

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 12, December 2019

Enhanced Vehicle Surveillance with Remote Kill Switch

Divyani Pore¹, Pournima Thakare², Rupali Panchal³

U.G. Student, Department of Computer Engineering, Sinhgad Academy of Engineering, Pune, India¹

U.G. Student, Department of Computer Engineering, Sinhgad Academy of Engineering, Pune, India²

U.G. Student, Department of Computer Engineering, Sinhgad Academy of Engineering, Pune, India³

ABSTRACT: An Enhanced Vehicle Surveillance System with Remote Kill Switch is designed to track and monitor vehicles in real time. The proposed system would make good use of technology that is based on Embedded Linux board namely Raspberry Pi and its advanced feature of storing database at real time. The proposed system works on Global Positioning System (GPS) and Global System for Mobile Communication (GSM) which is used for vehicle tracking and monitoring mechanism. For this purpose, SIM908 Module is used which includes all the three things namely GPS GPRS GSM. The GPS gives current location of the vehicle; GPRS sends the tracking information to the server and the GSM is used for sending alert message to vehicle's owner mobile. The proposed system would place inside the vehicle whose position is to be determined on the web page and monitored at real time. It uses SIM908 Module which includes GPS, GSM and GPRS as the GPS gives current location of the vehicle; GPRS sends the tracking information to the server and the GSM is used for sending alert message and to establish communication. This system is deployed in the interior of the vehicle whose location is to be determined on the web page and supervised at real time. Hence, if the driver drives the vehicle on the wrong path then the alert message will be sent.

KEYWORDS: GPS, GPRS, GSM, Vehicle Tracking, Vehicle Monitoring, Automatic Vehicle Monitoring, Enhanced Surveillance System.

I. INTRODUCTION

Now a days with the increase of automobiles, the problems related to vehicles has been increased. The vehicle related issues include vehicle theft, accidents, negligence by the drivers, children missing cases and other hazards. We daily see or read such type of activities which are raising the question of our safety and security in both public and private sectors. So, there is a need of real time monitoring and tracking the vehicle also storing and updating its database of certain situations. With the advancement in the technology we have solution for these insecure problems with the help this project. The principal aim of the project is to develop a module which is able to send correct location of vehicle to an authorized person who will be able to track and monitor the respective vehicle at real time. The authorized person can track the vehicle on the web page and monitor real time activities.

The proposed system consists of a small kit installed inside the vehicle to be tracked. The system provides a fully automated tracking and monitoring of the vehicle which is helpful for school bus, their owners, individual vehicle owners and also it provides accurate arrival time of the vehicle at particular location. In order to reduce man power and saving of money, here the system provides easy tracking solution using Raspberry pi.

The proposed system gets tracking information of the vehicle like vehicle number (Unique ID), location, speed, Date, Time and stored into the database of Raspberry Pi. The system also provides a kill switch which can operated only by an authorized person in case of hazardous situation. As soon as the kill command is raised the vehicle will immediately get witched off on the spot.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 12, December 2019

II. PROPOSED SYSTEM

In the proposed system, we have designed vehicle tracking system along with monitoring of vehicle parameters through GSM technology. The vehicle is tracked by using GPS technology it monitors the parameters and sending the status of vehicle using the GSM to the owner thereby providing security to it. The proposed system continuously monitors and tracks the vehicle at real time environment using web page. If the driver chooses the wrong path the system gives alert message, so the provision of more safety and security is improved. This system also provides the safety environment by using sensors and updating the alerts such as speed, time, and location to vehicle owner with the help of database. This database is also useful in vehicle theft detection.

The proposed system would get controlled with the help of Raspberry pi which is placed in the vehicle. In this system we have used 908 module which includes GPS, GPRS, and GSM. To communicate GPS/GSM/GPRS modules we use USB interface with Raspberry pi. The current received path longitudes and latitudes are compared with stored longitudes and latitudes present in the database file format inside Raspberry pi, if there is any mismatch found with the help of GPS the wrong path detection alert message is send to the vehicle owner mobile and also send to the server with the help of GPRS. So, anyone can easily track the vehicle location with the help of login facility on web page. Additional feature provided by the proposed system is kill switch. The kill switch is operated only in hazardous and distress situations such as kidnapping, vehicle theft, etc.

