

# Smartphone based Vehicle Tracking and Accident Prevention System

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**Abstract**— Nowadays, we have seen that automobile thefts are increasing at the faster rate all over the world. Therefore providing the security to their vehicle is always central concern to the people. We are developing an intelligent vehicle tracking and locking system in which the user will be able to interact with the system and to control his vehicle through an android based smart phone. Through this system we can establish the secured communication between the smart phone and the vehicle via the GSM network. The second module of our project is to prevent the accidents so that we can save the valuable human Life. No one can prevent the accidents, but can save their life by expediting the ambulance to the hospital in time. Therefore we provide this module in our system, when a person is met with an accident an automatic message is sent to the nearby hospitals, after receiving the messages immediately an ambulance is sent on the accidental spot, so that the human life can be saved.

**Keywords**—automobile theft, GSM and GPS model, intelligent Vehicle tracking

## I. INTRODUCTION

Our aim is to design such tracking system that reduces the time and cost to find out our stolen vehicle. Our objective is to develop such system by which vehicle owner or police follow the signal emitted by the tracking system to locate a robbed vehicle in parallel the stolen vehicle engine speed going to decreased and pushed off. After switch of the engine, motor cannot restart without permission of password. The development of satellite communication technology is easy to identify the vehicle locations. Vehicle tracking systems have brought this technology to the day-today life of the common person. Today GPS used in cars, ambulances, flights and police vehicles are common sights on the roads of developed countries. All the existing technology support tracking the vehicle place and status. Our second purpose is to prevent the car accidents and saving the human life. For that purpose we are using an alcohol sensor, which prevents the accidents due to drink and drive. Whenever the person has consumed alcohol, the sensor will detect the percentage of alcohol. If the percentage is high then alarm will automatically ring. By this we could prevent the accidents. Our third aim is to take the necessary actions after an accidents has occurred.

Our system is providing a technology in which we Put a device in which a threshold limit of vibration is provided which detects the vibration of the mobile caused due to the accidents, our system will measure the rate of vibration of the mobile installed in the car. If the rate of vibration exceeds the threshold value it will automatically send the messages to the nearby hospitals and as well as the relatives of the victim.

## II. LITERATURE SURVEY

Traditional navigation systems have been large, expensive, and used only in aviation or military applications. The existing systems only track or provide the accident prevention also these systems are mainly hardware based. Due to the increased hardware the cost of such system is more so it is not affordable to the common peoples to purchase or install such kind of systems into their vehicle. Due to the presence of GPS and different motion sensors this technology is affordable to the common people. The existing systems do not provide the facility of registering the complaints in the

police station through an application which saves the time of the user. Traditionally the vehicle owner had to go to the police station to register his/her complaint about his/her lost vehicles, which cost him a lot of time and also sometimes bribe to the police officer to investigate our case as early as possible. After investing so much time and money there is no guarantee of tracking the vehicle by the police. There is no app which provide such facility of registering the complaint in the police station and track the car.

In [1], this system describes the Accident detection and prevention system which is used to locate the location of the vehicle and provide the ambulance services in shortest amount of time. In [2], this system describes the accurate detection of the vehicle. This design is a system which can detect accidents in significantly less time and sends the basic information to first aid center. In [3], this system provide the multiple tracking System. Multi-tracking system is a real time tracking platform which uses integration of technologies such as GPS and GSM. The platform supports multiple tracking devices for variety of applications such as live vehicle tracking, personal tracking and also assets tracking. In [4], it provide the secured wireless network communication, If GSM network is not available then automatically the system will switch to Bluetooth mode. The whole system will communicate using triple DES algorithm for security.

### III. PROPOSED SYSTEM

In this proposed system, we are providing the tracking as well as accident prevention methods. It is not only use to tracking the stolen vehicles location but also provide the security features so that we can prevent the accidents by using the GPS and GSM technologies. This system puts into sleeping mode while the vehicle handled by the owner or authorized person otherwise goes to active mode, the mode of operation changed by in person or remotely. We are going to develop an application, where we can lodge a complaint which will be registered on the cloud server, which is indirectly connected with the RTO database. So after the complaint registration the tracking process starts. With the help of GPS, the location of the vehicle is getting tracked and the corresponding longitude and latitude of the location is send to the vehicle owner as well as to the RTO server with the help of GSM module. Then we can on the system remotely, after that owner will sends the message to the microcontroller. The controller will issue the message to the motor engine, and the vehicle will stopped eventually. To again unlock the engine the owner will provide the username and password. We can easily lodge a complaint through the application in a short span of time. We can easily track the location of the vehicle by using GPS and GSM technologies. When an accident has occurred an SMS is automatically sent to the nearby hospitals. With the help of alcohol sensor accidents due to drink and drive will be prevented.

### IV. SYSTEM ARCHITECTURE

The Block diagram of Vehicle tracking and locking System based on GSM and GPS technology is shown in the FIG. It consists of 2 android mobiles with GPS and GSM facilities, Bluetooth devices, Raspberry pi controller, alcohol sensor, cloud server.

