# SmartPi: An Industrial Meter Reading Recognition System for Online Data Processing

| Prachi Kulkarni | Pratik Kute | SayaliDavale |
| :---: | :---: | :---: |
| (MIS: 111107075) | (MIS: 111107074) | (MIS: 111107061) |

Name of the Guide: Prof. V. N. More

## Abstract

An efficient data logging and analysis system has the following requirements:

1. Automation to reduce human error
2. Low time lag
3. Less memory storage requirement
4. Low computation complexity

The most effective solution would be to design meters that perform all these functions. However, upgradation of all existing industrial meters is impractical. This creates a need for a device like SmartPi. The SmartPi is a Raspberry-Pi based standalone system for optical recognition of the reading of various industrial meters suitable for online data processing. It satisfies all the requirements of an efficient data logging and analysis system. A single device can be used to read, analyze and upload the data of multiple industrial meters. The project illustrates the use of SmartPi for the electricity billing system. The current system for electricity billing involves capturing the image of the electricity meter and manually entering the reading in the software for bill calculation. This system does not allow for instantaneous bill calculation and has a lot of scope for human error. Further, it keeps on using more and more disk space instead of the more convenient cloud storage facilities. The SmartPi is a standalone device that captures the image of the electricity meter, automatically extracts the meter reading from the image and uploads the reading to a cloud storage which also performs the task of bill calculation. This system reduces human intervention and thus the scope for human error greatly. It also provides for centralized and instantaneous bill calculation. Authorized personnel can access the records from any Internet-enabled device such as laptop, PC, tablet, Smartphone etc. from any location. Disk space consumption is also controlled through the use of cloud computing.

# SMART HOME USING ZIGBEE COMMUNICATION

Nikhil Kamble          Ankush Deshmukh          Tejesh Chulbulkar

(111107028)          (111107019)          (111107015)


Name of the Guide: Prof. Dr. P. P. Bartakke

## **Abstract**

Home automation is a wide and varied field that involves devices as small as temperature, light and motion sensor, and as powerful as modern home appliances. In today's world technology is available for home automation but these technologies are incompatible with each other and addresses only communication and physical media, the main objective of this work is to facilitate the user to control appliances by two ways one is automatically and second is using remote control to control the appliances which is also an override control.Our Smart home system focuses on controlling home electronic devices & giving you complete control of your home. Smart Home gives an individual the ability to remotely or automatically control things around the home. It is a device or instrument designed to perform a specific function, especially an electrical device, such as a lights & fans, for household use.

A hardware system is installed to monitor and control the various appliances. The system would control the appliances based on its configuration. For example, it could measure the ambient light using a hardware sensor and turn on the lights when it grows dark. It can also allow a person to control appliances from a remote location. For example, one could turn on the air conditioning of the control room. The task can be performed by on bases of sensor data, which will take itself decision and action to perform. This microcontroller based project demonstrates a home automation system that also includes the security and communication facilities. LCD is provided for displaying information to user and keypad is provided for controlling all the applications. By detecting the surrounding temperature system can start fan/AC for high temperature and can switch of fan/AC for low temperature. Also by detecting the light intensity the lights are switched on if the intensity is below some defined value. The system allows the user to control each of the lights and fans individually. Because of efficient use of electric equipment the power is saved. For any kind of security violation in the controlled room user can be alerted with the buzzer.

