:** Online social networks, virtual currency, malicious accounts, intrusion detection, network security.

## I. INTRODUCTION

Online social networks (OSNs) that integrate virtual currency serve as an appealing platform for various business activities, where online, interactive promotion is among the most active ones. Specifically, a user, who is commonly represented by her OSN account, can possibly get reward in the form of virtual currency by participating online promotion activities organized by business entities. She can then use such reward in various ways such as online shopping, transferring it to others, and even exchanging it for real currency [1]. Such virtual currency-enabled online promotion model enables enormous outreach, offers direct financial stimuli to end users, and meanwhile minimizes the interactions between business entities and financial institutions. As a result, this model has shown great

promise and gained huge prevalence rapidly. However, it faces a significant threat: attackers can control a large number of accounts, either by registering new accounts or compromising existing accounts, to participate in the online promotion events for virtual currency. Such malicious activities will fundamentally undermine the effectiveness of the promotion activities, immediately voiding the effectiveness of the promotion investment from business entities and meanwhile damaging OSNs' reputation. Moreover, a large volume of virtual currency, when controlled by attackers, could also become a potential challenge against virtual currency regulation [2].

It therefore becomes of essential importance to detect accounts controlled by attackers in online promotion activities. In the following discussions, we refer to such accounts as malicious accounts. The effective detection of malicious accounts enables both OSNs and business entities to take mitigation actions such as banning these accounts or decreasing the possibility to reward these accounts. However, designing an effective detection method is faced with a few significant challenges. First, attackers do not need to generate malicious content (e.g., phishing URLs and malicious executables) to launch successful attacks. Comparatively, attackers can effectively perform attacks by simply clicking links offered by business entities or sharing the benign content that is originally distributed by business partners. These actions themselves do not perceptibly differentiate from benign accounts. Second, successful attacks do not need to depend on social structures (e.g., "following" or "friend" relationship in popular social networks). To be more specific, maintaining active social structures does not benefit to attackers, which is fundamentally different from popular attacks such as spammers in online social networks. These two challenges make the detection of such malicious OSN accounts fundamentally different from the detection of traditional attacks such as spamming and phishing. As a consequence, it is extremely hard to adopt existing methods to detect spamming and phishing accounts.

In order to effectively detect malicious accounts in online promotion activities by overcoming the aforementioned challenges, we have designed a novel system, namely ProGuard. ProGuard employs a



# Real Time Automated Teller Machine(ATM) Based On Biometric Identification And GSM Technology

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**Abstract**—We are facing theft, attacking the automated teller machine which has increased over a decade. To overcome this problem we are going with the technology of using biometrics for personal or individual identification to increase and provide high level security and accuracy. The use of this biometrics technology in our ATM system replaces the use of ATM cards and Pins by the physiological biometric fingerprint and iris authentication. Here we also include the feature of providing the one time password(OTP) to the users privacy and an easy way for recalling his/her Pin's. To protect the ATM system terminal from fire accidents and thief attacks we use pump motor and DC motor for closing and opening of the shutter instead of doing it manually. This system also collects the samples of user's fingerprint and iris patterns during their enrollment and keeps it in the database for the further process of transaction done by the users. Any fake attempts done, immediately the account will be blocked and it also easily differentiates the real samples collected and fake samples of fingerprints and iris patterns. The system here generates a three digit code which will be sent as a message to the registered mobile number of the user using GSM module connected to ARM7 LPC2148. Once the user enters the OTP which the user received through the mobile number it is checked for its correctness. If the valid code is entered the process of transactions continues or the account gets blocked. In this paper we provide experimental result on the fingerprint samples and iris patterns collected from the users in real time using minutiae matching algorithm and GUI based on circular hough transform respectively.

**Index Terms**—Authentication, Biometrics, Circular Hough Transform,(GSM), Minutiae Based Algorithm, One Time Password (OTP).

## I. INTRODUCTION

The ATM is heart of banking which provides 24\*7 self banking service.The use of ATM is increasing in number and there is also increase in fraudulent attack on the ATM .To solve this problem biometric system in integrated on the traditional ATM. ATM is built on fingerprint verification and fingerprint of user is incorporated into the database of the respective banks to simulate it for ATM operation. Fingerprint matching algorithm is proved to be inefficient, proposed system

Which includes both the fingerprint and GSM technology into traditional Pin based ATM system which performs authentication .To enhance the ATM authentication system short message service (SMS) algorithm is constructed.

Fingerprint and iris recognition is used to secure the system, along with this system used RFID reader module. For identification RFID card was developed to give input to the microcontroller and to send message GSM module is used which involves three option(Yes,No,Action) for the authorized users mobile. Efficient system was proposed that is analyzing iris pattern for user identification .To avoid crimes in ATM transaction system uses iris recognition and palm vein recognition technology was proposed. Facial recognition is incorporated in traditional ATM for authentication user.

Hough transform for iris recognition is used in order to isolate the unique feature of particular shape with an image .To enhance the security of ATM transaction advanced encryption standard (AES) algorithm was used and another system uses face as key. Facial recognition is done using principal component analysis and also OTP for security of transaction of transaction.All these proposed system utilizes Minute matching algorithm for fingerprint recognition and Circular Hough transform for iris recognition.



## Smart Integrated Campus Using IOT

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**Abstract**-This paper describes the development of smart campus using Internet of Things (IoT) technology. Through smart campus, it is possible that a campus is connected via online by the outside entity, so that the teaching approach based on technology can be conducted and monitored in real time.

This research was conducted in smart campus using all the technology based on education, parking, classroom, library and campus management. Observation and literature studies were applied as the research method with the related them for the of system design of smart campus. The result of this research is the design of smart campus system that includes smart education development, smart parking, smart classroom with monitoring attendance, smart library management and management of the campus entities which includes (garden management, bus tracking for women safety, efficient power management) within a campus of Universities, and a part of this project can also be implement in companies as well as in hospitals.

