REAL TIME VEHICLE CEASING AND TRACKING USING GSM AND GPS TECHNOLOGY

[1]Charu Saxena, [2]Pankaj Bhardwaj, [1]Adesh Sharma, [1]Arpit Rastogi, [1]Bobby Arya
[1]Final Year Students of Dept. of E&C Eng., MIT Moradabad
Ram Ganga Vihar, Phase II, Moradabad (244001), India
[2]Assistant Professor, Dept. of E&C Eng., MIT Moradabad
Ram Ganga Vihar, Phase II, Moradabad (244001), India

ABSTRACT

This is the anti-theft system that not only stop your vehicle but also track the location of your lost vehicle. We have made a system which will provide users the capability to track vehicle remotely through the mobile network. Specifically, the system is providing the owner of the vehicle to stop his moving vehicle whenever he found it riding by the unknown person. This is done by sending a command to the GSM modem present in the system to stop the engine. The ceasing o the vehicle will be done through relay Moreover he can utilize the GPS receiver to obtain his vehicle's location anytime and transmit it using the GSM modem to his cell phone through the mobile network. This received location will be in the form of LAT, LONG which can be further entered directly on the Google app to trace the actual location. This system also proves fruitful for crosschecking the driver's location anytime by asking for the coordinates of the location. Main objective is to design a system with a great emphasis laid on the compactness for installing it within the vehicle and to provide platform for further enhancement.

KEYWORDS: *Ceasing, GPS, GSM, Technology, Tracking*

I. INTRODUCTION

In this urban life, transportation is very common. Automobile thefts are increasing at an alarming rate all over the world. To resolve such problems, a system is developed using GPS and GSM technologies and an application is introduced in this research work. Various problems that we face:

    a. To catch running thief with stolen vehicle.
    b. To recover important things present in the vehicle.
    c. To find the shortest path available.

All these problems are overcome by the proposed system. In wireless data transporting, GSM and SMS technology is a common feature with all mobile network service providers [1]-[2]. Utilization of SMS technology has become popular because it is an inexpensive, convenient and accessible way of transferring and receiving data with high reliability [3]. Currently GPS vehicle tracking ensures safety of people at travelling. The GPS receiver collects the latitude, longitude and speed information and forwards them to the microcontroller [4]. This vehicle tracking system found the client's vehicles as a theft prevention and rescue device. Vehicle owner just use his cell phone to send the off command as sms. After switching off the engine, motor cannot restart without retransmission of SMS driven by user or by resetting the whole system. This system is user friendly, easily installable, easily accessible and can be used for various other purposes. After installation system will allow to track the target anytime and anywhere in any weather conditions.

Chen, H., Chiang [5] in his paper said that the main objective is to interface the GSM technology with the embedded system in a compact way. 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.

The paper is divided in 5 sections. First section provides introduction about the idea of the paper. Second section is dedicated to the literature review which provides the survey of the related work done about the proposed idea. Third section gives the design implementation of the idea which includes the building blocks of the system plus their description. Fourth section is dedicated to the circuit diagram on the software tool "proteus" and the fifth section includes the result and conclusion.

II.   SURVEY OF THE RELATED WORK

Real-time tracking and management of vehicles has been a field of interest for many researchers and a lot of research work has been done for tracking system. Recently the various anti-theft modules like steering wheel locked equipment, network tracking system and traditional electronic alarm are developed along with client identification and real time performance monitoring. The hardware and software of the GPS and GSM network were developed. The proposed GPS/GSM based System has the two parts, first is a mobile unit and another is controlling station. The system processes, interfaces, connections, data transmission and reception of data among the mobile unit and control stations are working successfully.

Kai-Tai Song and Chih-Chieh Yang [6] in his paper focuses on the design of a real-time visual tracking system for vehicle safety applications. He built a novel feature-based vehicle-tracking algorithm, which automatically detect and track several moving objects, like cars and motorcycles, ahead of the tracking vehicle.

Albert Alexe, R.Ezhilarasie [7] in his paper 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.

