

Design and Development of Vehicle Theft Detection System

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Abstract:

In the present era Security plays an important role in every situation or in everything and it was a big concern at present days. Fingerprint based vehicle theft recognition system provides us the best secure system from different type of theft attacks. Every individual have fingerprints and the prints can be scanned quickly by using proper devices and this uniqueness provides a height security and it was very easy to use, no need to do anything just placing of finger is enough. The proposed system is an attempt to make a highly securable recognition system using fingerprint scanner to identify the person and along with this GPS and GSM has been interfaced to detect the exact vehicle location and send this location to a mobile number using GSM. The main aim of our vehicle theft detection system is to give the Security to all the vehicles. For vehicles this is the improved security system. The most useful modules like GPS module are highly useful in present era (days), the proposed system allows the owner to observe the vehicle location and track his vehicle and it finds out the every movement of the vehicle.

Keywords: GSM, Theft detection, GSM, Finger print sensor.

1. INTRODUCTION

Now a day's vehicle theft cases are increasing every day. It was difficult to give security to our vehicles when we parked our vehicles. The best way to secure the vehicle from thefts is locking vehicle framework. It is vehicle security system that gives a best to one's vehicle. However, this framework cannot be established to give complete security and directness to the vehicle in the event of burglary. So mainly if we give more security framework it makes the use of an already inserted framework which is going to be focused the GPS and GSM module innovation. Vehicle theft detection system was proposed by Prabhakar et.al [1], it uses the Number plate detection (License Plate Number detection System) which detects the theft vehicle by identifying the characters on the plate of automobile. Number plate is detected by 3 processing steps ,Detection and segmentation of characters in the plate. First they take the picture of the vehicle and converting into gray scale image they extract the letters and numbers of the plate. So that they can identify the vehicle that was stolen and the vehicles not obeying traffic rules can be caught. An Automated vehicle theft detection proposed by Shammi et.al [2] which uses the number plate detection of a vehicle using edge detection methods of a image. If an object is detected it will extract from the background and letters and numbers are detected If there is any noise in the image it uses

filters and removes the noise. The characters are detected by Canny edge detection. Anti-Theft Vehicle Tracking and Immobilization System was proposed by Mukherjee [3], it utilizes the GSM module and GPS module which sends the information regarding vehicle. When the vehicle had stolen the owner receives the latitude and longitude of the vehicle location. The owner gets directly to his mobile number because they used the GSM module. Vehicle Number Plate recognizing system that used the Bounding Box Technique proposed by Babuet.al[4] which detects the vehicles that have violated rules and have been stolen. They used the Bounding Box method, Segmentation and filter of the image. These methods are useful if the image is visible very clearly and if there is some noise by filtering we can remove the noise. Nowadays, vehicle robberies are very high in cities, so tracking sensors are being kept with more and more prestige. These systems though tolerate a few restrictions such as too high rates, and are easy to remove. Mohanasundaram [5] describes the achievement and assessment for dealing with these restrictions. In this model, sensors in vehicles kept at the same place lot initial detect a sensor system, then detect illegal vehicle driving and inspect for possible vehicle theft. After an illegal move is detected, an alert and good report will be made to the station where the car is parked, By which carefully mails the station. This project mainly tells about practical problems for systems. Sreedevi et.al [6] proposed that each critical electrical device should be included with this module it will not tolerate the functions of apparatus if it found by itself, so it is criminally transported to a new vehicle. Each model enabled electrical device will validate itself with the car's permitted center, forward power-on, to see if it is in the correct car. Permitted centers may also be restricted by immobilizer. Such a move would increase the anti-theft capability of cars. Saravanan et.al [7] presented identification of scam actions and anomalies in vehicle driving are two main concerns for vehicle convoy production. The planned system monitors certain vehicle parameters and provides solutions to these problems with the help of sensors and related mechanisms. The discrepancy and scam action detects using the sensors present in the vehicle that it is continuously reorganized and send the number to the server, at what place and other important information. System always interacts with the server when there is incidence of an action which reduces the price of usage and the matching alerts are also given to the monitor agents. The schematic repeated mobile phone-based model uses a new Android application to inspect and visualize the locations of various functions avoiding the need for a 24/7 monitor. Shrivastava et.al [8] presented an electronic device, which can be used in times of emergency when the person driving the vehicle. It involves the definitive