To build a smart campus, it needs to build the digital infrastructure inside campus that can give services so that it will be beneficial for surrounding citizens. IoT which bases on the internet, uses a variety of information sensing identification device and information processing equipment, such as RFID, GPS, GIS, JIT, EDI and other devices to combine with the internet to form an extensive network in order to achieve information and intelligence for entity [3]. is the design of smart campus system that includes smart education development, smart parking, smart classroom with monitoring attendance, smart library and management of the campus which includes (garden management, bus tracking for women safety, efficient power management)that are located in Universities PGRI Yogyakarta (UPY)

### Introduction:

In the developed countries, Information and Communication Technology (ICT) has been used as the unseparated parts to increase the quality of higher

education. ICT can be used to fix and increase the quality of learning process, research, library, information services and university management. One of the ICT implementations is the using of internet technology that is integrated to all of things of daily life, which is called as Internet of Things (IoT). IoT is a structure in which objects, people are provided with exclusive identity and the ability to relocate data over a network without requiring two-way handshaking between human-to-human or human-to-computer interaction [1]. IoT technology has been widely used for the development of smart home, smart campus, smart building and smart city.

The concept of smart campus already being developed in developed countries several years ago. Smart campus is a trendy application in the paradigm of the IoT. The concept of constructing a smart campus implies that the institution or universities will adopt advanced ICTs to automatically monitor and control every facility on campus [2]. The design and the implementation of smart campus is different with others, depends on the campus needs. The infrastructures to build a smart campus is costly. However, when it is implemented, all the campus activities will be effective and efficient.

To build a smart campus, it needs to build the digital infrastructure inside campus that can give services so that it will be beneficial for surrounding citizens. IoT which bases on the internet, uses a variety of information sensing identification device and information processing equipment, such as RFID, GPS, GIS, JIT, EDI and other devices to combine with the internet to form an extensive network in order to achieve information and intelligence for entity [3]. is the design of smart campus system that includes smart education development, smart parking, smart classroom with monitoring attendance, smart library and management of the campus which includes (garden management, bus tracking for women safety, efficient power management)that are located in Universities PGRI Yogyakarta (UPY).



# Effective Cyber Security Architecture for Distribution Management System Using Cyber Security

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**Abstract**— Cyber security has rapidly become a fundamental requirement of any automation project in the power industry. However, much confusion remains on how to specify security requirements that will result in secure solutions. Requesting that vendors comply with NERC CIP or NIST IR 7628 does not ensure a secure system. Creating an efficient and effective cyber security architecture for substation and distribution management system which are robust enough to withstand many attacks and resilient to recover in the event of security compromise and check for the functionality of automation systems and products event during the attacks, this is achieved by using a strategy called defence in depth strategy. This strategy includes designing a product, testing its security, building secure system architecture, patch management and security audits. Understanding practices and processes helps in handling cyber security in a holistic manner with an explicit focus on operational performance.

**Index terms**—Distribution management, Security architecture, Cyber security, Defense in depth strategy.

## 1. INTRODUCTION

With new control system threats and vulnerabilities being exposed on an almost daily basis, cyber security has rapidly become a fundamental requirement of any automation project in the power industry. However, much confusion remains on how to specify security requirements that will result in secure solutions. Cyber security once considered a non-issue has gained traction and become main stream as information technology (IT) networks get integrated with operational technology (OT) networks.

This is highlighted by several cyber security incidents including the one mentioned below. Recently in Ivano-Frankivsk region with a population of 1.4 million resulted without electricity reportedly for 6 hours. This occurred due to the cyber-attack on the power grid in Ukraine. The attack was conducted mainly through distribution supervisory control and data acquisition (SCADA) system computers along with a denial of service attack to the phone systems. Computers running the SCADA human-machine interface (HMI) software and related SCADA servers, mainly based on Windows operating system, were infected using booby-trapped

macro functions and malwares embedded in Microsoft Office documents. The industrial control systems used to supply power to millions of people could be infected using such a simple social-engineering ploy of tricking the users to click on attachments. In this case, the utility operators resorted to turn the system to 'manual mode' of operation in order to restore the power system back into operation. Concepts such as remote configuration/parameterization, monitoring, remote SCADA communication, remote diagnostics and firmware updates are becoming important requirements for relays and control systems.

This leads to inherent requirements of integration of IT and OT networks. This in turn necessitates 'availability', 'integrity' and 'confidentiality' of information and data in substation automation systems and distribution automation networks. In this paper, the various efforts are being undertaken to define actionable security requirements for distribution automation system and products.

In order to help utilities make sense out of all these requirements and implement secure automation systems, various industry groups have been formed and have focused on defining directly actionable guidelines and security controls.

Our intent is to examine these efforts and provide the reader with technical guidance that can be used in distribution automation systems and products. While electric utility systems and processes having responsibility of creating and maintaining secure power system networks consistently provided some of the highest levels of reliability and security in the world by virtue of being isolated stand-alone networks that are often proprietary which limits interoperability.

### 1.1 Security Challenges in distribution system

The systems are becoming cyber-physical. Isolated physical access controlled systems can now be controlled using logical access from cyber-space. Substation and feeder equipment like protection, automation and control relays, and smart meters are being deployed with advanced communications networks which make them more vulnerable to cyber threats. Threat landscaping and identifying threat vectors



# Implementation of Visual Cryptography and OCR Techniques for Processing the Enhanced Password Mechanism

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**Abstract**— In recent past conversion of password for user authentication is to convert the password into hash values. But these passwords based on hash values are simple and fast because those are in form of text and famed cryptography. Due to this the password can be easily cracked by making use of cracking tool or hash-cracking online sites. Attackers can easily hack the original password if they are aware of the hash value when they are plain and simple. To overcome all these limitations, a scheme for processing the enhanced password based on visual cryptography and OCR was suggested. This cryptographic scheme is completely different from the existing one, where the user ID of text type is transformed into the two encrypted images. The server will have a user ID and one of the encrypted image, user sends the another image to the server when it needs to login then the server extracts the ID by making use of OCR(Optical Character Recognition). Finally by comparing the extracted ID with the saved one the exact user is identified. This scheme helps in authentication prevents cyber attack and has low computation when compared with other schemes.

**Index terms**—Hashing, Optical Character Recognition (OCR), Password Processing Scheme, Visual Cryptography.

## I. INTRODUCTION

User authentication in general systems has processed basically by the verification of user ID and password. The system makes use of hash-based password scheme to send and verify the password and this scheme converts the original password to hash value. The benefits of this scheme are it can be adapted in system without any difficulty and it can process very fast because it is based on hash function such as SHA256, MD5. But it is easily exposed to brute force attack or dictionary attack and the passwords can be easily cracked by making use of hash-cracking online sites. For example we define a password “1qaz2wsx” in a system,

if attacker is aware of the hash value “1c63129ae9db9c60c3e8aa94d3e00495” then he can simple crack the password by using crack site as shown in figure 1:Even if the attackers are not aware of the hash value he or she can cause the damage to the system just by guessing the hash function that is adapted in the system.

