

# VEHICLE TRACKING AND LOCKING USING GSM AND GPS MODULES

Dr Radhika Dora<sup>1</sup>, K. Varshika<sup>2</sup>, D. Shirisha<sup>3</sup>,  
P. Shanthiraj<sup>4</sup>

<sup>1</sup> Assoc. Professor, Dept. Of EEE, Geethanjali College of Engineering and Technology, Telangana, India,

<sup>2,3,4</sup> B.Tech Students, Dept. Of EEE, Geethanjali College of Engineering and Technology, Telangana, India.

**ABSTRACT** - Vehicle theft is one of the major problems faced by civil society today. Statistics shows vehicles which get stolen only 1 by 4th of them recovered by the use of protective camera's at main locations. Current frameworks utilizes key and remote to lock the vehicle. Along these lines, to overcome this circumstance we have proposed a model in which the spot of the vehicle distinguished utilizing Global Positioning framework (GPS) and Global system mobile communication (GSM). By the utilization of IOT we can stop the vehicle by bit by bit diminishing speed of ignition motor and lock the entryway utilizing servo motor. The microcontroller issue the control signs to stop the engine motor. Approved individual is expected to control and restart the vehicle and open the entryway. This is more secure, dependable and minimal effort.

**KEYWORDS:** Vehicle Tracking, IOT Technology, Microcontroller, GSM.

## I. INTRODUCTION

This is a cheaper solution than a two-way GPS communication system wherein communication is done in both ways with GPS satellites. This project uses only one GPS device and two-way communication is achieved using a GSM modem. GSM modem with a SIM card used here implements the same communication technique as in a regular cell phone.

The framework can be mounted or fitted in your vehicle in a covered up or appropriate compartment. After this establishment, you can easily track your vehicle utilizing your cell phone by dialling the mobile number of the SIM attached to the GSM modem [1]. You will consequently get the area of the vehicle as a SMS (short message) on your cell phone.

This framework permits you to follow your vehicle whenever and anyplace. Regardless of whether you own an organization with a fleet of many vehicles or you have expensive bit of equipment and you need to watch out for them, this following framework can illuminate you regarding the status without you being really present on the site.

## II. LITERATURE REVIEW

**Chen, H., Chiang, Y. Chang, F., H. Wang, H.**[1]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. These results are compatible with GPS technologies.

**Asaad M. J. Al-Hindawi, Ibraheem Talib** [2] 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.

**KunalMaurya, Mandeep Singh, Neelu Jain [3]** Face Detection System 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.

**VikramKulkarni&ViswaprakashBabu [4]** This system provided vehicle cabin safety, security based on embedded system by modifying the existing modules. This method monitors the level of the toxic gases such as CO, LPG and alcohol within the vehicle provided alert information as alarm during the dangerous situations. The SMS sends to the authorized person through the GSM. In this method, the IR Sensor used to detect the static obstacle in front of the vehicle and the vehicle stopped if any obstacle detected. This is avoiding accidents due to collision of vehicles with any static obstacles.

**V.Ramya, B. Palaniappan, K. Karthick [5]** This system provided vehicle cabin safety, security based on embedded system by modifying the existing modules. This method monitors the level of the toxic gases such as CO, LPG and alcohol within the vehicle provided alert information as alarm during the dangerous situations. The SMS sends to the authorized person through the GSM. In this method, the IR Sensor used to detect the static obstacle in front of the vehicle and the vehicle stopped if any obstacle detected. This is avoiding accidents due to collision of vehicles with any static obstacles.

**Kai-Tai Song, Chih-Chieh Yang[6]** He have a designed and built on a real-time visual tracking system for vehicle safety applications. In this paper built a novel feature-based vehicle-tracking algorithm, automatically detect and track several moving objects, like cars and motorcycles, ahead of the tracking vehicle. Joint with the concept of focus of expansion (FOE) and view analysis, the built system can segment features of moving objects from moving background and offer a collision word of warning on real-time. The proposed algorithm using a CMOS image sensor and NMOS embedded processor architecture. The constructed stand-alone visual tracking system validated in real road tests. The results provided information of collision warning in urban artery with speed about 60 km/hour both at night and day times.

### III. METHODOLOGY

#### (i) SOFTWARE TOOLS

##### ➤ **Arduino Software (IDE) :**

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuine hardware to upload programs and communicate with them.