# DUAL TERRAIN SURVEILLANCE ROBOT WITH WIRELESS NAVIGATION SYSTEM

DINESH GURAV                    SHAILESH KELKAR
111107025                        111107030

## ABSTRACT

This project aims to deliver a fool proof system capable of handling tasks which if performed by humans will take much time. Developing such a real-time control system requires enhanced and deterministic control of peripherals and is thus challenging yet implementable. The main aim of designing this robot is to traverse either water or land to generate the database required for design of advanced, real time warning systems and for research purpose. For the stabilization of robot in water terrain, a pneumatic based suspension system with propellers has been developed. The control system incorporates two video feedback channels, one being for terrestrial surveillance purpose and the other for underwater surveillance. A wireless BLE based digital radio link has been employed to control the robot remotely. The entire robot is controlled through a multi-purpose hand held console so that the hazardous tasks can be completed without risks. A robust actuation system has been developed for the robot mobility control. The system can handle payloads up to 3 kilograms without affecting the dynamic stability in water or undergoing any degradation in the performance. The robot can then be used for unmanned ground vehicle applications like remote surveillance, environment disaster related researches, study of coral reef regions for biodiversity and for providing database for early warning systems etc. The robot is designed to operate on uneven terrain with obstacles up to 5cm with the aid of Pneumatics controlled suspension system for base drive and smooth ground operation using Ackermann steering control mechanism. The underwater camera has motion detection feature which can be used for marine life research.

# Data Transfer Through Visible Light Using LED

Manoj Mahajan

(111107040)

Sagar Metri

(111107042)

Nitin Panchal

(111107047)

Name of the Guide: Asst. Prof. Mrs. Rashmika Patole

## ABSTRACT

With the radio frequency spectrum becoming crowded, an alternative means to wireless communication is necessary to accommodate the exponentially increasing wireless traffic demand. Visible Light Communication systems provide an alternative to the current standards of wireless transfer of information, using light from LEDs as the communication medium. In these systems, light-emitting diodes blink at a rapid rate such that the human eye will not notice the change in light intensity, but a sensitive photodiode can detect the on-off behavior and decode the information embedded within it.

This project first analyzes various issues with current wireless communication systems, and discusses how Visible Light Communications can resolve these issues. Then, the design and implementation processes of the Visible Light Communication system are described in detail, including a value analysis of the parts used to build the prototype, as well as the necessary steps to design each functional block of the system. The achieved results of the system, including transmission distance and speed, as well as quality of transmission and type of data are discussed.

# Robotic Fish

Shruti Dalvi

(111107016)

Arvind Deshmukh

(111107018)

Pariksheet Pinjari

(111107050)

Name of the Guide: Dr. P. R. Apte

## Abstract

This project aims to design and develop a biomimetic fish robot for the application of surveillance. The simple and efficient design is inspired from Mother Nature. Robot mimics the real fish which helps to navigate through the water causing minimum disturbance to underwater life. Developed fish robot navigates through water. Servo motors enable to obtain swift forward and rotational motion and pump assembly assists robot for deep diving in water. The robot will survey underwater world by sending video. This robot is manually controlled by base station. Wireless Bluetooth link is established for manual control of robot. Temperature and pressure data at various depths is received at base station.

The innovative design of robot helps to reduce the complex structure without compromising the agility and performance of the robot which helps to achieve the real motion of the fish. Ability to mimic the real fish makes robot competent for aquatic based applications such as underwater exploration, oceanic supervision, detection of pollution level and military detection.

# Smart Embedded Electric Meter Based on  Zigbee Communication

Name of Students:

| | | |
|---|---|---|
| Nilay R. Banginwar | Nishant R. Banginwar | Omkar P. Swami |
| 111107003 | 111107004 | 111107066 |

Project Guide:

Dr. R. A. Patil

## Abstract

The project is about designing an embedded electric meter based on Zig bee data acquisition. We want to build wireless data acquisition system based on processor and zig bee chip in the embedded electric meter which can reduce the human efforts of taking readings. This system, which is comprised of Zig Bee network has many important advantages such as low cost, low power consumption but low data rate. Furthermore, the system is simpler, integrated, anti-interference, stronger mobility and practicability. The system dedicates to automatic meter data collection and energy auditing and management.

We can implement pre-paid or post-paid electricity supply service. Company can charge at different rates based on the data acquired by the meter, during peak hours and rest of the day.

