Study on the Factors that Increase the Lead Times in Small and Medium Level Enterprises in IT Sector

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Abstract--- Lead time refers to the latency between the initiation and execution of a process. Longer lead time has a direct impact on project delivery time and the project cost. This paper describes the problem which the Small and Medium Level enterprises (SMEs) face due to an increase in the lead time. The paper attempts to identify the factors contributing to increased lead time in three stages. In the first stage, a survey was conducted at SMEs, PSUs, Private and Public Sector IT firms to understand the factors causing turbulence in the business environment. In the second stage, a case study was carried out to find out the challenges faced by a SMEs in Bangalore. The case study brought forward the need to adapt agile development with an objective to develop new features with a shorter lead time and also unfolded several 'waste' factors. Finally to understand these 'non-value added' factors (which are major contributors in project delay) and also the cause and effect behind the longer lead time, Value Stream Mapping (VSM) and Failure Mode Effective Analysis (FMEA) was performed to carry out a statistical analysis of the given problem.

Keywords--- SMEs, FMEA, VSM, Agile Development.

I. Introduction

The term "Lead time" [1] refers to the time gap between the initiations of the process where the customer places the order to the order being delivered to the customer. Ideally the lead time refers to the total time required for completing the process ordering the product to shipping them to the customer. The issue involved here is the time, the time required to deliver the product will vary due to various factors like lack of skilled workers, lack of software tools, insufficient of funds, lack of understanding of the problem from the client's needs. Lead time has various advantages:

1. Bringing flexibility especially during rapid changes in the market.
2. In order to beat your competitors by promptly delivering the goods in more efficient way.
3. To avoid problem of losing stocks leading to loss in sales and customers.
4. Effectively meeting the deadlines and maintaining consistency.

A. Problems with Longer Lead Time

It is not for every organization as it has various roadblocks and constraints as a results various projects will be in the pipe line. The following are various roadblocks generating longer lead time.

1) Handoffs – There is always cultural break down between the development and operational department of the product development teams. The requirement flows in the forms of batches and queues during the handoff process. There is an information flow between various departments. Now if there is delay in sending of the information from one team to another organization then there is potential of more batches of the information in the pipeline. As a result there will be more ambiguity between the teams and result in the high costs and failed releases.

2) Approval Processes – Insufficient data sharing between the various departments leads to more complexity especially in the larger organization where without the data sharing the approval process is near to impossible as a results it frustrate the delivery team. Also the quality of the product will also be reduced.

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Analysis of Machine Learning Algorithms in Health Care to Predict Heart Disease

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ABSTRACT

This article describes how healthcare organizations is growing increasingly and are the potential beneficiary users of the data that is generated and gathered. From hospitals to clinics, data and analytics can be a very powerful tool that can improve patient care and satisfaction with efficiency. In developing countries, cardiovascular diseases have a huge impact on increasing death rates and are expected by the end of 2020 in spite of the best clinical practices. The current Machine Learning (ml) algorithms are adapted to estimate the heart disease risks in middle aged patients. Hence, to predict the heart diseases a detailed analysis is made in this research work by taking into account the angiographic heart disease status (i.e. ≥ 50% diameter narrowing). Deep Neural Network (DNN), Extreme Learning Machine (elm), K-Nearest Neighbor (KNN) and Support Vector Machine (SVM) learning algorithm (with linear and polynomial kernel functions) are considered in this work. The accuracy and results of these algorithms are analyzed by comparing the effectiveness among them.

KEYWORDS

Deep Neural Network, Extreme Learning Machine, K-Nearest Neighbor and Support Vector Machine Learning Algorithm, Machine Learning

INTRODUCTION

In the present world there are numerous logical innovations which are not precise but help the specialists in taking clinical choice. Heart disease prediction framework can help therapeutic experts in anticipating condition of heart, in light of the clinical information of patients nourished into the framework (Maglogiannis, Loukis, Zafiropoulos & Stasis, 2009). Around the world 12 million deaths happen consistently because of the heart sicknesses and this has been evaluated by the World Health Organization. Due to cardio vascular illness a large portion of the deaths happen and is creating nations the most important motivation in research. The various infections that influence the heart are encompassed by the term heart disease. In general, it is viewed as the essential explanation for deaths in grown-ups (Kang, Li & Wang, 2013). In the diverse nations including India, heart disease is the real reason for setbacks. In the United States it kills one individual at regular intervals.

The expression of cardiovascular sickness normally integrates the multiplicity of situation that manipulate the heart and the veins the way in which blood is pumped and travel through the body. Cardio Vascular Disease (CVD) is a serious ailment, inability and passing while Coronary Heart Disease (CHD) can take place by the reduction of blood and oxygen supply to the heart (Feng, Zhang, Chen, Hua & Ren, 2015). The CHD includes the myocardial areas of dead tissue, heart assaults and angina pectoris, or trunk agony. A heart assault occurs because of a sudden blockage of a coronary corridor because of blood coagulation. The trunk torments is the deficiency in heart

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Cluster Based Deep Neural Network (C-DNN) Approach to Detect Heart Disease

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Abstract

The term 'heart disease' refers to circumstances that block blood vessels and may lead to a heart attack, chest pain or stroke. The heart conditions will the affect heart's muscle, valves or rhythm leading to heart diseases and bypass surgery or coronary intervention is used for solving these issues. In this research work, an effective Cluster based Deep Neural Network approach is proposed to detect the angiographic heart disease (i.e. to detect the patients with ≥ 50% diameter reduction of a major coronary artery). The data set is grouped using K-Means clustering algorithm and then the heart disease is predicted using cluster based deep learning approach. The proposed method is compared with various parameters for classifier algorithms like DNN, SVM-Linear, SVM- polynomial, KNN, ELM, ELM- cluster and to prove the system effectiveness in terms of accuracy.

Keywords: ***Heart Disease, Deep Neural Network, K- Means clustering, Prediction, Data Cluster, CNN.***

1. INTRODUCTION

Heart disease is the major disease globally, that the census shows many people die annually with this and research works have been carried out so far to find the risk factors that lead to heart disease. To provide a promising solution by identifying heart risk factors is still a research challenge. The main risk factors identified in developing heart diseases are the high blood cholesterol in patients with hypertension and diabetes. Other risk factors in heart disease is because of life style factors such as eating, drinking alcohol, smoking, obesity etc. [1,2].

A set of methods that accordingly discover patterns in data is determined by Machine Learning (ML), and can be applied to uncover patterns to determine or enable decision making

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Lung Cancer Survivability Prediction based on Performance Using Classification Techniques of Support Vector Machines, C4.5 and Naive Bayes Algorithms for Healthcare Analytics

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Abstract

The Healthcare Analytics(HcA) is a process in which clinical data is analyzed and patient's treatment is performed. The treatment depends on the analysis of clinical data accumulated from Electronic Health Records (EHRs), pharmaceutical and research and development cost and claims of patient. Lung cancer is the most common among cancer disease and the foremost reason for deaths in both men and women. In this research work EHRs are analyzed and the survivability rate is predicted for lung cancer. Researchers apply Machine Learning Techniques (MLT)for predicting the survivability rate so that chemotherapy can be provided for cancer affected people. MLTare well accepted by doctors and work well in diagnosing and predicting cancer. An ensemble of Support Vector Machine (SVM), Naive Bayes (NBs)and classification trees (C4.5) can be used to evaluate patterns that are risk factors for lung cancer study. The North Central Cancer Treatment Group (NCCTG) lung cancer data set along with new patient data is used for evaluating the performance of support SVM, NBs and C4.5. The comparison isbased on accuracy, Area Under the Curve(AUC) , Receiver Operating Characteristic (ROC) and the resultshows that C4.5 performs better in predicting lung cancer with the increase in training data set.

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Cluster Optimization in Wireless Sensor Networks Using Particle Swarm Optimization

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Abstract. Clustering approaches have been used to an extensive range of issues and also in Wireless Sensor Network (WSN) domain efficiently to address scalability problem. This paper proposes a Particle Swarm Optimization (PSO) technique to enhance the lifetime of wireless sensor networks. Better scalability is achieved through clustering process to make sure of even distribution of nodes into clusters and thus eliminating leftover nodes problem which will be a major cause for draining out the energy of sensor nodes and results in reduced lifetime of overall network. The Spanning tree based data routing process will ease the task of cluster heads while forwarding the data further towards base station. The proposed work is carried out in NS-2, the results show that PSO outperforms the existing techniques such as DRINA, BCDCP, OEERP, E-OEERP in terms of network lifetime, throughput, packet delivery ratio, residual nodes and packet drop count.

Keywords: Routing protocol · Wireless sensor networks
Particle Swarm Optimization

1 Introduction

The sensor nodes used in Wireless Sensor Network (WSN), sense the real world events and transmit data to base station for further processing. Sensors assist the society, since they can be integrated into vehicles, eco space and many devices. They can help to avoid terrible events such as collapsing of buildings, preserve natural resources, improves productivity and security. It also helps in developing new technologies such as smart home applications. As the technology advances in integrated circuit system, electro mechanical system wireless systems, the usage of wireless sensor networks are increased extensively. The size of the microprocessors has reduced in time and there is reduction also in its cost. This reduction in size, cost and increase in computation of microprocessors has led to the development and usage of more sensors. Wireless Sensor Networks are used extensively in sensing and reporting about floods, pollution, water usage, improving crop quality and fertilizers [1–4].

Many of the sensors get connected to controlling devices and devices which process (for through LAN), a rapidly increasing sensor nodes communicate the information through wireless channels to a base station. Most of the applications need dense

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ROC Structure analysis of Lean Software Development in SME's using Mathematical CHAID Model

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Abstract: These days, numerous software associations are utilizing Agile philosophies to improve the execution of their procedures. In any case, some of them are discovering benefits in the better approaches for improving these officially settled procedures. Lean software development has been utilized to upgrade these procedures significantly more, for the most part because of the decrease of waste. So as to have the capacity to push forward the impact of this marvel, giving progressively empiric proof on this theme is required. This Paper attempts to present a questionnaire survey summarized results of SME's in Bengaluru regarding Lean software development , Results are analysed using IBM SPSS package , The questionnaire used was verified using Cronbach alpha test reading a high reliable and valid status of the conduction of collection process .

Index Terms: Agile, IBM SPSS, Cronbach Alpha Test,SMEs

I. INTRODUCTION

"Lead time" is a term obtained from the assembling technique known as Lean or Toyota Production System, where it is characterized as the time passed between a client submitting a request and getting the item requested. There are different advantages of lead time:

- Flexibility amid fast moves in the market
- The capacity to outpace your rivals with quicker, progressively productive yield
- Quicker renewal of stock to maintain a strategic distance from stock outs, lost deals, and lost clients
- Meeting due dates reliably and effectively
- Increases in income on account of expanded request satisfaction

A. Difficulties looked in Lead times

Long Lead Times-Every venture IT association is extraordinary in that it will have diverse bottlenecks and requirements in its arrangement pipelines.

Handoffs-DevOps culture endeavors to separate the authoritative storehouses and progress more to item groups. This is on the grounds that the current siloed hierarchical structure gives headwinds to the goal of short lead times and persistent stream.

Endorsement Processes-Approval forms were initially created to moderate hazard and give oversight to guarantee adherence to auditable principles for moving changes into generation.

Condition Management· and Provisioning-There is nothing more debilitating to a dev group than holding on to get a domain to test another element. Absence of condition accessibility as well as condition dispute because of manual procedures and poor booking can make incredibly long lead times, defer discharges, and increment the expense of discharge arrangements.

Manual Software Deployments-Machines are obviously better and substantially steadier at conveying applications than people. However there still are countless that still physically send their code. Robotizing manual arrangement can be a speedy win for these associations. This methodology can be conveyed quickly without major hierarchical changes. It isn't exceptional for associations to see sending lead times diminished by over 90%.

Manual Software Testing-Once nature is prepared and the code is sent, it's time to test to guarantee the code is functioning of course and that it doesn't break whatever else. The issue is that most associations today physically test their code base. Manual software testing drives lead times up on the grounds that the procedure is exceptionally moderate, blunder inclined, and costly proportional out crosswise over vast associations.

B. Problem Statement

The software advertise is winding up progressively powerful which can be seen in every now and again changing client needs. Software organizations should almost certainly rapidly react to these changes. This implies they need to end up light-footed with the target of creating highlights with exceptionally short lead-time and of high caliber.

An outcome of this test is the organizations should convey in all respects rapidly, in the meantime keeping up the quality. Our Research goes for Understanding the total procedures directly utilized in SME's, further recognizing the Non Value Added exercises and diminishing it by proposing a model.

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Fisheye state Protocol in Correlation with Power Consumption in Ad-hoc Networks

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Abstract

Ad-hoc networks are self-organizing networks and hence the challenges are also larger. Active research is going on in the field of ad-hoc networks for the same reason. The challenges are numerous like routing, MAC, mobility, scalability, reliability, security, power consumption, bandwidth etc., Depending upon the application of ad-hoc networks the specific challenges can be dealt.

In this paper routing protocols has been studied thoroughly and proactive routing protocols have been chosen for a particular challenge, power consumption. FSR is compared with other proactive protocols like DSDV and OLSR. It is found from simulation results that Fisheye state routing protocol has been proved to be best for many parameters like throughput, packet delivery ratio and energy consumption. FSR, OLSR, DSDV has been implemented and FSR is chosen to be best for power consumption. The simulation is executed using discrete event simulator NS-2.

Category: Smart and intelligent computing

Keywords: Ad-hoc Networks, DSDV, Fisheye state, OLSR.

INTRODUCTION

Wireless communication is the quickly expanding & most vital technological areas in the communication field. Our lives are unimaginable without Wireless communication like TV, Radio, Mobile, Radar, GPS, Wi fi, Bluetooth, RFID etc. [18]. In latin adhoc means "for this purpose" . Ad-hoc networks are collection of autonomous nodes or terminals that communicate with each other by forming a multi-hop radio network and maintaining connectivity in a suburbanized manner in an infrastructure less environment. [16] Several classifications of Ad-hoc networks are MANET, VANET, FANET, WSN etc. Ad-hoc network often refers to a mode of operation of IEEE 802-11 wireless networks. Initially these networks were designed for battlefield networks & disaster recovery applications, due to their quick deployment feature without the existence of any infrastructure .But with rapid growth of mobile communication, MANETs are considered as major contemplate in the next generation network technologies.

Various power optimization techniques are existent in Ad-hoc networks. Optimization of power is of great importance in Ad-hoc networks as their organizational composition & lack of central co-ordination. The power control requirements vary depends on various layers like the physical, network & MAC layer implementations of Ad-hoc network [5].Generally power conservative protocols are divided into two main categories transmitter power control protocols & power management algorithms. Second classification can be further divided into MAC layer and network layer protocols.

It has been seen that in Ad-hoc network, power consumption does not always demonstrate active communication in the network. In a transmitting or receiving state power consumption of wireless devices is only moderately smaller than sleep state. It is better to turn radio off when it is not in use. Most of the power conservation schemes consider the nodes can adapt this transmission power, some of them consider position awareness of the nodes using GPS & capability of energy replenishment etc.

The rest of this paper is organized as follows we briefly discuss routing protocols in section 2. In section 3 in particular Fish eye state protocol is discussed. Section 4 is simulation results & analysis. Section 5 is conclusion & future work.

ROUTING PROTOCOLS

In mobile Ad-hoc networks nodes are mobile and can be connected actively in a random style. All nodes here are routers and involve in route discovery & conserving of routes to another nodes in the network. [4]. There are many classifications of protocols depending upon the diversity of application areas. The basic aim of the protocols are the maximize throughput and packet delivery ratio while minimizing packet loss, control overhead & energy usage. Nevertheless the comparative preferences of these criteria vary among different application areas. There are certain situations where ad-hoc networks are really the only possible solution, while in some other application ad-hoc network participate with other technologies. [11]. The routing protocols can be classified as flat routing, hierarchical & graphic position assisted routing [10]

Discovering & conserving routes in an Ad-hoc network is a challenge as topology of the network changes very frequently & requires more efficient & flexible mechanisms. Apart from handling the topology changes these protocols must deal with other restrictions such as low BW, limited power consumption, high error rates.

Proactive methods maintain router to all nodes, irrespective of whether those routes are needed or not. The main advantage of this category of protocols is that hosts can quickly obtain route information & establish a session.

Physical Layer Secret Symmetric Key Generation and Management Techniques for Wireless Systems-A Study

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Abstract-Symmetric encryption is more attractive due to its simplicity in implementation especially under restricted environment where there is a constraint on computation, memory, power etc. One of the basic requirement is that both the legitimate parties to posses common secret key which is quite challenging in the wireless medium which is unsecure to share. There is a shift in the paradigm from developing complex and secure encryption algorithms, to emphasise in securing and sharing the secret information i.e., secret key. In this paper we make an extensive survey of methods in generating secret key in various context and the key management techniques. The concept of symmetric key management and generation techniques were studied under physical layer security context.

Keywords: key sharing, key generation, key management, physical layer security, channel state information (CSI), biometric key, elliptic curve cryptography, channel model.

I. INTRODUCTION

With the popularity and advancement of connecting technologies, wireless devices have paved it way in our day to day life. Even critical data applications such as banking, military, business have become wireless. Wireless mode of communication are more vulnerable for unintended audience, hence there is a need for achieving secrecy for the data.

Secrecy mechanisms are broadly classified under concealment systems, secrecy systems and privacy systems. Concealment systems are those similar to stenographic techniques which involves data hiding , security systems uses codes and mathematical transformations, whereas privacy systems requires devices to recover messages.

We are concerned with security systems to achieve confidentiality, integrity, availability, authorisation, non repudiation, freshness, accountability and assurance.

Critical data is transformed into codes with some of the cryptographic primitives such as symmetric/asymmetric encryption, digital signatures and hash functions.

In present communication system, security is implemented at each level as an additional cryptographic feature. It has become a part of network design and security reinforcement.

We are concerned with physical layer security as it aims at providing security at the initial level i.e.., bit level. Also physical layer security does not require additional equipment than that are already employed for communication.

The public key or asymmetric cryptography has an advantage of scalability, while digital signatures have intrinsic authentication properties, but both lacks due to high computational overhead and authentication by public certificates. Symmetric cryptography attracts due to its simplicity and less weight computation but lacks in providing authentication and not scalable.

As wireless nodes have constrained by its computational capability, memory size & power hence we prefer symmetric cryptography which is light computational weight and less complexity in implementing at the physical layer level. The key challenges to implement symmetric key cryptography is sharing a common key between sender and receiver, as wireless medium are open systems and are vulnerable to security attacks[18].

In this paper we address to the various symmetric key generation and management techniques on wireless mediums. We also discuss recent works carried in this field.

The rest of the paper is organised in this manner: section II deals with the basic symmetric key management concepts while section III with physical layer security which also discusses about key management techniques. Basics of wireless channel characteristics followed by key generation channel models are discussed in section IV. Section V summarises the recent related work in symmetric key generation techniques and conclusion and future works is presented in the end in section VI.