Chen Peijiang [8] in his paper implemented the remote monitoring system based on SMS and GSM. 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.
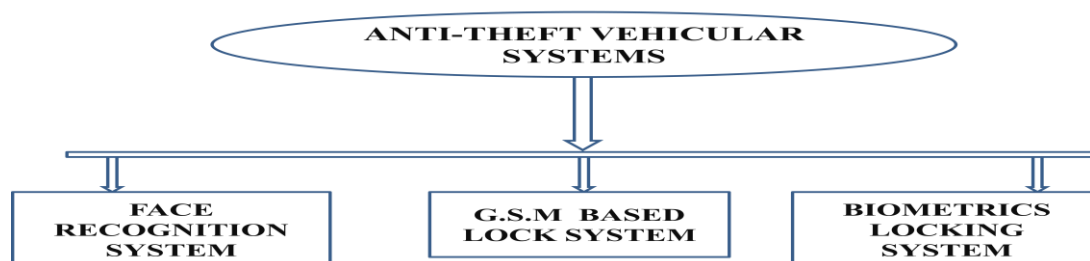

Fig.1 Types of anti lock vehicular system

In Vikram Kulkarni & Viswaprakash Babu [9], Face Detection System is used to detect the face of the driver, and compare with the predefined face. The car owner is sleeping during the night time and

someone theft the car. Then Face Detection System obtains images by one tiny web camera, which is hidden easily in somewhere in the car. Face Detection System compared the obtained images with the stored images. If the images don't match, then the information sends to the owner through MMS. The owners get the images of the thief in mobile phone and trace the place through GPS. The place of the car and its speed displayed to the owner through SMS. The owner can recognize the thief images as well as the place of the car and can easily find out the hijackers image. This system applied in our day-to-day life.

III. SYSTEM ARCHITECTURE OF PROPOSED MODEL

It consists of two units one is transmitting side (vehicle unit) and other one is monitoring side [10].
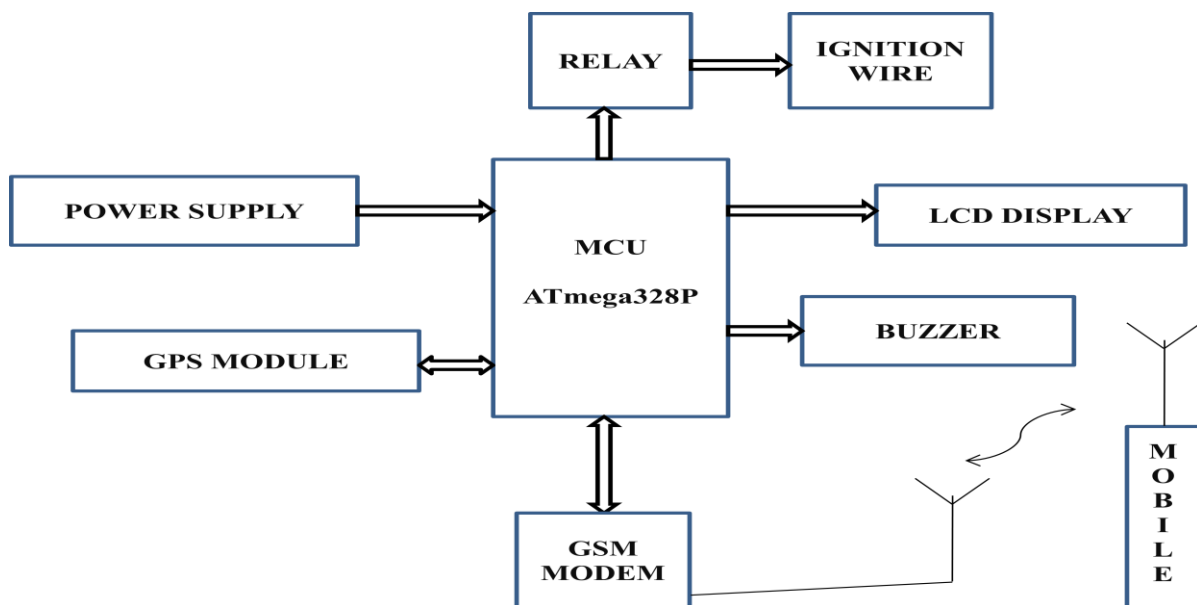
A. Block diagram

Fig.2 Block diagram of vehicle ceasing & tracking using GSM & GPS

B. Components description

1. Global Positioning System (GPS)

GPS is a satellite-based navigation system consists of a network of 24 satellites located into orbit GPS modules are popularly used for navigation, positioning, time and other purposes. GPS antenna receives the data from the satellites which is called as ephimeris.