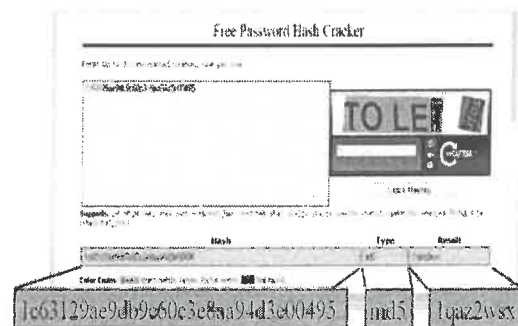


Figure 1: Result of cracked password in “crackstation.net”

Users are responsible for this kind of attacks, where researchers have done a lot research work on the password management and most of the people’s responses were based on following negative behaviour:

- Rarely changing passwords
- Computer password chosen for the first time
- Allowing others to use our password
- Sharing passwords with friends and family
- Writing password next to the computer
- Using of easy password

Password reuse, length, entropy level, frequency of changing password is the factors of password security. Figure 1.2 how the password is managed by the people based on the factors.



# Machine Learning Algorithm for Smart Energy Management- ARIMA Model

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**Abstract :** A greater interest arises in reducing our energy needs as electrical energy becomes more costly and the environmental effects of fossils become more deceptive. Objectives to find new ways of making our everyday lives more energy efficient have now become an essential part of the tussle to sustain our present quality of living. This project targets domestic usage which has a more direct approach in changing the way we consume energy. In this project we take up House Hold Loads as the application but this project can also be applied for large industrial loads. Smart energy metering and normalized energy data on load usage are one of the major goal setters for the future smart grid and improved energy efficiency in smart homes. Load Monitoring (LM) is essential for energy management and cost fixing. To obtain appliance-specific energy consumption statistics that can further be used to formulate load scheduling strategies for optimal energy utilization, disaggregation of Load is essential. Non-Intrusive Load Monitoring (NILM) is an alternative and best method for Load Disaggregation, as it can distinguish devices from the aggregated data measured at only a centralized location. In this project we provide an experimental idea of using NILM technology by actually implementing sub-metering system for each load to forecast its futuristic development on the basis of Machine Learning Algorithm to end up with an energy efficient smart home and smart grids.

## 1. INTRODUCTION

### Smart Meter

In the early phase of household technology, delivery of electricity is completely depended on traditional energy meters. These meters play a key role in measuring the consumption of electrical energy in individual households. The usage of these meters has been slowly declining with the advancement in technology as rapid changes has been made to encounter the problems occurred by the traditional meters. The major problem arises when habitants are unaware of their daily behavior. Monthly feedback given to the consumers is not sufficient as the consumers will not have knowledge

on how much energy does the individual appliances consume.

To overcome the problems of traditional electricity meters, Smart Meters have been upgraded and developed. With the use of Smart Meter data, energy alerts will be provided to the consumers based on hourly utilization of energy. The primary objective of the Smart Meters is to reduce the energy consumption in the households. Our thesis utilizes real time Smart Meter data sets obtained from a Swedish electricity company.

Energy expenditures will be lowered by increasing the possibility of reduced consumption using analyzed Smart Meter data motivated to perform this research work. During the usage of traditional meters, there is involvement of wastage of much energy to man power. As the electricity consumption of the household is known on monthly basis by conventional meters, there is an overall demand for the electricity utilities to explore a new development for benefit of the consumers as well as themselves. However, the study determines to make attempts to replace electricity meter in respective households by minimizing the drawbacks occurred by consumer.

The main objective of this paper is to investigate the best types of approaches that have been reconnoitered till date and to solve the problem of load disaggregation, in specific, to feed back the data for improved and efficient energy management. A normal meter measures the aggregated consumption of the entire household. These measurements are used by the energy providers to bill the consumers according to the usage. Since these meters were designed for billing purposes, they measure the data using a low sampling rate for a single main supply line. In order to accommodate the dynamics of Smart Grids, more intelligent control of the home, and hence a finer granularity of data is necessary.

## 2. LITERATURE SURVEY

The electrical devices that can detect and display energy in the form of readings are termed as electricity meter. Traditional meters are used since the late 19th century [28]. They exchange data between electronic devices in

# A survey on different techniques for Black Money Deduction

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**Abstract:** Cloud Computing is a process of accessing the remote servers for the different user requirements, contain large amount of data, the user information are stored and authenticated. Big data is the large set of data which are complex to handle manually, it is the collection of structured, unstructured and semi structured data. This paper surveys different techniques to black money detection in the banking application like Range Aggregate Queries, Hadoop Technology, Map Reduce and Pattern Matching, also surveys its architecture, advantages, disadvantages and comparison between all the three.

## I. Architecture

This section explains the architecture of different techniques used in black money deduction

### Range Aggregate Queries in Big Data

This Big data analysis is generally used to explore the hidden patterns from the large datasets.[1] This provides a new approach to discover the solutions for the various difficulties in the real world. Efficient Range Aggregate Queries are important tools in decision management, online proposition, trend estimation and so on.

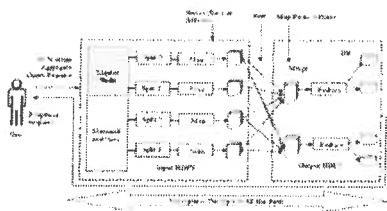


Figure 1.1: Architecture of Range Aggregate Queries

1. Big data is partitioned into multiple partitions and then it generates local estimation sketch for each partition as shown in figure 1. When a range aggregate query request arrives, system will obtain the result by summarizing estimations from all partitions.

2. It divides all data into different groups with regard to their attribute values of interest. Then separates each group into multiple partitions according to the current data distributions.

3. The big data involves major increase in data volumes, and the selected tuples may be located in different files formats. Data may be present in structured, semi structured format.

4. Semi structured dataset is converted into structured format and estimated result of range aggregate query is displayed to the user.[2]

### Advantages

1. It acquires accurate estimations quickly for range – aggregate queries in big data environment.
2. It is used in centre network to improve manageability and availability of big data.

### Disadvantages

1. Users cannot obtain an appropriate answering with satisfied accuracy in the early stages.
2. It cannot measure the quality of tuples distributions more accurately.