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IOT BASED CAMOUFLAGE ROBOT

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Abstract :The most primitive and natural method for avoiding detection is camouflaging, exhibited by many flora and fauna. Implementing this concept in the field of robotics is the main objective of this paper. The use of a multifunctional army robot associated with various sensors is discussed. The use of LEDs and colour sensor plays a vital role for camouflaging. A cloud based IOT interface with Blynk app and WiFi module is used for retrieving, storing and recovering information. Applications of various sensors for detecting parameters are discussed. The usage of wireless camera for live streaming surveillance is also featured in this paper. The various methods discussed are used to design an efficient camouflaged combat robot that serves numerous purposes.

IndexTerms **-WiFi, AdaBoost,IOT**

I. INTRODUCTION

Over millions of years, natural evolution of living creatures has evident reports with very high adaptive environment blending capability. Some of them being, salamanders, snakes, cockroaches, cuttlefish, golden tortoise, beetle, north pacific giant octopus, chameleons and so on. These gave rise as solutions to traditional problems pertaining locomotion, mechanism design and perception. To accomplish these techniques in real time, camouflage technology can be employed. The camouflage problem is defined as concealing a 2D object located between an observer and a background scene/screen which may be static or dynamic. Active camouflage or adaptive camouflage is a method that adapts, often rapidly, to the surroundings of an object. In theory, active camouflage could provide perfect concealment from visual detection. With the advancement of technology in various domains especially in military, the application of camouflage for infiltration and for primitive security measures to protect the border from the trespassers has played a prominent role. Some organizations working in risky inaccessible areas take the help of robot which are otherwise not feasible by human efforts. The robotic technology has entered into many domains in which they can interact and cooperate closely with human beings; they can incorporate additional features such as autonomy and robustness, through building of a versatile perception and recording various parameters using a multi-sensor platform. The interfacing module is accomplished by using IOT (Internet Of Things) which allows objects to be sensed remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world. The main aim of the paper is to implement a Camouflaged technology based Wireless multifunctional Army Robot which can be controlled through Blynk application using WiFi module.

II. METHODOLOGY

The paper [1] describes about BAE Systems announcing Adaptive infrared camouflage technology. It uses about 1000 hexagonal panels to cover the sides of a tank. The panels are rapidly heated and cooled to match either the temperature of the vehicle's surroundings, or one of the objects in the thermal cloaking system's "library" such as a truck, car or large rock. Stealth technology also termed LO technology (low observable technology) is a sub-discipline of military tactics and passive electronic countermeasures, which cover a range of techniques used with personnel, aircraft, ships, submarines, missiles and satellites to make them less visible (ideally invisible) to radar, infrared, sonar and other detection methods. To achieve the feat of 'cloaking' an object, they have developed a material known as meta materials, some of which can bend electromagnetic radiation, such as light, around an object, giving the appearance that is not there.

The paper [2] proposes bio-inspiration work based on chromatic behavior change with respect to multiple predators. Here the robot exhibits similar concept of showcasing difference in color response on detecting multiple predators. Dwarf chameleons alter their detection ability by encompassing difference in its exposure values with that of the surroundings. The exposure values are said to be maximum detectable on encountering species of their own kind and minimum detectable on encountering its predators. A simple example to this can be noticed by the camouflage feature of a chameleon exhibiting a brighter exposure contrast as stealth in presence of a snake and a lower exposure in presence of a bird respectively. These chromatic behavioral changes are incorporated to our cylindrical based prototype which basically involves many stages as described further. The robot can be controlled automatically or by tele-operation. In the tele-operation the controlling is done mobile device noticing the changes through a visual streaming camera onboard. The robot is initially free to roam; if and only if it encounters a hostile or friendly agents the next phase starts. Here in the next phase on detecting its predators it changes itself to a significant color and also is programmed to remain still in stealth for exhibiting effective camouflaging. If the robot encounters species of its own then it changes to a detectable color. Here the color changing is exhibited based on the visual characteristics of the surrounding terrain.

WATCHDOG FOR ATM

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Abstract—**In real world applications, target tracking in low resolution video is a difficult task because there is loss of discriminative detail in the appearance of moving object. The methods which are existing are mostly based on the enhancement of LR (low resolution) video by super resolution techniques. But these methods require high computational cost. The cost further increases if we are dealing with events detection. This paper is able to detect unusual events without high end conversion and well suited for enhancement of security of ATMs. Conventional low-resolution cameras are used due to their low cost. Proposed algorithm only uses close morphological operation with disk like structuring element in the pre-processing steps to cope up with low resolution video. This algorithm further uses rolling average background subtraction technique to detect foreground object from dynamic background in a scene.Our proposed algorithm will able to detect the occurrence of uncommon events such as overcrowding inside the ATMas well asa fight in the low resolution video. Here we provide a onne stop solution for the overall surveillance of the ATM's and their security 24/7.The ATM's are secured from various mal-practices like theft , Camera masking , overcrowding and unusual event.**

Keywords— **Object Tracking, Unusual event detection, video surveillance, background subtraction, ATM**

I. INTRODUCTION

An Automated Teller Machine (ATM) allows customers to perform banking transactions any and at any time without the need of human teller. By using a debit or ATM card at an ATM, individuals can withdraw cash from current or savings accounts, make a deposit or transfer where money from one account to another or perform other functions.

Automated teller machines is almost a direct currency dispenser terminal permitting the client to directly get the money, however a while thanks to lack of security in some way or the other, some unauthorized user or hackers or criminals take an opportunity to tamper the machine and steal the money by physical attacks on Automated teller machines and by tampering with the machine, cutting the safe, bombing, shoulder surfing, ram riding are the other common abuse of Automated teller machines by the frauds. There are several criminal attacks on Automated teller machines' involving hold-up, removal of Automated teller machines from its premises by force, or by assault to the Automated teller machines within the premises with safe-breaking instrumentally or by explosives.

In the majority of attempts of attacks, the criminal has gained success of varying degree. To safeguard from this sort of frauds some security features are being added/created for Automated teller machines from time to time but these security features gets holed by the criminals. Wayside cheaters and gangster used to loot money from victims at deserted/isolated places by nabbing the passerby, with introduction of Automated teller machine, they did find small money or no money from the victims. Since they noticed that invariably all the victims had ATM cards with them, they added the practice of forced withdrawal from the victims from ATM cards. Gangster either wait in Automated teller machine kiosks for the victim as if they are waiting to withdraw the money or nab a victim at deserted place and bring the victims to Automated teller machine kiosks and force the victim at knife point or gunpoint to use his ATM card and withdraw the money from the Automated teller machine using ATM card and his PINnumber.

HOW ATMSWORK?

A data terminal with two input and four output devices is nothing but an ATM.ATM willconnect and communicate through a host processor like any other data terminal devices. The Internet Service provider (ISP) will be connected to host processor which is analogous, it is in this gateway through which all the various ATM centre networks becomes available to the cardholder (the person wanting the cash).

Many of the host processors can support eitherdial-up machines or leased line. Leased-line machines will connect directly to host processor through a point-to-point, four wire and dedicated telephone line.ATMs with dial-up will be connected to the host

IOT BASED CAMOUFLAGE ARMY ROBOT

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Abstract **- Science is a field developing in a rapid phase in order to create the technology which can make human life easier. Nowadays, many innovations and inventions are made in the field of defence to reduce the loss of human lives. One such invention is Camouflage Robot that plays a vital role in reducing the damages that occur during disasters. This robot is designed to work on the principle of Chameleon's camouflaging technique which is one of the most natural and primitive methods for avoiding detection. The main objective of this paper is to implement a multi-functional army robot consisting of various sensors. The proposed system consists of a wireless camera for live video streaming surveillance and a colour sensor is used as a part of camouflaging feature. In the proposed model cloud based IOT interface with Blynk app and Wi-Fi module are used for retrieving, storing and recovering information to increase the range of communication.**

Keywords - IoT, Camouflage, Surveillance, Blnyk

I.INTRODUCTION

In the modern combat techniques employed by various militant forces across the globe, stealth and ability to maneuver in inaccessible areas plays a key role. The idea of the proposed system is to use robots which are capable of disguising itself in order to infiltrate the enemy campsite [1]. The word robot means "A machine which is capable of performing complex series of actions automatically that is programmable by a computer." These robots used in defence are usually employed with the integrated system, including cameras, sensors and video screens [2]. The main motive behind Camouflage Robot is to reduce human losses in terrorist attacks or military operations. Many military organizations take the help of robots in the risk prone areas. Camouflage Robot acts as a virtual spy that can quietly enter into enemy area and send information via camera to the controller [10]. The movement of the robot is remotely controlled using a mobile. Robots can be made to interact and cooperate more closely with human beings by incorporating additional features such as robustness and autonomy. A versatile perception and recording of different parameters in this robot is accomplished using a multi-sensor platform. In this system an interfacing module is incorporated to remotely sense the object parameters using IoT (Internet of Things). Finally, the purpose of the project is to design, manufacture and operate a robot using a remote controlled device. A small mobile robot is designed which can duplicate its colors similar to the platform it moves on, appearing as camouflaged to the outside world.

II. PROPOSED METHODOLOGY

A Camouflage Army Robot is designed in such a way that it can reproduce the color independently at various areas with specific spots of the ground surface which allows the robot to mock up as a checkerboard of multiple colors i.e. the various colors it drives over. In the implemented system the movement of the robot can be controlled in any required direction using IoT platform and smart phone which receives the information from the sensors and camera.

The main processor used in the proposed system is Arduino Mega, which is a microcontroller board based on the ATmega2560. The ATmega series is much more advanced since it has many more peripherals that can be easily programmed when compared to 8051 Microcontroller. An ultrasonic sensor is incorporated which measures the distance to an object by using sound waves and helps in detecting the obstacles [5]. Here a passive

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A FRT - SVD Based Blind Medical Watermarking Technique for Telemedicine Applications

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ABSTRACT

In this article, a blind and robust medical image watermarking technique based on Finite Ridgelet Transform (FRT) and Singular Value Decomposition (SVD) is proposed. A host medical image is first transformed into 16 × 16 non-overlapping blocks and then ridgelet transform is applied on the individual blocks to obtain sets of ridgelet coefficients. SVD is then applied on these sets, to obtain the corresponding U, S and V matrix. The watermark information is embedded into the host medical image by modification of the value of the significant elements of U matrix. This proposed technique is tested on various types of medical images such as X-ray and CT scan. The simulation results revealed that this technique provides better imperceptibility, with an average PSNR being 42.95 dB for all test medical images. This technique also overcomes the limitation of the existing technique which is applicable on only the Region of Interest (ROI) of the medical image.

KEYWORDS

Arnold Scrambling, Blind Watermarking, Finite Ridgelet Transform (FRT), Medical Image, Singular Value Decomposition (SVD)

1. INTRODUCTION

In the last few years, medical treatments and diagnosis of the patients are being solved with the support of a variety of medical data such as images or signals. While the examples of medical images which are widely used are Magnetic Resonance Imaging (MRI), X-ray, Computerized Tomography (CT) and Ultrasound (US), the examples of 1-D medical signals are ECG and EEG signals. Nowadays, it has become a common practice to share medical data among doctors and radiologists for better diagnosis, health solution, and treatment. Transferring medical images over a transmission medium is referred to as telemedicine (American Hospital Association, 2015; Yassin, 2015). The telemedicine aids in emergency treatment, home monitoring, military applications and medical education (Yassin, 2015) to name a few. Security of medical images becomes necessary when they are transferred over any open access network. Corruption or modification of medical images by someone or some process leads to serious health issues for any individual. There is in fact high probability for the medical images being corrupted or modified by various intentional and unintentional processing during storage or transmission over a medium. While various techniques such as cryptography and steganography are available for protecting medical images, the digital watermarking technique is the proven solution for copyright protection (Borra et al., 2017; Thanki et al., 2017; Lakshmi and Borra, 2016; Borra and Lakshmi, 2015; Borra and Swamy, 2014; Borra et al., 2012; Borra and Swamy, 2012; Thanki et al., 2011; Borra and Swamy, 2009).

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Fragile watermarking for copyright authentication and tamper detection of medical images using compressive sensing (CS) based encryption and contourlet domain processing

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Abstract

With the rapid growth in communication and computing technologies, transmission of digital images and medical images over the Internet is on the rise. In such scenario, there is a special need to meet the security and privacy issues and challenges of an individual and Intellectual Property (IP) owners. It is highly important for an individual to keep his/her personal images against invalid manipulation by the impostors. Hence developments of authentication and tamper detection techniques are the need of the hour. In this paper, a new hybrid non-blind fragile watermarking technique is proposed for tamper detection of images and for securing the copyrights of sensitive images. A combination of Compressive Sensing (CS) theory, Discrete Wavelet Transform (DWT), and Non-Subsampled Contourlet Transform (NSCT) are employed to achieve security, high embedding capacity, and authenticity. In this technique, the requirements are achieved by inserting encrypted watermark in lower frequency contourlet coefficients of cover images. The experimental results prove that this proposed technique provides high security, high imperceptibility, authenticity and tamper detection of various common signal processing and geometrical attacks.

Keywords Authentication · Contourlet transform (CT) · Fragile · Medical image · Non-blind watermarking · Security

1 Introduction

The digital images are convenient, but can be easily accessed, modified, and distributed by unauthorized people when shared over Internet. A medical image which includes personal

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Crypto-watermarking scheme for tamper detection of medical images

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Continuous Ambulatory Peritoneal Dialysis(CAPD) Assistive Device

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Abstract— **The use of the various forms of automated peritoneal dialysis (CAPD) has increased considerably in the past few years. This increase has in part been driven by technology, through improved cycler design. Other contributing factors include better adjustment of CAPD to patient lifestyle, the flexibility that CAPD offers to patients, and the increased ability of CAPD to achieve adequacy and ultra filtration targets. For high transporters and for patients unable to perform peritoneal dialysis (PD) on their own (for example, pediatric and elderly patients), CAPD is considered the most suitable PD modality.**
Furthermore, CAPD has been associated with improved compliance, lower intraperitoneal pressure, and lower incidences of peritonitis. On the other hand, concerns have been raised regarding increased complexity and cost, a more rapid decline in residual renal function, inadequate sodium removal, and disturbed sleep. Automated PD is an alternative to continuous ambulatory PD when a higher dialysis dose is needed, and it could be a reliable alternative for unplanned or urgent dialysis start. Other than beneficial results in high transporters, the medical advantages of CAPD remain controversial. Individual patient choice therefore remains the main indication for the application of CAPD, which should be made available to all patients starting CAPD.

Keywords— Continuous Ambulatory Peritoneal Dialysis(CAPD), Peritoneal Dialysis(PD), Automated Peritoneal Dialysis(APD).

I. INTRODUCTION

Kidneys are the purifying factories of the body. Kidneys contain millions of tiny blood vessels that filter waste from your blood and eliminate it in your urine. If your kidneys are failing, you may need dialysis to help control your blood pressure and maintain the proper balanceof fluid and various chemicals – such as potassium and sodium in your body. It is an artificial way to remove waste products and extra fluid from your blood when kidneys can no longer do so on their own. There are two types of dialysis: Hemodialysis and peritoneal dialysis. In Hemodialysis, transfer of metabolites from blood into the dialysate is carried out in a mass exchange device and cleanses the blood outside the body. In peritoneal dialysis, sterile solution is poured into the peritoneal cavity of the patient through special catheter. Fresh fluid is replaced with spent dialysate. CAPD provides mobility for the patient, and thus improved quality of life. The user can do this according to his/her daily routine. It can be carried out by the patient in home or office.

Section 2 presents literature survey on existing continuous ambulatory peritoneal dialysis assistive devices. Section 3 presents the proposed model for CAPD. Section 4 provides the discussion and suggests the improvements. Lastly, section 5 concludes the paper.

II. LITERATURE SURVEY

Akanksha Fadnavis et al. [1] proposed Automated Peritoneal Dialysis. This paper is aimed to draw a sense of awareness in people regarding the option of APD for a much regular & healthier lifestyle. This paper tells the pros and cons of the available systems in market. In this, a low cost machine for APD has designed which will be easily available and affordable to common man. Also this paper proposes a model for APD which is cost effective system and can be efficiently used by any patient who chooses home automation. It concludes that patients can't visit hospital 3-4 times a week for dialysis exchanges.

Arifah Fasha Rosmaniet al. [2] proposed a system which evaluate the usefulness of CAPD eBook, an interactive multimedia application which is developed by integrating various multimedia elements such as text, animation, graphics, and audio. It is designated for renal patients who undergo CAPD as their dialysis method. The application helps to increase the knowledge and understanding of renal patients in practicing and training CAPD. Images used in the application are simple to understand and can help patients to visualize the step by step process that they need to follow. CAPD animation picture is to illustrate the whole general process that is experienced by CAPD users. The patients can see the whole picture of CAPD before they learn and perform it by themselves. It can facilitate them to perform the dialysis. The patients and their family members can also learn the CAPD process together with the patient at their own pace.

Vivekanand Jha [3] written an article about challenges and current status of peritoneal dialysis in India. With its ambulatory nature and freedom from complicated and expensive technology, PD is ideal renal replacement therapy for resource poor India. The number of patients initiated on

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Automated shopping trolley for billing system

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ABSTRACT

The modern technology has increased the standard of living for humans. There has been an emerging demand for quick and easy payment of bills in supermarkets. Every one of us craves for quality in everything we use in our daily lives. This project describes how to build an automated and time-saving system for the world of retail which will make shopping experience impetuous, customer friendly and secure. So, this has resulted in large crowds at shopping malls which have to lead to long lines at the billing counter because the cashier has to scan every product item and then enter it into the billing record. The prevailing billing system is a bit time-consuming. So, we thought of inventing a remedial electronic product to catch-up with this problem. We call it "Automated shopping trolley for billing system".

Keywords— Smart shopping trolley, Barcode scanner, Raspberry Pi, LCD display

1. INTRODUCTION

Commonly as in vogue of now, shopping has become an integral part of today's society. We can see a huge rush at the mall and supermarkets during weekends, holidays and sales. A major concern for the customer at the mall and supermarket occur when there is a long waiting queue at the billing counter. The customer tends to leave the queue rather than standing for hours at the billing counter this turns out to be a trouble for the mall and supermarket owner. So, the automated shopping trolley which comes together with a bar code scanner and a touch screen display is designed which would help the customer to pay for their goods in the mall and supermarket without being served by a sales associate. Every product in the supermarket will have a bar code the customer will pick the product scan the barcode with the help of barcode scanner attached to the shopping trolley. After scanning the barcode, the concept is designed into a smaller version of the automated self-checkout system on a shopping trolley with a user interface screen which allows customers to make payment for items scanned and placed in the trolley before leaving the entrance of the store. This is to release pressure during peak hours. The Smart Trolley comes with all the traditional services including scanning an item to check for price and details, also there are other additional features that will be included in the design such as locating an item in the store by typing in the item's name in the search field on the user interface screen which will automatically show the item's location and also we can set the budget. The Smart Trolley is designed with security measures to prevent it being wheeled out from the store's premises and also to protect customer's card details as it is designed to accept only card payment for items bought in the store. The details and the price of the product will be displayed on the touch screen display along with the total bill of the items purchased. This system would also be beneficial for the customer with a certain budget limit and saves long waiting time at the billing counter.