concept of wireless technology. When the person affected by an accident, the technology used to identify the accident location is ZigBee and GSM and many other sensors with the help of which the accident person can be reached immediately. The complete formation is done by the microcontroller. And furthermore, we can use another function of DTMF, with the help of which the appropriate user can follow the security measures when the vehicle is robbed, then the material for the study that Zig for the communication purpose of the message -bee can use other vehicle at the time of necessary help for the possibility of being well and safe, the speed of the vehicle is clearly visible and with the effect of the search mechanical Door lock is used. We use Global Positioning System technology to find the exact car location. Akshay et.al [9] planned a system providing three features together with suggestion about the interloper, calculating the vehicle and also provide the ability of detection of known User or sending capture image unidentified person using SMS and MMS. The planned system notifies the owner about the unofficial entry by sending an SMS. The owner of the vehicle can stop the engine by sending SMS to the car. Additionally, owner facial image is captured by the camera attached to the system and forward to the owner's mobile using MMS. In general systems is designed and implemented using GPS and Raspberry PI regulator. The results are confirmed and experienced to confirm the system's checking. Kung et.al [10] designed an automobile air gesture vehicle theft detection using the keyless remote as the main part to escape from the vehicle theft. But by using this system it is used for some extent only and some gravitational system smart lock is used to escape from the vehicle theft by giving the air gesture key to the vehicle then it can give high security to vehicle. The owner can able to track his vehicle and see his vehicle which was stolen at anytime from anywhere. In this system they didn't used thumb impression. Before opening the vehicle door by using thumb impression we can identify the theft easily when the thumb is not matched and the owner gets the message by using GSM module. If the thumb didn't matched more than three times automatically the owner gets the message. Pandit et.al [11] developed a RFID based system for the vehicles by which we can identify the theft who are trying to open the vehicle door. Mainly, it addresses the three main major problems like timings of the traffic lights, congestions on vehicles which are stolen by theft on roads. This is a simple technique and one way to measure the quotient of traffic which depends on the measurements of the road and the behaviour of the traffic. The main aim is to track the vehicle by using the radio frequency ID and if we add thumb impression in this system we

can find easily and can send the message to the vehicle owner through GSM later we will track that vehicle location by GPS.

2. Research Gaps

1. In Vehicle theft tracking system project proposed by different authors had not been implemented or best use of the finger print sensor has not been implemented. By using this finger print sensor only the authorized person can access the system and unauthorized person cannot access the system.
2. In this project proposed by all authors who have been implemented or investigated ,most of them have used voice detection system but by using the voice detection there are many drawbacks like thief can mimicry and sometimes owner voice can change due of his health conditions.
3. In vehicle theft tracking system GSM module and GPS module is used widely but with these finger print sensor has not been interfaced.
4. When comparing to face detection and finger print sensor the cost of face detection is high and efficiency also less.
5. In this Vehicle theft tracking system using finger print sensor project. We are aimed to implement theft tracking device with real time tracking and control by user and by using GSM and GPS modules.
6. Many of the authors has not proposed the prototype that can be used real time like implementing real engine of a vehicle.

3. OBJECTIVE

To detect and track the theft vehicle using the GSM module, GPS module and the Fingerprint sensor. In this system we used thumb impression. By using thumb impression we can identify the theft when the thumb is not matched and the owner gets the message by using GSM module and allow only authenticated users. It also user friendly, fast access, fingerprint reorganization technology. Along with GPS and GSM system. This system model of the vehicle security system is made using microcontroller which is based on embedded platform that control the all operations. The cost of this is less and it enhances the security. If theft attempts to unlock the vehicle using a thumb impression, if it is not matched with the fingerprint which is already saved then it sends a SMS to owner. Thumb impression system is placed at the engine ignition .By using the GPS module technology vehicle tracking is very

easy. Thus the system provides high security at all the level. Initially from the satellite GPS module every time takes the input information and it will keep the latitude and longitude values in microcontroller. If anyone wants to track and see the position of the vehicle, by using GSM module we want to send a message. It will activate by finding the accident on IR sensor, by finding the theft who is connected to the vehicle and parallel GPS module will deactivates. After activating GSM module it will take the positions of vehicle and sends the sms to the particular number already which we have kept. This new technology mainly called the vehicle theft detection and which are created the many useful things in the security of vehicles. This system hardware is assembled in the vehicle in such a way that it was not able to be seen to any person who is in the vehicle or outside the vehicle. Vehicle tracking System can be able to sense the unauthorized actions of the vehicle and then it will ready to act to the owner.

4. Research methodology

4.1 Arduino

Arduino is a platform that is open for all and it will be very easy for using and it is the combination of the hardware and the software. For many projects it was like a head. It has able to read the inputs from the sensors connected to it for example light detection, finger placed on something or a message from other services. And then it will collect these inputs and gives output appropriately. Like turning the LED ON and turning on the motor etc., It can read the Analog and the digital inputs but it can give output only in the form of digital. It has the six Analog pins and 14 pins of digital and two serial pins(RX and TX). It has microcontroller ATmega328P. And the programming for this IDE is very easy and easy environment.