## 2. HADOOP TECHNOLOGY:

Hadoop is a big data framework used for data mining

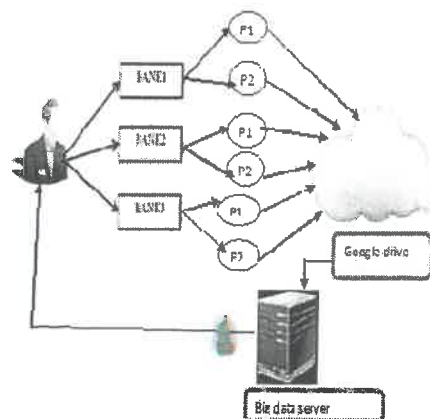


Figure 2.1: Architecture of Hadoop

1. The user banking data from figure 2 is partitioned into multiple tuples and these data are stored in different set of database[3]. Here new application is designed to track multiple users having multiple accounts in different banks. The users who transact more than 50000 are



## A Study on Bigdata Components Architecture on Hadoop

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**Abstract-** In today environment of growing demand, a large set of data is to be processed, aligned and segregated to retrieve meaningful information. Thus a major challenge is to fetch huge data into a computable platform. To achieve this challenging scenario a solution is proposed under Hadoop framework and packaging. This paper provides a brief overview towards Hadoop architecture and Bigdata components and supporting scheduling mechanism. This survey is also extend toward PRISM -a Phase and Resource Information-aware scheduler for MapReduce.

### I INTRODUCTION

Big data is data sets that are so voluminous and complex that the traditional data processing application software are inadequate to deal with them. Big data has few challenges that includes capturing of data, storing of data, data analysis, searching, sharing, transferring, visualization, query, updating and information privacy. Data sets are rapidly increasing due to gathering of numerous information sensing internet of things devices such as mobile devices, remote sensing, camera, microphones, wireless sensors network.

Bigdata have been existed in many forms some are often built by the corporations for some special need and commercial vendors historically offered parallel database management system for Bigdata beginning. Big data technology is important in order to provide more accurate analysis that lead to decision making it results in greater efficient, it reduce cost and reduce risk for business. In 2004 Google published a paper on a process called *map reduce*. This provides a parallel processing model and an implementation was released to manage or process huge amount of data with map reduce, initially the queries were split and distributed across parallel nodes and processed in parallel this specifies map step. The results were then gathered and delivered which specify reduce step.

This framework was successful so other wanted to replicate the same algorithm therefore this framework was adopted by an apache open source project named *hadoop*. Big Data is

the massive information which is a part of liberal datasets that can't be prepared utilizing standard get ready frameworks. It is not single structure or a gadget rather it fuses different extents of business and advancement. Huge information consolidates the information passed on by various contraptions and applications. Big data is a data set which is large and complex that the normal data processing application software is insufficient to deal with them.

#### 1.1Hadoop.

Hadoop is open source framework based on java programming used for processing and storing of large datasets in a distributed computing environment. Hadoop is a part of an apache project sponsored by the apache software foundation. It consists of computer clusters built from commodity hardware. The core of apache hadoop consists of storage part known as HDFS (hadoop distributed file system) and processing part which is MapReduce programming model. Hadoop split the files into large blocks and distribute them over the nodes in cluster then it transfers the packaged code into nodes to process the data is sent to a node, that data is also replicated to another node in a cluster so in case of any failure there's another copy available for use. Some of the other advantages of hadoop is scalability, cost effective, flexible and fast. Using the course of action gave by the Google, Doug cutting and his gathering developed an Open source wander called HADOOP.

Hadoop executes the applications using the Map Reduce count, where the data is executed parallel. The framework is used for storage and processing of a data set of big data using map reduce programming model. Hadoop is written in java language. It also distributes large data across many computers using simple programming model built form commodity hardware, the data is executed parallel. Essentially, hadoop is used to develop the applications that could perform complete examination on huge measures of data. Hadoop is an Apache open programming accounting in java that grants broadcast treatment of unlimited datasets past clusters of PC application clear programming models. Hadoop is asked to game plan up from individual server to sacks of machines, festivity duties obliged figurings and





# Design of an IoT based autonomous vehicle with the aid of computer vision

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**ABSTRACT-** The autonomous vehicle concept all started with the advancement of driver assistance and has extended to a new level that now it is semi-autonomous and autonomous vehicle. In this connection an attempt is made to integrate obstacle detection and lane detection. An HD Pi camera along with ultrasonic sensor and IR sensors are used to provide necessary data from the real world to the car. Many existing methods like lane detection, obstacle detection are combined together to provide the necessary control to the car. This car will also have limited automation features like obstacle avoidance system and lane detection system so that it can drive itself safely in case of connectivity failure. A miniature car including the above features has been developed which showed optimum performance in a simulated environment. The system mainly consists of a Raspberry Pi, a Pi camera, internet modem. The Raspberry Pi was mainly used for the Computer Vision algorithms and for streaming video through internet. The proposed system is very cheap and very efficient in terms automation.

**INDEX TERMS:** Internet of things (IoT), Raspberry Pi, Pi camera, Ultrasonic sensor, IR sensors, L293D motor driver.

## I. INTRODUCTION

With the ever-growing technological advancement, human civilization is looking for automation in every sphere of life. Automated car is one of the latest trends which has been massively recognized by people all around the world as they want maximum security and comfort during driving. Nowadays, road accident is one of the prime concerns for the people. It became very frequent and uncertain. Most of the road accidents occur due to lack of abidance of the traffic rules. Most of the time, the drivers become drowsy or distracted during driving and eventually hit objects ahead of them. If the driving process can be handled with the aid of Computer Vision and efficient sensors then the risk of human mistakes can be highly reduced. Besides, sometimes it gets necessary to access the car from a remote location in order to reduce hassles. In this case, it would be a lot more convenient if the car could be viewed from a remote computer and driven by interaction through the computer keyboard. This could be as easy as playing a computer game. Our work is based on Internet of Things technology and Computer Vision to control to mobile application our vehicle and automation features.

## II. LITERATURE REVIEW:

In past, the following works were carried out by people. Gurjashan Singh Pannu, Mohammad Dawud and Pritha Gupta, "Design and Implementation of Autonomous Car using

Raspberry Pi"- (2015), In this paper focus is on building a monocular vision autonomous car prototype using Raspberry Pi as a processing chip. An HD camera along with an ultrasonic sensor is used to provide necessary data from the real world to the car. The car is capable of reaching the given destination safely and intelligently thus avoiding the risk of human errors. Many existing algorithms like lane detection, obstacle detection are combined together to provide the necessary control to the car.

