Vehicular Security using IOT

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Abstract: *IoT (Internet of Things) is the network of physical objects or things. IoT has vast applications in all domains. 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. This is more secured, reliable and low cost.*

Keywords: Rasp Pi Camera, Gyro Sensors, Raspberry Pi, Wi-Fi Module.

1. Introduction

Now a days almost of the public having an own vehicle, theft is happening on parking and sometimes driving insecurity places. The safe of vehicles is extremely essential for public vehicles. Vehicle tracking and locking system installed in the vehicle, to track the place and locking engine motor. There are many technique used for vehicle tracking. One of them is GSM and GPS system. 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. Our proposed 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. Our aim to 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.

2. Existing System

In 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) and GSM are commonly used as global navigation satellite system which is used to locate the vehicles and also to stop the vehicle if stolen. Accuracy is not provided by previous method. 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 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. Further to prevent the seizure of the vehicle, tire 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.

GPS is one of the technologies that are used in a huge number of applications today. 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.

Paper ID: ART20174094

3. Literature Survey

Many researchers have proposed the use of cutting edge technologies to serve the target of vehicle tracking. These technologies include:

Communication, GPS, GIS, Remote Control, server systems and others. The remote monitoring system based on SMS and GSM was implemented. Based on the total design of the system, the hardware and software designed. In this paper, the GSM network is a medium for transmitting the remote signal. This includes two parts that are the monitoring center and the remote monitoring station. The monitoring centers consist of a computer and communication module of GSM. The software-monitoring center and the remote monitoring station implemented by using VB. The result of this demonstration shows that the system can watch and control the remote communication between the monitoring center and the remote monitoring station.

The proposed tracking system based on cloud computing infrastructure. The sensors are used to monitor the fuel level, driver conditions, and speed of the vehicle. All the data transferred to cloud server-using GSM enabled device. All the vehicles equipped with GPS antenna to locate the place. To avoid the drunk and drive, the alcohol sensor installed to monitor the driver status. The proposed technology significantly avoids the accident in highways.

A vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third party to track the vehicle's place. This paper proposed to design a vehicle tracking system that works using GPS and GSM technology. This system built based on embedded system, used for tracking and positioning of any vehicle by using Global Positioning System (GPS) and Global system for mobile communication (GSM). This design will continuously watch a moving Vehicle and report the status of the Vehicle on demand. In modern day vehicles, vehicle antitheft system is of prime importance . 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.
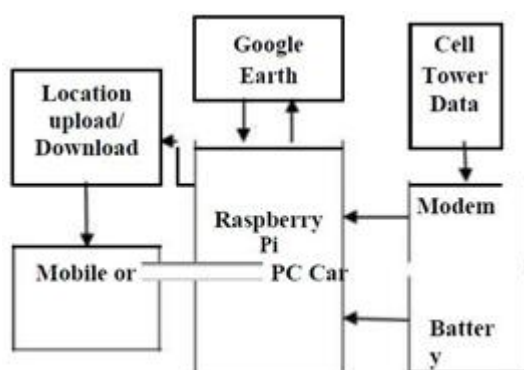
3.1 Architecture of System

Figure 1: Block Diagram of system

3.2 Proposed System

This paper, we present a solution on how to protect the car logo with affordable cost. 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. 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. 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.

4. Conclusion

We have proposed a new method "Web Controlled Security System using Raspberry Pi (IOT)". Our project aims the solution for tracking the vehicle 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 software like Raspbian. This versatile minicomputer has 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 like mobile and also stores these information in Database for further process according to a Program. This system is useful in many applications such as security, vehicle tracking, which may be installed in cargo cars, motorcycle, trucks, and boat.

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