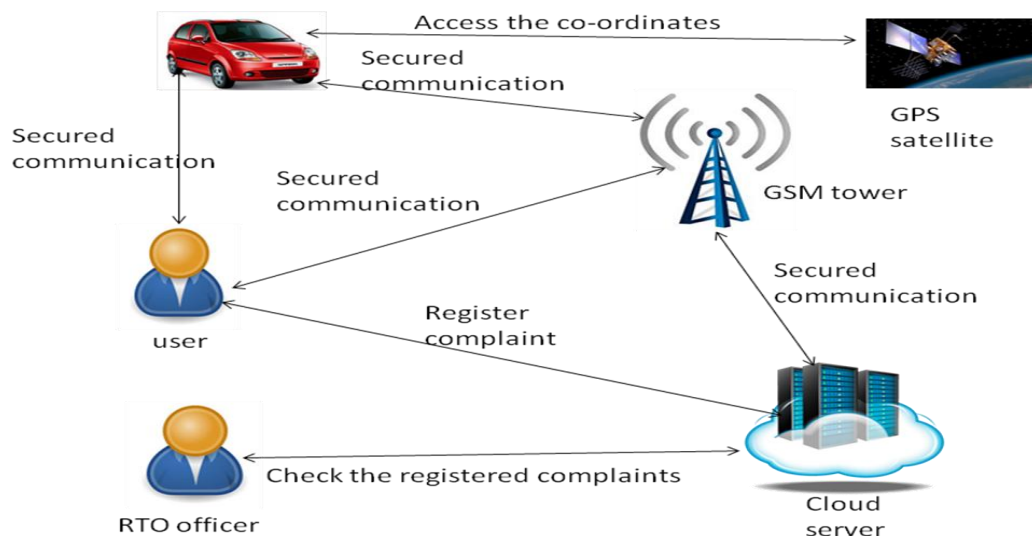


Figure 1: System architecture block diagram

Our tracking system is composed of 2 android mobiles, a server and a database, Blue-tooth device, controller, and sensor.

1. The vehicle owner will register the complaint through the app and it will store to the cloud server.
2. With the app the tracking system is getting enabled, by using the GPS we get the location of our stolen vehicle.
3. At the same time the information about the location is also sent to the police station.
4. After that the owner will send the message to the controller, after receiving the message the engine get pushed off.

5. They caught the thief, and to restart the engine the system will ask for the valid user name and password.

A.ALGORITHM

- 1 Every time GPS device receives the co-ordinates and sends it to the server after a fixed amount of time.
- 2 The server receives the information from the GPS device and stores it to the database.
- 3 The owner put the information of his vehicle to the server database, and request for his vehicle.
- 4 After that the server processes the request and gives the information about the location of his vehicle.

V.MATHEMATICAL MODEL

Let us consider S as a system for Secured Vehicle Management.

$S = V, Tc, Av, I, U, P, D, F$

Where,

- $V = \{v1, v2, \dots, vn\}$  is a set of vehicles
- $Tc = \{Tc1, Tc2, \dots, Tcn\}$  is a set of track vehicles
- $Av = \{Av1, Av2, \dots, Avn\}$  is a set of accident vehicles
- $D = \{D1, D2, Dn \mid n > 0\}$  is a set of used devices(sensors).
- $I = \{I1, I2, \dots, In\}$  is a set of instructions given by the user
- $U = \{U1, U2, \dots, Un\}$  is a set of username module
- $P = \{P1, P2, \dots, Pn\}$  is a set of passwords to authenticate.

F=set of functions.

F=authenticate(),lock(),unlock(),track(),update(), delete(),notify(),pair(),initiate().

Some functions are shown as follow,

F1 (authenticate (U, P)) =A

A=d|d contains the information about the success

Or failure

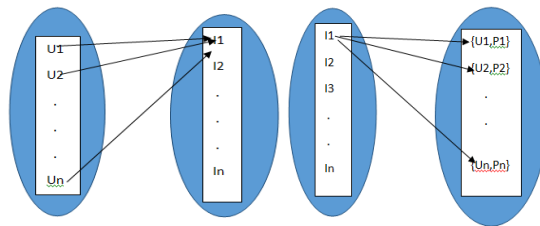


Figure 3. Authenticate Mapping Function

F2(lock())=L

L= d|d contains the information about success/failure of locking

F3(track())= T

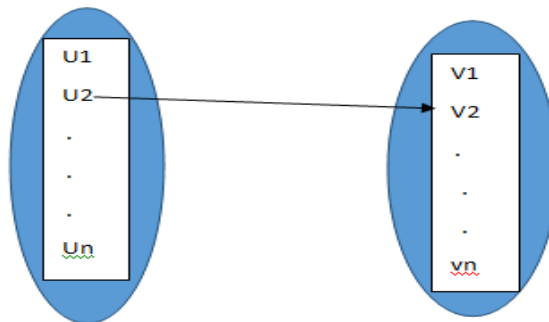


Figure 4. Locking Function

T=d|d contains the coordinates of the location of the vehicle. Output O=O1,O2,..On |O operations performed by the system.

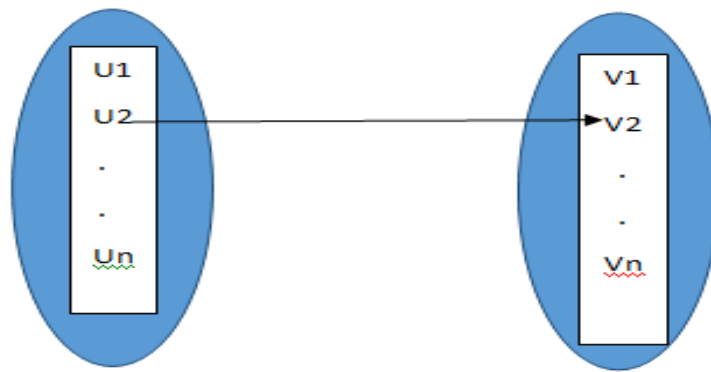


Figure2. Tracking System

### VI. 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. This system puts into the sleeping mode vehicle handled by the owner or authorized persons; otherwise goes to active mode. 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 all the doors locked. To open the doors or to restart the engine authorized person needs to enter the passwords. In this method, easily track the vehicle place and doors locked

### VII. REFERENCES

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