Sumit Garethiyal, LohitUjjainiya and VaidehiDudhwadkar, "predictive vehicle collision avoidance system using Raspberry – Pi"- (2015) In this paper, an effective method is proposed for the collision avoidance system of a vehicle to detect the obstacle present in front and blind spot of the vehicle. The driver is made alert via a buzzer and LED indication as the distance between vehicle and obstacle reduces and is displayed on display board. The ultrasonic sensor detects the state of the object whether it is in motion or Arjun K1, Prithviraj and AshwithaA 528 Static with respect to the vehicle. This system is useful for detecting vehicle, motorcycle, bicycle and pedestrians that pass by the lateral side of vehicle. V.Sagar Reddy, Dr.L.PadmaSree, and V. Naveen Kumar, "Design and Development of accelerometer based System for driver safety" – (2014) This paper presents a new design of commodity hardware with cheap and it consumes very less power designed oriented product for getting information from accident location of driver drowsiness and indicating be alert to the driver in the prevention of accident. This system is designed by using Raspberry Pi (ARM11) for fast accessing to control and accelerometer for event detection. Is there any event is occurs the message sent to the authorized person so they can take immediate action to save the lives and reduce the damages. M.H Mohamad, Mohd Amin Bin Hasanuddin, MohdHafiz Bin Ramli, "Vehicle Accident Prevention System Embedded with Alcohol Detector" – (2013) An efficient system of vehicle accident prevention system embedded by alcohol detector has been proposed. This system capable to alert the driver about the level of drunkenness by indicates the condition on LCD display. It also produce an alarm from buzzer to make the driver aware their own condition and to vigilant other people in surrounding area. The most safety element provided by this system is the driver in high level of drunkenness is not allowed to drive a car as the ignition system will be deactivated.

## PROBLEM STATEMENT:

Here autonomous vehicle control by the internet but in some time internet connectivity is not good than autonomous car get



# Survey on Patient Health Monitoring System Using IOT & Arduino

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**ABSTRACT :** As elderly population increases day by day partaking demands are also increasing. Hence patient health monitoring system are gaining importance these days. This PAPER is based on monitoring of patients. We have designed and developed a reliable, energy efficient patient monitoring system. It is able to send parameters of patient in real time. It enables the doctors to monitor patient's health parameters (temp, heartbeat, ECG, position) in real time. In the current proposed system, the patient health is continuously monitored using different sensors which is connected to the Arduino board. And the acquired data is send to the server using Ethernet shield attached to the Arduino board. If any of the parameter values goes beyond the threshold value an alert is given to the doctor using an Android application installed in the doctor's smartphone.

**Keywords:** Internet of Things(IOT), Arduino Board, Android, Sensor, Health parameters

## I. INTRODUCTION

Health is one of the global challenges for humanity. According to the constituents of World Health Organization(WHO) the highest attainable standard of health is a fundamental right for an individual. A recent healthcare system should provide better healthcare services to people at any time anywhere in an affordable and patient friendly manner. Capturing and sharing of vital data of the network connected devices through secure service layer is what defines IOT. Currently, the healthcare system is going to change from a traditional approach to a modernized patient centered approach. In the traditional way the doctors play the major role. For necessary diagnosis and advising they need to visit the patients. In hospitals there are provisions for continuous monitoring of patients. Their ECG, heartbeat is continuously monitored. There is no provision to check the parameters when they return to home. And hence there is a chance that the disease may return again. In order to solve these problems, the patient oriented approach has been received. Patients data (temperature, heartrate, ECG, Position) will be frequently measured and sent to server). In this theme, the patients are aware

with knowledge and information to play a more active role in disease diagnosis, and prevention. The important element of this approach is a reliable and readily available patient monitoring system(PHS). Professional medical staff can monitor the statistical analysis data and provide the necessary advisory services, remote medical monitoring, and treatment. To keep people effective and healthy, a readily accessible modern healthcare system is a prerequisite. In the current proposed system, the patient health is continuously monitored using different sensors which is connected to the Arduino board.

## II. INTERNET OF THINGS

Capturing and sharing of vital data of the network connected devices through secure service layer is what defines IOT. In simple terms, Internet of Things (IOT) can be defined as the wireless network of devices which are connected to each other to share information and data in order to communicate and produce new information so as to record and analyze it for future use. Internet of Things gains its full potential by utilizing the key role playing objects i.e. "Smart" objects which use various sensors and actuators that are able to perceive their context, and via built in networking capabilities they could communicate to each other, access the open source Internet services and interact with the human world. This not only makes the world connected but also robust and comfortable. The Internet of things in the field of healthcare also plays a major role in providing ease to patients and doctors. It consists of a system that communicates between network connected systems, apps and devices that can help patients and doctors to monitor, track and record patients' vital data and medical information. Some of the devices include smart meters, wearable health bands, fitness shoes, RFID based smart watches and smart video cameras. Also, apps for smartphones also help in keeping a medical record with real time alert and emergency services. IOT also enables machine to machine (M2M) communication which allows machines being controlled by the Internet and by other machines. These interconnected IOT devices produce large amounts of



## CERTIFICATE OF PARTICIPATION

This is to certify

Inbalatha.M

has successfully presented a paper entitled

Premature Cardiac Verdict plus Classification of Arrhythmias

and Myocardial Ischemia with k-NN Classifier


in the 2017 International Conference on Computational Vision and Bio Inspired Computing (ICCVBIC), organized by Inventive Research Organization and RVS Technical Campus, Coimbatore, India during 21-22, September 2017.

  
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3<sup>rd</sup> National conference on

"Recent Advancements in Engineering Science and Technology"

(RAEST-2018)

## Certificate

This is to certify that **Mrs. INBALATHA K.** of **Dr. TIT**

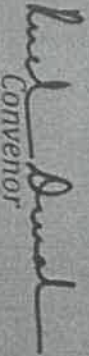
has presented a paper titled

**"DEEP CONVOLUTION NEURAL NETWORK FOR LEFT VENTRICLE SEGMENTATION"**

in the national conference on "Recent Advancements in Engineering Science and Technology

"(RAEST-2018), organised by Department of Electronics and Communication Engineering,

Dr. T. Thimmaiah Institute of Technology on 9<sup>th</sup> May 2018.

