

## Review of vehicle protection system against thief

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**ABSTRACT:** Transportation system is one of the needs of human being. For private transportation, vehicle safety is necessary. Vehicle security system includes various things such as, vehicle tracking, vehicle speed control; automatic obstacle detections by different-different sensors as well as it will identify the owner of the vehicle by interrupt switch. Vehicle need to be smart against the theft. Safety system not only provides security against the theft but it is also providing information about the stolen vehicle to the owner and to its reference contacts. Initial motive of this project is only to notify about the stolen vehicle to the owner, but from the survey we conclude that stolen cases are increasing day by day. Then we decided feature enhancement in our security system by providing location co-ordinates to owner of the vehicle. In this review, we present about more efficient ways of vehicle security system using microcontroller interfacing,

**Key Words:** Vehicle security, vehicle tracking, sensors, GPS and GSM.

### 1. INTRODUCTION

Due to increase the rate of vehicle stolen cases, we must need vehicle security system for our vehicle safety. In past, vehicle security system needed GPS and GSM modules with AT89C51 microcontroller for vehicle location tracking and it needed a greater number of modules in a system [3 & 6]. After that system came with Arduino, it reduced the cost for the system [8-10]. ARM based system has capability to interface easily with GSM and GPS modules [4-5]. In Bus transportation system based on RFID can track the location of the bus using ATMEGA microcontroller [13].

Generally, vehicles are stolen from the no-parking area and from the crowded area. According to Times of India (TOI) survey in interval of 13 minutes a vehicle is stolen. Figure 1 statistics shows the increasing rate of vehicle stolen cases in Gurgaon, India [16].

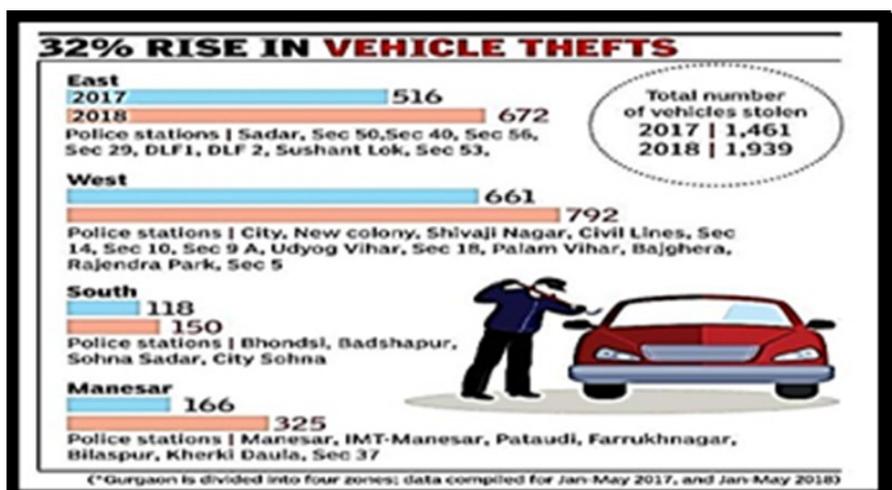


Figure1: Survey of noise pollution in Mumbai

Data base applications are also efficient for location tracking and real time movement of the vehicle. Through data base tracking, we can track the live location and can store for further inquiry. Data base can contain various information like street name, nearest land mark, vehicle direction, speed, about owner etc. Now a day for memory utilization purpose IoT (Internet of Things) based tracking system are popular [14]. In IoT, cloud storage is playing important role.

## 2. VEHICLE DETECTION AND LOCATION RECOGNITION ON DIFFERENT APPROACHES:

Moving vehicle detection is very much complicated to capture the location as well as inform about it to the emergency contacts. One of the ways to recognize the vehicle location by USB camera with Raspberry pi interfacing. Through this system it increases the cost of the system .Now at every place we can see the CCTV cameras like, ATMs, crossing roads, shops for security motivation against theft.

Several techniques can use by manufacturer. But here we are focusing on main tracking techniques for vehicle security system. It consists of three main approaches to detect location specific data, as mentioned below:

- 1) Latitude and longitude calculation or web applications.
- 2) Location storage in database of server and client.
- 3) Location storage on cloud through IoT (Internet of Things).

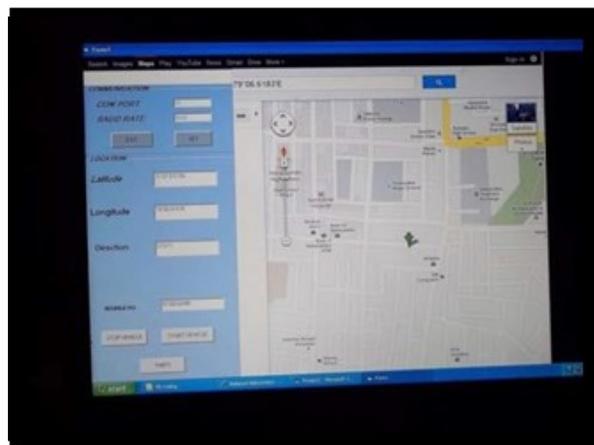
### A. Latitude and longitude calculation or web applications:

GPS gives the information of latitude and longitude in the reply of contactor or owner message. Then we need to convert that information in to location form by the online websites. It will give probable location of the vehicle location. Certain location may discover by high resolution cameras. It takes lots of time to get the data and its conversion. As an example, we can see in Figure 2 [17].