The continuous monitoring is done by the authorized person on the web application. If the person finds out, vehicle is not following expected path or going wrong way, that time the person would make a phone call to the driver to know the reason of behaviour. If the driver doesn't answer to call or doesn't give a valid reason then the authorized person can initiate the kill command, which will make the vehicle to stop on the spot. The kill switch can be operated only by authorized person and owner of the vehicle. Once the kill switch is turned on the driver will not able to start the vehicle.

III. DESIGN AND METHODOLOGY

1. Raspberry Pi:

The raspberry pi can be seen as the center of the emergency beacon. The raspberry pi is the place, where the trigger occurs, information is captured, processed and finally forwarded to the server. The power source for the raspberry pi is a power bank connected via a USB cable. The camera is connected to the raspberry pi via the CSI Port. The raspberry pi has four usb ports, out of which two are used for connecting to the GPS module and Wi-Fi Module. The GPS receives a 7V power supply via an electrical adapter. The GPS module is connected with the antenna through the cable that comes with the antenna.



Fig.1 Raspberry Pi

2. SIM908 GSM/GPRS/GPS Module

SIM908 Module is a high-performance quad-band GSM / GPRS / GPS module of industrial grade, which can be controlled via AT command set. It can be used to make or receive calls, to send and to receive SMS messages.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 12, December 2019

Moreover, it can be used to send and to receive data after connected to the network. Besides, it can realize global positioning by locating its geographical position with GPS.

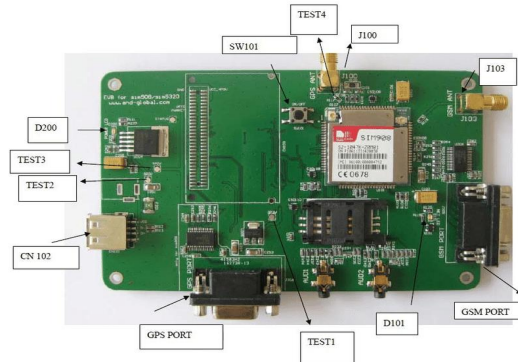


Fig.2 SIM908 Module

3. GPS

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver.



Fig.3 Global Positioning System (GPS)

The GPS is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense. GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS.

4. GSM

GSM (Global System for Mobile communication) is a digital mobile network that is widely used by mobile phone users in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies: TDMA, GSM and code-division multiple access (CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 megahertz (MHz) or 1,800 MHz frequency band.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 12, December 2019

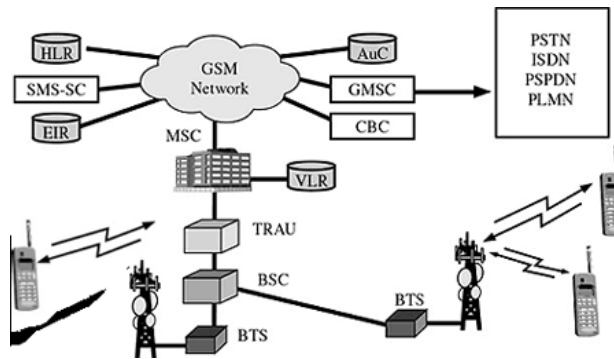


Fig.4 Global System for Mobile communication (GSM)

GSM, together with other technologies, is part of the evolution of wireless mobile telecommunications that includes High-Speed Circuit-Switched Data (HSCSD), General Packet Radio Service (GPRS), Enhanced Data GSM Environment (EDGE) and Universal Mobile Telecommunications Service (UMTS).

5. GPRS

General Packet Radio Service (GPRS) is a packet oriented mobile data standard on the 2G and 3G cellular communication network's global system for mobile communications (GSM). GPRS was established by European Telecommunications Standards Institute (ETSI) in response to the earlier CDPD and i-mode packet-switched cellular technologies. It is now maintained by the 3rd Generation Partnership Project (3GPP).

