GSM and GPS Vehicle Theft Detection and Tracking Based System

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Abstract - *In view of these, there is a need for adequate records of stolen, identified and recovered vehicles which are not readily available in our society and as such very important. The issue of vehicle theft has increased tremendously, mostly at gunpoint or car parks. The crime rate in every part of the society these days has become a threatening issue such that vehicles are now used for committing criminal activities more than before. Insecurity is one of the major challenges that the entire world is facing now, each country having their peculiar security issues. The development of a vehicle theft alert and location identification system becomes more necessary for vehicle owners to ensure theft prevention and a speedy identification towards recovery efforts in situations where a vehicle is missing, stolen or driven by an unauthorized person. The owner can respond with an SMS to stop the engine. A buzzer is also activated to alert the nearby people or the security personnel if the right password is not entered after maximum number of trials. This system also provides provision for vehicle tracking using GPS. An alert message is sent to the owner if the wrong password is entered. Message is also sent when the ignition system of the vehicle is started. Message is sent to owner even when vehicle is started using correct password. The proposed system provides two levels of security, password protection for the vehicle and remote ignition cut-off mechanism. GSM and GPS technologies are used for that purpose. GSM technology is used for intimating the owner.*

Key Words: **GSM, GPS, password, Ignition cut-off, buzzer.**

1. INTRODUCTION

The statistics of vehicles theft are increasing day by day in India. So, the security of our vehicle is the most essential. As we know that track our vehicle location anytime is not possible so we made a device which track the vehicle location whenever we want with the help of message containing a link (location) on our smart phone. The system we are designing ensures the security of our vehicle. In that way, we are going to make our Anti Theft Vehicle Security System for two wheelers as well as for four wheelers. In the last few decades, India has progressed at such an enormous rate that many companies have strongly established themselves here. These companies bring a huge amount of workforce with them. Arranging transportation to such a huge mass is a difficult task involving many problems. Generally, this transport is arranged through the local transport vendors on a yearly contract basis. Recently happened problems are such as burglary, rape cases etc.

The development of satellite communication technology is easy to identify the vehicle location. Vehicle tracking systems have brought this technology in day-to-day life of the common person. Today GPS used in cars, ambulances, fleets and police vehicles are common sights on the roads of developed countries. All the existing technology support tracking the vehicle place and status. The GPS/ GSM Based System is one of the most important systems, which integrate both GSM and GPS technologies. It is necessary due to the many of applications of both GSM and GPS systems and the wide usage of them by millions of people throughout the world. This system is designed for users in land construction and transport business, provides real-time information such as location, speed and expected arrival time of the user in moving vehicles. This system may also useful for communication process among the two points. Currently GPS vehicle tracking ensures their safety as travelling.

This vehicle tracking system found in clients vehicles as a theft prevention and rescue device. Vehicle owner or police follow the signal emitted by the tracking system to locate a robbed vehicle in parallel the stolen vehicle engine speed going to decreased and pushed to off. After switch of the engine, motor cannot restart without permission of password. This system installed for the wheelers. Vehicle tracking is usually used in navy operators for navy management functions, routing, send off, on board information and security. The applications include monitoring driving performance of a parent with a teen driver. Vehicle tracking systems accepted in consumer vehicles as a theft prevention and retrieval device. If the theft is identified, the system sends the SMS to the vehicle owner. After that vehicle owner sends the SMS to the controller, issue the necessary signals to stop the motor.

Insecurity is among the challenges that the entire world is battling with, each part of the world with different security issues. Crime rate in our society these days is becoming frightening as vehicles are been used for committing crime and research shows that perpetrators of this acts make use of stolen vehicles snatched at gun points which is causing damages to live and properties. According to there is assumption that vehicle theft only occurs in seedy areas, but vehicle theft can also occur anywhere in any area of a town. The researchers also asserted that theft is among

the common attitudes exhibited by people where the ownership of property such as vehicle, land, and other physical properties can be altered without the knowledge of the owner.

Recently, the role of mobile phones in the society is largely still unexplored. This was collaborated by, that because of the fast improvements in mobile phone technology, it seem that in future mobile phones would replace computers. Also, new innovative vehicle tracking systems have been developed with the capabilities of operating vehicle controls such as locking the door, stopping and starting the vehicle engine, switching fuel tank off, locking of steering and disabling the vehicle brake and clutch. All these can render the thief or unauthorized user useless with very few options while trying to steal or use the vehicle.

2. RELATED WORK

This system built is 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 paper proposed to design a vehicle tracking system that works using GPS and GSM technology. A vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third party to t rack the vehicle's place. This design will continuously watch a moving vehicle and report the status of the vehicle on demand.

The proposed system also consists of an embedded system with ARM processor which is installed in the vehicle. [9]designed a vehicle tracking and locking system based on GSM and GPS using GSM Modem SIM300 V7.03 as the technology. This GSM modem was designed such that it can accept SIM card. Also, the system has the capacity such that when SMS message is sent to the controller, it has the features of sending signals to the vehicle engine motor which enable the engine of the vehicle to decreases steadily and then off, thereafter, it will locked all the doors and the engine which has to be restarted again before the door can be opened by entering the password given to the rightful owner of the vehicle. Proposed the design and development of Global positioning system and Global system for mobile communications based vehicle tracking in a real time. The paper further stated that the designed system is sets such that it will go into sleeping manner when the vehicle is being driven by the vehicle owner, otherwise, it will be in active status. The designed system gives an alert which is used for reporting any events that happens to the vehicle as it moves. The system has the ability to send an SMS which consist of latitude and longitude of the vehicle by using AT commands after pressing the emergency key if there is any problem that is associated with the vehicle.