# Vehicle Tracking Using GSM and GPS

Tushar Rathod

(111107052)

Sanchit Jadhav

(111107056)

Prathamesh Zade

(111107070)

Name of the Guide: Dr. P. R. Apte

## ABSTRACT

The Best statement for our project is

"Design and Develop a Vehicle Tracking System using GSM and GPS to reduce human effort & increase security."

`The main aim of this project is to offer an advance security system in automotives, , a GPS module, a GSM module and a control platform.. The other modules transmit necessary information to users and help to keep eyes on cars all the time, even when the car is lost.

In modern world, many new techniques such as biometric recognition technique, image processing technique, communication technique and so on, have been integrated into car security systems. At the same time, the amount of accident of cars still remains high, specially, lost. Traditional car security systems rely on many sensors and cost a lot. When one car is really lost, no more feedback could be valid to help people to find it back.

This system prototype is built on the base of one embedded platform ARM 7 which controls all the processes. Experimental results illuminate the validity of this car security system.

Vehicle tracking system can inform us location, speed and route travelled by vehicle using GPS and that information can be transmitted by GSM Modem to any remote location.One can create web application that provides you exact location of target and its moment.The system uses GPS and GSM moduleIt is interfaced with microcontroller in vehicle.It collects data from GPS and transmit data using GSM.It includes the hardware part which comprises of GPS, GSM, microcontroller16x2 LCD and software part is used for interfacing all the required modules and a web application can be developed at the client side.Main objective is to design a system that can be easily installed and to provide platform for further enhancement

# Solar MPPT charger

. Sneha B  Jadhav
(141207004)

Viren V Pardeshi
(141207007)

Shraddha Suralkar
(141207011)

Name of the Guide: Mrs. Vanita Agrawal

## ABSTRACT

In this 21$^{st}$ century, increasing energy demands and energy crisis are two contradictory things exist together. Two of the solutions for it, from an engineer's prospective are: Efficient use of available energy sources and use of renewable energy sources or combination of both.

Our project, Solar MPPT charger is inspired by this idea. Use of renewable energy resource, solar energy along with MPPT i.e. Maximum Power Point Algorithm to use it energy efficiently.

We compared various algorithms of MPPT, and chose Fuzzy logic algorithm. We implemented our algorithm in VLSI kit (Spartan xc3s500e), because of its high performance features.

Our project investigates in detail the concept of Maximum Power Point Tracking (MPPT) which significantly increases the efficiency of the solar photovoltaic system. It extracts maximum obtainable solar power from a PV module and uses the energy for a DC application.

# Intelligent Stick for the Blind

Namrata Gannu
(111007068)

Prateek Gholve
(111007034)

Akash Jadhav
(111007046)

Name of the Guide: Mr. Swapnil Mali

# ABSTRACT

It is not difficult to conclude that the lives of blind people can be quite challenging. For them, it may not be easy to carry out daily activities, such as going to the kitchen, bathroom or finding their bedroom. It can also be challenging for them to operate appliances or figure out if they are safe in their current location.

This project allows blind patients to go to their desired location through voice guidance. The blind person would set a destination using passive RFID tags, and would navigate based on the working and voice guidance of the device.

The device also offers benefits such as detecting fire, or power failure, and reports this to the patient so he/she can find safety.

Using this device, we hope that the lives of blind patients become easier, and we can make a positive impact on the society.

# ANDROID BASED FACE AUTHENTICATION FOR DATA HIDING USING STEGANOGRAPHY

Kasturi Chopade   Khushboo Kuchhal   Shweta Nivdange

(111107013)    (111107035)    (111107045)

Guide :

Dr. Ms. S. P. Metkar

## ABSTRACT

In today's world the threat to hacking of sensitive information of an individual has increased. So, incidences such as stealing of money, online frauds are augmented. And thus security of such sensitive data has become an important issue.

