International Journal of Research and Reviews in Applied Sciences And Engineering (IJRRASE)
Vol 8. No.1 –2016 Pp.219-224

available at : www.ijcns.com
ISSN: 2231-0061

WEB CONTROLLED SECURITY SYSTEM USING IOT

P.Srinivasan[1], S.Sowmiya Devi[2], S.Archana Devi[3], S.Ganeshpandi[4] and K.Anbukkarasi[5]
[1, 2, 3, 4] UG, [5]Assistant Professor, Department of ECE
Dr.Mahalingam College of Engineering & Technology
Coimbatore, India

ABSTRACT— IoT (Internet of Things) is the network of physical objects or things. IoT has a vast applications in all domain. This project aims the solution for tracking the car and identifying the car theft. Raspberry Pi can be connected to any moving vehicle, making a cheap option to track your vehicle or any moving object for that it matters in real time on Google Maps. An alert will be received to the owner, when the car is moved in the lock mode through Wi-Fi module connected to the rasp pi kit which is kept inside the car. This system consists of Raspberry Pi, Wi-Fi module, rasp pi camera, Sensors and Android phone. Raspberry Pi camera is used to take pictures when the car is lock or unlock mode. Gyro sensors are used to measure or maintain the orientation. The proposed system gives the solution for tracking and identifying the car by giving an alert in the web page with face recognition. This system is very found to be safe, efficient, low cost and more secured.

KEYWORDS – Raspberry Pi, Wi-Fi Module, Rasp Pi Camera, Gyro Sensors.

I. INTRODUCTION

Despite the various technologies that have been introduced in recent years to detect car thefts and tracking them , it was reported that as many as cars were stolen yearly in the world. According to National Crime Information Center (NCIC), in 2006, 1,192,809 motor vehicles were reported stolen and the losses were 7.9$ billion.

Several security and tracking systems are designed to assist corporations with large number of vehicles and several usage purposes. A fleet management system can minimize the cost and effort of employees to finish road assignments within a minimal time. Besides assignments can be scheduled in advanced based on current vehicles location. Therefore, central fleet management is essential for large enterprises to meet the varying requirements of customers and to improve the productivity.

However, there are still some security gaps where these technologies don't prevent a vehicle from theft, don't assist to recover it and don't allow the users to know the status of their vehicles. They can't permit the owner to communicate with the vehicle online, even if the owner is certain that his vehicle was stolen.

The proposed security system is designed to track and monitor vehicles that are used by certain party for particular purposes, also to stop the vehicle if stolen and to track it online for retrieval. This system is an integration of several modern communication technologies.

To get the latitude and longitude data, there are various web based geolocation services. We have used Google Maps Geolocation API as it was easy to use.

The principle of the proposed work is to outline and create strong security framework for vehicles that can avert robbery. The framework that has been produced in the proposed work utilizes Raspberry Pi, Wi-Fi or even sim card with data connection can be made, so that it can be utilized as a part of ease vehicles even in bikes also.

II. EXISTING METHODS

In many previous research works, the authors have given some analytical view of the circuit used in the various projects, while in some other, global positioning system (GPS) is commonly used as global navigation satellite system which is used to locate the vehicles and also to stop the vehicle if stolen.

The location information is sent in the form of message containing latitude, longitude and speed information to the owner of the vehicle. Location can also be traced using internet through Google maps. A number of developments have taken place in anti-theft systems for vehicles and some of the relevant ones are as follows.

A hybrid GPS-GSM localization of vehicles Tracking System has been developed by Al-Khedher [1] that portrays an incorporated GPS-GSM framework to track vehicles utilizing Google Earth application. The remote module has a GPS mounted on the moving vehicle to recognize its present position, and to be exchanged by GSM with different parameters procured by the car's information port as a SMS to a beneficiary station. The received GPS directions or coordinates are shifted utilizing a Kalman filter to upgrade the precision of measured position. After information processing, Google Earth application is utilized to view the current area and status of every vehicle. The objective of this framework is to oversee armada, police cars dissemination and auto burglary alerts.

Nagaraja et al. [3] describe the outline and improvement of a GSM based vehicle robbery control framework for a car. The created framework makes utilization of an inserted framework focused around GSM innovation. An interfacing mobile or GSM modem is associated with the microcontroller, which in term is joined with the engine through relay. In the event that the vehicle is stolen, the data is sent to the owner that somebody has stolen his vehicle. After that, the user or owner will send the message to GSM modem or mobile which is joined with motor ignition through transfer or relay to switch off the engine.

A security system based on RFID, GPS and GSM [3] consolidate the establishment of an electronic gadget in a vehicle, with reason planned machine programming to empower the organization to track the vehicle's area. At the point when the car selects the worker, he/she needs to swap the RFID card. The micro controller matches the RFID card number. With its database records sends the representative's id, taxi id & the taxicab position co-ordinates to the organization unit by means of GSM module. The GSM modem will get the message through GSM in the organization unit. On the off chance that worker ends up/herself in an issue, he/she will press the catch. Microcontroller will distinguish the activity and sends a signal to the GSM which will arrange with to the organization unit and police.

