International Journal of Innovative Technologies
WWW.IJITECH.ORG
ISSN 2321-8665
Volume.06, Issue.01,
January-June, 2018,
Pages:0249-0252

# Antitheft Protection of Vehicle by using Raspberry Pi & GPS with Fingerprint Verification

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**Abstract:** As of late vehicle tracking framework is getting huge notoriety in light of the rising number of the stolen vehicles. Vehicle robbery is occurring on stopping and once in a while driving in unsecured spots. This examination work investigates how to stay away from this sort of taking and gives greater security to the vehicles. The actualized framework contains single-board inserted framework which is outfitted with worldwide framework for versatile (GSM) and worldwide situating framework (GPS) alongside a microcontroller introduced in the vehicle. The utilization of GSM and GPS advancements enables the framework to track the protest and gives the most up-todate data about on-going outings. Besides, unique mark confirmation is done in the executed framework to guarantee the driving of right individual. The executed framework is exceptionally straightforward with more prominent security for vehicle against robbery insurance and minimal effort system contrasted with others.

**Keywords:** GSM, GPS, Vehicle Tracking Framework (VTS), Automatic Vehicle Location (AVL).

## I. INTRODUCTION

A vehicle tracking framework consolidates the establishment of an electronic gadget in a vehicle or armada of vehicle to empower the proprietor or outsider to track the vehicle's area and gathering information all the while. Present day Vehicle Tracking framework (VTS) is the innovation used to decide the area of a vehicle utilizing distinctive strategies like GSM and GPS module and other radio route frameworks working through satellites and ground based stations [1, 2]. GSM and GPS based vehicle area and tracking framework gives viable, ongoing mapping based vehicle area tracking. The framework utilizes geographic position and time data from the Global Positioning Satellites [3]. In the wake of rising of GPS framework created by The United States government [4], first it was just for military reason. In the wake of opening for open, it has been utilized generally. Al-Bayari and Sadoun examined in points of interest Automatic Vehicle Location (AVL) framework that works under GIS condition [5]. A total FPGA execution of the vehicle position tracking framework utilizing short message administrations (SMS) was accounted for by Hapsari [6]. The plan and execution of a versatile question administration framework that makes utilization of the current GSM systems and its expansion GPRS for information correspondence was examined by Xiaobo Fan et al. [7]. Hsiao and Chang created explanatory model to break down the ideal area refresh procedure with the target of least aggregate cost [8]. Tamil et al. did comparable works [9]. Video reconnaissance and tracking of moving regular citizen vehicle done by Nishi Kanta Pati added new measurement to the advancement of the tracking frameworks [10]. In this exploration work, a framework has been created in light of microcontroller that comprises of a GPS and GSM.

A two way correspondence process is accomplished utilizing a GSM modem. This examination likewise contains a bio-metric assurance arrangement of the vehicle and unique mark check of the driver of the vehicle is utilized to shield the vehicle from against burglary. Unique mark acknowledgment or unique mark confirmation can be characterized as a strategy for checking a match between two human fingerprints in a robotized conduct. Fingerprints are one of numerous types of biometrics used to recognize people and confirm their character. It is realized that each individual has a special unique mark picture [11]. At the point when driver gives his confirmed unique finger impression picture before beginning the vehicle, the framework will be considered as reasonable condition. However, when vehicle's area is changed without unique finger impression check, the framework will be taken as unusual condition. At that point the framework will send a SMS to proprietor of the vehicle with a URL of 'GOOGLE MAP' [12] having the arrange of the present area of the vehicle. SMS will be then sent to the proprietor having refreshed area's co-ordinate each interim of 10 seconds until doing the correct unique finger impression confirmation. Also, vehicle's proprietor can get the vehicle's area whenever by SMS in the wake of making a 'missed call'.

## II. EXISTING SYSTEM

### A.Intelligent GSM Device for Automation and Security

In nowadays, the GSM portable terminal has turned out to be one of the things that are always with us. Much the

same as our wallet/satchel, keys or watch, the GSM versatile terminal gives us a correspondence channel that empowers us to speak with the world. The prerequisite for a man to be reachable or to call anybody whenever is extremely engaging. In this venture, as the name says venture depends on GSM arrange innovation for transmission of SMS from sender to recipient. SMS sending and getting is utilized for pervasive access of apparatuses and permitting break control at home. The framework proposes two sub-frameworks. Apparatus control subsystem empowers the client to control home machines remotely and the security ready subsystem gives the programmed security checking. The framework is sufficiently skilled to educate client by means of SMS from a particular cell number to change the state of the home apparatus as per the client's needs and prerequisites. The second perspective is that of security ready which is accomplished in a path that on the discovery of interruption, the framework permits programmed age of SMS along these lines alarming the client against security hazard. GSM will permit correspondence anyplace, whenever, and with anybody. The functional design of GSM utilizing intelligent networking standards, and its philosophy, which gives the improvement of GSM is the initial move towards a genuine individual correspondence framework that enough institutionalization to guarantee similarity.