The essence of the project lies in the fact that, the internet is forever. Once information is on the internet, it can be accessed illegally without authentication by anyone with the knowledge of how-to and proper skills. The same can be said about all electronic media. Hence, it is necessary to use preventive measures against such attacks. Moreover, most of our identification documents such as Aadhar card, voter card, PAN card as well as banking & financial documents such as credit card, debit card, account information have huge amounts of sensitive & vital information which must be remembered yet should be kept safe i.e. It is advised not to write passwords and sensitive information on paper or electronic media. This presents a dilemma as how does a User easily remember & access information yet not store it anywhere.

The project proposes a solution in form of an Android Application. This Android Application can be used to store personal sensitive information such as bank account, credit card details, and passwords and PIN details. Also it can be used to save long numbers which are difficult to remember such as Aadhar Card number, bank account details, credit card numbers, email id, sensitive confidential information. This project intends to hide information from naked eye and provide Biometric Authentication to access that information.

# USE OF COMPUTER VISION TECHNIQUES FOR CONGESTION DETECTION

Pallavi Bhagyawant

(111107006)

Apeksha Chipade

(111107011 )

Pratiksha Khade

(111107031)

Guide:

Dr. Vibha Vyas

## ABSTRACT

A system using Computer Vision Techniques for tracking and providing early information of hazardous locations in huge gatherings is the need of the hour as the number of video streams generated outnumber the personnel watching them. This system is based on optic flow estimations and detects sequences of crowd motion that are characteristic for devastating congestions. Initially, the temporal features of the scenes are extracted using Motion History Image (MHI) technique. This involves the weighed subtraction of consecutive frames of the video stream. Then the Optical Flow (OF) vectors are calculated for each MHI image. For optic flow computation, Lucas-Kanade method is employed to determine the optical flow vectors. Segmentation of video sequences is done and optic flow is determined for respective segments. A threshold optic flow is chosen in such a way that the tracking of congested area in video is easily done by comparing it with respective segment's determined optic flow values. Finally, location of crowd congestion is presented that helps in taking further protective measures to handle unusual events.

# Xerobot

Pankaj Gabale         Mihir Deshingkar         Rahul Khedkar

111107020              111107017              111107032

Guide: V.N. More

## INTRODUCTION

The objective of XEROBOT is to have a robotwith task learning ability for industrial application as well as household purposes which will learn from human actions. For multitasking of the robot there are multiple ways to make them use for various activities by programming them or by attaching them with different hardware.

There are several categories of robots depending upon their usages like industrial robot, household robot, Military robots etc. who may need continuous monitoring and special programming depending upon their usage. While in industrial purposes industries depending upon the various task to carry out industries invest lots of money on these robots. While cost for one robot will be in the range of $1000 to $100,000.

Though spending these amount of money they still get their robots bounded for one task only. Even in military purposes also the robots will be bounded or available for only one military task. There have been approaches for the multitasking robots but they need intensive task specific programming. These robots costs above $1mn, which is subsequently not for serving the purposes of small scale business.

XEROBOT is an exception for all these things because of its easy usages. It traces the activity of the host and perform the same. It will also save the activities. Though it may use lot many sensors it will not cost more than $2000. It will be storing the activities done and can perform it asked at any time to perform.

XEROBOT requires the basic initial programming which will be done by the manufacturer. After that it will be fully depend upon human body movements and tasks. It does the activity in proper manner as it is performed by the user. The main feature of XEROBOT is it can easily be switched from one usage to other. If one is using the simply household robot then he will be able to switch it directly to military purposes just by providing more strength, increasing the storage and more capabilities.

The main features of XEROBOT systems are:
1. Utilizes the minimal possible hardware
2. Human action tracking and decodes that
3. Higher processing power with ability to switch
4. Usable for small scale business or within range

The device will be helpful for users even if user is not present there through wireless communication between users PC and the main controller provided on the robot. It can also accept the commands through WI-FI connectivity (if provided). Thus XEROBOT gives the futuristic approach towards the robot manufacturing and their usages.