SIM28 is a stand-alone or A-GPS receiver that supports jamming removing function, Time-to-First-Fix (TTFF) with lowest power consumption.A GPS receiver must be locked on to the signal of at least three satellites to estimate 2D position (latitude & longitude.

2. GSM Modem

GSM modem is used for transmitting and receiving the data. It is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone.

SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. The communication between microcontroller with GSM is done by using AT commands.

3. .Microcontroller

ATmega328P is the high-performance Atmel picoPower 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-while-write capabilities, 1024 B EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers.

4. Relay

Relays are simple switches which are operated both electrically and mechanically. The switching mechanism is carried out with the help of the electromagnet. Single Pole Single Throw **(SPST)** has a total of four terminals. Out of these two terminals can be connected or disconnected. The other two terminals are needed for the coil.

5. Arduino

An Arduino is a microchip, which is a very small computer that you can program to respond to things. Attaching the arduino to a computer with a USB cable will supply the 5 volts of power, we need and allow us to start programming. Arduino is composed of two major parts: the Arduino board, which is the piece of hardware, you work on when you build your objects and the Arduino IDE, the piece of software we run on our computer

6. LCD

The LCD is to display the location which is computed by the GPS receiver and also displays the sms received by the owner. LCD display device (JHD162A) is interfaced with the microcontroller unit (ATMEGA328P).
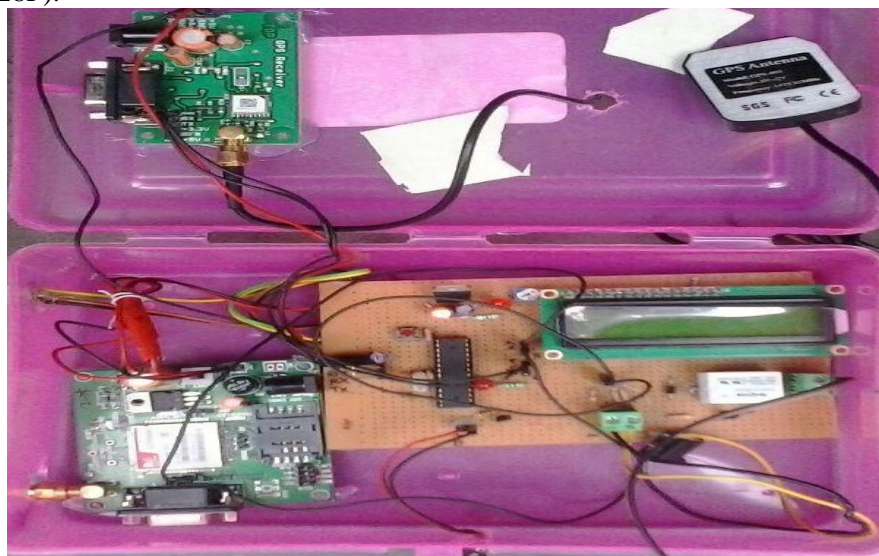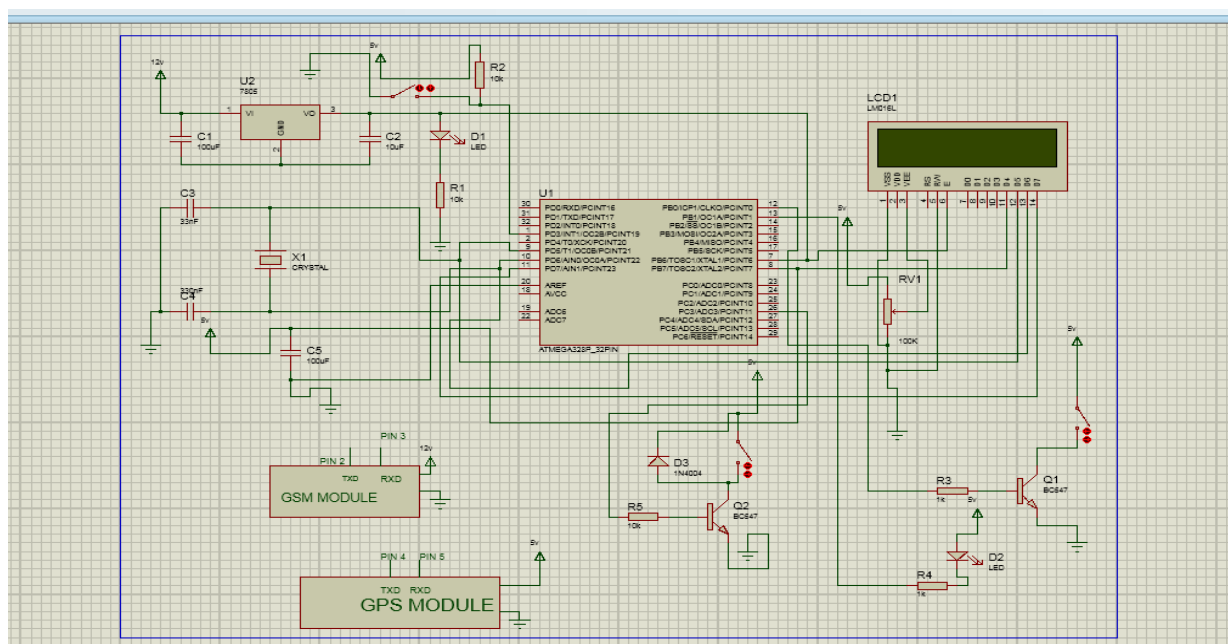