2. LITERATURE SURVEY

Janhvi Iyer et al. [1] proposed a system where each and every product has an RFID tag instead of a barcode scanner. The smart trolley will contain RFID reader, LCD display and Zigbee transmitter. When a person put any product in a trolley it will scan the product and the cost and name of the product will be displayed. RFID (radio frequency identification) automatically identifies and track tags attached to the objects. All the products have to be connected with RFID tags. The tags are read in any orientation and accuracy of the reading is more. It reads many tags at a time and the precision is more. In the shopping, trolley items can be read without a necessity to maintain a clear line of sight.

Bhagyashree Bhumkar et al. [2] in this paper all the trolleys in the mall are attached with the device which contains RFID reader, Microcontroller, Zigbee. So each trolley will send the item information to the main billing server for calculating the final bill of the purchased items. The customer puts the items into trolley here items are with RFID tag so when the customer selects the item and put an item into the

HAND GESTURE RECOGNITION AND VOICE CONVERSION SYSTEMS FOR PHYSICALLY IMPAIRED PEOPLE

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Abstract : Communication between normal and handicapped person such as deaf, dumb, blind and paralyzed patients has always been a challenging task. It has been observed that they find it really difficult at times to interact with normal people with their gestures, as only very few of those are recognized by most people. The home appliances can be modified and made to operate automatically with the modern home automation technology. This technology is growing drastically due to increasing demands in a wide range of sectors. The proposed system deals with the technology which uses a wearable gestural glove that interacts with physical world around us with digital information and convert those gestures into the voice output. The aim behind this approach is to develop a system which is trained to recognize and perfect gestures of a human arm using a smart glove.

IndexTerms **– IOT[Internet of Things], Cloud Computing, flex sensors.**

I. INTRODUCTION

Now a days , there is an increase in the number of physically challenged people like hearing impaired, paralyzed people and speech disabled, which is caused due to birth defects, accidents and so on. These people find it more difficult to interact with the normal people, as normal people fail to understand them. Thus for the better understanding they use hand gestures to communicate among themselves as well as with the normal people. Research has been made to find the hand gestures and have succeeded in developing the applications in robotics, and artificial hands which can function similar to the normal human hand. There are many ways through which the gestures can be converted. As per the survey, an IOT based Automation using sixth sense technology also known as wear your world(WUW) is proposed in [1] which uses the digital information to interact with the physical world using the natural hand gestures. A web camera is used to identify the gesture images drawn on a paper and this image is processed using Lab view VI. The processed image is used to turn on or turn off the electrical devices and thus the home appliances are controlled. The techniques which are required to implement a G programming language are of a very high quality. The memory management and the syntax of Lab View should be properly known by the programmer so as to implement algorithms which are complex and complicated. Images need to be drawn and must be understood by the Lab View application. Flex sensor [4] is the resistive type of sensor which is used as a transducer which converts the physical energy into electrical energy. A human hand can exhibit many gestures through figure movements which are detected by flex sensors. The controller takes the input from all the five flex sensors and store in 5 8-bit resistors. Every value is sent to speak jet to convert it into speech using USART. Each 8-bit information can be combined to form a word. The serial data is accepted by speech synthesizer, by combining all phenomenon's a sentence is generated and that is synthesized to audible human voice. The synthesized voice can be replaced by a memory voice kit which could hold real human recorded voice which would make it more natural. The flex sensors in addition with the International Measurement Unit (IMU) [6] provide more accurate output. In order to control more appliances an accelerometer based Micro Electro Mechanical system [2] was implemented to sense the acceleration of hand in motion in three perpendicular directions i.e, X Y Z and is transmitted to wireless protocol using Radio Frequency. The recognizable gestures are stored as templates in the microcontroller and when there is a mismatch in the gestures recognized by the microcontroller the home appliances are controlled as to be turned ON/OFF. A similar approach is extended to translate the hand gestures of a person to audio signal in [3] using the Flex sensors and Accelerometer. To process the information the information a PIC microcontroller is used in 2 modes as coaching mode and operation mode. In coaching mode information and measured voltages are being stored and in operational mode the values are compared with the values which were predefined. The speech converter module consists of speak jet and TTS block. Here each 8-bit address represents a different allophones, and is converted to the word to be spoken, the same voice message is represented in form of text using TTS module. The PIC microcontroller can be replaced into any better development boards like Arduino which would provide a better environment for programmers. The power supply can be improvised using batteries which would give better power backup. Two way communication can be adopted which can convert audio input to text to help deaf people. A two way communication system [5] is developed using the flex sensors and android technology. This technique proposes two modes of operation in which one is to convert the hand gestures to voice output using the flex sensors and in the other the audio signal is being converted into text but it's functionality is confined to English language only. This mode has an android app with a google API developed using the android studio to convert speech to text. The application can be improvised to visual gesture recognition using Open CV which can capture images analyze the finger positions and provide a voice output. A novel approach of hand gesture recognition based on shape features [7] uses a camera to capture the gestures made by human hand and is fed as input to the algorithm. The algorithm is divided into 4 different steps segmentation, orientation detection, feature extraction and classification. This algorithm is tested on 390 images, gives a recognition rate of approximately 92% and average elapsed time of 2.76 sec. To assist the speech and hearing impaired people to communicate directly with doctors a cost effective technology [8] is implemented in which the user will have to depict the illness condition to the concerned doctor by selecting an appropriate picture from the pictures file which describes the particular illness condition. This is accompanied by choosing another picture of a relevant hand gesture to convey the message. Further, the processing is performed by comparison and combination with the previously constructed words that are stored in the memory of STM32F429ZIT6 microcontroller having flash memory of 2MB. This leads to the formation of corresponding sentence, which gets displayed on the Thin Film Transistor LCD. Non availability of certain Images may lead to inability in conveying the information and can generate only one-way communication. The primary data of hand gestures in form of video is converted into English language output [9] where the video frames are cropped for vital information neglecting the others, by using crop co-ordinates. After which, the difference image is obtained by the subtraction of two subsequent frames. For segmentation of image, equation $T_i = T\{F_i - F(i+1)\}$ is applied on the difference image. At the same time, skin color detection algorithm using YCbCr model is applied to determine the skin color of the hand performing gestures. The boundary detection implemented using canny edge detector helps determine the boundary of the hand performing gestures. These combindly help in Motion detection of the hand, which is significant as

Survey on Object Recognition Techniques using Machine Learning

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Abstract---**Object Recognition is one of the most exciting areas in machine learning right now. Recognize objects like faces or cats are not so difficult, but recognizing arbitrary objects within a larger image set has been the difficult by artificial intelligence. The real surprise is that human brains recognize objects so well and effortlessly convert photons bouncing off objects into a spectacularly rich set of information about the objects around us. Machine learning still struggles with these simple tasks, but in the past few years, it's gotten much better.**

Keywords---Deep Neural Network (DNN), Convolutional Neural Network (CNN), Object recognition, Machine Learning, Deep Learning

I.INTRODUCTION

Object Recognition technology has seen a quite good adoption rate in various and diverse industries. It helps in safe navigation of self-driving vehicles through traffic, spots violent behavior in a crowded place, it can used by sports teams for analyzing and build scouting reports, quality control of parts in manufacturing can be monitored and many other things. Deep learning is adopted so that brain neural network functions to perceive the data, such as image, sound can be simulated artificially. Deep learning by ImageNet has made an huge amount of progress toward object recognition by, collecting and processing those data sets. This paper involves analyzing various machine learning techniques for object recognition, so that different methodologies and algorithms used for object recognition can be achieved.

II.LITERATURE SURVEY

The paper [1] proposes deep learning approach in the recognition of objects in the historical building photographs of the town Trnava. It uses Deep learning architectures based on convolutional neural networks (CNN) for object recognition tasks. Cascade of convolution layers and activation functions are used to improve architecture. It is very important to setup of the number of layers and the number of neurons in each layer. TRNAVA LeNet 10 model was built and trained the purpose. This model is based on the dataset of 460 training images and 140 validation images which is the ratio of 3:1, images are of dimensions 28x28 pixels and image type used was color, image encoding was jpg. The model successfully recognized the right object in the photograph of historical building in Trnava. The proposed model gained 98.88% prediction accuracy.

The paper [2] proposes deep learning methods for facial expression recognition instead of hand-crafted features. Two kinds of deep networks such as deep neural network (DNN) and convolutional neural network (CNN) are used to solve recognition problems. The deep networks were developed using CUDA supported deep learning toolkits such as Caffe and CudaConvnet2 for high speed. Also, for implementing Haar-like face detection algorithm, they used OpenCV library. The images were cropped and resized to 64×64. Then, the 327 face images were divided to 10 groups, and then used one group for training and nine groups for test. The recognition results were good for 6 emotions, but the recognition rate of disgust label was poor. Because, the number of training images of disgust label in FER 2013 database was only 547. The DNN has the possibility of overfitting.

The paper [3] proposes considerable improvement in object detection and tagging using convolutional neural networks has given way to accurate yet complex methods, which can identify objects in real-time. However, the growth in the area of implementing the algorithms on low powered portable devices has been relatively slow, aims to converge the fields of computer vision and robotics, focusing on implementation of image description applications on an embedded system platform. The objects in the image are restricted to a fixed number, specific to data set used for training the model. According to Shaoqing Ren et al, the introduction of Region Proposal Network (RPN) allows sharing of whole image convolutional features with the network, thus, providing near cost-free region proposals. Wherein, region proposal technique is used to guide the algorithm in order to locate objects residing in an image. Secondly, execution of this method in our system allows the system to be computationally efficient and customized to run on low-powered machines.

The paper [4] proposes an object localization method to boost the performance of current object recognition techniques, utilizes the image edge information as a clue to determine the location of the objects. The Generic Edge Tokens (GETs) of the image are extracted based on the perceptual organization elements of human vision. These edge tokens are parsed according to the Best First

Visual Object Recognition using Tensorflow

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The paper [4] proposes an object localization method to boost the performance of current object recognition techniques, utilizes the image edge information as a clue to determine the location of the objects. The Generic Edge Tokens (GETs) of the image are extracted based on the perceptual organization elements of human vision. These edge tokens are parsed according to the Best First Search algorithm to fine-tune the location of objects, where the objective function is the detection score returned by the Deep Convolutional Neural Network. Applying the BFS to the object localization and its search space, the search space is a set of edge

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DUSTLESS ENVIRONMENT

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Abstract - Residue can be something beyond an aggravation – it very well may be executioner. Residue is just little particles noticeable all around. Regularly these particles are too little to even think about being seen however manages the serious issue that is bothering in the eyes, hacking, sniffling, roughage fever, asthma assaults and so forth. This task used to naturally clean residue particles from the street of the city. The framework will be fitted on any vehicle, where DC engine used to gather the residue particles from the street and store it in a compartment. At the point when the compartment is filled, at that point the framework will give a caution. The proposed framework can be fit into any four-wheeler vehicle to limit the dimension of residue particles on street, where the DC engine is utilized to gather the residue particles and store it in a compartment gave. When the holder gets filled, it will consequently send an alarm to the driver. The utilization of the sensors can recognize the residue particles present out and about and subsequently can be utilized to gather the residue. The framework takes a shot at an ARM Controller which is utilized for interfacing and controlling the gadget. The utilization of LCDs can show the substance. The successful utilization of the considerable number of strategies and gadgets delivers a proficient gadget that can gather the residue particles on street and subsequently diminishing the specific dimension of contamination in air.

Index Terms - DC motor, LCD, Solar Panel, Buzzer, ARM Microcontroller, IR Sensor.

I. INTRODUCTION

In the ongoing years, tidiness has turned into a significant factor for the advancement of nature. Cleaning of the residue on city streets is a basic and effective approach to lessen the dimension of contamination in air. The residue particles being a noteworthy wellspring of toxin noticeable all around, can cause a few destructive conditions, for example, hack, influenza, asthma assaults, roughage fever, bothering in the eye and some more. Breathing in of these residue particles through the span of an extensive stretch can cause respiratory issues. The Industrial discharges may once in a while result in extreme residue in the adjacent networks. The residue particles on street primarily comprise of fumes from vehicles, depletes from enterprises, particles from tire and break wear, dust from cleared streets or potholes, and the residue from building locales. In the ongoing years there are gadgets that are utilized to clean the residue from streets with the assistance of human endeavors. Cleaning of the residue on streets are finished by brush and floor brush like structures. At that point the residue from the streets are evacuated with the assistance of blowers. This is a repetitive and long procedure that requires a ton of human mediation. The enormous machines are being utilized to clean the streets. By utilizing huge machines, little advancement is made in clearing the residue off of the streets. A monster vacuuming machine slithers through the dusty streets with a goliath brush moving them from the sides. Be that as it may, there is no certification that this vacuum cleaner will gather all the residue particles out and about. These are the couple of strategies to clean the street from brushes, these does not make street to clean rather more to spread residue in the street. Continuously, we don't have any instrument to diminish dust from the open social occasion places. In this way, we have a thought of making a framework which lessens the residue particles from the street. This proposed gadget can be fit into any four-wheeler vehicle, which naturally cleans the residue particles out and about by a moving vehicle and subsequently lessens the need of monster gadget and less human intercession.

AUTOMATIC AND MANUAL FLOOR CLEANING ROBOT

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Abstract: Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and the adoption of domestic robots is evolving. Several robotic vacuum cleaners are available on the market but only few ones implement wet cleaning of floors. The purpose of this project is to design and implement a Vacuum Robot which has two cleaning modes Autonomous and Manual mode and manual mode is via phone application. Vacuum Cleaner Robot is designed to make cleaning process become easier rather than by using manual vacuum. The main objective of this project is to design and implement a vacuum robot prototype by using Arduino Uno, Sensors, DC motor, motor driver L298N, Ultrasonic Sensor, and Vacuum suction unit and to achieve the goal of this project. Vacuum Robot will have several criteria that are user-friendly. With the advancement of technology, robots are getting more attention of researches to make life of mankind comfortable. This projects presents the design, development and fabrication of prototype automatic floor cleaner. This robot operates autonomous mode with additional features like dirt container with air vacuum mechanism and pick and place mechanism. This work is very useful in improving life style of mankind.

Index Terms – **Ultrasonic sensor, Motor driver, vacuum unit, dustbin unit**

I. INTRODUCTION

From the very beginning of human era, cleaning was one of the tedious tasks. There were many methods for cleaning the premises. But those methods were tedious and needed high effort. It became difficult for the working population to find time for room cleaning. Because of the difficulties, the existed system was not considered as an efficient method. As the technology has advanced, with the help of automation this task was made much more efficient. This paper presents about how the burden of cleaning can drastically be reduced by means of using an automatic floor cleaner capable of accepting user commands via mobile. Main objective of this project is to design and implement a robot by using Arduino Uno, Motor driver L293D, Ultrasonic Sensor, LCD display and thereby controlling the robot through user commands by means of GSM and Wi-Fi technology.

Robot is an intelligent device having its own brain fed with computer logic so that it can do the work according to the algorithm designed. Autonomous movement of vehicle is guided by the logic controller designed. Robots plays an important role in each every field of life. It is used in industries, in households and in institutes. The robots are just becoming as intelligent as Human now a days. Mostly an average human uses 2-3 robots per day in his day to day life.

Sensors are the sensing devices which transmit a signal and receives the signal and accordingly used to accumulate the various environment information which is ultimately fed to microcontroller for deciding the working of machines. Microcontroller is the brain of robot where program is written and sensors are connected as input and actuators as output.

II. IMPLEMENTATION METHODOLOGY

A floor cleaner robot based on ATMEGA328 have been developed. This cleaner robot is an electric home appliance, which works in both Automatic and Manual mode.

In this project mainly four applications are there.

- Cleaning.
- Mopping.
- Robot control with Wi-Fi in Manual mode.
- Ultrasonic for obstacle avoidance ,especially in Automatic mode.

RFID BASED PREPAID ENERGY METER

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Abstract— **World is looking towards automation and we achieve a step towards it by using radio frequency identification (RFID) based prepaid energy meter and home automation system with an android application running at subscriber's mobile station. The energy meter is credited through RFID technology and the automation of different appliances are controlled by the subscriber via an android mobile application. The subscribers may check their current credit, consumed units, current load and they can manage appliances remotely. A load management system is introduced, when load exceeds a certain defined level then appliances are automatically shut down. Fire sensor alerts the subscriber via GSM whenever a fire accident occurs.**

Keywords — Android application, home automation, load management, prepaid energy meter, Radio Frequency Identification (RFID).

I. INTRODUCTION

Electricity plays a vital role in growth of our country. Even though power production corporations focusing highly on generation, transmission and distribution, they are meeting power loss due to illegal consumption of electrical power from the transmission lines by the consumers. Power theft has become a great challenge to the electricity board. The dailies report says that Electricity Board suffers a total loss of 8 % in revenue due to power theft every year, which has to be controlled. In case of Industries, the industrialists have to monitor and control the usage of electrical energy level. The main objective is to prevent energy usage beyond the maximum allotted energy by the power supplier, by preventing from over load usage. In this paper we proposed and designed a prepaid energy meter using a microcontroller PIC16F877A from microchip. Energy consumption is audited by using current transformer connected series to the load. The reason for using this microcontroller is its high performance, power efficiency.

The additional feature of this system is that there is no need of manual interface as the entire system is fully automated and also meter reading also accurately calculated in this system, which overcomes the traditional manual meter reading

Then the current is measured by implementing Analog to Digital Conversion (ADC) techniques of the PIC (Peripheral Interface Controller) microcontroller, if any invariance is found tripping device takes the charge there by removing the excess load and invariance. Microcontroller is giving control signals to tripping various equipment provides controlling feature. Output can then be displayed in the LCD (Liquid Crystal Display).

RFID is a contactless wireless technology which uses radio waves for the automatic remote identification of different objects; we can differentiate between RFID systems according to the operating ranges of 0-1 cm for close coupling, 0-1m for remote-coupling, and greater than 1m for long-range systems. RFID technology allows the transmission of data through a small portable tag; an RFID reader reads the data from this tag and consequently processed as per the requirement of the given application. There are two major categories of RFID tags, either active or passive.