# Automatic Parking Lot Management System

Ajay Wavhale

(111107068)

Sachin   Telgote

(111107067 )

Prasad Ghodke

(111107023)

Guide:

Mr.P.P.Tasgaonkar

# ABSTRACT

We are proposing a new system for automated parking and fare collection. 'Automatic parking lot management' which is having advantages such as no need of manpower, errorless traffic and fare calculations, database creation.

The utilities and government continually look for improved methods to support their day to day operations as well as monthly operations, which include: Providing quick update on vacant parking place, customer interaction in peak traffic hour giving a parking place to customer, performing Monthly/daily billing reads, implementing time of using billing etc.

Using this system all methods can be implemented. We can have above problems taken into consideration. We can have prepaid or post-paid connection as required by customers. Advanced parking management systems include elements from traditional traveller information systems, as well as specialized parking management applications. Advanced parking management systems functions mainly in venues like airports, central business districts and transit park-and-ride locations. The system examined in this study provides directional and space availability information to patrons as they proceed to the parking facility.

# Traffic Signal Control Using RF and Data Transfer Using GSM For Ambulance

Chame Sneha

(111107009)

Shinde Sachin

(111107055 )

Shingade Ramesh

(141207009)

Guide:

Dr. R. D. Joshi

## Abstract

The road accident in the present era is increased to greater extent. The loss of human life due to accident must be avoided. Even if each and every vehicle passing through the traffic has its own need, the prior importance is given to the Ambulance and other emergency vehicles which needs to wait longer time on the traffic thereby increasing the probability of risk .Transportation of a patient to hospital in emergency seems quite simple but in actual it is pretty difficult during peak hours. Optimum utilization of the time after an accident is actually the golden hours as a measure of effectiveness of an emergency response service provider system. Recovery action should be taken immediately.

So our project aims to provide a smooth transport of the ambulance in the traffic area. With the help of Radio Frequency and GSM technologies we can design a smooth traffic system for the ambulance. The system will identify the arrival of the ambulance and will provide the free path, done with RF technology. The GSM modem will help ambulance to communicate with the hospital.

# Accident Prevention by Drowsiness Detection

VrushaliLokhande          Anjali Mondhe          Prachi Singh

(111107038)               (111107043)            (111107076)


**Guide**

**Mrs. Vaishali V. Ingale**

## Abstract

India has highest number of deaths due to road accidents. It is estimated that 10-30% accidents occur due to drowsy driving or driver fatigue. Under monotonous conditions drivers generally fall asleep which deviate their focus from the road. Such situations many times result into accidents which can be fatal. The presented work will help in promoting human and vehicle safety.

Various measures like vehicle based, behavioral and physiological can be used for detection of drowsiness. Physiological measures like ECG provides earlier detection of drowsy condition. Driver's drowsiness detection based on biological signals is being studied in preventive car safety. Autonomous Nervous System (ANS) activity, which can be measured non-invasively from the Heart Rate Variability (HRV) signal obtained from surface ECG, presents alterations during stress, extreme fatigue and drowsiness episodes. In such drowsiness conditions, indications are given to awaken the driver.

Here we present both software and real world hardware implementation to solve the discussed problem. Software implementation involves use of data from various sources including authorized sources like Physionet[10] where databank is available and comparing the obtained results from the expected results. Hardware implementation utilizes gel-free, non-contact EPIC sensors that capacitively couple to the skin. These sensors along with amplifiers and A/D conversion circuits are used to continuously monitor the electrical signals of the heart. These captured ECG signals are then given to the signal processing system. By this we compare signals of the same person but at different time instants for computing Heart Rate Variability(HRV) in the form of LF/HF ratio along with Heart Rate and PNN50. When these values change beyond a certain threshold as compared to the initial then the driver will be alerted using an alarm system. Thus system helps in prevention of accidents.