#### (ii) HARDWARE TOOLS

##### • **ESP8266 WiFi Module :**

Your ESP8266 is an impressive, low cost WiFi module suitable for adding WiFi functionality to an existing microcontroller project via a UART serial connection. The feature list is impressive and includes:

- ✓ 802.11 b/g/n protocol

- ✓ Wi-Fi Direct (P2P), soft-AP
- ✓ Integrated TCP/IP protocol stack

- **GPS Technology**

This is a navigation technology providing accurate location and information. Preserved by the U.S, GPS is a space-based satellite system, granting contact to anyone owning a GPS supported receiver. Started in 1973 was designed for military purpose but later was allowed for commercial use. The system consists of 24 satellites of United States. A GPS receiver calculates the radio signals that are rhythmically sent from the satellites. It measures the signal from at minimum 3 satellites to find the longitude and latitude



using various techniques.

Fig 1: GPS module

- **GSM Technology**

This GSM technology was established in 1982 to develop a common mobile telephone standard. Although it resembles the traditional modem, but differs in the way it transmits and receives data. A dial-up modem uses telephone lines whereas a GSM modem makes use of radio waves. A GSM modem uses commands with each command beginning with AT i.e. Attention followed by a character. For example Dialling command would be – ATD123123234. A GSM modem obtains a SIM (Subscriber Identity Module) and making use of circuit switching establishes a communication between two devices. Once connected constant streaming of data takes place.



Fig 2: GSM module

#### IV. WORKING PROCEDURE

The system consists of Modern hardware and software of the GPS network with help of Internet which enable to track the vehicle. Any vehicle tracking system consists of mainly three parts mobile, vehicle unit and data base. Vehicle unit is the hardware component attached to the vehicle having a GPS and Wi-Fi modem. With the GPS module the location information is received and sends it to the database. From there location information can be viewed on the android application which is installed in the mobile. This design will continuously watch a moving Vehicle and report the status of the Vehicle on demand. The Global Positioning System (GPS) is the only fully functional Global Navigation Satellite System (GNSS) [7]. The GPS uses a constellation of between 24 and 32 Medium Earth Orbit satellites that transmit precise microwave signals that enable GPS receivers to determine their location, speed, direction, and time. A GPS receiver receives the signals from at least three satellites to calculate distance and uses a triangulation technique to compute its two dimension (latitude and longitude) position or at least four satellites to compute its three dimension (latitude, longitude and altitude) position.