II. EXISTING SYSTEMS

The equipment of electricity defense energy meter is designed, which adopts Atmega128 as the control core and with low power consumption and high accuracy. It is showed that this system can not only accurate measurement of electrical energy but also to accurately determine the occurrence of electricity stealing and time of stealing is also recorded, which brings great convince to the power system [1]. The design scheme of a three-phase multi-purpose standard electrical energy meter, The experiment results indicates that the tested model compiles with national standards of 0.02 standard electrical energy meter and has already been put into application. due to modular structure designing, simple combination of different modules can produce series products of three-phase standard electrical energy meter [2]. A wireless digital energy meter will definitely offer greater convenience to the meter reading task. Bluetooth technology is chosen as a possible wireless solution to this issue [3]. The communication system is connected with electricity regional/sub-regional office which will rather act as a base station. Base office can verify the energy meters performance by checking the day to day consumption of energy. This helped to avoid any tampering or break down of energy meter [4].The consumer will purchase a cash-card of amount depending on consumption of energy and after the full consumption, the consumer will purchase a cash-card of amount depending on the energy consumption [5]. Smart meter is introduced to minimize electricity theft, because of its high security, best efficiency, and excellent resistance towards many of theft ideas in electromechanical meters [9]

A SURVEY ON SECURITY DEVICE FOR WOMEN AND KIDS SAFETY

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Abstract : This paper studies about the security framework for ladies and kids which permits quick reactions in any badgering in open spots, social orders and so on. Viciousness against ladies in India is in reality more present than it might show up at first look, the same number of articulations of savagery are not viewed as wrongdoings, or may some way or another go unreported. These reasons all add to India's Gender Inequality Index rating of 0.524 in 2017, placing it in the base 20% of positioned nations for that year. Ladies everywhere throughout the world are confronting exploitative physical badgering and kids can't be left unattended at a get-together or outside the home. Our task tackles both the issues. A convenient gadget which will have a frenzy switch. When assailant assault the ladies/youngsters press the frenzy switch, in a flash with the assistance of GPS and GSM, the injured individual's area will be sent to their folks/gatekeepers phone numbers put away in the gadget, and furthermore to the closest police headquarters. The gadget will creates the alert sound to the fascination of adjacent individuals. The aluminum sheet which is set on the gadget delivers little measure of electric stun exertion to the aggressor, if attempts grab the gadget.

Watchword - **Security gadget, GPS and GSM, alert sound, Electric shock.**

I. INTRODUCTION

Today young ladies are not ready to walk unreservedly in the lanes without stressing over their wellbeing. Guardians are stressing for they little girl, to send for the activity.
Presently multi day's Women are rivaling men in each field of society. Ladies contribute equivalent need to the improvement of our country. In any case, the ladies have dread of getting irritated and executed. Every one of these sorts of ladies provocation cases are expanding step by step. So it is essential to guarantee the security for ladies.

Ladies from different moves of life face issues that make them feel compromised in various conditions. More level of ladies inappropriate behavior cases are accounted for in the year 2010 at New Delhi. In urban conditions, ladies are increasingly inclined to encounter badgering particularly in creating nations. In such case, the guide of a security gadget will educate the injured individual's relatives or the specialists may enable ladies to feel more secure, sure and diminish the odds of provocation.

As the school child's wellbeing are significant worries for guardians just as school the executives because of the ongoing occurrences of youngster wrongdoings like kids missing, misuse and so forth.

The ladies and youngsters are exposed to such abominations, physical and sexual, there is a need a gadget that would assist them with altering somebody in instances of crisis. This paper proposes a gadget that would be turned ON by an activity of human hand. The principle thought isn't just have a ready framework yet additionally a gadget that would gather proof.

As indicated by an article "55,000 youngsters hijacked in 2016 in India: Report". Distributed by Times of India at Jul 8, 2018. The Article advises that According to the 2017-18 report of the Ministry of Home Affairs (MHA), 54,723 youngsters were hijacked in 2016 however charge sheets were recorded in just 40.4% of the cases.

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CERES-An Autonomous and Versatile Agriculture Robot

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Abstract: ***In recent years, robotics in agriculture sector with its implementation based on precision agriculture concept is the newly emerging technology. The main reason behind automation of farming process are saving the time and energy required for performing repetitive farming tasks and increasing the productivity of yield by treating every crop individually using precision farming concept. Designing of such robots is modeled based on particular approach and certain considerations of agriculture environment in which it is going to work.A robot capable of performing operations like automatic ploughing, seed dispensing and pesticide spraying is developed. It also provides manual control when required and keeps tabs on the humidity with the help of humidity sensors .The main component here is the ARM 7 microcontroller LPC2148 that supervises the entire process. Initially the robot tills the entire field and proceeds to ploughing, simultaneously dispensing seeds side by side. The device used for navigation is an ultrasonic sensor which continuously sends data to the microcontroller. On the field the robot operates on automated mode, but outside the field is strictly operated in manual mode. For manual control the robot uses the zigbee or wifi modules as control device and helps in the navigation of the robot outside the field. The field is fitted with humidity sensors placed at various spots that continuously monitor the environment for humidity levels. It checks these levels with the set point for humidity and alerts the farmer.***

I. INTRODUCTION

Agriculture in India dates back to Indus Valley Civilization Era and even before that in some parts of Southern India. India ranks second worldwide in farm outputs. Agricultureand allied sectors like forestry and fisheries accounted for 15.4% of the GDP (gross domestic product) in 2016 with about 31% of the workforce in 2014. India ranks first globally with highest net cropped area followed by US and China.

The economic contribution of agriculture to India's GDP is steadily declining with the country's broad-based economic growth. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. In recent years the agro sector has faced a severe brain drain due to its low fiscal turn over and its tedious fabric of work. With the advent of 20th century many age old practices underwent a digital upgrade. Our project aims for such a revolution in this anachronistic field which is the backbone of our society.

Many agriculture operations are automated nowadays and many automatic machineries and robots available commercially. Some of the major operations in farming which are under research and automation are seeding, weeding and spraying processes. When it comes to designing a robot for automating these operations one has to decompose its idea into two considerations which are agriculture environment in which robot/system is going to work and precision requirement in the task over traditional methods. Based on this for seeding process, considerations which are taken into account in terms of environment are: robot must be able to move in straight away properly on bumpy roads of farm field, soil moisture content mayaffect the soil digging function, sensors to be selected for the system must be chosen by considering farming environmental effects on their working. Apart from these three other requirements are in terms of accuracy required in the task and these are: digging depth, particular optimal distances between rows and plants for certain type of crop, rows to be sown at a time and accurate navigation in the field. Whereas the other processes like weeding, spraying and harvesting, for which functioning depends on seeding stage by knowing the exact location of crop and then making those operations on it accordingly. So the major stage of all subsequent operations is maintaining a precision in seed sowing process.

When considering the physical aspects of the vehicle or robotic system, farmer's present condition in particular area plays a major role in designing these aspects. Considering facts of farming industry of India, system to be developed must have advantage over traditional methods and tractors in terms of cost, speed, accuracy in operation for which it is designed, fuel consumption and

FOREST MONITORING

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Abstract: The system of ecological monitoring accumulates, systematizes and analyzes information about observations, estimation and the forecast of the environmental conditions in the forest. Forests are part of the important and indispensable resources for human survival and social development that protect the balance of the earth ecology. Even if an ecosystem is balanced, that doesn't mean that no changes ever occur. These changes include forest fires, climatic changes etc. Endangerment or extinction of one species can threaten the viability of another species. The proposed system consists of wireless sensor network for detection of forest fires and also to monitor the health of animals. Even the location of the animals will be detected.

Keywords- forest fire, animal monitoring, shock generator and ecology.

1. INTRODUCTION

Wildlife monitoring is crucial for conservation of biodiversity and ecology. In recent years, passive and non-invasive methods for data collection have been used by leveraging advances in sensing, communication and information technology. Image data has been particularly useful for monitoring the population, health, behavioral, and breeding patterns of various species. For monitoring large land mammals, camera traps have been extensively deployed in strategically chosen forest regions most frequented by these animals. Naturally caused forest fires are usually started by dry lightning where little to no rain accompanies a stormy weather disturbance. Lightning randomly strikes the earth an average of 100 times each second, or 3 billion times every year and has caused some of the most notable wild land fire disasters in the western United States. There are three primary classes of wild land fires and they are surface, crown, and ground fires. Each of the classification intensity depends on the quantity and types of fuels involved and their moisture content.

Literature

The detecting of forest fire and the tracking of it was done using multiple UAVs' [1]. These UAVs are meant to be in a formation all the time. The formation is made such that, it covers almost all the space with minimal number of UAVs. If anyone of the UAVs detects fire, a message is sent to the manager or the ground station and action will be taken by them. The paper [2] proposes a system for automatic animal detection using HOG and Cascade classifier algorithm. This system was basically implemented to reduce the number of road and highway accidents occurring due to animal vehicle collision. . More than 2200 images are fed to the system to make the system learn. An early stage forest warning system was developed after certain areas were thoroughly examined with L-band SAR. The experiments in paper [3] were conducted in Brazil and also in Peru. The proposed system in the paper [5] implement a Support vector machine based segmentation method for forest fire metrology. The obtained results from SVM method is compared with four other techniques using three evaluation protocols.

2. METHODOLOGY

The animal detection near the boundaries is very vital and to keep them from harming human beings or even themselves is a difficult task. And it is critical to monitor the health of animals constantly and treat them. Wild animals often fight with each other and almost kill one another and humans cannot stop it by intrusion.

We should monitor the health of endangered species and if there is any abrupt change in the temperature of the animal it should immediately be informed to the officers. Should maintain the animal within the boundaries and avoid them to enter into the human living areas so as to protect both animals and human beings and also to avoid fighting between the animals of same and/or different species.

Forest fires either starts by dry leaves or by the friction between the branches of trees, it is very difficult to stop the fires from starting therefore should take measures to stop them from spreading. When the fire starts it is very hard to stop because it spreads in all direction taking many living organisms lives. Should detect any sign of forest fire and inform the forest officers immediately and should make sure to reduce the fire from spreading and destroying more area including animals. Protecting both animals and trees restores the balance of the ecology.

ECOLOGY MONITORING

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ABSTRACT: Balance of the ecology has been a big concern and it has been the most important duty of every person. Ecology monitoring is the system of regular long observations in space and time, informing about environmental conditions with the purpose to estimate the past, the present and the future forecast of environmental parameters which are important for the human being. There is no chance that the condition of the earth will increase unless wildlife and trees are protected. 8000 years ago, half of the earth's land was covered by forests. Today, these areas represent less than one third. This not only disturbs the atmosphere of the earth, but also the animals. If one species in the food web ceases to exist, one or more members in the rest of the food chain could cease to exist too. The proposed system consists of wireless sensor network for detection of forest fires and also to monitor the health of animals. Even the location of the animals will be detected. It is very important to protect the endangered species and to make sure that the forest fires do not spread too far and cause more damage in order to maintain the balance of the ecology. When the fire starts or even if there is any sign of forest fires, immediately the forest officers are informed about the same. The health of the animals is monitored frequently. The location of the animal is traced so that there can be assurance that animals do not enter human living areas.

IndexTerms - **Forest fires, animal monitoring, shock generator and sensors.**

I. INTRODUCTION

The system of ecological monitoring accumulates, systematizes and analyzes information about observations, estimation and the forecast of the environmental conditions in the forest. Forests are part of the important and indispensable resources for human survival and social development that protect the balance of the earth ecology. Forest mainly consists of trees and animals and protecting them is a very difficult task.

Due to some uncontrolled activities and abnormal natural conditions forest fires occur which ends up damaging most of forest areas. Forest Fires occur frequently. In recent years, the frequency of forest fires has increased considerably due to climate changes, human activities and other factors. The prevention and monitoring of Forest Fires has become a global concern in Forest Fire prevention organizations. Currently, Forest Fire prevention methods largely consist of Patrols, Observation from watch towers, Satellite Monitoring and lately Wireless Sensor Networks. Although observation from watch towers is easy and feasible, it has several defects. In the first place, this method requires many financial and material resources and a trained labour force. Second, many problems with fire protection personnel abound, such as carelessness, absence from the post, inability for real-time monitoring and the limited area coverage.

Many algorithms and methods have been developed in order to have a better understanding on the animal behaviour. Besides, these applications also can acts as a warning system to human beings from intrusion of of dangerous wild animal for early precaution measures. These applications are being monitoring and tracking. The animal tracking is the main topic in monitoring animal locomotive behaviour and its interaction with the environment. With the technology of sensor, radio frequency identification (RFID), and global positioning system (GPS), we can develop new zoological systems for animal tracing ability, identification. By tracking the animal movements, it helps human to have a better understanding on living creatures on earth, especially on how the animal interacts with its environment.

LITERATURE SURVEY

The paper [1] proposes a UAV based forest fire monitoring and detection method using visual sensors. The purpose of this paper is to improve fire detection performance, while reducing false alarm rates. The proposed system deploys a group of fire detecting sensors equipped UAVs in an assigned area to search while communicating with the ground station, if fire is confirmed related authorities are notified with fire images data. Here the fire is detected by the following design procedure: 1) based on motion feature of fire, optical flow technique is adopted for extracting moving regions as candidate fire pixels; 2) colour features of fire are extracted employing colour-based decision rules to segment fire coloured pixels from candidate fire pixels; 3) finally, fire is confirmed if the suspicious fire region can be extracted based on both colour and motion features. The UAV is controlled by slide mode control and linear quadratic control regulator (LQR), and the quad rotor control is divided into two loops, inner and outer loop. (LQR) is used to control the quad rotor positions, while the sliding mode control is used for the inner-loop control which is responsible for the attitude stabilization In order to demonstrate the proposed model a indoor environment is created and a unmanned quad rotor Helicopter is used which is equipped with a QuaRC-powered (QuaRC is a real-time control software developed by Quanser Inc.) single-board Gumstix embedded computer, which is adopted to implement algorithms developed in MATLAB/Simulink environment for real-time applications. To monitor and detect fire a camera is mounted at the bottom of UAV for the purpose of collecting images from ground and this data I transmitted to ground station via a wireless communication system (consists of a 5.8GHz 200mW transmitter and a 5.8G AV receiver) Motion and colour features are extracted by employing optical flow method and colour-based decision rules, respectively. The drawback of this system is that it does not capture the 360 degree view of the area and if an adjacent UAV failed to communicate with other the system fails in intimating the department about the failure in most of locations.

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Women Safety Devices and Applications

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Abstract: **Women safety has been a big concern and it has been the most important duty of every person. There is no chance of the welfare of the world unless the condition of the women is improved. Since the ancient time, women are given most respected place in the society but every day and every minute some women of all walks of life (women, girls and babies) are getting harassed, molested, assaulted and violated at various places all over the world. It is estimated that 35% of the women have experienced physical and/or sexual violence at some point in their lives. This paper includes various ideologies and methodologies of numerous authors who have reviewed multiple applications and devices using present technologies and processors and they have also upgraded these with certain requirements in order to decrease violence against women. Also a small measure of improvement proposed in this paper, adds to the better performance of these devices and lead to better women safety.**

Keywords— Two Parameter Physiological Sensing Systems, Healthcare, PCG and ECG.

I. INTRODUCTION

This paper involves few precautionary devices and applications in order to prevent or avoid the problems faced by women. It is not only about prevention, but it also helps the women deal with the problems faced in the past and achieve fair justification and morality in the society. The safety and security of a woman can never be at rest, no matter what new device is on the market or no matter how nice a new application is made, there always can be something added to it. There cannot be a cop always guarding a woman, but there can be secret safety measures with them which can be easily used at the time of threat and let the nearby people know that there is something bad happening and their support is need. By keeping all these things in mind many safety devices have been made and few of them are discussed in this paper.

Literature

The paper [1] proposes a safety device and application called FEMME using ARM controller. It is a security device which is specifically designed for women. The device and be purchased or the application can be installed in smart phones and can be accessed in emergencies. FEMME provides quickest and easiest way to contact for help, when a person is in distress. The application is activated by pressing the volume key and the power button together. When the application is being used, first it displays 4 main icons, audio recorder, SOS message, video recorder, hidden camera detector. Depending on the option pressed now, it either sends message and recording to the preset contacts or detects the hidden cameras. Whereas the device is activated by pressing the button on it, the device is linked with smart phone and it provides 2 buttons, one being the emergency button and the other to activate hidden camera detection. If the emergency button is clicked once (Single Click) the GPS location is tracked and is sent to preset contacts once in every 2 minutes with updated location. If it is clicked twice (Double Click) audio recorder is activated and is sent to preset contacts with an emergency help message. If it is pressed for long (Long Press) it automatically calls the preset contact. By using ARM controller the device works without internet connectivity and is an all in one system, the controller uses less power and gives more efficiency.

The paper [2] proposes a device which is portable and it also resembles a belt. This device was developed after seeing few applications and devices such as VithUapp which was initiated by a popular TV series Gumrah aired on channel [V], SHE(Society Harnessing Equipment) which generates current to help victim escape, and ILA security founder designed an alarm that can shock and disorient attackers. This device includes Arduino board, GSM shield, GPS module, screaming alarm and pressure sensors. The arduino board consists of everything which requires to start up the microcontroller, it can be started by connecting it to a computer or powered with an adapter or even a battery. The GSM shield provides data, voice, SMS and fax in a small form factor with low power consumption. It is a very powerful single chip processor with high efficiency and speech quality and it supports low cost handsets and is also compatible with almost all telephone services. The GPS module provides current date and time, corresponding longitude and latitude, and also sends speed and travel direction if the victim is travelling. It helps to track the victim and makes it easier to access their location and find them. The screaming alarm offers single chip voice recording and playback capability for 40 to 60 seconds. It is ideally used in portable voice recorders. The pressure sensor generates a signal when pressure is imposed on it, it is usually used to capture the change in pressure. In this device a threshold limit for pressure sensor is set, and when the threshold crosses the device gets activated and tracks the location of the victim using GPS module and sends the location to preset contacts and other emergency services such as police control room for every 2 minutes with updated location. The screaming alarm will be activated and it sends sirens to let people know that there is trouble nearby and help is needed

The paper [3] proposed a system consists of wearable safety device having an emergency button for sending notification and camera for capturing assaulter image, thus location of the victim is traced with help of GPS and image gets captured. Emergency message with image link will be sent to all

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Recent Trends in Automotive Industry

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Abstract: Advancement in technology has made a lot of changes in today's life. New technologies such as automatic breaking system, adaptive and co-operative cruise control, self-driving cars, vehicle running on artificial intelligence etc., have helped in maintaining road safety, obeying traffic rules thus increasing the chances of life expectancy. Both electric and solar chargeable batteries help in saving fossil fuels from getting extinct. All the new technologies mainly help the car drivers to maintain an optimum distance between the vehicles to avoid collisions.

Keywords: Artificial Intelligence, Automatic Breaking System, Adaptive Cruise Control, Co-Operative Cruise Control,Renewable sources,Non-renewable Resources.

I. INTRODUCTION

The proliferating economic growth and energy consumption intensification are leading to ever-growing demand for energy. This problem is worsened by the steady depletion of fossil fuels such as natural gas, oil and coal. Burning these fossil fuels has increased the amount of carbon-dioxide in the atmosphere leading to extreme weather patterns. The 2017 Global Energy and $C0_2$ Status Report revealed that demand for energy worldwide rose by 2.1%. In 2017, over 70% of the growth in global energy demand was met with oil, natural gas and coal, resulting in energy related carbon emissions rising by 1.4%. Thus, there is a need for utilizing the natural resources such as solar and wind energy to meet the requirements of energy.

Due to high population growth, traffic congestion is a common problem in urban areas. Also, road safety is a major concern. The number of deaths due to road accidents is staggeringly high. According to WHO, an estimated 1.25 million deaths occurred due road injuries in the year 2010. Most of these accidents occur due to poor judgment in driving, distraction, and over-speeding or by simply not following the lane discipline. By implementing AI in driving, many accidents can be avoided. It provides assistance to the driver in reaching the destination.

The special features of our vehicle are:

A. It is solar-powered and hence, is eco-friendly, since it does not burn fuel and emit green-house gases.
B. Adaptive Cruise Control: This feature makes the vehicle adjust its speed based on the speed of vehicles in front of it. This helps in avoiding collision between the vehicles.
C. Automatic Forward-Collision Braking: The forward-collision braking system, when it detects an imminent collision alerts the driver and quickly applies the brakes, to avoid accident.