**Figure2: Web-based outcomes for area recognition**

For security purpose this method is less efficient compare to others. This method generally used for area identification and latitude and longitude calculation [6]. One of the ways, to overcome this time-consuming process by Google Earth application. Using this application, we can see the high-resolution printing of the map, email support and movie making options. Through the visual studio tool, we can also see the location on map in specific manner and we can see the result as Figure 3 [13].



**Figure3: Google Earth visualization**

This is the useful application from the Google and now days Google Maps and other Google apps used to represent geographical details. By this app we can see the location possible routes according to vehicles (two-wheeler, four- wheeler etc.), famous places nearer to our location like hotels, restaurants, shops, temples, hospitals, petrol pumps, ATMs, gardens, shopping malls etc.

**B. Location storage in database of server and client:**

Vehicle security system uses on-vehicle modules like GPS (Global Positioning system) receiver and GSM (Global System for Mobile) modem. Here we know about location through the map and GPRS gives the latitude and longitude according to it. Through this approach we can get the position of the vehicle on cell phone [1-8]

Various websites are also getting the details about the location through information as we applied. This developed web application can work on any operating system. They are also tracking based on GPS system or from co-ordinates of the location.

Location latitude and longitude send by GSM and GPS will pass to the internet as Hyper Text Transfer Protocol and client can browse the track by their computer system, we can see webpage as Figure 4 Webpages can show the traffic status of the route, distance according to bus or train transportation with pedestrian route. It can recognize the direction of vehicle with Google assistance service [11-12]

This web application contains details about the vehicles, possible routes of the vehicles so we can get continuously real time location tracking of the vehicle. Generally, this kind of web is used for decreasing the rate of traffic through the possible routes for more congested area. Server is continuously making database and provide to the clients. Data base contains several data with the significant information. During cut-off , server operates on stand-by so data-loss may not happen.



Figure 4: Website view of the location

**C. Location storage on cloud through IOT(Internet of Things):**

IoT is the latest technology with lots of new ideas. It can find as economically open source hardware system and compatible with various technologies such as, RFID [13], GSM, GPS, Wi-Fi, Bluetooth, ZigBee, Ethernet, optical technologies etc. IoT in the technology which can easily support to any device through which we can communicate or manufacture the thing. [15]

Nodes of the IOT network are the significant part. IoT used in different-different systems like, vehicle monitoring, tracking system, intelligent traffic control, parking control, safe fleet management, smart mall system, smart home system etc. Below statistic shows the number of devices connected in world from 2015 to 2025(Figure 5).

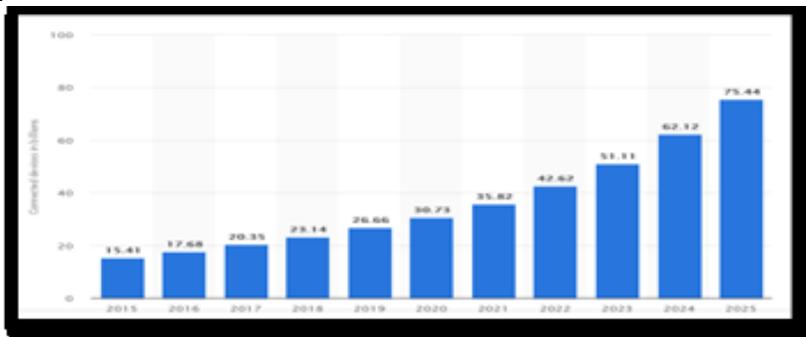


Figure 5: the increasing rate of IoT based system

**3. FUTURE SCOPE**

Vehicle security system has huge scope in the world, using latest technologies like IoT, Machine learning, Image processing we can increase the features of the system. It is economically efficient and smart with precise information. As an enhancement of project work we can develop product based on IoT which

reduced storage of the system.

A smarter system which can respond by it-self is also possible. This feature we can see using machine learning based system. Smart shopping carts respond on price rate of the grocery with quantity. It can communicate with the smart refrigerator and remind to the buyer about the shopping list.

**Advantages of new technologies are:**

- Limited number of devices.
- Real time live data.
- Instant and safe.

#### 4. CONCLUSION

This paper provides a summarizing study on the proposed techniques which used in vehicle security system. Different techniques contain different approaches. Using these techniques, we know about vehicle positions as well as their safety through different sensors and applications. This technique may enhanced by different microcontrollers and GPS/GSM modules with accurate sensor. More specifically, this review allows better understanding and highlights the issues and its possible solutions for vehicle security system.

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