### B. Project Features/Objectives

- **Sending SMS:** The vehicle owner will get an SMS through GSM module when the vehicle theft by another person.
- **A Mobile Station:** It is the mobile phone which consists of the transceiver, the display controlled by a SIM card operating over the network.

### C. Disadvantages Of Existing System

- **False alarm:** These security systems are prone to false alarms that involve the alarm ringing when anyone from your family enters the restricted area. Or there are instances when the alarm is triggered by itself without any reason.
- **Expensive:** Both ,wireless and hardwired alarm systems are expensive to install. They require an initial investment, which includes equipment cost, installation and subscription of security monitoring service.
- **Limited:** It is confined to that particular area. Owner couldn't get any information regarding theft when staying away from the vehicle.

## III. PROPOSED SYSTEM

### A. Architecture of System

This Project presents an automotive localization system using GPS and Raspberry pi services. The system permits localization of the automobile and transmitting the Position to the owner on his /her mails as a short message at his/her request. In case of vehicle theft situations the owner can know the vehicles current location and based on that he/she can stop the vehicle by sending a predefined message to this system. After receiving message from owner this system automatically stops the ignition system hence the vehicle will not function any more. From the Fig.1 we can understand the main process of the system.

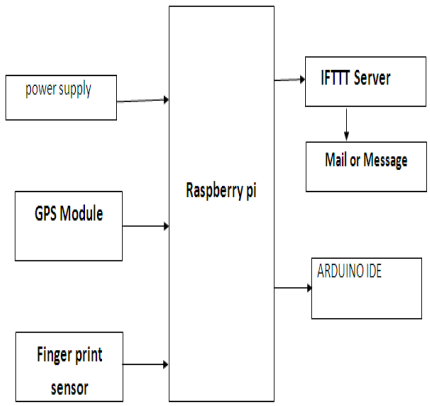


**Fig.1. Block Diagram.**

### A. OBJECTIVE

The venture is intended to discover the correct area of any stolen vehicle and close the position to the concerned specialist through a mail and sms. this framework incorporates a unique mark module and GPS modem which recovers the area of a vehicle as far as its longitude and scope in case of burglary. This information is nourished to the microcontroller which is interfaced with a server. Microcontroller recovers the area points of interest from the GPS and sends it to the concerned expert as a mail or sms over IFTTT on periodical interims s0set by the client. A LCD show is interfaced to the microcontroller for intersection the information got before being sent over GSM Embracing this innovation will be exceedingly valuable to individuals to continue tracking of their vehicles. This venture can be additionally upgraded by making a game plan to stop the vehicle start by the proprietor remotely by sending a SMS in robbery circumstances.

## IV. SYSTEM DESCRIPTION

In the vehicle, tracking unit is installed which includes Raspberry pi 0, Arduino-2560, SIM908 and GT-511C1R. SIM908 and GT511C1R device are connected to the Arduino via serial COM port. Proper voltage level conversion is done by resistor divider. Various parts of the tacking unit are described below.

### A. Raspberry pi

The Raspberry Pi is a progression of little single-board computers created in the United Kingdom by the Raspberry Pi establishment as shown in Fig.2. Raspberry Pi-3 Model B discharged in February 2016 is packaged with on-board Wifi, Bluetooth and USB Boot abilities. As of January 2017, Raspberry Pi 3 Model B is the most current mainline Raspberry Pi. Raspberry Pi sheets are evaluated between US$5-35. It incorporates different highlights, for example, ARM perfect focal handling unit (CPU) and an on-chip illustrations preparing unit (GPU, a videocore IV ). CPU speed

ranges from 700MHz to 1.2GHz for the Pi 3 and on board memory extend from 256 MB to 1 GB RAM. Secure Digital (SD) cards are utilized to store the working framework and program memory in either the SDHC or MicroSDHC sizes. Most sheets have in the vicinity of one and four USB spaces, HDMI and composite video yield, and a 3.5mm telephone jack for sound, Lower level of yield is given by various GPIO pins which bolster basic conventions like PC. The model B have a 8P8C Ethernet port and the Pi 3 and Pi Zero W have on board Wifi 802.11n and Bluetooth.