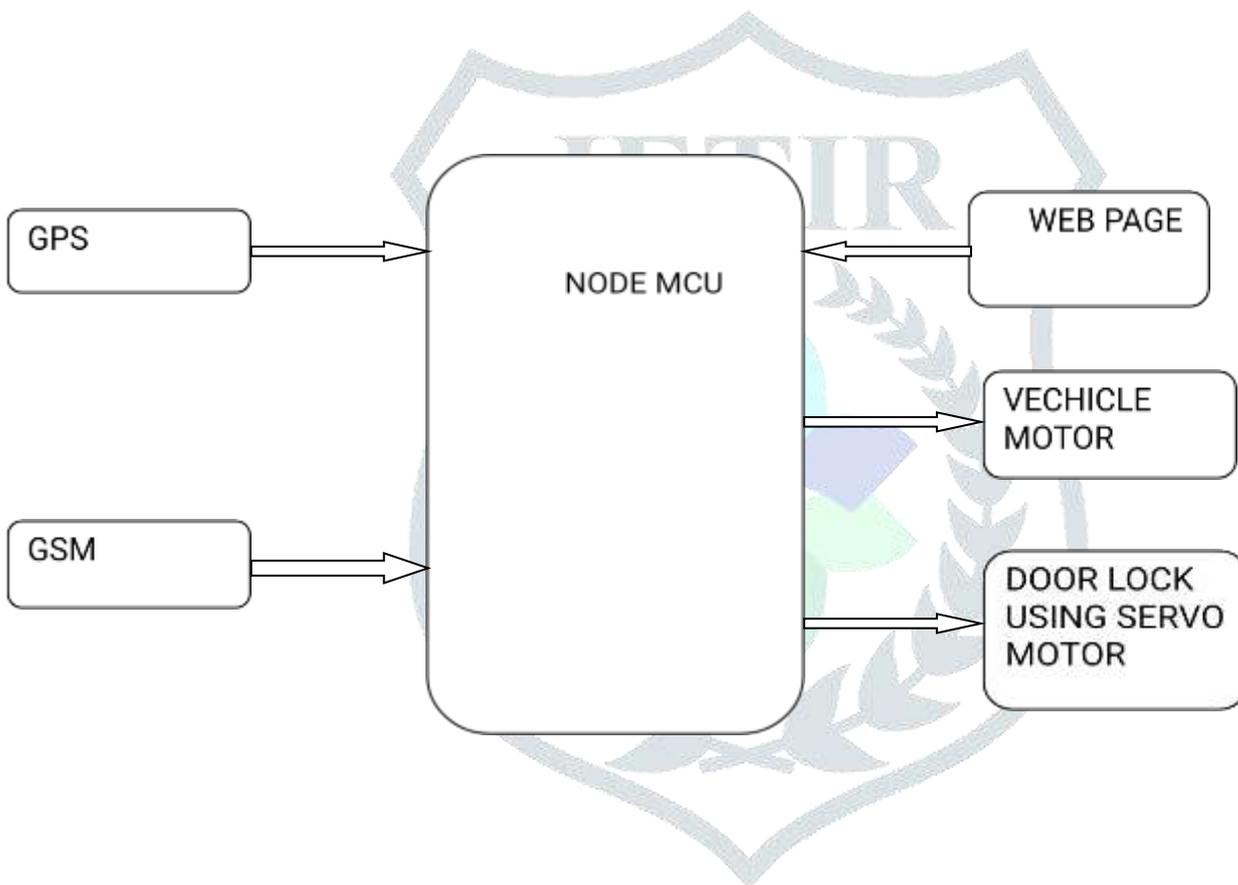


Figure -3: Block diagram

#### V. RESULTS & DISCUSSIONS

A microcontroller-based system is a complex activity that involves hardware and software interfacing with the external world. Doing well design of a microcontroller-based system requires skills to use the variety of debugging and testing tools available. The debugging and testing of microcontroller-based systems divided into two groups:

- **Software-only tools:** Software-only tools come as monitors and simulators, which are independent of the hardware under development.
- **Software-hardware tools:** Software-hardware tools are usually hardware dependent, more expensive and range from in-circuit emulators and in-circuit simulators to in-circuit debuggers.

The factors to consider when choosing a debugging tool are cost, ease of use and the features offered during the debugging process. A software simulator is a computer program running on an independent hardware and it simulates the CPU, the instruction set and the I/O of the target microcontroller. Simulators offer the lowest-cost development tools for microcontroller-based systems.

### **HARDWARE ASSEMBLING AND TESTING:**

First step, we need to make single side PCB layout for the given circuit diagram. After made the PCB the following process is required to complete the project.

1. Assemble all the components on the PCB based on circuit diagram.
2. Connect the GPS module according to circuit diagram.
3. This projects implemented and tested successfully by us.
4. This system is very useful and secure for car owners.

### **MERITS**

- a) Save your operating expenses
- b) Optimize your resources
- c) Achieve customer satisfaction
- d) Augment employee productivity
- e) Reduce insurance costs
- f) Maximize vehicle utilization
- g) Optimize financial management
- h) Reduce fuel costs
- i) Keep track of your driver
- j) Improve driver safety
- k) Improved vehicle maintenance

### **CONCLUSION**

In this paper, we have proposed a novel method of vehicle tracking and locking systems used to track the theft vehicle by using GPS and GSM technology. The proposed system uses the IOT for vehicle accident detection and alarming the authorities regarding accidents, vehicle tracking using GPS Modem. Hence IOT can revolutionize the way the system interact and respond for the variety of applications especially in case of traffic control.

### **REFERENCES**

1. Chen, H., Chiang, Y. Chang, F., H. Wang, H. (2010). Toward Real-Time Precise Point Positioning: Differential GPS Based on IGS Ultra Rapid Product, SICE Annual Conference, the Grand Hotel, Taipei, Taiwan August 18-21.
2. Asaad M. J. Al-Hindawi, Ibraheem Talib, "Experimentally Evaluation of GPS/GSM Based System Design", Journal of Electronic Systems Volume 2 Number 2 June 2012.
3. Kunal Maurya , Mandeep Singh, Neelu Jain, "Real Time Vehicle Tracking System using GSM and GPS Technology," (IJECS)ISSN 2277-1956/V1N3-1103-1107.
4. Vikram Kulkarni & Viswaprakash Babu, "embedded smart car security system on face detection", special issue of IJCCT, ISSN (Online):2231-0371, ISSN (Print):0975-7449, volume 3, issue 1.
5. V.Ramya, B. Palaniappan, K. Karthick, "Embedded Controller for Vehicle In-Front Obstacle Detection and Cabin Safety Alert System", (IJCSIT) Vol 4, No 2, April 2012.