  
Convenor

Prof. Rudramani Divakaran

  
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3rd National conference on


"Recent Advancements in Engineering Science and Technology"  
(RAEST-2018)

### Certificate

This is to certify that **Mrs. MANJUSHREE K. CHAVAN** of **Dr. T. T. I. T.** .....  
has presented a paper titled **"HEART...BEAT...MONITORING...SYSTEM...USING...  
ARDUINO WITH IOT"**  
in the national conference on "Recent Advancements in Engineering Science and Technology  
(RAEST-2018), organised by Department of Electronics and Communication Engineering,  
Dr. T. Thimmaiah Institute of Technology on 9th May 2018.

  
Convenor  
Prof. Ruckmani Divakaran

  
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# Wireless Power Transfer for Electric Vehicles Application using the Principle of ICPT System

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**Abstract:** Wireless Power Transfer is method of transferring the power from the power source to the electrical load without the physical contact, by using the principle of magnetic resonance. Due to the increase in the cost of the petroleum product and environmental issues led to development of the Electrical Vehicles (EV's) globally for transportation. The charging of electric vehicles using wire causes losses therefore, it decrease in efficiency of the system. The preliminary review of the WPT analysis tells that the Inductively Coupled Power Transfer system ICPT is one of the promising and convenient methods for charging the EV's. The paper is about designing the circuit using the MATLAB Simulink Software .The results for different values of load versus Efficiency of the system of ideal case is been plotted were the maximum efficiency is around 98% assuming the alignment errors as zero. The system parameters and performance equations are coded using MATLAB for Model based design for charging the EV application. Also, efficiency and load curve characteristics are demonstrated. The paper demonstrates the experimental setup of the same for the distance of about 15 cm. Each part of the setup and the components used along with their features has been discussed briefly. The same setup for higher power rating can be implemented in future with design modifications.

**Keywords** — *Wireless Power Transfer (WPT), MATLAB Simulation, Inductively Coupled Power Transfer system ( ICPT), Pulse Width Modulator (PWM) Generators.*

\*\*\*\*\*

## I. INTRODUCTION

All conventional vehicles are powered by an internal combustion engine (ICE) only. These conventional vehicle produce exhaust gases during operation which are harmful for human health. But electric vehicles (EVs) run on electricity only. They are propelled by one or more electric motors which are powered by rechargeable battery packs. Due to this electric vehicles have several advantages over conventional vehicles. No harmful gas emission. Fuel cost will be up to 70% less than conventional vehicle, maintenance cost is less, ideal for stop-start city driving as

No energy is utilise when the vehicle is stationary.[6][7]

Besides the high initial cost, the long charging time of EV batteries also makes the EV not acceptable to many drivers. For a single charge, it takes about one half-hour to several hours depending on the power level of the charger, which is

many times longer than the gasoline refuelling process. The EVs cannot get ready immediately when they have run out of battery. Because of this, the owner has to find any possible opportunity to plug-in and charge the battery. It really brings trouble as people may forget to plug-in and find themselves out of battery energy later on. The charging cables on the floor may lead to tripping hazards. Leakage from cracked old cable, particularly in cold zones, can bring additional hazardous conditions to the owner. Also, people

May have to brave the wind, rain, ice, or snow to plug-in with the risk of getting an electric shock. The wireless power transfer (WPT) technology, which can eliminate all the charging trouble, is therefore most desirable by the EV owners. By wirelessly transferring energy to the EV, the charging becomes the easiest task. For a stationary WPT system, the drivers just have to park their car and leave. Also

# Modified Newton-Raphson Technique for Integrated Object-Oriented Water Pipe Network Analysis

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## Abstract

*In the proposed research, modified Newton-Raphson technique is developed for integrated object-oriented analysis of water pipe network. An object-oriented concept is used for the integrated simulation model of water pipe distribution network analysis for efficient data handling. This is achieved by treating first the pipe network as a graph data structure with its nodes as the graph's nodes and the pipes as the edges. The algorithm for cycle (real or pseudo cycles) extraction has been developed using Nested Breadth First Search (NBFS) to give cycles in clockwise order. Pseudo loops are found out using shortest path algorithm between two adjacent supply nodes. Pipes in cycles are initialized using conservation of mass at nodes. Friction factor is updated for every change in discharge in pipes. Modified Newton-Raphson technique is developed to obtain solution of the non-linear equation for analyzing the water pipe network considering third order convergence in next step. This technique is more efficient and takes less time to converge the final solution than the traditional Newton-Raphson method. The pressure calculation has been done at last by using balanced discharges and input parameters of pipe network. Balanced discharges and nodal pressure in the pipe network are compared with simultaneous loop flow adjustment method and are found more efficient for complex network. Results have been validated with the results obtained by EPANET software.*

**Keywords:** Simultaneous loop flow adjustment method, Hydraulic analysis, Loop detection, NBFS, Modified Newton-Raphson technique.

## 1 Introduction

Flow analysis of the water pipe network is done in the proposed work using modified Newton-Raphson method in which non-linear equation is solved considering third order convergence. All processes involved in flow analysis are integrated. Proposed analysis is necessary for water resource management. Looped pipe network has been considered in proposed work for reliable pipe distribution network analysis. To know details of pipes diameter, reservoir and pumps are necessary for design analysis of water pipe network to provide required demand at suitable nodal pressure. Continuity equation at nodes and energy conservation equation within the loops are two basic equations for pipe network analysis. Energy equation gives the nonlinear system in which flow adjustment in loops ( $\Delta Q$ ) are the fundamental unknowns. For given network parameters (roughness, length, diameters of pipes and elevation at nodes), solution for the unknowns mentioned above will be obtained by the help of known initial pipe discharges using numerical techniques such as Linear theory method [1], Newton-Raphson [2, 3], and Gradient global algorithm [4]. These techniques are meant to solve linear and non-linear equations. H-Newton-Raphson method has been improved by Spiliotis and Tsakiris [5] by evaluating the discharge in each branch of pipe network using Swamee and Jain equation [6]. Several Newton-Raphson based algorithms have been developed by Todini [7, 8] which have linearized the global algorithm [4]. Several new algorithms based on linear theory have been developed by Todini and Rossman [9] which are an extension of the work [7, 8]. Lumped junction demand based technique has been developed by Giustolisi [10] which is not using head loss equation. Gudino-Mendoza et al. [11] have developed Hybrid Petri Nets based technique for analysis of water pipe distribution network. Arsene et al. [12] have given loop-equations based technique which uses DFS and works in real-time by improving numerical algorithms. Cerna and



# Enhancing the Underwater Image by using Linear image interpolation and Limited image enhancer technique

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**Abstract**— The images that are taken under the water are haze, low contrast, loss of color, etc. So the quality of images that are taken under the water is not clear due to the impurities present in the water and some properties of water. Here we proposed a methods to improve the quality of the underwater images. The proposed work in this paper consist of two methods they are Interpolation based Enhancement and Limited Image Enhancer.