II. LITERATURE SURVEY

"Autonomous Electric Vehicle Using Ultrasonic Sensor Skirt Approach", in this proposed system an ultrasonic sensor skirt approach and a GPS system is used to map travel path and navigate autonomously. It utilizes three microcontrollers that are connected to each other via UART. The vehicle detects the side walls to follow a straight path. It avoids all static and dynamic obstacles in between the travel path .The system runs on a battery that is charged using solar panels using MPTT technology. The system is entirely autonomous. It can be used for automatic shuttle services within a predefined location such as an industrial site or a college campus.[1] "Combining Raspberry pi and Arduino to Form a Low-cost, Real-Time Autonomous Vehicle Platform", this paper presents a low-cost platform for autonomous vehicle research. It uses two micro controllers Arduino Uno and Raspberry pi. They work together to create a real-time feedback control system and are connected using a USB cable for serial communication. The Arduino allows the control law to be executed at hard real-time intervals while the Raspberry Pi provides additional computing power, a web interface, and wireless data-streaming for control tuning and debugging. In the proposed system the USB-to-serial connection limits the digital control frequency to 100-150 Hz.[2]

"Automated Vehicle Control System", This paper utilizes elementary robotics, digital imaging with image processing and artificial intelligence for design of a completely automated vehicle which follows lane driving at a constant speed of 30kmph with an accident prevention due to automatic collision control. This work is ideal for locomotion of physically challenged people or

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Food Monitoring and Control System using Internet of Things

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Abstract: *Raw food product's hygiene is a scientific disciplinary mainly emphasizing with handling and storage. Storage of food under imprecise environmental condition will reduce the service life of the raw food material causing rotting and browning effect resulting in wastage of the food. This paper focuses on a system which controls and monitors the quality and quantity parameters such as temperature humidity and weight. The controlling unit is hinge on the databases of optimum parametric values for various raw food materials. This unit using the internet of things technology notifies the user about the intended parameters of the food continuously.*

Keywords - IoT, Quality and Quantity, food monitoring and control, temperature and humidity.

I. INTRODUCTION

One-third of the raw food produced over the world i.e.,1.3 billion tonnes is being wasted every year, according to resource Organization of the United Nations. In Singapore, the National Environment Agency (NEA) estimated that 790,000 tonnes of food was thrown in 2014. Such amount of wastage of resources ridicules the mankind. These wastage may be due to various reasons such as environmental conditions or buying excessive food, all these ambiguities can be reduced if the raw food materials stored will be properly monitored (to keep an eye on…). Parameters like temperature and humidity play a major role in maintaining the quality of the raw food material. The monitoring unit present in the system is done using various sensors to monitor relative humidity and temperature of the storage area where the raw food is stored, sensors continuously records the sensed values. Now the controlling unit makes sure that the parameters lie in the desired range of that particular raw food material, this is done with actuators, both actuators and sensors should go hand in hand i.e., based on the recorded values by the sensors the actuators must take an action to maintain the temperature and humidity in the desired range if it goes beyond or below the threshold range, all these help in maintain the quality of the raw food. Quantity is also an important factor to avoid wastage which is done by a sensor for continuously monitoring the weight of the raw food stored. The quantity of the food material is monitored continuously and a certain minimum threshold is set and if the quantity falls below the threshold minimum value set then the user is notified of the shortage of food. Since the presence of food is monitored there will be no excess food bought by the user and this avoids food wastage. Thus, to keep the user updated about these factors some or the other wireless communication is necessary. There are many technologies nowadays and each differ from other based on range, speed and reliable transmission. Therefore an communication system which is reliable, fast and by which user can have knowledge of data from anywhere would be suitable for this system. Here we use the Internet Of Things technology which keeps the user notified at all intervals of time.

The various features of our system:

Wood as casing material as it provides proper insulation.

Automated controlling mechanism

A storage container can have multiple raw food materials but only one material at a time not mixture of raw food.

Usage of two peltier modules for temperature as well as humidity control to save power

Weekly analysis reports as well as real time notifications through web application.

II. LITERATURE SURVEY

[1] This paper tells about the Iot framework for monitoring of the food such that it wouldn't get spoilt due to surrounding conditions while storage and transportation. Their proposed solution gives detailed information about analysis of the recorded values by the sensors, it analyses parameters like temperature, moisture and light as they affect the food's nutrition value. All the recorded value analysis can retrieved by the mobile application. As there is transportation factor involved the information of the location of the shipment will also be provided via the application. They use a web server for storage of the data values from the sensors in real time. And they even provide graphical representation the data values recorded which can help in further analysis. They aim to develop a platform such that user can interface with the third party stakeholders to get the information of the shipment and storage of the food.

HYBRID POWER GENERATION

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Abstract: Now a day's electricity is most needed facility for the human being. All the conventional energy resources are depleting day by day. So we have to shift from conventional to non-conventional energy resources. In this the combination of two energy resources is taken place i.e. kinetic energy resources without damaging the nature. We can give uninterrupted power using hybrid energy system. Basically this system involves the integration of two energy system that will give continuous power. Wind turbines are used for converting wind energy into electricity. This electricity power can be utilize for various purpose. Generation of electricity will be takes place at affordable cost. This paper deals with the generation of electricity by using two sources combine which leads to generate electricity with affordable cost without damaging the nature balance.

IndexTerms - **wind turbine, piezoelectric, power hump and accelerometer**

I. INTRODUCTION

Electricity is most needed for our day to day life. There are two ways of electricity generation either by conventional energy resource +or by non-conventional energy resources. Electricity energy demand increases in world so to fulfill demand we have to generate electrical energy. Now a day's electrical energy is generated by the conventional energy resources like coal, diesel. And nuclear etc. The main drawback of these sources is that it produces waste like ash in coal power plant, nuclear waste in nuclear power plant and taking care of this wastage is very costly. And it also damages he nature. The nuclear waste is very harmful to human being also. The conventional energy resources are depleting day to day. Soon it will be completely vanishes from the earth so we have to find another way to generate electricity. The new source should be reliable, poilution free and economical. The non-conventional energy resources should be good alternative energy resources for the conventional energy resources. There are many non-conventional energy resources like geothermal, tidal, wind, solar etc. the tidal energy has drawback like it can only implemented on sea shores. While geothermal energy needs very lager step to extract heat from earth. Solar and wind are easily available in all condition. The non-conventional energy resources like solar, wind can be good alternative source.

II. RELATED WORKS

The hybrid system can be standalone or can be grid connected. In this paper the grid connection hybrid system is used which is more reliable to deliver continuous power to the grid because if there is any shortage of power or fault in the renewable energy sources then the loads are directly connected to grid. The various FACTS device alike UPFC, IPC, Fuzzy logic, SVS, STATCOM etc. are used to maintain stability [1].

These paper performances of the wind/PV hybrid system are studied under different grid perturbation conditions. The optimal operating conditions of the grid-connected SOFC were obtained by solving the NLP problem considering the power consumed by the air compressor. With the optimal operating condition at different active power output levels, a hierarchical load tracking control scheme was proposed to realize the maximum electrical efficiency operation with the stack temperature bounded [2].

In this [3] paper it propose a two-stage rolling dispatch approach based on Model Predictive Control(MPC),which contain an intra-day rolling optimal scheme and a real-time rolling base point tracing scheme. The closed-loop optimization is formed to correct the power deviation timely, making smoother output.

In this [4] paper proposes an Adaptive Power System (APS), it is used to mitigate the negative levied on the platforms resulting from large dynamic loads.it uses DC motor as speed control over a wide range both above and below speed High starting torque.

A SURVEY ON VARIOUS METHODOLOGIES USED FOR CONSERVATION OF FOREST TREES

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Abstract **-** Smuggling of environmentally and economically important species of trees in forest areas such as Teakwood, Sandalwood, Pine and Rosewood has been dramatically increased. There have been several initiatives undertaken by different stakeholders and in particular by the Govt. of India, to mitigate these problems. These include the recruitment, training and deployment of anti-poaching watchers and private or government security guards across forests. Strict punishments for convicted offenders, as well as giving special incentives for anti-poaching activities were aimed for eradicating the menace. However, the punitive measures have remained largely ineffective. The most effective solution is "the implementation of a real time, wireless sensor network (WSN) and data logging system" which will be an advanced and a cheap modern technology to make monitoring more robust, effective and feasible.

Index terms **- WSN [Wireless Sensor Networks], Sandalwood trees, Zigbee, Arduino.**

I. INTRODUCTION

Forest resource has become an important strategic resource, playing a crucial role in economic development and improvement of people's livelihood and mitigating climatic changes. Sandalwood trees are known for their fragrance and medicinal value due to which they are grown in farmlands by farmers and in forests by the forest department. These trees are expensive and less available in the market. In recent years there has been an increase in the number of sandalwood robberies as there is no appropriate solution available for protecting sandalwood trees, thus, making them endangered. Smuggling of precious trees in forests such as sandalwood and forest fire is serious threat to forest resources causing significant economic loss and ecological imbalance of an environment all over the world. To avoid smuggling of these valuable trees and to save the forests around the globe some preventive systems need to be developed.

II. LITERATURE SURVEY AND SUMMARY

This paper[1] proposes a microcontroller based anti-poaching system employing WSN technology, and MEMS accelerometer. WSN is widely used technology in remote monitoring applications. The micro-controller that is used over here is PIC16F877A. MEMS accelerometer senses the tilt of the tree. Sound sensor combines a microphone and some processing circuitry. It detects sound from silence and outputs digital trigger signal. Fire sensor is used to detect the rise in temperature. Smoke sensor detects the lubricant gases the surrounding environment. GPS gives the latitude, longitude and altitude values. For the purpose of serial communication UART is used. Internet of Things is used to transfer data without requiring human to human or computer interaction and objects, animals or people are provided with unique identifiers.

This paper[2] makes use of routing technique which sends signals to the base station about poaching activity using sensor nodes. Sensor nodes communicate over a short distance through a wireless medium and collaborate to accomplish a common task. They make use of WSN which consists of nodes integrated with sensors, communication module, powering unit interfaced with and controlled by a low power microprocessor. MSP430F5528 microcontroller uses the SPI interface to communicate with CC2500 communication module and ADXL362 accelerometer. The voltage regulator down converts the supply voltage from the solar rechargeable batteries to 3.3 V for operating the sensor node. There are 2 modes of operation in ADXL362: Measurement mode and Wakeup mode. Measurement mode is the usual operating mode of the ADXL362. Wake-up mode is ideal for simple discovery of the presence or absence of motion at extremely low power consumption. The farm will be divided into two fields: Ordinary field and Area field. Area field will be selected based on the received signal strength (RSSI) of the sensor node. The area based routing protocol will measure the received signal strength of sensor node and forward the signal if RSSI is within the required range.

DIFFERENT TECHNOLOGIES USED FOR SERICULTURE FIELD: A SURVEY

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Abstract: Sericulture insinuates the raising of silkworm to convey silk. India is the second greatest producer of silk by conveying 15% of the total silk creation nearby China. Temperature, Relative Humidity, Light power and Atmospheric air expect a basic part in the progression of sound silkworms and genuine urging should be finished by the requirements in each stage. This model resources and controls the regular factors like temperature, relative dampness. Sustenance feeder and arrangement sprayers are moreover mounted over. the residence. This is going to give mechanized control the agriculturists using remote sensors and microcontroller

IndexTerms - **Arduino Microcontroller, Temperature and Humidity Sensors, Motors.**

I.INTRODUCTION:

Sericulture is the science that manages creation of silk by rising of silkworm. Delivering silk is a protracted, complex procedure. Silkworm is a standout amongst the most significant tamed bugs, which produces lively silk string in type of cover by expending mulberry leaves amid larval period. The regular contrasts in the natural segments impressively influence yield of silkworm harvest, for example, cover weight, shell weight, and casing shell proportion. The inspiration for this task originated from the nations where economy depends on horticulture and the climatic conditions lead to absence of downpours and shortage of water. The ranchers working in the homestead lands are exclusively subject to the downpours and bore wells for water system of the land. The vast majority of the ranchers are little land holders and rely upon different wellsprings of pay. Regardless of whether the homestead land has a water-siphon, manual mediation by ranchers is required to turn the siphon on/off at whatever point required.

II.RELATED WORKS

2.1 "Automation in sericulture farm"

Sericulture is a standout amongst the most ideal approaches to procure more cash and it can give independent work and gainful returns. The current strategy for silkworm raising requires greater advancement. This undertaking gives a total security to the ranch and each procedure has experienced improvement with the assistance of electrical and gadgets parts. It encourages ranchers by selection of robotization in temperature and dampness control, feed supplement. The development of silkworm includes three phases. These stages require diverse temperature and dampness level. This is built up with the assistance of temperature and dampness sensors and PIC16F877A small scale controller, since the complete procedure is controlled. Different procedures like feed supplement, security and therapeutic wellbeing for silkworm are given via mechanization through this venture. Power splitter is utilized and is driven by motordriveL2930. With the assistance of information keys, inputs are given. This undertaking could be completed both naturally and physically. This task will help ranchers financially with the goal that that they may not invest more energy in the sericulture ranch.

Date of Conference: 2016

Authors: S. Vijayanand, E. Immanuel Bright, and L. Vijay Anand

ANTI-THEFT ALARM SYSTEM FOR FOREST TREES USING WSN

Abstract - Our life is dependent upon trees. There is a long association of man and trees. Since the hoary past man and trees have been the two major creations of nature. In his prehistoric days man turned to trees and plants to collect the things vitally necessary for his existence. Since that time man and trees have been interdependent. From past few years, it is seen that smuggling of environmentally and economically important species of trees such as Teakwood, Sandalwood, Pine and Rosewood has been dramatically increased. They are useful in medical sciences and cosmetics. Since they are costly, smugglers allegedly cut down many of these trees and transport them to their factories for commercial purposes. The most effective measure is "the implementation of a real time, wireless sensor network (WSN) and data logging system" using GSM module and three type of sensors, which will be an advanced and a cheap modern technology to make monitoring more robust, effective and feasible.

Keywords– WSN [Wireless Sensor Networks], Sandalwood trees, Zigbee, Arduino.

1. INTRODUCTION

From many days we are reading in the newspapers about the smuggling of precious trees like sandalwood, teakwood, rosewood etc. These trees are very costly. These are mostly useful in the medical sciences and cosmetics. Because of huge amount of money involved in selling of such tree woods illegal activity like smuggling is taking place. There have been several initiatives undertaken by different stakeholders and in particular by the Government of India, to mitigate these problems. These include the recruitment, training and deployment of anti-poaching watchers and private or government security guards across forests. Strict punishments for convicted offenders, as well as giving special incentives for anti-poaching activities were aimed for eradicating the menace. However, the punitive measures have remained largely ineffective. This problem isn't related to India only. China, Australia and African countries are also struggling with same issues. Putting cost in mind, Indian sandalwood costs 12000 to 13000 INR per kg whereas in international market Red Sandals command a high price of INR 10 core per ton. The Indian sandalwood tree has become endangered in recent years, and in an attempt to curb its possible extinction the Indian government is trying to limit the exportation of sandalwood. For an individual, maximum permissible purchase limit is not to exceed 3.8kg as per Government.

In order to avoid the smuggling, a system which consists of Micro Controller, accelerometer sensor, flame sensor, vibration sensor, GPS and GSM module is designed. Communication between the trees and server will be done by GSM modules and GPS is used to get the location parameters. At main server, there will be one authorized person who will receive the messages and can take actions accordingly to provide security. Tree cutting will be detected by accelerometer sensor. Putting this problem in mind, a system is designed which help us to achieve our goal.

2. LITERATURE SURVEY

This paper [1] proposes a microcontroller based anti-poaching system employing WSN technology, and MEMS accelerometer. WSN is widely used technology in remote monitoring applications. The micro-controller that is used over here is PIC16F877A. MEMS accelerometer senses the tilt of the tree. Sound sensor combines a microphone and some processing circuitry. It detects sound from silence and outputs digital trigger signal. Fire sensor is used to detect the rise in temperature. Smoke sensor detects the lubricant gases in the surrounding environment. GPS gives the latitude, longitude and altitude values. For the purpose of serial communication UART is used. Internet of Things is used to transfer data without requiring human to human or computer interaction and objects, animals or people are provided with unique identifiers.

Smart Guide at Museum

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Abstract - This paper is designed to avoid the human intervention in the museum by implementing a smart guide system. The model acts as an excellent device for automatic information access & reference in the museum. This ensures the enhancement of user experience at museums using RFID Technology by facilitating the freedom of selecting specific language. Here, the highlight of the model is that the device is a portable one which ensures ease of use and flexibility. Thus it is associated with a set of Voice Chips, so as to convey the pre-stored information about the artifact when the respective RFID tag is scanned with the RFID reader. In addition to this, Bluetooth device is also used to increase the number of users using the portable device.

Keywords - RFID - Radio Frequency Identification, Bluetooth.

I. INTRODUCTION

In the scientific world, Human hopes to do daily life activities easily and efficiently. Here arises the need of tools and machine which reduces the workload. This design proposal is aimed at increasing museum visitors and, boosting profits, and greatly reducing maintenance costs for museum operators. The purpose of the model stands for the same reason and provides genuine information about the monuments in a museum. It provides clear and simple structure to the user to access the information. Millions of people visit museum every year and with our smart phone, these people can gain much deeper information about the artifact. RFID has an ability to read hundreds of tags in few seconds which provides an advantage for tracking museum exhibits. Also, if RFID technology is correctly implemented, we can achieve 100% read accuracy which is advantageous over manual methods. The artifact is associated with three different RFID tags. Each RFID tag is assigned with a information in particular language. The design aims at the interaction between the user and specific artifacts by providing additional data sent wirelessly through the Bluetooth. When the respective RFID tag is scanned with the low frequency RFID reader, as the receiver pin of the RFID reader is interfaced with the transmitter of the Arduino Mega which in turn triggers the Mp3 module to fetch the information about the artifact in the form of audio signal to the user.

II. LITERATURE SURVEY AND SUMMARY

The paper proposes a new wireless radio frequency identification (RFID) repeater system, which is entirely a passive and cost effective with low frequency RFID tags of range about 125 kHz. After reading the tags, the RFID reader transmits the unique id using serial communication to the Arduino Mega using UART. The RFID reader can support bi-directional functionality such as reader-to-tag as well as tag-to-reader communication. The memory storage capacity of the RFID tag is up to 12 bytes [1].

The paper proposes about the different RFID tags used to access the information about the artifacts in favorable language of the user. This will retrieve the data when the tag is matched to the required artifact tag. Once the tag is matched, the next step is to transmit the information to the Arduino Mega 2560 the program for the design implementation will be loaded on this device and the system functionality will be verified which in turn drives signal to the Mp3 module in form of audio speech [2].

The paper proposes an application implemented on an Arduino development system using an ATMEGA 2560 microcontroller. The program controls outputs in sequential order and it is loaded onto the memory of the microcontroller. As it works sequentially each output is activated only when the system receives information about the previous command. The commands are highlighted by an optical LED display as an output function & circuit is provided with galvanic separation by the usage of op-to-couplers. The outputs could be analog in nature, but there should be analog-to-digital converter in turn to represent the information in digital form. The output of MC is used to control the Mp3 module [3].