# Remote Security System

**Ashwathy Menon**

**(111107041)**

**Neil Chitnis**

**(111107073)**

**Guide**

**Dr. Mr. R.A. Patil**

## ABSTRACT

This project aims at building an efficient and simple automated home security and surveillance system. The setup is equipped with motion sensors that are able to detect the presence of motion and set off an interrupt to an Atmega16 microcontroller. A GSM module, connected to the same, is used to send an SMS via the 2G GSM cellular network and alert the home owner of a possible intrusion. In addition to this, this project also functions as a fire alarm, by making use of a temperature sensor that can detect sudden changes in the sensor. This, along with an SMS alert, is used to inform the home owner that there could be possible cases of a fire.

Keywords: Home Security, LCD Screen, Motion Detection, Fire Alarm System, ATmega16, IR sensors

# WIRELESS WEATHER MONITORING SYSTEM

Shital Machana            Sonal Pawar            Anuradha Nalage

(111107039)            (111107049)            (111107044)

**Guide**

Prof. S.G.Mali

ABSTRACT

In this 21st century, weather monitoring holds great importance and have uses in several areas ranging from keeping track of agricultural field weather conditions to industrial conditions monitoring. Weather monitoring would help in keeping track of different climatic behaviors including temperature, humidity and light intensity. Weather Monitoring System can be either wired or wireless one. In case of wireless communication, the connectivity will be more convenient and user friendly and weather monitoring would not require physical presence of the person at the location. Wireless communication is the transfer of information over a distance without the use of wires. The distances involved may be short (a few meters as in television remote control) or long (thousands or millions of kilometers for radio communications).GSM technology is the cheapest and the most convenient technology now being used for wireless communication. The wireless weather monitoring system basically requires few basic modules such as GSM module, display module, sensors and microcontroller module.

The main objective of this project is to develop a standalone modular weather station with a remote communication facility to capture and transmit meteorological parameters. An automated weather station is an instrument that measures and records meteorological parameters using sensors without intervention of humans. The measured parameters can be stored in a built-in data logger or can be transmitted to a remote location via a communication link. If the data is stored in a data logger, recorded data must be physically downloaded to a computer at a later time for further processing. Therefore, the communication system is an essential element in an automated weather station.

# VOICE OPERATED WHEEL CHAIR WITH OBSTACLE DETECTION

PRADEEP KAWALE      SANGEETA DHONE      AMAN TAMRAKAR
(111107029)         (141207003)         (141207012)

Guide

Mrs.Yogita Vaidya

## ABSTRACT

Power assisted wheelchair can be widely used as a mobility support for elderly and disabled people. But, some of the members of disabled community lack physical strength to control motion of wheelchair and find it difficult to operate a standard power wheelchair. To accommodate this population, we are designing a Voice Operated Wheelchair with Obstacle Detection (VOWOD). This facilitates users with obstacle detection, safe downhill road driving and speech controlled movement. VOWOD can be added to commercially available power wheelchairs with minimum modification. People with low vision are nearly 40% of the disabled community. For these people of any age, lack of independent mobility can manifest itself in a negative self-image. To overcome this problem VOWOD provides obstacle detection facility. Obstacle detection will help these people to travel independently, without anyone's help and will help them to pursuit their vocational and educational goals. Power wheelchairs have no braking system to suppress its velocity. It may lead to dangerous and fearful driving especially on downhill roads. Commercially available wheelchairs provide joysticks to control motion. But it requires physical touch to control motion and it's also costly. So, VOWOD provides intelligent system that can control itself on downhill road at cheaper rate. For lame people lacking soft motion of hands and legs, it will be difficult to control left- right turns of the wheelchair manually. To overcome this problem VOWOD provides speech controlled movement of wheelchair. So a simple voice command will turn wheelchair right or left. It will also help to stop the wheelchair with immediate effect.