The First method is mainly based on increasing the resolution of the image and the second method is based on increasing the contrast of the images. The main aim of the paper is to enhance the image that are taken under water. The qualitative for both the algorithms compared with the previous image enhancement techniques of ICM and UCM.

**Keywords**- Underwater Image, Dehaze, Liml and LIE techniques.

## I. INTRODUCTION

In Underwater images, things are less visible because of lower levels of natural illumination caused by rapid attenuation of light with distance passed through the water. They are also blurred by scattering of light between the object and the viewer, also resulting in lower contrast. These effects vary with wavelength of the light, and color and turbidity of the water. The Researchers have shown great interest in exploring underwater in order to gain greater knowledge on underwater species, landscape, plants etc. Now-a-days the underwater image processing has gained lot of Interest.

Water attenuates light due to absorption which varies as a function of frequency. In other words, as light passes through a greater distance of water color is selectively absorbed by the water. Color absorption is also affected by turbidity of the water and dissolved material. Water attenuates to light exponentially, due to light scattering and light absorption. Scattering of light is divided to two

kinds where Forward Scattering is responsible for blurring of images and backward scattering is responsible for limiting the contrast of an images.

Most of the images that are taken under water appears blue-green since these components are absorbed last. The color level absorption is Red which appears upto 50ft, for yellow and orange it absorbs upto 100 to 150 ft., deeper the sea absorbs the blue-green color for 200 to 250 ft.

So in order to increase the quality of the underwater images which is affected wit loss of color and low contrast, we work on a computer based vision like making use of image processing techniques, so this techniques can increase the contrast of the images.

In order to overcome the above problem and to enhance the underwater images, the two important techniques has been implemented, the first technique is the linear image interpolation techniques and the second technique is the limited image enhancer technique. The enhancing of images are done in two ways :The first half process uses a filter which is used to remove the distortions, and second process involves in enhancing the images using linear image interpolation and limited image enhancer techniques which is done to increase the resolution and the contrast of an image.

Mean Square Error (MSE) and Peak Signal to Noise Ratio (PSNR) they are the quantitative metrics which is used to compare the captured underwater images and the enhanced images and also compares the UCM and ICM techniques with the linear image interpolation and limited image enhancer techniques.

Iqbal makes use of histogram modification technique in [1,2] to enhance the quality of underwater image. ICM and UCM techniques creates good output of underwater image by increasing the contrast of the image.

The grayscale range I stretched using the nonlinear histogram stretching method, proposed by Yang [3]. The





# DESIGN OF WPT SYSTEM AND PERFORMANCE PARAMETERS USING MATLAB PROGRAMMING FOR ELECTRIC VEHICLE APPLICATION

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**Abstract**— In recent years due to the depletion of fossil fuels and increased global warming issues related to transportation sector have caused an enormous researches and advancements in Electric Vehicles(EV). Boosting features like high pick up torque, lower maintenance and fuel cost, silent operation also free from exhaust gas shifted the focus towards EV's. Challenging task is to establish a charging infrastructure to energize the vehicle, as battery technology is required for energy storage system. Constrains in recharging the battery is affected by two factors, firstly cables used for charging medium where occurrence of electric shock and tripping hazards during plugging-in. Secondly simplicity and flexibility to plug into source for any user.

The aforementioned constrains can be overcome using Wireless Power Transfer(WPT) technology using Magnetic Resonant Coupling(MRC) principle. The system parameters and performance equations are coded using MATLAB for Model based design for charging the EV application. Also, efficiency and load curve characteristics are demonstrated.

**Keywords:** Electric Vehicle(EV), Wireless Power Transfer(WPT), MATLAB, Magnetic Resonant Coupling(MRC)

## INTRODUCTION

Wireless power transfer (WPT) is emerging as a promising technology for powering the electronic devices without a wired power line. Also, it eliminates the need for a wired power connection, In addition, it has a wide application, including portable devices, embedded computing systems, and biomedical devices wireless power transfer (WPT) provides reliable power transmission with the use of WPT can reduce the cost and size of devices as well as provide mobility and flexibility to users with low maintenance cost where it is most efficient way of power transmission. The faults

which are occurred by the wired transmission and E-waste problems can be avoided by this wireless transfer. It is eco-friendly which is the major necessity today. Also we can avoid the problem of e-waste. Just imagine the future with wireless electricity, where there will be no need of cables and transmission lines. In this paper we are considering about the wireless power transmission using inductive coupling method.

The problem for an electric vehicle is the electricity storage technology, limited life time and high cost. In an EV, the battery is quite difficult to design because all the following requirements: high energy density, high power density, affordable cost, long cycle life time, good safety and reliability, should be met simultaneously. Lithium-Ion batteries are recognized as the most competitive solution to be used in electric vehicles [1]. However, the energy density of the commercialized Lithium-Ion battery in EVs is only 90~100Wh/Kg for a finished pack [2]<sup>1</sup>. This number is so poor compared with gasoline, which has an energy density about 12,000Wh/Kg. To challenge the 300-mile range of an internal combustion engine power vehicle, a pure EV needs a large amount of batteries which are too heavy and too expensive. The Lithium-Ion battery cost is about 500 \$/kWh at the present time. Considering the vehicle initial investment, maintenance and energy cost, the owning of a battery electric vehicle will make the consumer spend an extra 1000\$/year on average compared with a gasoline-powered vehicle [1]. Besides the cost issue, the long charging time of EV batteries also makes the EV not acceptable to many drivers. For a single charge, it takes about one half hour to several hours depending on the power level of the attached charger, which is many times longer than the gasoline refueling process. The EVs cannot get ready immediately if they have run out of battery energy. To overcome this, what the owners would most likely do is to find any possible opportunity to plug-in and charge the battery. It really brings some



# Laser Diode Efficiency Evaluation in Continuous Mode for Wireless Power Transmission

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**Abstract—** Wireless Power Transfer to long distance objects has been a much-awaited task for researchers and scientists but old technologies like magnetic resonance coupling method were fail to provide any satisfactory result for long distance power transfer, though it was good for small or very near distance power transfers. The High-Intensity Laser Power Beaming (HILPB) system is one of the most promising system in the field of long-range wireless power transfer. In HILPB system, the high-power laser diode (LD) is employed for its excellent character of high efficiency, high reliability and small size. Normally, LD can operate in two different driving modes, the continuous mode and the pulse mode. The injected current has a direct effect on the electro-optical conversion efficiency of LD. This paper presents the LD model and its current source driver. The conversion efficiencies of the continuous driving modes are evaluated by means of simulations and experiments. The experimental results are shown to verify the theoretical analysis.