4.2 GSM Module

GSM means Global System For Communication which is used for communication purpose. In the GSM we have to insert a SIM card for communication by using SIM card we will receive messages and calls to our defined number. It uses the Time Division Multiple Access method. It can communicate mobile, Computer over a network. It can also be connected to the computer through Bluetooth or serial ports. It has the abilities to make a call or send a message and it can delete messages also in the SIM card that are received or send by the GSM.

4.3 GPS Module

Global Positioning System module is used to get the Location and time where this module is fitted. It a satellite navigation system and works in All type of weather conditions. It is connected to minimum of 4 satellites in the space. It send the Latitude and Longitude and we can search these details in the google Maps and we can get the location of it. It is maintained by the USA government and we access it freely. It is used in many applications in medical, Military etc.

4.4 Finger Print Sensor

Everyone has an individual finger prints, based on this the finger print sensor works. It reads the finger prints and gives the scanned information to the device and then the device recognizes the scanned print and checks the authorised person. It is used for Mainly security purpose to access something.

5. Description of the project:-

This work is based on the Arduino, using this vehicle tracking system user gets the location details of the vehicle where it is currently on his mobile and it can track it on Google map. To implement this system we are using Arduino Uno as the main processing unit. The total system is controlled by Arduino Uno. Mainly this Arduino is interfaced to liquid crystal display to display the longitude and the latitude. Also, it is interfaced to GPS module and GSM modem. GSM module is used to send SMS to the owner of the vehicle. Once you start the vehicle it will starts the sending location details to the owner. By using that SMS we can track the location of the vehicle. The block diagram for operation is shown in Fig. 1. Nowadays every smartphone has Google Maps application preinstalled. So the message will be opens in the Google Maps app. By using GPS module system it sends the location of the vehicle constantly to the owner where the vehicle is placed. Using the google maps we can watch the places around the vehicle and also we can watch the road on that map which we will open.

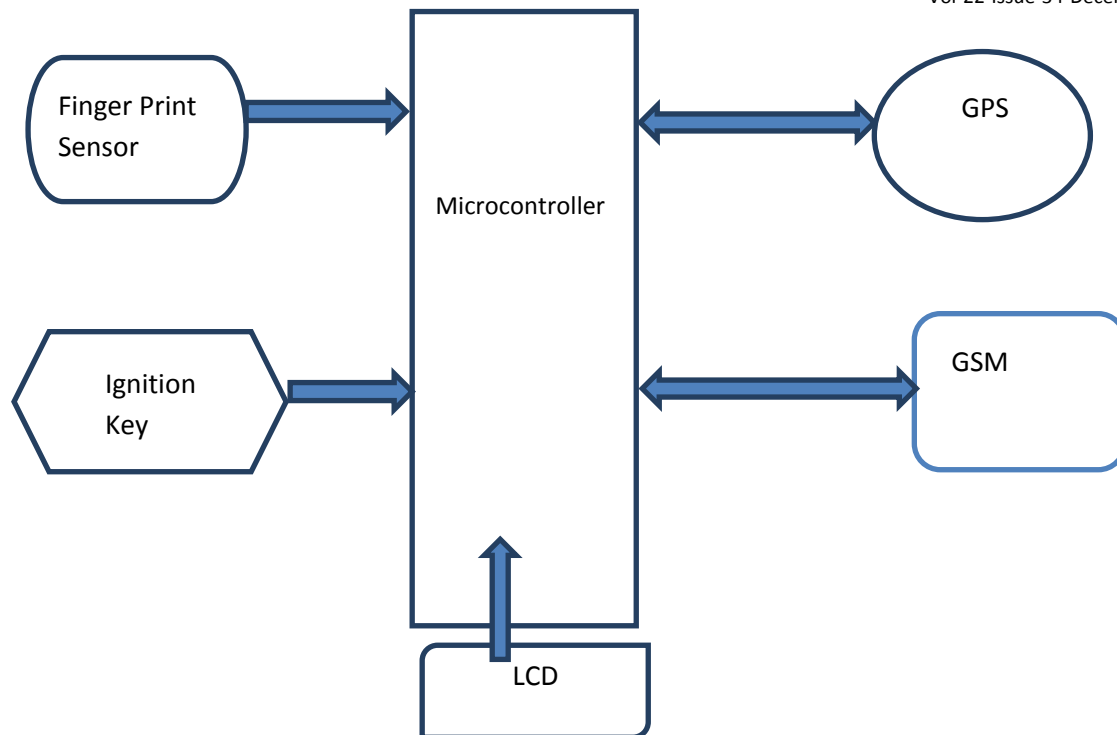


Fig 1. Block Diagram for Vehicle Theft Detection System

6. Conclusion

Vehicle theft detection is a system for tracking theft vehicles by using GSM and GPS. This proposed project is mainly used for security purpose. The main part of this project is using of fingerprint sensor. By using this device we can find our lost vehicle by seeing our phones and we can find through the location send by this device. It sends the immediate information once it is theft to our mobile phone.

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