**Fig.2. Raspberry Pi.**

**B. Arduino MEGA-2560 Microcontroller**

Arduino MEGA-2560 [19] is powerful microcontroller board based on ATmega2560. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analogue inputs, 4 UARTs (hardware serial ports as shown in Fig.3. It has 256 KB of flash memory, 8 KB of SRAM and 4 KB of EEPROM.

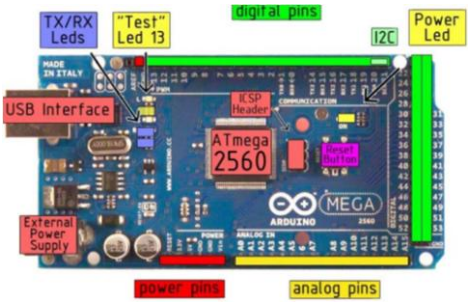


**Fig.3. shows the Arduino MEGA Board.**

**C. GPS/GPRS/GSM (SIM908)**

SIM908 has Quad-band GPRS/GSM engine. It works on the frequencies of 900 MHz, 1800 MHz, 850 MHz and 1900 MHz [20]. GPS technology for satellite navigation is also supported in this device as shown in Fig.4. As both of the GPS and GSM technology is supported by it, any on purpose tracking is possible at anywhere and anytime with signal coverage.


**Fig.4. SIM908 module.**

**D. GPS Module**

The GPS is a Global Navigation Satellite System (GNSS) developed by the United States Department of Defence. It is the only fully functional GNSS in the world as shown in Fig.5. It uses a constellation of between 24 and 32 earth orbit satellites that transmit precise radio signals, which allow GPS receivers to determine their current location, the time, and their velocity.

**Fig. 5 GPS module.**

**E. Fingerprint Module (GT-511C1R)**

GT-511C1R has an on-board optical sensor and 32-bit CPU that does reading and identifying the fingerprints with sending the corresponding command. The module can only store up to 20 different fingerprints and is only capable of 30° fingerprint recognition. The optical fingerprint algorithm uses 240x216 pixel image for its input. It captures raw image from the sensor and converts it to 240x216images for the fingerprint algorithm. Not pressing of finger returns with non-acknowledge. Fig. 6 shows the fingerprint scanner (GT-511C1R).

**Fig.6. Fingerprint module (GT-511C1R).**

## V. SYSTEM IMPLEMENTATION& RESULTS

A project or system has to be tested under various conditions to ensure its correctness. The testing conditions for this project include several authorized and unauthorized attempts to access the system. These include:

- Authorized access i.e., registered fingerprint to access the system.
- Unauthorized access i.e. unregistered fingerprint.
- Vehicle being dragged for a specific duration.
- Notification from the user to activate .

Fig.7 shows Wheel moving when an authorized person made his finger print matched

Here vehicle will move when an authorized person made his finerprint and it matched. Fig.8 shows location of vehicle when vehicle was theft by another person fingerprint mismatched. When finger print mismatched, vehicle theft by another person then the location of the person Directly come to an authorized person through email.

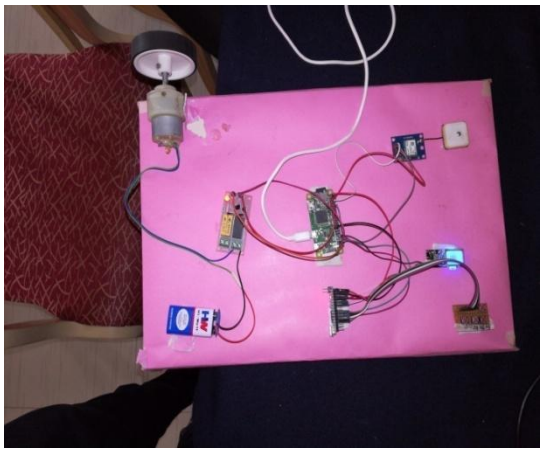

**Fig. 7. Wheel moving when an authorized person made his fingerprintprint matched.**

**Fig. 8. location of vehicle when vehicle was theft by another person fingerprint mismatched.**

## VI. CONCLUSION

In this examination work, vehicle area can be followed and anticipation of it from robbery with unique mark confirmation is finished with least cost in semi constant mode. Unique mark innovation is exceptionally successful security check innovation and furthermore in bring down cost to abstain from taking of vehicles. In future, cell phone (i.e. android, windows) application can be made and interfacing a devoted advanced cell introduced in vehicle with unique mark gadget should be possible to get constant vehicle tracking with between dynamic mapping.

**Future Scope:** By and by just SMS highlight is accessible, we can incorporate the Call include for simplicity of task. 2. Utilizing android application we can likewise stop the motor. 3. Amplifier could be interfaced to the Raspberry pi/GPS module so that amid robbery movement voice call could be set up with the proprietor.

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