This design will continuously watch a moving vehicle and report the status of the vehicle on demand. This system built is 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 paper proposed to design a vehicle tracking system that works using GPS and GSM technology. A vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third party to t rack the vehicle's place. The system processes, interfaces, connections, data transmission and reception of data among the mobile unit and control stations are working successfully. These results are compatible with GPS technologies. The proposed GPS/ GSM based System has the two parts, first is a mobile unit and another is controlling station.

3. METHODOLOGY

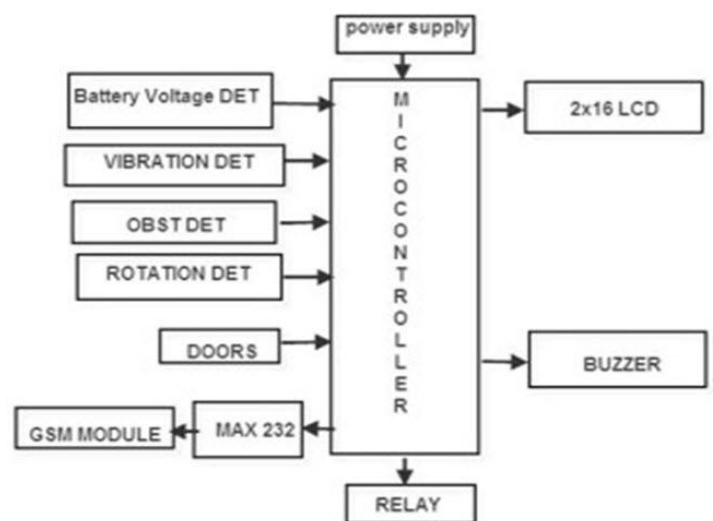### 3.1 Block Diagram of Proposed System

Fig.3.1 Block Diagram of Vehicle Theft Detection

Here we use Battery for switching the circuit firstly start the battery using switch. The battery turn on and the microcontroller ATmega 328P also `ON`. Here we use the voltage regulated IC 7805. Because the voltage capability of microcontroller is 5V.Now, when vehicle will move forward then automatically IR sensor activated signals and turning on the GSM and GPS module. The GSM module sends the text message and the location to the owner of the vehicle or users mobile and we get the link. For extra security purpose we use the NRF module. The NRF module is a wireless communication module.it work as a transreceiver device. In our yard, suppose any thief can make attempt steal it, after the 100m distance. The range of transreceiver module will be disconnect and buzzer will start. Also we get the text message from GSM module and location.

The proposed method presents the researchers framework for achieving a more cost effective vehicle theft alert and identification system. The framework proposes the use of the GPS, GSM and the web technologies.

Fig.3.1 represents a physical working scenario showing the communication established in actualizing the theft alert functionality. The Global System for Mobile communications (GSM) uses a network carrier by examining mobile phone masts in the vicinity to transmit information from one mobile phone to another. The GSM cell tower (i.e. mast) enables the Short Message Service (SMS) to be sent from one mobile phone to another or from a web application to a mobile phone.

Fig.3.2. Physical architecture of the theft alert function

Incorrect logic or errors in computations can analyze by stepping through the code in simulation. Some simulators accept only the assembly language of the target microcontroller. After compiler operation, the hex code generated and stored in the computer. Simulators run at speeds 100 to 1000 times slower than the actual micro controller hardware and, thus, long time delays should avoid when simulating a program. Most of the microcontroller software has written a high-level language such as C, Pascal or Basic, and it has become necessary to simulate a program has written in a high-level language.

The software program has written in c or assembly language and compiled using Keil software. The user program operated in a simulated environment where the user can insert breakpoints within the code to stop the code and then analyze the internal registers and memory, display and change the values of program variables and so on. Inputs to the simulator can come from files that may store complex digital I/O signals and waveforms. The hex code of the program should be loaded into the AT89C52 by using Top win Universal programmer. Micro controller-based systems usually have interfaces to various external devices such as motors, I/O ports, timers, A/D converters, displays, push buttons, sensors and signal generators, which are usually difficult to simulate. Some advanced simulators, such as the Proteus from Lab center Electronics allow the simulation of various peripheral devices such as motors, LCDs, 7-segment displays and keyboards, and users can create new peripheral

devices. Outputs can be as form of digital data or waveforms, usually stored in a file, or displayed on a screen.

3.2: Advantages

(i) This device consumes less power.
(ii) The message will be sent on mobile phone as our system gets on.
(iii) We get the location of the vehicle on mobile when it gets misplace from the current parking position.

4. CONCLUSION

Vehicle theft prevention by means of alert and location identification as effort towards recovering missing, stolen or unauthorized use of vehicles. Several literatures reviewed shows how various technologies (e.g. Sensors, GPRS, GPS, GSM, RFID etc.) have been used in this area over the years. Most of these technologies have been helpful but fails at times due to signals distortion and lack of network coverage. This project proposed the use of GSM, GPS, and the Web technologies to achieve the implemented system. The system integration testing was carried out on the implemented system in order to ascertain the workability and functionality of each component that makes up the system. System acceptance evaluation was also carried out to ascertain acceptability and effectiveness of the developed system. Results analysed from both the system integration testing and acceptance evaluation shows the implemented system can be deployed and used as a cheaper means of preventing vehicle theft and as a recovery tool for missing or stolen vehicles. The implemented system realizes the architectural framework herein proposed. A future research recommends a non- network based communication between applications developed.

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