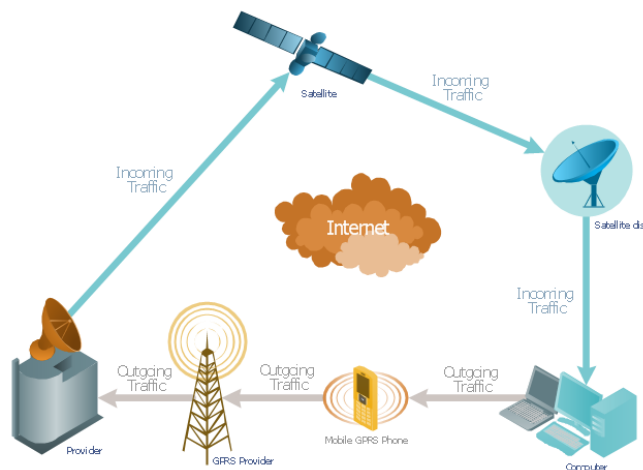


Fig.5 General Packet Radio Service (GPRS)

GPRS is typically sold according to the total volume of data transferred during the billing cycle, in contrast with circuit switched data, which is usually billed per minute of connection time, or sometimes by one-third minute increments. Usage above the GPRS bundled data cap may be charged per MB of data, speed limited, or disallowed. GPRS is a best-effort service, implying variable throughput and latency that depend on the number of other users sharing the service concurrently, as opposed to circuit switching, where a certain quality of service (QoS) is guaranteed during the connection. In 2G systems, GPRS provides data rates of 56–114 kbit/sec. 2G cellular technology combined with GPRS is sometimes described as 2.5G, that is, a technology between the second (2G) and third (3G) generations of mobile telephony. It provides moderate-speed data transfer, by using unused time division

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 12, December 2019

multiple access (TDMA) channels in, for example, the GSM system. GPRS is integrated into GSM Release 97 and newer releases.

6. SERVER

The server can be seen as the backbone of the entire system. All the messages that are to be transferred travel through the server. The server is responsible for the routing of these messages as well. Thus, the server ensures that each device is mapped to the correct monitoring app without causing any confusion.

- The server is a bitnami server hosted on a t2.micro instance of Amazon EC2.
- The server receives messages from the Raspberry Pi as HTTP POST requests.
- The server receives messages from the android app in the form of HTTP GET requests.
- PHP is used on the server to handle all requests.
- MySQL is used as the database on the server.

7. Web Pages

Web pages are what make up the World Wide Web. These documents are written in HTML (hypertext markup language) and are translated by your Web browser. The proposed system uses such web page where an authorized operator can login. This web page can be accessed by authorized person and owner of the vehicle. Complete monitoring and tracking of the vehicle is provided on this web page. This web page is dynamic.

IV. IMPLEMENTATION

The implementation of the project was done in accordance with Raspberry Pi which is the place, where the trigger occurs, information is captured, processed and finally forwarded to the server.

- First, we initialize the Raspberry Pi kit which is located in the vehicle as the vehicle is in ignition state starts.
- GPS (which is the Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information anywhere on or near the Earth gets started.
- GPRS (General Packet Radio Service) is initiated to establish the connection with server.
- Once the connection has been established it checks for commands from the server. If kill command is active the module then switches the engine off.
- Otherwise, location details such as longitudes and latitude of the position of vehicle has been sent to server along with the speed of the vehicle.
- Location details the get compared with categories such as Green Zone, Yellow Zone and Red Zone. These zones are nothing but the area prespecified for a particular route which driver is going to take.
- If the route is in Red zone then alert messages are generated by system and the authorized person will try to contact the driver. If no communication is done then kill command is initiated by operator.
- Otherwise location data get stored for further use.

International Journal of Innovative Research in Science, Engineering and Technology