The paper proposes about the working principle of Hc05 Bluetooth module in the domain of wireless communication and implementation of interfacing the Arduino Mega 2560 with the Bluetooth module. The information exchange between the two different nodes without any electrical conductor is called wireless communication. The Bluetooth module is one of the most used wireless communication protocols. The wireless communication increases its prominance due to the resolving the problem of mobility in the network topology. The coverage area of Bluetooth would range up to 10 meters with the data rate of 3 mega bits per second. It is best suited for the applications of short range radio communication between the different electronic devices. The Bluetooth module is even cost effective due to its availability is not only in Android or smart phones but also in the basic mobile phones. The connectivity speed of the Bluetooth module is quite economical. The main aim of this wireless communication protocol Bluetooth is low power consumption and ensures security for both stationary as well as mobile devices. The different power modes available in the Bluetooth module create an flexibility for an adaptive environment. It adapts the particular power mode depending on the requirement. The feature of security in Bluetooth is highly efficient due to its authentication capability using encryption keys. The appropriate pin codes should be used in order to pair the devices for the exchange of information [4].

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A SURVEY ON ELECTRONIC VALVE WITH QUANTITATIVE CONTROL AND TO AVOID REVERSE FLOW OF BLOOD

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Abstract: Automated glucose flow control and monitoring system is about monitoring the flow of glucose automatically. Whenever if patients got too much tiredness that time nurse will put the glucose for the recovery of patients. While putting the glucose bottle she only has to control the flow of glucose amount. If the glucose bottle got empty means nurse should be there to replace or remove the bottle. But this won't happen every time. Incase nurse is not there that time patients body blood will into the bottle in reverse direction.

Index Terms – **Arm controller, Wi-Fi module, Load cell, Temperature sensor**

I. INTRODUCTION

In order to achieve the function of the quantitative control in a variety of flow systems, a new type of electronic valve with quantitative control is designed. The valve collects flow pulse signal from the impeller Hall flow sensor. Micro controller chip is used to calculate the flow value and cumulate the total value. It`s also used to control relay in order to real-time control solenoid valve. Electronic valves have been widely used in production and daily life. Now electronic valves are moving towards four directions of streamlining, intelligent, generalization and customization. Except for switch function of basic solenoid valve, dedicated solenoid valves also have some kind of special function or apply to some special occasions, such as gas solenoid valves, steam solenoid valves, oil solenoid valves, refrigeration solenoid valves, high temperature solenoid valves and explosion-proof solenoid valves and so on.

In this project by interfacing a load sensor to the ARM micro controller, this load sensor will sense the weight of the chemicals and displayed it on the LCD display. In the next stage we are giving a flow input in ml/sec, in one second a particular quantity of chemical should go to the outlet this will be controlled by a solenoid valve.

II. LITERATURE SURVEY

Electro-hydraulic proportional control system is an interface linking electronic system and engineering. power system. The electronic-hydraulic converter often consists of a proportional valve and its controller. Proportional valve has been widely used in electromechanical integration systems, in which the performance of its controller plays a very important role. At present, proportional valve controller is commonly designed by separated components and operational amplifiers, which make it has complicated circuit, simple function and poor flexibility. In addition, it is more fatal that this circuit has not any interface to be led to any computer control system or network control system, so that this controller is not able to meet the new needs of modern industrial control [1].

In the medical field and in biotechnology, a new type of micro pump that can supply micro liquid flow has urgently been demanded and by developing a novel type of micro pump that has the characteristics of flexibility, driven by a low voltage, good response and safety in body. This micro pump consists of two one-way valves, a pump chamber made of elastic tube, and a casing. The overall size of this micro pump prototype is 18mm in diameter and 54mm in length. Characteristic of the micro pump is measured. The experimental results indicate that the micro pump has the satisfactory responses, and the proposed micro pump is able to make a micro flow and is suitable for the use in medical applications and in biotechnology[2].

Valveless micro pumps are extensively used in micro fluidic systems, including health care monitoring and diagnostic devices, computer devices, and so on, as it forms the critical component in the micro system for precise and controlled fluid handling. The design and development of a novel, significantly low cost, planar micro pump with piezoelectric polymer composite, consisting of lead zirconate titanate and polyvinylidene fluoride, for actuation. The novelty lies in the synthesis and use of the piezoelectric polymer composite as the actuating mechanism and the diffuser/nozzle design around the line of appreciable stall to achieve maximum flow rate for the given boundary conditions. The parametric stud on the micro pump geometry, including, chamber depth and diameter as well as diffuser/nozzle was carried out by using numerical simulations in

Ethical Driving System

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Abstract —Technology is being used in all aspect of life to implement the smart system for daily life which ensures easy, simple and secure method of completing the job. This paper proposes designing and development of anti-theft as well as driver surveillance embedded system that uses biometric authentication to access the vehicle. This system scans the fingerprint of a person trying to get access of vehicle and compare with authorized person's thumb print image which checks for driving license of the person using centralized database that is updated by RTO and then allowing or denying access. In the case of denial of vehicle access notification is sent to the owner and respective action is decided by her/him. Further if the access is accepted the key latch is opened using DC motor mechanism and engine is started. Adding to which the the owner can authorise people of his convenience by attaching their information in his database provided at the RTO. The project also proposes automatic penalty collection on those who have lapse data such as vehicle insurance, if vehicle is not undergone emission test. This is implemented with the help of OCR number plate recognition. This will help to catch thieves or any unauthorized access.

Keywords— Raspberry pi 0 ; Raspbian; camera ; Biometric sensor ; Vehicle security-alert; Email ; DC motor.

I. INTRODUCTION

In olden days most of the people are illiterate. So in many documents their fingerprints are taken as a signature. But now a day's many people use their signatures instead of thumb impression, because of the literacy. To avoid forgery, the government has implemented a finger print system. The new field of biometric technology, the way to identify people through theirs physical characteristics is attractive. Biometric technologies have great potential in various technical fields such as network security, public security, and financial industry systems. Biometrics has grown into an independent industry, whose standardization is making rapid progress with a large number of standards. These standards have focused on various aspects of biometric industrialization, including data formats, application program interfaces, security issues, system profiles, and evaluation methodologies. Vehicle analysis has attracted much attention recently. It is widely used in various vehicle-centered applications such as intelligent traffic and transportation systems, large-scale vehicle searches, intelligent parking, automatic toll collection and number-plate forgery detection. In intelligent infrastructure systems, the license plate numbers must be in machine-encoded text for easier store and processing, so OCR plays the important role in extracting data from license plate image. Because the complexity of OCR algorithms, the traditional methods usually use a combination of high resolution camera and powerful computer to perform recognition. Extract license plate number in machine-encoded text type from image captured by available camera of that device. Some image processing techniques are used to crop the license plate from image including noise reduction, adaptive binarization, and skew correction. Based on the properties of letters/numbers in the plate, we can separate each of them for recognition. We considered OCR methods: Tesseract engine

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Advanced Driver Scrutiny System

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Abstract: ***Today due to rapid increase in vehicles, there is an exponential increase in crime and accidents hence it has become challenge for governments to limit such crimes especially from professional thieves. This paper proposes designing and development of anti-theft as well as driver surveillance embedded system that uses biometric authentication to access the vehicle. This system contains camera which take the fingerprint of a person trying to get access of vehicle and compare with authorized fingerprints in server and then allowing or denying access. In the case of denial of vehicle access, notification is sent to admin reporting the unauthorized access. Camera will capture the images of the number plate and check for the lapsed data, fine is deducted if any lapsed data is present from the linked account. This will help to catch thieves, also allows the government to monitor vehicle information. The recent work on proposed system is written in this paper.***

Proposed system is conceptually simple, providing low cost less complex, highly reliable and most importantly user friendly to implement as well as easy handling for a lay man. The system is designed and developed using raspberry pi, high resolution camera, finger print sensor and open source software.

Keywords: Raspberry pi 3; Raspbian camera; vehicle security-alert; SMS; driver surveillance and alert, optical character recognition.

I. INTRODUCTION

In biometric authentication-based vehicle door locking system, the biometric authentication plays an important role to provide high security. Nowadays security is very important in order to keep our data confidentially from unauthorized persons. The main aim of this paper is to protect the car from unauthorized people by using the unique id that is finger print authentication. At the place of car door locking system, the finger print scanner is placed to lock and unlock the doors in place of the conventional door locking system. Which gives more protection to the car owner. The entire system is controlled by the Raspberry pi 3 processor. Optical character recognition (OCR) which plays chief role in automatic number plate recognition is among the main aspect of research in artificial intelligence and computer vision and have evolved greatly since its inception. In the recent past, rapid population growth led to a blast in multiplicity of vehicles which make use of the intelligent traffic control highly demanded. This requires extremely strong license plate recognition methods, presenting super-fast results while maintaining its best performance in so many different applications as exuberance of vehicles grows rapidly. They can form the bases for automatic systems steering the access to protected areas, e.g., a car park, route traffic monitoring systems, offences, and crimes on public routes. Extraction of license plate regions out of vehicle images is a challenging task for they are extremely varied in size, shape, color, texture, and spatial orientations of license plate regions in such images. Besides, some additional problems may occur during the recognition procedure along with the above mentioned difficulties such as similar shapes to license plates, bumper stickers, and cluttered backgrounds.

Our VLP Recognition system was based on the following model:

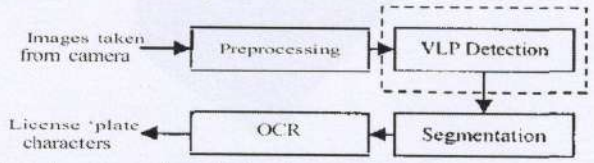

Fig 1. An automatic vehicles' license plates Recognition system

Web services are moving towards mobile world as a new emerging technology for applications communication. Mobile devices can operate as service consumers or service providers. Most approaches nowadays support consuming web services from mobile devices. This paper introduces a new architecture called "Web-based SMS Passenger Application" for providing mobile web services for web applications. In this paper, we proposed a news alert SMS system that distinguishes itself in the aforementioned two points; it is free and novel in that SMS alerts are sent whenever a predefined event is triggered.

The rest of the paper is organized as follows: Section II contains System design, Section III comprises of methodology and Section IV comprises of Applications and Section V comprises of Applications Conclusion.

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Smart Voting System

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ABSTRACT:- Elections are the fundamental defining characteristics of any democracy that upholds the very meaning of a system that is being governed by the people expressing their choices or articulate opinions in the form of voting. Now the voting mechanisms have evolved from leaps and bounds of simple hand written ballots to online voting systems. This project aims to build a Smart voting system using finger print recognition technology that allows any voter in INDIA to cast the vote to their respective constituency from anywhere in INDIA by going to their nearest voting booth in the place of stay. This project is used to maintain High level biometric security. The voter details are stored in Server database. Before entering the voting process that person should place the finger on to reader, the finger print scanner will read the image of fingerprint. After reading the details the microcontroller sends the details to the Web application through serial port. The Web application software maintains the person database. In "Smart Voting System" once a person casts his vote, the webpage gives a confirmation message that the vote is successfully registered and if a person's age is less than 18 years then the LCD displays the message that he is not eligible to vote as his age is less than 18 also if a person tries to vote once again using his fingerprint, the web page will display that the vote is already casted successfully. The Election commission can login and check the results of the Election after the voting process is completed, also it can reset the votes and the update the candidate results every year.

Key Words: Aadhar, Biometric, Electronic voting machine, Fingerprint and Voting system

I. INTRODUCTION:-

India is a Democratic country every citizen above 18 years of age is eligible to elect their leaders. When a person's age becomes 18 has the constitutional right to voluntarily enroll for voter id given by the Indian Election Commission (IEC). Voter ID is only used for electing purpose once in 5 years or on occurrence and voter card will not provide any government facility like Aadhaar, Citizens miss out to enroll for Voter card and even after getting the Voter card during the election time voter may neglect voting because voter is living in some other region which is far from his resident and voter is not ready to travel such a distance. To avail constructional voting right to every citizen, Smart Voting System is the best solution.

Nowadays with the rise in population the need for checking the validity of the voters has become a problem. As the modern communications and Internet, today are almost accessible electronically, the computer technology users, brings the increasing need for electronic services and their security. Usages of new technology in the voting process improve the elections in natural. This new technology refers to electronic voting systems where the election data is recorded, stored and processed primarily as digital information. In the past, usually, information security was used mostly in military and government institutions. But, now need for this type of security is growing in everyday usage.

II. PROPOSED SYSTEM:-

This project aims to build an electronic voting machine using finger print. This project is used to maintain High level biometric security. The voter details are stored in database in computer. Before entering the voting process that person should insert the finger on to reader, the finger print scanner

SMART GREENHOUSE MONITORING SYSTEM

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Abstract: Agriculture is the major occupation sector of our country where 70% of India's revenue comes from agriculture. The advancement in the field of embedded technology is a boon in the field of electronics and is mind-blowing. Embedded technology plays a vital role in designing of circuits such as sensors that together form a network for various application domains. The objective of this project is simple design, easy installation process, microcontroller based circuit for specific tasks to monitor and record the temperature readings, and sunlight from the natural environment are continuously absorbed and controlled in order to optimize them to achieve maximum plant growth and yield and to implement growth of crops in cost friendly manner. It involves interfacing of various sensor networks with other components to monitor the intensity of light, aeration and water draining process effectively in a greenhouse by actuating the required parameters of the subsystem.

Index Terms - Embedded system, agriculture

I. INTRODUCTION

India is an agricultural dependent country where 70% of the population depend on agriculture for their livelihood. In this project we are proposing the model which prevents spoilage of crops due to heavy or uneven rainfall, drought and other natural calamities by providing an artificial environment. This objective is achieved with Embedded System design using GSM technology for communication purpose. The actual concept of this project is inhibiting the growth the crops by covering the field automatically, save the collected rain water and use automated sensor network that decides and controls the entire environment by updating the user. This method greatly reduces the human purpose, time constraints and operates effectively in real time environment. WSN is a collection of sensor and actuator nodes linked by a wireless medium to perform distributed sensing and acting tasks. The sensor network collects information and provides a network with the Computer system, which is referred as a base station. According to the data gathered, the base station decides the next process and further the actuator performs required operation in the system. In this process users control the data obtained from the sensor network through communication networks from a single place. There are many situations in which the application of the WSN is preferred, for instance, environment monitoring, product quality monitoring, and others where supervision of big areas is necessary. To achieve this we are interfacing bidirectional dc motor and GSM module with ARM7 LPC2148.

II. METHODOLOGY

In hydroponics green farming using IOT the plant growth is cultivated without soil. The nutrients for the plant are supplied to the roots in a solution which can be either static or flowing through wood chips, glass wool or sand interface. In this method the pH and the electric conductivity of the nutrient medium is monitored constantly and is well maintained and the system is further connected to the sensor automation network which would be turned when the user provides the sensor parameters through mobile app which would be further updated to cloud that makes the computer take its own decision using IOT technology. The farmer is updated back regarding the changes happened in the environment and hence a greenhouse farming is developed artificially using hydroponics, sensor network and IOT techniques [1].

In [2] this paper for the greenhouse management a free standing structural house is utilized here the entire structure is created by highly resistant glass and the roof is triangle sized and the sidewalls monitor the air circulation effectively the arduino microcontroller AT mega 328 is used for controlling different parameters of plants in a certain environmental conditions the LDR device is used to verify the light

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Plant Identification Methodologies using Machine Learning Algorithms

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Abstract:- **Plants are the backbone of all life and there are about 40 million plant species on Earth providing us with oxygen, food and many essential products helping for the existence of human life. A good understanding of plants is essential to help in the process of identification of new or rare plant species to improve the balance in the ecosystem. The matching of specimen plant to a known Taxon is termed as plant identification which implies assigning a particular plant to a known taxonomic group by comparing certain characteristics. Plant identification which has evolved over hundreds of years ago depends on the criteria and the system used. As identification enables us to retrieve the appropriate facts associated with different species to serve a particular kind of application, plant identification is essential. This paper includes various methodologies of numerous authors who have worked on different plant identification techniques.**

1. INTRODUCTION

Plants are of central importance to natural resource conservation. Plant species identification provides significance information about the categorisation of plants and its characteristics. Manual interpretation is not precise since it involves individual's visual perception. Sampling and capturing digital leaf images are convenient which involves texture features that help in determining a specific pattern. The most important feature to distinguish among plant species are venation and shape of a leaf. As information technology is progressing rapidly, techniques like image processing, pattern recognition and so on are used for the identification of plants on basis of leaf shape description and venation which is the key concept in the identification process. Varying characteristics of leaves are difficult to be recorded over time. Hence it is necessary to create a dataset as a reference to be used for a comparable analysis. Leaves are used in most of the plant identification methodologies due to their attractive properties and availability throughout the year.

2. METHODOLOGIES

The paper[1], describes image processing technique for identifying ayurvedic medicinal plants by using leaf samples. Forests and wastelands sources for over 80% of ayurvedic plants. There exists no predefined database of Ayurvedic plant leaves. A set of leaf images of medicinal plants were collected from the botanical garden. To improve the efficiency of plant identification system, machine learning techniques can be used over human visual perception as it is more effective. Weka is a collection of machine learning algorithms for data mining. It contains feature selection, regression, classification and pre-processing tools. Graphic user interface is used for accessing the functions. This proposed scheme uses some of the classifiers such as Support Vector Machine (SVM) and Multilayer perceptron (MLP). For reverting and classifying of data SVM is used. MLP is an artificial neural network which helps in routing the input data of one set to appropriate output pertaining to another set. The highest identification rate in SVM is 98.8% and 99% obtained in MLP.

The paper[2] discusses the Computer-assisted android system for plant identification based on leaf image using features of SIFT along with Bag of Word (BOW) and SVM as classifiers. This identification method for android involves 8 stages. It employs client-server model of architecture. Server involves 2 main activities. The first activity is to train the SVM classifier to generate feature vector required for classification and then save it. The second activity is generation of feature vector with the help of photographs uploaded. These are uploaded by android client. The generated vector is used for identification by the SVM classifier. The process of training SVM involves SIFT descriptors along with Bag of Feature model that helps in generation of classifier. The generation of classifier involves 4 steps. In the first step, using the reduction method of data space SIFT descriptors are extracted from each leaf image belonging to the training data set. The second step is to cluster all the extracted features into feature bags using BOW methods. In the next step bow histograms are generated by taking all the images in the training dataset into consideration. In the final step all the histograms are passed to the SVM as the classification feature vector. SVM creates and saves the classifier in the server storage. The RGB image is converted into a greyscale image before extracting SIFT feature points as a pre-processing step. Following which involves extraction of key point and generating of descriptors by using SIFT algorithm that involves CBIR (content-based image retrieval) algorithm. Using k-means clustering method all the collected SIFT features from training dataset are clustered into several clusters. A histogram represents each image in the training dataset. Histograms are classified using multi-class linear support vector machine. Android implementation involves client application that consumes algorithm of leaf recognition. Dynamic Link Library (DLL) application is used to invoke

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SURVEY ON RESEARCH CHALLENGES AND APPLICATIONS OF UNMANNED MARINE ROBOT

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Abstract **–** The security at marine borders are important and crucial. It is very difficult to continuously monitor enemies at marine borders. Also, marine exploration is very important in understanding the global climate and environmental changes which helps in research areas for the purpose of various data collection, weather monitoring, pH sensing. Using these data disaster prevention like tsunami and earthquakes can be done. In the absence of garbage disposal facilities, the practice of dumping garbage into nearby water bodies has become quite common in recent years and has posed long-term negative impacts on the environment. Present technologies make use of batteries as the source of power. Once the battery dies, replacing them every time becomes difficult. The challenges of replacing the battery needs to be overcome. In this paper we present the literature survey on research challenges and applications of unmanned marine robot in order to overcome the drawbacks.