Fig.3 Hardware of the proposed system

C. Circuit Schematic

IV.   RESULTS

Therefore, we can successfully stop the vehicular theft by ceasing the engine and also by tracking its location, we can catch the thief as well. We are receiving the SMS "BIKE IGNITION ON" as soon as the ignition key is activated by someone as shown in the following figure.

Fig. 4 LCD showing engine detection processing

Again when the engine starts, we are receiving the sms "Engine ON". We can stop the engine by sending command <OFF> to our system. The engine off success will be sent to the owner along with the LAT and LONG of that place as shown in the following fig

Fig.5 LCD showing LAT, LONG of some location

At any time, by sending the command, "LOC" to the system, we can separately receive the latitude & longitude of that place. This is a great advantage in terms of crosschecking the locations of children by their parents.

V.   CONCLUSION

In this paper, we have proposed a novel method to track the theft vehicle by using GPS and GSM technology. This system puts into the sleeping mode after the vehicle gets handled by the owner or authorized persons through the reset button over it. The mode of operations changed by persons or remotely. When the theft identified, the responsible people send SMS to the micro controller, then issue the control signals to stop the engine motor. After that, engine of vehicle gets off or cease. To restart the vehicle, the system will be reset.

The project is all about controlling theft of a vehicle. The system is about making vehicle more secure by the use of GPS, GSM technology and a web application. It can also be beneficial for parents to look after their children, to track animals in jungles, delivery services, cops department and fire services

The limitations may include the network problem of the GSM network being used. This can be overcome by using a fine network. This project can be further enhanced by the use of camera and by developing a mobile based application to get the real time view of the vehicle instead to check it on PC, which would be more convenient for the user to track the target.

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AUTHORS' PROFILES

Charu Saxena is pursuing B.Tech (Final year) in Electronics & Communication Engineering from MIT Moradabad, Uttar Pradesh. Her area of interest includes telecommunications and networking

Adesh Kumar Sharma is pursuing B.Tech (Final year) in Electronics & Communication Engineering from MIT Moradabad, Uttar Pradesh. His area of interest includes embedded systems and networking.

Arpit Rastogi is pursuing B.Tech (Final year) in Electronics & Communication Engineering from MIT Moradabad, Uttar Pradesh. His area of interest includes telecommunications and embedded systems.

Bobby Arya is pursuing B.Tech (Final year) in Electronics & Communication Engineering from MIT Moradabad, Uttar Pradesh. His area of interest includes networking and embedded systems.