GPS is one of the technologies that are used in a huge number of applications today [4]. One of the applications is tracking your vehicle and keeps regular monitoring on them. This tracking system can inform you the location and route travelled by a vehicle, and this information can be observed from any other remote location. It also includes the web application that provides you the exact location of the target. This system enables us to track the target in any weather conditions, uses GPS and GSM technologies. The paper includes the hardware part which comprises of GPS, GSM, and ATMEGA microcontroller MAX 232,16x2 LCD a software part which is used for interfacing all the required modules with a web application development at the client side. The main objective is to design a

system that can be easily installed and provide platform for further enhancement.

In modern day vehicles, vehicle anti-theft system is of prime importance [5]. The vehicle anti-theft system presented here consists of multiple layers of protection with one complementing the other, rather than the conventional anti-theft system where a particular system is only being used. The first layer of protection in the system is a fingerprint recognition based on which the doors are opened. The fingerprint matching is done by utilizing the Minutiae based Fingerprint recognition scheme.

Also to prevent thieves from breaking the glass and getting inside the vehicle, vibration sensors are used in all the windows with a threshold level to prevent false alarms. Once inside, the vehicle is turned on, only with the mechanical keys along with correct key number entry on the combination keypad present, failing to do so for three successive times will result in vehicle getting immobilized by cutting the fuel supply and an alert message is sent to the mobile number of the owner.

Further to prevent the seizure of the vehicle, tyre pressure sensor is also being used which also alerts the owner through a mobile message. The seized vehicle can be tracked using a GPS tracker which is also being attached. The different layers of protection defined are controlled by an ARM 7 based controller acting as the central node. The whole system was tested using a test set up by mimicking the vehicle door, vehicle immobilizer etc. With equivalent motors whereas fingerprint data was received from Matlab based GUI application. The experimental results proved the functionality of the anti-theft system in working environment.

III. PROPOSED CONCEPT

In this paper , we present a solution on how to protect the car logo with affordable cost [6]. Here, we made an attempt to develop a system based on raspberry pi-2 technology. With this system, when someone is trying to steal the car logo , it alerts the car owner when he is at nearest distance as well as when he is far away from the car. But with this alarm, it is not possible to alert the car owner who is unable to hear that alarm. So, in that case, we can use GSM network to send the text message to the car owner at his phone. In addition to this the car owner will get the captured image of that thief also.

The use of vehicle is must for everyone. At the same time, protection from theft is also very important [7]. Prevention of vehicle theft can be done remotely by an authorized person. The location of the car can be found by using GPS and GSM controlled by FPGA. In this paper, face recognition is used to identify the persons and comparison is done with the preloaded faces for authorization. The vehicle will start only when the authorized person's face is identified. In the event of theft attempt or unauthorized person's trial to drive the vehicle, an MMS/SMS will be sent to the owner along with the location.

Then the authorized person can alert the security personnel for tracking and catching the vehicle. For face recognition, a Principal Component Analysis (PCA) algorithm is developed using MATLAB. The control technique for GPS and GSM is developed using VHDL over SPTRAN 3E FPGA. The MMS sending method is written in some modifications in the systems wherever the face recognition or detection is needed like, airports, international borders, banking applications etc.

IV. HARDWARE DESCRIPTION

In our proposed system, we have used Raspberry Pi which is connected to any moving vehicle, making a cheap option to track our vehicle or any moving object with real time on Google Maps. Tracking is done by using sim cards cell tower location.

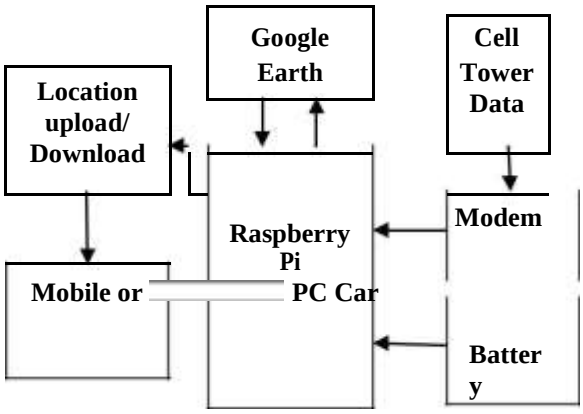

Figure 1: Block Diagram of proposed concept

While on the move, first thing we need is power supply. Raspberry Pi needs 5V and around 1A as power input. We can use a mobile charger/ USB input in our car entertainment system or any other source.
It will be safer to use a USB power bank that can draw uninterrupted power supply.

For location provider, we shall connect a 2G/3G/4G USB dongle. Alternatively, we can connect a USB Wi-Fi dongle to Raspberry Pi. Wi-Fi dongle should have access permanent access to a hotspot.

Figure 2: Hardware Connections

To get the location of the moving Raspberry Pi using cellphone tower data from USB dongle, we have to Google as 'what's my location' and can notice HTML 5 based websites asking for permission to share our location. They use a combination of cell tower data, Wi-Fi access points, IP address, etc. to get the location.

To get latitude/longitude data, there are various web based geolocation services. We have used Google Maps Geolocation API as it is easy to use. We have to signup to get a private key. The key is passed to the API along with the input parameters like IP address, cell tower, and Wi-Fi access points. The result from the API is a pair of latitude and longitude.