**Index Terms—** Continuous Driving mode, efficiency, laser diode (LD), Wireless Power Transmission (WPT).

## I. INTRODUCTION

As a novel technology of power transmission, wireless power transmission (WPT) can transmit electrical energy to the load without any electrical or physical connections. It is suitable for many applications where either an instantaneous amount or a continuous delivery of energy is needed, but where conventional conduction wires are prohibitively inconvenient, expensive, hazardous, or impossible [1,3]. Its potential of vast application makes the pursuit of the WPT system a worthwhile endeavor.

WPT technology is classified into short-range, midrange, and long-range applications [4]. Short-range wireless power transfer has a typical transmission distance from a few millimeters to a few centimeters. Such short-range applications by means of inductive

magnetic coupling can be found in everyday life, such as radio frequency identification (RFID), wireless charging of consumer electronics, and biomedical implanted devices [5]. Mid-range applications are also well known because of ultra-high frequency RFID, by which passive transponders are powered a distance longer than 10 m [6].

Finally, the most promising technologies in long-range wireless power transfer field involve power lasers and microwave transmission [7].

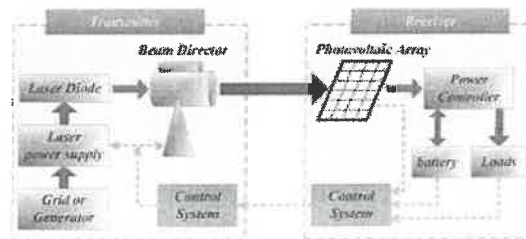


Fig. 1. Schematic diagram of a HILPB system.

Long-range wireless power transfer is an enabling technology, by extending the capabilities of existing applications and facilitating the development for completely new paradigms. Compared to the microwave, the laser beam has higher energy density and more flexible device, which is more suitable to deliver energy indefinitely to mobile electronic device, such as unmanned aerial vehicle, robots, orbiting satellites, etc., [8]. Therefore, the wireless laser power transmission is attracting more and more attention.

Fig. 1 schematically shows the high-intensity laser power beaming (HILPB) system. The function of transmitter is to convert electricity into light via laser diodes (LD). This laser beam is then directed via a beam director to a remote photovoltaic receiver. The function of photovoltaic array is to convert the light back into electricity, which is used to power the load or charge a battery. Ideally, the HILPB system would have the ability to transmit any amount of power to any point in space, but the conversion efficiencies at the source and



# Wireless Power Transfer for Electric Vehicles

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**Abstract:** Wireless Power Transfer is method of transferring the power from the power source to the electrical load without the physical contact, by using the principle of magnetic resonance. Due to the increase in the cost of the petroleum product and environmental issues led to development of the Electrical Vehicles (EV's) globally for transportation. The charging of electric vehicles using wire causes losses therefore, it decrease in efficiency of the system. The preliminary review of the WPT analysis tells that the Inductively Coupled Power Transfer system ICPT is one of the promising and convenient methods for charging the EV's. The paper is about designing the circuit using the MATLAB Simulink Software .The results for different values of load versus Efficiency of the system of ideal case is been plotted were the maximum efficiency is around 98% assuming the alignment errors as zero.

**Keywords—** Wireless Power Transfer (WPT), MATLAB Simulation, Inductively Coupled Power Transfer system (ICPT), Pulse Width Modulator (PWM) Generators.

## I. INTRODUCTION

All conventional vehicles are powered by an internal combustion engine (ICE) only. These conventional vehicle produce exhaust gases during operation which are harmful for human health. But electric vehicles (EVs) run on electricity only. They are propelled by one or more electric motors which are powered by rechargeable battery packs. Due to this electric vehicles have several advantages over conventional vehicles. No harmful gas emission. Fuel cost will be up to 70% less than conventional vehicle, maintenance cost is less, ideal for stop-start city driving as no energy is utilise when the vehicle is stationary.[6][7]

Besides the high initial cost, the long charging time of EV batteries also makes the EV not acceptable to many drivers. For a single charge, it takes about one half-hour to several hours depending on the power level of the charger, which is many times longer than the gasoline refuelling process. The EVs cannot get ready immediately when they have run out of battery. Because of this, the owner has to find any possible opportunity to plug-in and charge the battery. It really brings trouble as people may forget to plug-in and find themselves out of battery energy later on. The charging cables on the floor

may lead to tripping hazards. Leakage from cracked old cable, particularly in cold zones, can bring additional hazardous conditions to the owner. Also, people may have to brave the wind, rain, ice, or snow to plug-in with the risk of getting an electric shock. The wireless power transfer(WPT) technology, which can eliminate all the charging trouble, is therefore most desirable by the EV owners. By wirelessly transferring energy to the EV, the charging becomes the easiest task. For a stationary WPT system, the drivers just have to park their car and leave. Also the battery capacity of EVs with wireless charging could be reduced to 20% or less compared to EVs with conductive charging.

## II.BLOCK DIAGRAM



Fig.1 Block diagram of EV's

The power source is of DC supply that supplies the electricity to the load of the EV.The dc supply of 150V is supplied to the; electric Vehicle.

The inverter circuit is used to covert the C to high frequency ac. the h inverter will contain the four mosfets where two mosfets are driven at a time with the help of power generators and further it is connected to primary coil and the power is transferred primary to secondary coil through the principle of resonant circuit. By resonating with the secondary windings compensation network the power is transferred ,then the ac current is rectified using the power electronics converters and charged to th batteries.

## III ICPT SYSTEM

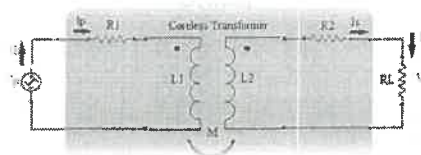


Fig.2 Equivalent circuit of electric vehicles