Index terms **- WSN [wireless sensor node], ASV [autonomous surface vehicle], floating waste scooper robot, cloud based surveillance system, Arduino, Zigbee, Bluetooth module**

I. INTRODUCTION

Today, many military organizations take the help of military robots for risky jobs. The robots used in military are usually employed within integrated systems that include video screens, sensors, grippers, and cameras. Military robots also have different shapes and sizes according to their purposes, and they may be autonomous machines or remote-controlled devices. There is a belief that the future of modern warfare will be fought by automated weapons systems. Further the robots can also be employed for the applications of weather monitoring, water pH monitoring, cleaning of water bodies.

Military robots are usually associated with the following categories: ground, aerial, and marine. Most military robots are still pretty dumb, and almost all current unmanned systems involve humans in practically every aspect of their operations. It can also pave the real way to massive use of advanced mobile robotics in human societies, military systems including and particularly.

The paper involves how different methods can be combined to implement a marine robot with other applications like weather monitoring, water monitoring, cleaning of water bodies, etc.

II. LITERATURE SURVEY AND SUMMARY

Paper [1] describes the Rapid Environmental Picture (REP) studies which made use of multiple aerial unmanned vehicles (AUV), autonomous surface vessels (ASV), and unmanned aircraft systems (UAS), as well as manned ships. The goal of this study was to demonstrate communication and coordination among these systems. Maritime law enforcement was their second goal. To demonstrate communication between AUVs and ASVs using

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Solar Powered Unmanned Marine Robot using Radar System

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Abstract - **Monitoring the marine borders is a very difficult task and the security at these borders is of high importance. In order to understand the global climate and environmental changes, marine exploration is necessary. This helps in research areas for the purpose of various data collection, weather monitoring, pH sensing. Using these data disaster prevention like tsunami and earthquakes can be done. Garbage disposal facilities are absent in many places. Hence the practice of dumping garbage into nearby water bodies has become a major issue. This type of dumping causes a negative impact on the environment. Today's existing systems provide the applications of cleaning, weather monitoring, pH sensing, etc. using batteries as their only source of power. Replacing the batteries from time to time becomes a major drawback. To overcome existing system drawback and to provide multifunctioning, we are implementing smart robotic vehicle which provides live video acquisition, data acquisition to understand climatic changes and radar detection using solar power also as a source of energy.**

Keywords - WSN [wireless sensor network], conveyor belt, cloud based surveillance system, Arduino, Bluetooth module, wireless camera, solar panels

I. INTRODUCTION

Today, many organizations make use of robots for carrying out risky or tedious jobs. Military organizations use robots within integrated systems that include video screens, sensors, grippers and camera. As per the application, robots are of different shapes and sizes, and may be either autonomous or remote controlled machines. Robots are also used in many other applications such as weather monitoring, pH sensing and cleaning of water bodies.

Grounds, aerial and marine are the groups into which the military robots can be classified. Since all autonomous actions cannot be completely controlled by the machine itself, thus involvement of humans in practically every aspect of their operation is required.

All the applications employed in the robot work on the energy from the batteries. But when these batteries are drained out, it is hard to replace them from time to time. In order to overcome these issues, in this paper, we have developed an autonomous robot which is cost effective and uses the solar power as the source of energy.

II. LITERATURE SURVEY

In papers [1], [2], [5], [8] - [10], WSN [Wireless Sensor Nodes] are used in order to acquire the various data like pressure, humidity, temperature and pH which are used to predict and analyze the various changes in the environmental climate and are also used for water monitoring. In paper [6], the usage of cloud based surveillance system is used in our model for storing the data from WSN in the cloud. In papers [3], [4], RADAR system is used and this concept is taken in our model. The radar system uses the sonar with a servomotor to build a radar prototype. Whenever an object is detected the video is recorded using a wireless camera. This idea of using a wireless camera with a system which can be operated from a remote location was taken from the home automation features as in paper [10]. In paper [7], a floating waste scooper was developed which used a conveyor belt in order to remove the floating waste from the water bodies. This method of using a conveyor belt is adopted in our robot model.

III. METHODOLOGY

The system makes use of an Arduino Mega 2560 processor to which an ultrasonic sensor, Bluetooth module, pH sensor, temperature, humidity and pressure sensor BMES

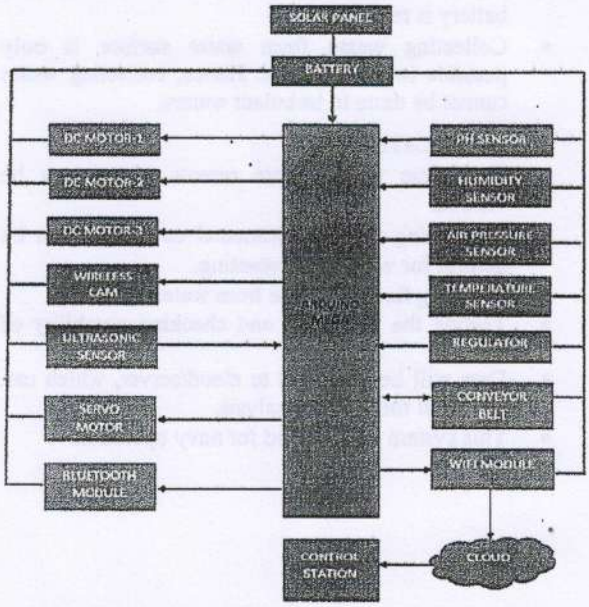

Fig. Block diagram of solar powered unmanned marine robot

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A Survey on Robotic applications in Surveillance and Rescue-Aid

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Abstract: ***Whilst a natural catastrophe like an earthquake hits a populated place, rescue groups should get a quick review of the scenario that allows you to identify feasible places of sufferers, which want to be rescued, and threatening locations, which want to be secured. With a view to offer the rescue facility, superior robots embedded with sensors are in top awareness of attention. Many structures of robots have been proposed and implemented in the literature. This paper provides a review of the various robots used for surveillance and disaster rescue aid. The paper discusses the unique features, pros and cons of each implementation. The key gaps and future directions are discussed.***
Keywords: Robots, Surveillance, Rescue aid, Disaster-Management, Snakebot.

I. INTRODUCTION

Over the last few years, many people have lost their lives because of earthquakes [1] and finding the survivors and evacuating them could be a tedious mission as human intervention is constrained in a certain disaster prone areas and lack of equipment pose a vital hurdle. As soon as a natural catastrophe like earthquake hits a geographical vicinity or accidents like gas leakage,blasts etc.., takes place in a building, rescue teams have to get a fast yet precise of knowledge of the location of victims and threatening locations to be secured. The chances of the victims surviving after a disaster exponentially reduces with passing time. Hence quick action is needed. In this direction, robots have proven to be a great aid to the rescue missions [2]. The rescue missions dictate speedy response, accuracy in assessment and quick and efficient measures. This requires that the first hand information provided regarding the disaster site is correct and reliable.

Today, rescue teams get in catastrophe zones even as not knowing what lies beforehand. This conjointly places their lives in danger [3]. The maximum essential undertaking that rescue teams face is the accessibility. A catastrophe- hit area is usually very difficult to enter or access. Hence acquiring necessary data about the site of disaster and status of victims or survivors is an even bigger challenge. Thereis a high demand on the tolerance and abilities of the robots deployed at disaster sites because They will have to truly task into unknown and risky territory humans probably cannot. Hence robots with an ability to be able to fit into narrow openings, withstand the unfavourable conditions at the disaster sites, move freely across the uneven and rugged pathways are needed. Superior robots embedded with sensors and diverse features are the centre of attention of researchers for disaster control and rescue aid.

II. LITERATURE REVIEW

Regardless of superior technology, rescue operations in the course of a disaster are often slow in mass panic. The reasons can be narrow inaccessible spaces, uneven terrain surfaces and debris.

Catastrophe surveillance advancements in the form of a marsupial group [4]. The robot consists of a large robot(referred to as mom)and one or extra smaller robots (further referred to as micro rovers) for the mission. The mom is equipped with electricity wheels chassis, an on board pc is attached and a radio ethernet hyperlink, GPS, six sonars for navigation, inclinometers, and a panning sensor pod including two cameras plus a thermal sensor for detecting survivors. The authors have delivered a microphone for hearing the survivors and a video transmitter to ship snap shots directly to the resuce team.The mom can also bring a payload of batteries. The micro rover can get this additional power supply via a tether. The batteries are retained close to the deployed micro rovers: this keeps the tether from going askew when it rubs against sharp objects [4]. As a substitute in [5],a tetherless micro rover can range for longer durations of time compared to [4]. Micro rover may attempt to reach the deepest indoors due to the fact this is wherein survivors are anticipated to be. It is a semantic seek. While she (the mother) travels, she uses sensor fusion to discover a survivor, based totally on affordances (the possibilities that the surroundings offers the robot) inclusive of imaginative and prescient cues, sound and heat. This opportunistic search is incomplete due to the fact the robot is processing sensor statistics accumulated as a derivative of navigation in place of from an energetic seek [5].

BIOMORPHIC HYPER-REDUNDANT ROBOT FOR DISASTER SURVEILLANCE

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Abstract : Whilst a natural catastrophe like an earthquake hits a populated place, rescue groups should get a quick review of the scenario that allows you to identify feasible places of sufferers, which want to be rescued, and threatening locations, which want to be secured. With a view to offer the rescue facility, superior robots embedded with sensors are in top awareness of attention. Many structures of robots have been proposed and implemented in the literature. The paper discusses the detailed implementation a compact and an efficient robot embedded with vital sensors and a live object detection functionality during the video surveillance. An RF transceiver module is used by the rescue team to control the bot (the transceiver has a 1km range LOS). The bot can get into the narrow spaces due to its compact physical structure and it pitch and yaw motions apart from the usual locomotion is an add on to the bot's functionality. A night vison camera capable of object detection is also present in this robot, the video output can be obtained using an Android application. These vital features and functionalities help the rescue team to quick rescue operations.

IndexTerms - Robots, Surveillance, Rescue aid, Disaster-Management, Snake-bot, IoT, Object detection, Live video streaming, Night Visiòn Camera, Radio frequency communication..

INTRODUCTION

Over the last few years, over 75% people are killed due to earthquakes and reaching the survivors and evacuating them is a tedious task as human intervention is restricted and lack of equipment posed an important hurdle. Advanced robots embedded with sensors and numerous functions are center of attention of researchers for disaster management to rescue human life.

Hyper redundant robot is a diminutive crawler. The major reason for using robots for rescue operations is that human intervention in a hazardous zone is dangerous. The robot is embedded with a gas sensor that detects presence of hazardous gases emitted so that the rescue team can be well prepared for the same and avoid or prevent the flame entering the area. The PIR (Passive Infra-Red) sensor is used to detect human beings trapped under the debris, the data is reported for consideration of further assistance by the rescue team. Gyroscopic sensor is used check the stability of the robot just in case it has toppled while moving on an uneven surface, the sensors output give us the X, Y and Z co-ordinates that can be used to determine the robot's stability. The robot has a live camera with Day and Night vision, enabled using IR lights around the camera. Live streaming of data is achieved over wireless link. The video output is available to the rescue team over an android app. The unique features and degrees of freedom of our robot will ensure better surveillance during natural disaster. The major reason for using robots for rescue operations is that an area of inspection is dangerous and hazardous for human intervention. The robot here is also embedded with flame sensor that can detect the flame and thereby giving a message to the rescue team the presence of the flame. The speaker is embedded in the robot to give a message from the rescue team to the rescuee. The robotic movements are controlled using an RF transceiver module. Fig.1 shows the general architecture and I/O diagram of the robotic system.

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RESEARCH ARTICLE

A SURVEY ON RASPBERRY PI BASED READER AND SMART ASSISTANCE FOR VISUALLY IMAPIRED PEOPLE

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ABSTRACT

The paper propose a survey conducted on the various methodologies and electronic system used to guide the blind people. Addressing the issues of People with Visual, Hearing and Vocal Impairment through a single aiding system is a tough job. Many modern day researches focus on addressing the issues of one of the above challenges but not all. The work focuses on finding a unique technique that aids the visually impaired by letting them hear what is represented as text and it is achieved by the technique that captures the image through a camera and converts the text available as voice signals. The paper provides a way for the people with Hearing impairment to visualize / read which is in audio form by speech to text conversion technique and we also provides a way for the vocally impaired to represent their voice by the aid of text to voice conversion technique. All these three solutions were modulated to be in a single unique system.

INTRODUCTION

Over 285 million people are visually impaired worldwide and 39 million of them being blind and 246 million have low vision, 90% of the world's visually impaired live in developing countries. The blind traveler should depend on any other guide like blind cane, people information, trained dogs, etc. but in today's fast people are busy in their own life and business hence they are not finding time to help others. Even though there are many electronic aided system present in market to help the blind people to live independently it may be expensive because of this we are proposing a system with low cost and many advantages where a middle class person can buy this device. A Smart assistance system concept is devised to provide a smart electronic aid for blind people. Blind and visually impaired people find difficulties in detecting obstacles during walking in the street. The system is intended to provide artificial vision and object detection, real time assistance via GPS by making use of Raspberry Pi. The system consists of ultrasonic sensors, GPS module, and the feedback is received through audio, voice output works through TTS (text to speech). The proposed system detects an object around them and sends feedback in the form of speech, warning messages via earphone, alerts with vibrators in waist level and also provides navigation to specific location through GPS. The aim of the overall system is to provide a low cost and efficient navigation and obstacle detection aid for blind which gives a sense of artificial vision by providing information about the them, so that they can walk independently.

RELATED WORKS

Smart stick for the blind and visually impaired people: Blind people face many types of hurdles in doing their everyday routine works. The visually impaired find difficult in travelling from one place to another such as travelling in bus, train, or crossing roads etc. They depend on others to do their daily works. This paper proposes a smart stick which guides the user by sensing obstacles in the range of stick. The obstacles are detected using the ultrasonic sensors installed on the stick. The microcontroller retrieve the data and it is passed to the vibrators which indicate the user about the obstacles on the way.

Advantages

- They are efficient and low cost
- The high frequency, sensibility and penetrating power of the sensor makes it easy detect objects.
- This smart stick is a simple, cheap, easy to handle electronic

Disadvantages

- The sensors can detect objects only at certain ranges.
- Objects or any obstacles near the head cannot be detected.
- The size of the stick is large which makes it difficult to use

SMART AMBULANCE WITH PATIENT MONITORING: A SURVEY

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Abstract: Emergency medical response in India is lagging behind other countries. This is partially because of lack of technology implementation at ground zero. To address the issue, we are introducing smart ambulance system. It would take India to competitive position in emergency services around the globe. In this system, we will be using RF technology for traffic light control for Ambulances. And patient monitoring will be done with temperature monitoring, heart beat monitoring, respiration monitoring parameters. If any parameters are varied the information will be sent to the hospital using GSM technology.

Index Terms - Global System for Mobile (GSM), Wearable Sensors, Health Monitoring

I. INTRODUCTION

Safety is a necessary part of man's life. Due to the accident cases reported daily on the major roads in all parts of the developed and developing countries, more attention is needed for research in the designing an efficient car driving aiding system. It is expected that if such a device is designed and incorporated into our cars as a road safety device, it will reduce the incidence of accidents on our roads and various premises, with subsequent reduction in loss of life and property.

The Automation for Vehicles is the current trend, the project presented here is one such idea in automating the movements of important vehicle like Ambulance & Fire Fighting Vehicle etc., here the idea is to ease the movement of Ambulance by detecting its proximity to the traffic light, if the traffic light is Red, then automatically it will be turned to Green [6]. In the ambulance any parameters of the patient are varied means, respective information will be sent to hospital using GSM technology [5]

II. LITERATURE SURVEY

Kasim M. Al-Aubidy et al. [1] proposed a monitoring system. The main objective of this research was to design and realization of real-time monitoring and alarming system for patient health, this was done especially for patients suffering from diseases during their normal life. The proposed system had an embedded microcontroller connected to a set of medical sensors and a Bluetooth module. Each patient is considered as a node in a wireless sensor network and connected to a central node installed at the medical center through an internet connection. The embedded microcontroller checks if the patient health status is going well or not by analyzing the scanned medical signals. If the analysis results are abnormal, the embedded unit uses the patient's phone to transmit these signals directly to the medical center. In this case, the doctor will send medical advice to the patient to save his/her life.

Deepesh K Rathore et al. [2] proposed a wireless system which enabled real-time health monitoring of multiple patients. The proposed system monitors the heart rate and other vital signs of the body. The heart rate was measured through a Photoplethysmo graph. A transmitting module was attached which continuously transmited the encoded serial data using Zigbee module. A receiver unit was placed in doctor's room, which receives and decodes the data and continuously displays it on a User interface which is visible on Personal computer. Thus doctor can observe and monitor many patients at the same time. System also continuously monitors the patients data and in case of any irregularities are found in the condition of a patient, the alarm system connected to the system gives an audio-visual warning signal that the patient of a particular room needs immediate attention. In case, the doctor is not in his chamber, the GSM modem connected to the system also sends a message to all the doctors of that unit giving the room number of the patient who needs immediate care.

Malik Tubaishat et al. [3] proposed a system which uses wireless sensor network to decrease vehicles average trip waiting time on the road. They studied the performance of using one sensor and two sensors and designed corresponding controllers. In the case of one sensor we developed two models; a non-occupancy detection and an occupancy detection. Non-occupancy detection detects passing vehicles only whereas, Occupancy detection detects vehicles that pass the sensor or stop at it. In both methods, changing of the sensor location relative to the traffic light's location was done. Then they used two sensors to calculate number of vehicles waiting or approaching a traffic light. In analysing the simulation, they found that the distance between the two sensors does not affect the performance of our design. Hence, placing both the sensors close to each other's produce the best performance in terms of quality of the data and reduce energy consumption which leads to extending the life time of the WSN.

SMART CARGO MONITORING AND SECURITY SYSTEM

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Abstract: Today's world 90 percent cargo is transported through containers which play a prominent role in the world trade. However, there is an issue related to security of cargo containers resulting in huge loss in the world market. In this paper new emerging technologies have been explored for creating a new level of security by proposing a centralized monitoring and security system to ensure the safety of the high valued containers. Here real time tracking system for the cargo using RFID tag, GPS and wireless sensors networks are used for the efficient security of containers. The RFID tags used are sealed at all the openings of the container. The RFID reader and GPS tracker are used for testing grounds which are wirelessly connected to the databases which secures the container from any theft. A GSM module is also used for sending SMS or any other notifications in real-time.