We should send as many inputs as available to get accurate latitude and longitude results. These results depend upon the location where we are and how much data we can gather from USB internet dongle or Wi-Fi dongle connected with Raspberry Pi. To store the geolocation data we need an online storage e.g. Spark fun. Uploading data will require a few lines of codes and we have to get a private key from Spark fun to upload the data. During the development and testing our location tracker, we may want to login to Raspberry Pi and check whether if we are getting the desired results when it is on the moving condition.

We have used Weaved service (http://weaves.com)as suggested on raspberrypi.org to control it over internet (http://raspberrypi.org/documentation/remote access/access-overinternet/internetaccess.md),

and it allows us to stay connected with Raspberry Pi for 30 minutes.

While on the move, there is a chance of losing signals which means our SSH connection might be disconnected. To overcome this problem it is better to use a utility package called screen. Run the screen command followed by c commands.

Figure 3: Latitude/Longitude point

Google Maps APIs expect a latitude and longitude pair to show the location on Google Maps in a browser window.Map.html has the JavaScript and HTML code for it. We can also track the distance from a starting point. We need to give the latitude and longitude of the starting point in map.html.We can display it on Google maps app on our smartphone or may be desktop based application.

V. SOFTWARE DESCRIPTION

The software requirements for "Web Controlled Security System Using IoT" to operate functionally is to have Raspbian or any other OS supporting Raspberry Pi. These software requirements are used to develop the system. With the help of python. We can control many input and output devices using GPIO pins for which it requires the software's like Raspbian, Google Maps Geolocation API private key. Private Key is used to upload the coordinates on data such as sparkfun.com or any other online storage. We should have basic knowledge of computer programming to understand Python, Java Script and HTML codes. Finally weaved.com account is used to control the Raspberry pi over internet.

VI. RESULTS

This prototype is an enhancement and development of the Anti-Theft System concept to attain the economic environment for maintenance, security and productivity basis. We can connect USB or Wi-Fi dongle to the Raspberry Pi for tracking the location of the car. To get the latitude/longitude data we have used Google Maps Geolocation API. The key is passed to the API along with the input parameters like IP address, cell tower, and Wi-Fi access points. The result from the API is a pair of latitude and longitude. The maintenance from of the program allows the car owner to track, locate and view the current changes within the car. The software design is constructed and developed to introduce the car owner with a new system that allows tracking and determining the location of the car and updating the location of the car is also one of the features of the software. The software required here is Raspbian or other OS which supports the Raspberry Pi. From Raspberry Pi the data is uploaded in Google Maps using an online web server. From mobile phone or computers we can get up to date information of the car.

This output satisfies the user's need and to monitor intruders. This technology makes the way for security of a system more efficient and reliable for tracking the car.

VII.CONCLUSION

In this paper, we have proposed a new method "Web Controlled Security System using IoT". This project aims the solution for tracking the car and identifying the car theft using Raspberry Pi. It is a single board on chip computer. It can control many input and output devices using GPIO pins which requires soft wares like Raspbian. This versatile minicomputer has enough power to run a wide range of applications including audio or video processing, remote control, or autonomous robots. The monitoring station display these information on GUI and also stores these information in database for further process according to a program. This system is useful in man applications such as surveillance, security, tracking, which may be installed in cargo trucks, cars, motorcycle, and boat.

REFERENCES

[1] M.A. Al.Khedher, "Hybrid GPS-GSM localization of automobile tracking system",

International Journal of Computer Science and Information Technology, vol. 3, no. 6, pp. 75-85, Dec 2011.

[2] B.G. Nagaraja, R. Rayappa, M. Mahesh, C. M. Patil, and T. C. Manjunath, "Design and development of a GSM based vehicle theft control system", presented at the International Conference on Advanced Computer Control, Singapore, January 22-24, 2009.

[3] S.S.Pethakar, Srivastava, and S. D.Suryawanshi, "RFID, GPS and GSM based vehicle tracing and employee security system", International Journal of Advanced Research in Computer Science and Electronics Engineering, vol. 1, no. 10, pp. 91-96, Dec. 2012.

[4] Pankaj Verma, J.S Bhatia "Design and development of gps-gsm based tracking system with Google map based monitoring", International Journal of Computer Science, Engineering and Applications Vol.3, No.3, June 2013.

[5] Arun Sasi, Lakshmi R Nair "Vehicle anti-theft system based on an embedded platform", International Journal of Research in Engineering and Technology eISSN: 2319-1163 | pISSN: 2321-7308.

[6] Chaitali N. Surkar, Prof. Amit Welekar "A Review: Raspberry Pi-2 Based Anti-Theft System for Car Logo", International Journal on Recent and Innovation Trends in Computing and Communication Volume: 3 Issue: 11.

[7] Y B T Sundari, Dr. G Laxminarayana, G Vijaya Laxmi "Anti-Theft Mechanism Through Face recognition Using FPGA", International Journal of Advancements in Research & Technology, Volume 1, Issue6, November-2012 ,ISSN 2278-7763.