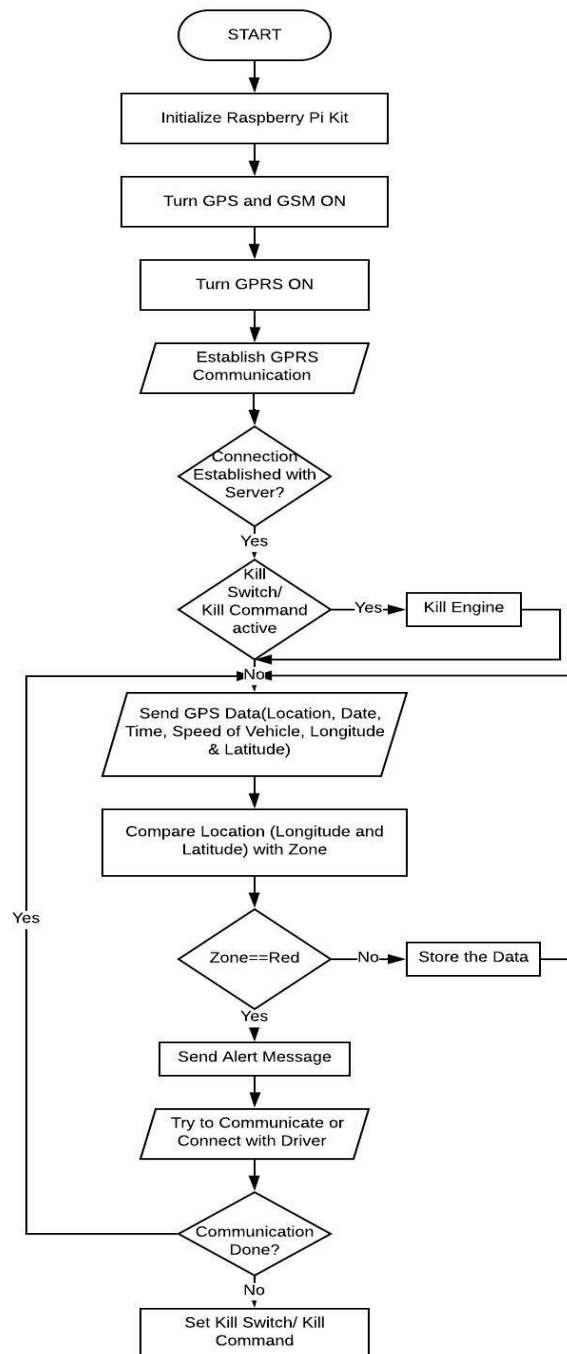
(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 12, December 2019

V. FLOWCHART

The complete operation of the Hardware module is explained by a flow Chart as shown in Fig. 6



International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 12, December 2019

VI. CONCLUSION

The project is intended to be designed using structured modelling to provide the desired results. Different technologies have different methodologies to implement the real time tracking and monitoring vehicles. The proposed system plays an important role in real time tracking and monitoring of vehicle by updating vehicle real time information on the server side after certain interval of time in order to monitor vehicle continuously. An SMS alert is sent to the authorized operator and owner of vehicle whenever driver unfollows the predefined path. The proposed system hence made good use of IOT technology that is use of Raspberry pi by providing safety and secure traveling to the traveller using wrong path alert mechanism. Whenever driver drives vehicle on the wrong path or in case of vehicle's accident situation occurs, the proposed system provides the vehicle's current location, speed to the vehicle owner's mobile.

REFERENCES

- [1] R Ramani, S Valarmathy ,N Suthanthira Vanitha , S Selnarajuana M Thiruppathi , "Vehicle tracking and monitoring system based on GSM and GPS ",Intelligent system ans application 2013,09,86-93
- [2] Bhavana Godavarthi et al 2017 IOP Conf ,ser: Mater .sci.Eng.225012262,"Advanced vehicle tracking system".
- [3] A.Anusha Scholar ,MTech(ES) Warangal Telangana india"real time vehicle tracking system
- [4] B. Hari Kumar ,Syeda Fatima Tehseen ,S.Thanveer,Guntha Vamshi Krishna,Syed Mohsi Akram,"Vehicle tracking and monitoring system using GPS and GSM.
- [5] I.Iszaidy,R Ngadiran,R,B,Ahmad ,M.I.Jais,D .Shuhaizar , "implementation of vehivle tracking and monitoring system".
- [6] Sumit Dukare Department of E&TC ,Datray Patil Department of E&TC ,Kantilal .P.Rane Department of E&TC,"Vehicle tracking and monitoring system
- [7] CH.Vinay Kumar M.tech(Embedded system) JITS,Knr, M.Rama Krishna Associate professor JITS,Knr,""Design and implementation of vehicle tracking and monitoring system.
- [8] Wen Leng and Chuntao Shi , "The GPRS based vehicle tracking and monitoring system'06.ppl-5 oct.2006