Keywords—Global Positioning System (GPS); Global System for Mobile (GSM); Radio Frequency Identification (RFID) tags.

I. INTRODUCTION

There is huge export of cargo and it is estimated that there are 20 million containers transported each day [1]. Also, there is huge pilferage in capital of cargo industries due to pilferage from the cargo containers which is used in transporting huge amount of manufactured projects from one place to another. Due to this the authorities whether guilty or not comes under the light of suspicion. This results in huge loss to industries.

Tracking of cargo can be done not only using passive RFID trackers but also active RFID trackers for long distance communication [2]. There are two RFID based tracking proposed where systems work on Relevant Time Tracking System (RTS) and Real Time Location and Tracking System (RTLS) [3]. The implementation of the system is very complex and expensive. This is resolved by tracking of the container by GPS for maintaining precise location information and RFID tags are used for sealing of the containers [4]. It is prominently dependent of internet and if the server goes down this leads to system failure.

GPS is used for monitoring the cargo and the data is sent to authorized person or the centralized monitoring system where tracking of container carrying cargos in real-time. GPS technology is used to keep the track of cargo's geographical positions till cargo reaches its destination [5-6]. GPS is usually used for tracking cargo for long distance transportation but for short distance GPS is not accurate.

Also, the network of sensors are used to tracking individual objects as well as to establish communication links between the sensors [7].As the number of sensors increase, the complexity of the system is also increased.

Communication and monitoring of the vehicle is done by emergence of GSM module. When an unauthorized person tries to break the cargo, message will be sent to authorize person. There is a simple Electronic Lock which is used to secure the cargo. Authorized person will be given with an encrypted message using which the cargo can be unlocked [8-10].The system cost will be expensive as the components used for securing system is more with less human interference.

A centralized monitoring system and internet based securing system is aided in the identification or authorization of drivers and the tracking of cargo containers. The system will accomplish the security checks in real-time scenario using internet and database [11]. After starting the cargo, the current GPS location and a message is sent to the Authorized person and also it is indicated in the Centralized monitoring System [12].It requires labor cost with more maintenance charges for the Cargo container.

Thus, by considering all the aspects of cargo containers starting from loading of a container till the destination where a cargo is unloaded, a clear idea is given to develop a strong securing system for the cargo. Where each and every movement of the cargo is tracked and updated to the centralized monitoring system or Authorized person.

This Paper proposes RFID tags which are used for sealing the containers, GPS module used to track the location of the vehicle, GSM module used for communication which updates the status of the cargo container and also it employs a basic locking system which ensures the security of the container.

SMART ELECTRONIC SECURITY SYSTEM FOR CARGO CONTAINERS

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Abstract: The cargo containers carry materials of high value and in high quantity. These containers are more prone to the pilferage and hence to protect the material we need an effective technique which minimizes the loss. The technical work undertaken here aims at providing an alternative mechanism to prevent pilferage in the cargo containers by implementing an electronic lock and having series of basic security checks like biometric verification of driver and by entering the password which is sent at the time of delivery to the owner. Therefore it minimizes the human involvement in the process. Present technologies of locking and monitoring do not provide efficient solution for the situation. A small corruption among employees can cause huge loss to the industry. This project aims at providing a new mechanism to prevent the pilferage in the cargo containers by implementing electronic lock and minimizing the human interference in the security of the cargo containers.

Keywords— **Sim808(GPS and GSM); Electronic lock; Biometric sensor; vibration sensor;**

I. INTRODUCTION

There is huge pilferage in capital of cargo industries due to pilferage from the cargo containers which is used in transporting huge amount of manufactured projects from one place to another. Due to this the authorities whether guilty or not comes under the light of suspicion. This results in huge loss to industries.

As mentioned before, the cargo containers are more prone to pilferage and a little corruption among employees can easily deceive the whole security system. So protect the material we require a sound technique which minimizes the loss due to involvement of corrupt employees. This project aims at providing a sound technique so as to minimize the pilferage in cargo containers by applying electronic lock and minimizing the human interference.

In another part of smart lock, biometric system will be implemented to record the database of drivers for further use.

The operator monitors the message received from the device to determine a proper response. The sensor information includes sensor data or alarm state information. The message includes GPS co-ordinates and personalized message.

This mechanism secures the containers by using electronic lock which will require the series of security check during opening of the lock. The lock is controlled and monitored by the base station.

Thus, by considering all the aspects of cargo containers starting from loading of a container till the destination where cargo is unloaded, a clear idea is given to develop a strong securing system for the cargo. Where each and every movement of the cargo is tracked and updated to the centralized monitoring system or Authorized person.

II. METHODOLOGY

2.1 Base Station

Centralized monitoring system is required to ensure the reliability and security of cargo container. Real-time data such as hardware and network performance, building power management, and environmental conditions need immediate attention if behaviour deviates from the desired or normal operating ranges.

A Centralized monitoring system is present to check the activity of the Cargo container represented as Base station in the Fig 2.1. The Base station will communicate to the Cargo containing vehicle through SIM 808 which has the features of GPRS+GPS modules.

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EGR, DPF and DOC techniques for comprehensive reduction of emissions for engine fuelled with diesel/Dee blends by three approaches (Conference Paper)

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Abstract

Objectives: 1. To study feasibility of diesel fuel usage in modified diesel engine with optimized engine parameters in terms of injection timing, injection pressure, number of holes on nozzle and combustion chamber shapes on its performance, emission and combustion characteristics. 2. To conduct performance tests on existing diesel engine with optimized DEE/Diesel blend ratio along with EGR and after treatment devices. 3.To conduct performance and emission behaviour of diesel engine with manifold injected Di Ethyl Ether and study combined effect of EGR and after treatment devices 4. To compare performance and emissions of Diesel engine at these various operating conditions and evolving an optimum condition leading to least NOx emissions. Methodology: Experiments were conducted on single cylinder four stroke diesel engine coupled to eddy current dynamometer. In the first approach, base line data generation for optimization of injection timing, injection pressure, number of holes and combustion chamber types is done. Further, EGR is supplied at the rate of 5, adopting DPF and DOC, NOx emission is measured. In second approach, test

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Effects of Using Diesel Particulate Filter and Diesel Oxidation Catalyst with Exhaust Gas Recirculation on the Performance of Compression Ignition Engine Fuelled with Diesel- Di Ethyl Ether Blend

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ABSTRACT

In the present work, a single cylinder diesel engine was suitably modified to operate on diesel, diesel and diethyl ether (DEE) in blended form in which percentage of diethyl ether in diesel blends was varied from 5 to 20% in steps of 5%. Further the effects of exhaust gas recirculation (EGR) on the performance of diesel engine fueled with alcohol and diesel blended fuels were studied. The pre-and post-combustion methods were adopted to study the performance of the modified diesel engine. Post combustion analysis involved use of emission control devices like Diesel Particulate Filter (DPF) and Diesel Oxidation Catalyst (DOC) combination for effective control of unburned hydrocarbon (UBHC) and particulate matter (PM) respectively. From the study it was observed that the engine was consistent in its operation throughout the experimental investigations when operated on selected fuel combinations. Based on the comprehensive experimental investigations carried out the following conclusions have been derived. The brake thermal efficiency (BTE) increased with increased injection of DEE and highest BTE was found to be 29.25% for 80% loading condition using 20% DEE and without EGR. In-cylinder pressure and heat release profiles showed delayed combustion for DEE blends compared to diesel and the same was more pronounced with higher DEE blends. Shorter combustion duration was observed with DEE compared to diesel. Increased smoke and UBHC emissions were observed for increased EGR induction for all operating conditions while the oxides of nitrogen (NOx) emission decreased. For 20% DEE fuel operation adopted along with DPF, smoke emissions reduced by 75%. It is observed that, adopting DPF, NOx emission reduced by 10%; while adopting DOC, NOx emission reduced by 6%. At 80% load optimum conditions for the modified diesel engine operation with selected fuel combinations were observed for 20% diethyl ether/diesel ratio, and 20% exhaust gas recirculation rate along with both DOF and DOC respectively.

Keywords: Di-Ethyl ether, diesel particulate filter, diesel oxidation catalyst, performance

INTRODUCTION

Diesel engines are durable, economical and therefore they are an important power source in farming and industrial equipments. However, the problems with them being their higher emissions. Therefore, all researchers should chant the statement "Research makes diesel engine greener".

A Comparative Analysis of RSA and BAES for MANET Routing Protocols

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***Abstract*—** The drastic up rise in exchange of data, digitally in Mobile Adhoc network, leads to a major concern of secure data mobility in the network. This paper introduces security extinction to AES cipher, Biometric Advanced Encryption Standard (BAES). BAES is an amalgamation of biometric as key to AES with. The paper includes comparative analysis of RSA and BAES ciphers. Also the paper throws light on the polarities between the two ciphers using Avalanche effect, time complexity and memory utilized efficiency determining parameters

Keywords— *AES, MANET, RSA, BAES, Fingerprint, Biometric.*

I. INTRODUCTION

Mobile Adhoc Network (MANET) is a genre of networks which has non static and self configuring nature. Secure data mobility in such non static, decentralized network is a challenging task. Any intruder can effortlessly launch malicious attacks in such networks with no firewall. To secure data from active and passive attacks is a confronting assignment. Therefore optimum schema is to exploit the concept of cryptography and its ciphers, in encrypting the data before transmission. This is the leading motivation in designing new ciphers, with reduced complexities. Study of literature provides a bird view into adequate number of ciphers and their applications. Ciphers can be classified as symmetric and asymmetric ciphers.

Asymmetric ciphers are known to use two keys for encryption, public key and private key. Private key is private to the user, whereas public key is the shared key in the network. RSA is the cipher which can represent asymmetric ciphers genre and is most widely used asymmetric cipher. The major limitation in using asymmetric key ciphers in MANET is their high power utilization factor, with medium security provided.

Symmetric ciphers have only one shared secret key. Secret key is provided to the users when he registers with the network. Also it can be exchanged between nodes, after the authentication process and before start of any session. AES is the most popular and widely used symmetric ciphers. Comparatively symmetric ciphers prove as best since the usage of power by these ciphers is optimum in networks such as MANET s where the resources are limited.

Every genre of ciphers has their own leads and limitations [1]. Here we design a cryptographic method Biometric Advanced Encryption Standard (BAES), which is a minor addition to the sphere of ciphers. Cipher efficiency parameters such as memory utilized, time taken and Avalanche effect are considered, to analyze BAES and compare it with RSA.

II. LITERATURE SURVEY

Septimiu Fabian Mare, et al. introduced a robust steganography-based communication system using RSA and AES ciphers, together with steganography. The key used for data encryption uses a combination of randomly generated sequence and a hash of cover image's color information. The proposed steganographic algorithm introduces steganography as an additional security level and avoids advanced reverse engineering techniques [3].

Jong Yeon Park et al. described unknown and interesting characteristics of ghost key patterns using real experiments [4]. They explained about the ghost key by selected bits. Also they stated that knowledge of ghost key patterns can be a useful tool to analyze enhanced scenarios and its countermeasures.

Michael Bourg et al. proposed an RSA based biometric encryption system which can be realized on Field Programmable Gate Arrays [5]. They showed that biometric is one of the safest form of privacy and security.

Asma Chaouch et al. programmed a flexible encrypting algorithm for encrypting text and compressed images. It was based on RSA, AES and elliptic-curves methods [6]. Also they provided a fair comparison between the three methods under study, considering the parameters like key size, block size and speed.

Amish Kumar et al. presented an efficient implementation of AES on MATLAB platform. They provided an explanation to Avalanche effect in AES [2].

III. RIVEST SHAMIR ADLEMAN

RSA is one of the first successful responses developed by Ron Rivest, Adi Shamir, and Len Adleman at MIT. It was developed to overcome the challenges faced in public key cryptography. RSA is best illustrated in fig.1.

RSA cipher uses two primes with Euler's totient function to obtain the value of variable 'n'. Plain text is transformed to cipher text by raising plain text to power of encryption key 'e'. Encryption key is public key of the destination node to which cipher text needs to be transmitted. The destination node uses

BRIDGE MONITORING SYSTEM

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Abstract : In recent time maintenance of structures has gained its importance. Bridge collapsing being a major issue shows us the need to monitor its condition. In this paper we propose a continuous monitoring system to know its condition. A sensor network is deployed to capture data from the changing bridge environment, the data is stored and monitored. Further a web application is developed to display a messages over any unpleasant changes in bridge condition.

Index Terms **- Structural Health Monitoring, Bridge Monitoring, Load, Structural bend, Vibrations, Flood Detection.**

I. INTRODUCTION

In many countries, a lot of bridges have exceeded their life span of 50- years. Old bridges cannot face to the severe nature disasters. In other words, these bridges in such countries are likely to suffer from severe damage due to aging or occurrence of natural disasters. Many bridges built on the river are subject to deterioration as their lifetime is expired but they are still in use. They are dangerous to bridge users. Due to heavy load of vehicles, high water level or pressure, heavy rains these bridges may collapse which in turn leads to disaster.

Bridges are important aspect of country's transport but are expensive to build and maintain. Sometimes minute fault inside the structure might affect whole body which would lead to collapse of the structure which might create a significant loss of property and human lives. To avoid these mishaps monitoring is necessary. Structural Health Monitoring (SHM) mainly aims to detect, locate and quantify damage happening to structure by the acquisition of data measured by sensors on the bridge. The SHM systems can also be used for other purposes, such as load estimation (e.g. traffic, wind), monitoring of construction and repair work, and to validate design assumptions regarding the static and dynamic behavior of the structure[2].

The government generally appoints an engineer who uses the method of visual inspection of structures for every 2-3 years. This method needs to be improvised. A new technology can be invoked with the help of different methods to deal with the bridges & structural monitoring in a more secure way[4]. Bridge monitoring system is necessary to understand the structural behavior and to pay a support for betterment of structural conditions . It helps in early damage detection which would reduce the cost of repair.

II. PROPOSED APPROACH

There are few major parameters those affect the structure's condition. The proposed system monitors four different parameters like load upon the bridge using a loadcell, detecting structural bend using a flex sensors, vibrations using accelerometer, water level detection using moisture sensor. All the sensor data is read to file and is further sent to a server using internet. The authenticated user shall login to the web page which shall display messages about the condition of the structure.

2.1 HARDWARE

Load Detection : We use a single point load cell to measure the load put upon the bridge [1]. The load cell is located under a platform that is loaded with a weight from above, that can be the pier of the bridge. The dead load is said to be neglected as it can be less in new structures but more in the older ones due to the factor called aging. The live loads such as traffic, human weight etc., is being measured.

Structural Bends : Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend to electrical resistance - the more the bend, the more the resistance value. These sensors can be positioned at desired spots over the bridge. Any sensitive area that can develop a structural bend due to damage must be recognized and the flex sensor placed in that position would help recognizing the bend in that part of the structure.

Vibration detection : Accelerometer ADXL335 is used to detect dynamic or damp free vibrations [5]. ADXL is a 3-axis accelerometer measuring X, Y and Z axis. The averaged measurement of all axis values would give a single dimensional output which would show major variations in its value upon major displacement in structure or any high vibrations.

Flood detection or Water level Monitoring : Moisture sensor with an onboard LM393 chip is being used. This sensor consists of a potentiometer using which the range of detection can be set. A digital output of either 0 or 1 is given out by digital output pin. The sensor uses an active low logic. The sensor consists of two probes that can sense the water level. The comparator compares the values given of both probes and gives out the larger one as the output. It has an option of both digital and analog output.

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Performance Analysis of Array Multipliers Using Different Logic Configurations

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Abstract - Power and speed are the two important design aspects that impact the designing of any circuits. One of the most widely used arithmetic operation in digital circuits is Multiplication. There are different Multipliers designed depending on the speed and the hardware. There are different technologies with different features. In this paper 4- bit and 8- bit Array Multipliers are been designed using different designing techniques. The Multipliers are designed using CMOS Logic Configuration, Pseudo-NMOS Logic Configuration and Transmission gate Logic Configuration and are compared in terms of Power and delay. The Power Delay Product (PDP) gives the overall performance of the Multipliers.

Keywords - Multiplier, CMOS Logic, Pseudo-NMOS Logic, Transmission Gate Logic, Power, Delay.

I. INTRODUCTION

Multiplication plays an important role in digital circuits. Adders and Multipliers are the two basic building blocks of any digital circuits. The two basic operation of Multiplication process is:

1. Generation of Partial Products.
2. Accumulation of the products.

The basic Multiplication process is the add and shift algorithm. The partial products are generated using the AND gates and these products are accumulated using the adders. Therefore by reducing the number of partial products or by accelerating the accumulation the multiplication operation can be speeded up. In this paper the Multipliers are constructed using CMOS, Pseudo-NMOS, and Transmission Gate logic configuration and are compared in terms of power and delay.

The paper is organised as follows: Section II provides the introduction for designing the Multipliers. Section III gives the various designing algorithms. The Power dissipation details are provided in Section IV. Comparison of the Multipliers based on different designing techniques is shown in Section V. Section VI gives out the final conclusion based on results obtained.

II. MULTIPLIER & DESIGNING

Multipliers play an important role in arithmetic operations. They are most commonly used in Arithmetic and Logic units, Filters, DSP applications, Processors.

A. Array Multipliers

The array Multiplier originates from the multiplication parallelogram. Multiplier is based on the add and shift on multiplication of the multiplicand with one multiplier bit. The length of the multiplier is represented by the number of rows and the width of width of each row represents the width of the multiplicand. The parallel adders receive the partial product inputs and the carry out is propagated into the next rows. The critical path delay consists of the horizontal and vertical terms. This delay consists of both adder delay and gate delay. The basic block diagram of 4 bit multiplier is shown in fig 1.

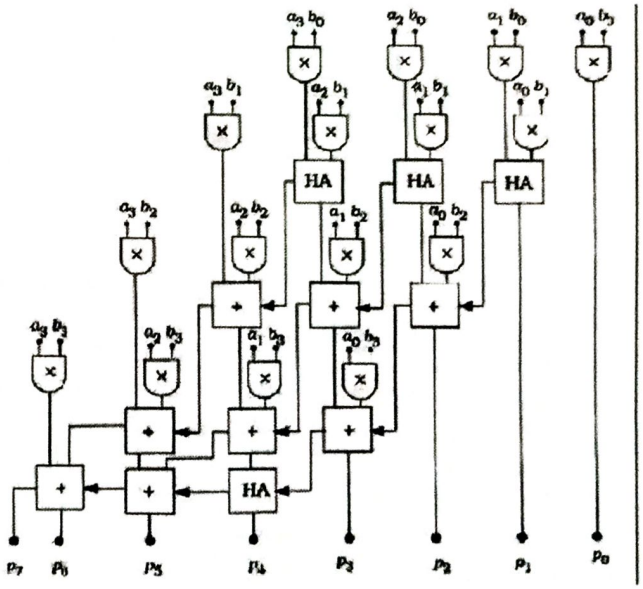

Fig 1. 4 bit unsigned array Multiplier.