# ECG BASED BIOMETRIC IDENTIFICATION SYSTEM

Kinshuk Basu Chowdhary    Shital Giram    Arundhati Kulkarni

(111107005)              (111107024)    (111107036)

A wide range of biometric traits are used in different security systems. The choice of trait depends upon the application at hand and more importantly, the reliability of the trait. The Electrocardiogram (ECG) is a universal characteristic, as the heart beat is a necessary sign of life, and it can be recorded with minimum inconvenience to the individual. The ECG, being a record of electrical currents generated by the beating heart, is potentially a distinctive human characteristic, since ECG waveforms and other properties of the ECG depend on the anatomic features of the human heart and body. Thus one may consider ECG as a human biometric characteristic.

This project aims to develop identification of system based on the ECG. This report has been divided into 10 chapters beginning with explaining the biometric characteristic of ECGs. In the later chapters, the system overview has been put forth followed by the processes of data acquisition, pre-processing, processing, and analysis carried out for identification. The ECG data acquisition has been done using 'Lifplot UNIQ' -an ECG device that reads and provides raw ECG signals as output. Pre-processing and post processing of the ECG signals has been done using appropriate filters to rid the signal off the noise and DC shifts in it. Analysis of the ECG signal mainly consists of the feature formation from the ECG signals. Features selected for this project were – features obtained from the fiducial points of the ECG signal and the principal components of the ECG signal. An identification algorithm has been developed where the principal components have been used as a supplementary feature along with fiducial features for identification. The implementation of this system on the Raspberry Pi has also been discussed. Finally, the results of the test runs carried out on the samples in our database have been provided.

# Design and Development of Radio Frequency Weather Satellite and Ham Signal Receiver

Shimoli Shinde      Rupesh Lad      Ashwini Jambagi

111107063      111107071      111107072

Guide: Dr. S. P. Mohani

Abstract:

Series of National Oceanic and Atmospheric Administration (NOAA) satellites broadcast weather images captured from space which are freely accessible on air. The satellites are active in Automatic Packet Transmission (APT) mode and transmit the frequency modulated data in coordinated VHF frequency eliminating the need of an uplink transmission. The bandwidth required for receiving these weather satellite signals is 40 kHz which is quite high compared to the bandwidth offered by most conventional receivers. Available sophisticated receivers provide numerous functionalities out of which many go unused for receiving weather signals. These extra features add up the cost of receiver rendering it unaffordable for most amateur radio operators and hobbyists. Cheaper versions of receivers with lesser functionalities are also available but these receivers provide lower bandwidth. The design of a receiver that makes a judicious trade off among the device parameters, to provide functionalities intermediate to these extremes, is the chief motivation behind the project. The device is a low cost, power efficient system interfaced with PC to extract data out of received RF signals. The received signals are converted to audio signals by the designed plug-in device which are then fed to computer wherein the software processes it to obtain a weather image. Sensitivity is a critical parameter in such receiving systems as compared to the one required for receiving signals transmitted by the Earth base stations. A wideband low noise amplifier (LNA) along with balanced demodulator has been used to enhance the sensitivity of the system. The novel feature of the design is the modularization of blocks and availability of various test points to readily evaluate the performance and debug the faults at every step. As the NOAA satellites are polar orbiting satellites and are available only for specific duration of day, it leads to underutilization of the hardware resource invested in receiver. Considering this underutilization, the project proposes a unique ancillary application of the receiver for monitoring VHF HAM band frequency.

# AUTOMATED LOCATION TRACKING AND SOS TRANSMISSION FOR ACCIDENTAL VICTIM

Amar Raut       Rohit Sangale       Asawari Sawane

111107053       111107057       111107060

**Abstract:**

This project mainly aims at getting help for the accidental victims who have met an accident in some remote place and have no scope of getting help from the surroundings. This project discusses about how to detect a serious accident, and how to trigger the further mechanism on the detection of this accident.

The accident is firstly detected using a accelerometer ADXL335. The threshold of accident is set to be 2g. PIC4550 is used to compare this threshold acceleration with the accelerometer output. Inbuilt 10 bit ADC is used to convert the analog input of accelerometer to digital output.

On detection of accident, the PIC controller will trigger the Smartphone which will use onboard GPS and location services to extract the latitude and longitude of the victim. Also as GPS sometimes can't be very accurate so the system will also be having a separate communication module for pin point tracking of the victim.

This system is very cheap as accelerometers, controllers and RF modules are cheap. Also everyone now-a-days use a Smartphone (Android Smartphone) which increases the scope of this project.

# DIGITAL WATERMARKING TECHNIQUES

**SANJAY GAWADE**       **LINCY VARGHESE**     **ASHMITA ROY**

**111107021**                 **141207005**                 **141207008**

## ABSTRACT

Internet evolution, along with the advancement of digital multimedia tools have create a major impact in making the storage and distribution of multimedia content a straightforward tasks. Thus security of multimedia contents becomes a vital issue and there is a need in protecting the digital content against counterfeiting, piracy and malicious manipulations. Digital watermarking is an evolving field that requires continuous effort to find for the best possible method in protecting multimedia content. Digital watermarking has been proposed as a viable solution to the need of copyright protection and authentication of multimedia data in a networked environment, since it makes possible to identify the author, owner, distributor or authorized consumer of a document. In this project, we have proposed an algorithm for copy write protection of digital images. We are embedding a certain piece of information ,technically known as watermark into an image such that the watermark can detected or extracted later to make an assertion about the data.

# Smart Courier System

Name of Students:

| | | |
|---|---|---|
| Abhishek Lahoti | Shivani Sarin | Sandesh Soni |
| 111107037 | 111107058 | 111107064 |

Project Guide:

Dr. R. A. Patil

## ABSTRACT

As the time moves the life style of the persons has completely changed and there is no time for the people for micro management of every issue personally. So, this is the right time to provide some space to the technology into our lives for monitoring the issues which requires our personal presence for the things to happen. One among those issues which require our personal presence is receiving the courier which is sent back in case of absence of the receiver. This may lead to the delay in receiving the data and in some scenarios it may also lead to tough situations. So our project aims in providing a very reliable and very user friendly solution to overcome this kind of problem.

With the advancements in the Radio Frequency and GSM technologies and making use of existing technologies we can design a device which is capable of identifying the arrival of courier and forward the same to the receiver and also send an acknowledgement to the courier office so that they do not require the signature of the particular person for whom the courier is meant for.

The major advantage of this system is the presence of the GSM modem which enables the device to communicate with the receiver. The system also ensures that every household is provided with a unique identification number (number on which the message will be sent) for its mailbox. This will allow tracking the user anywhere on the earth.

# Webcam mouse

Piyush  kherdikar         Nikita Pandit         Pranita Sonawane

111107033                141207006              141207010

Project Guide:

M.S. Sutaone

## ABSTRACT

In this project we decided to do our own take on a pointing device that would track a user's movements and act as a replacement to the mouse on a computer. Hands-free mouse control can be achieved through the use of accelerometers to coordinate mouse movement. As such, we are hoping to explore some other means of mouse position generation that haven't been acted upon in previous years.

Ultimately, our intent for this project is to design a hand-motion based mouse. We are going to design and built a pointing device with webcam-tracking based movement control.  Our implementation allows the user to wear a set of finger-sleeves complete with buttons for clicking and scrolling.  Users have the freedom to control their computer's cursor movements and functions simply by moving a hand in the air without the need for a desk.

Our project consists of five main components: a webcam, three finger sleeves, an on-off switch, Arduino board and a Matlab interface. Serial communication is used to interface Arduino board with the computer. The Matlab image hardware acquisition Toolbox was used for image acquisition from the webcam, which adheres to all standards for video communication and processing.