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Vehicle security using Raspberry-Pi

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ABSTRACT

Recently every individual person preferring to use own vehicle for transportation rather than public transportation because of flexibility in schedule. Thefts are happening on parking and sometimes driving insecurity places like highways. Hence the security and safety become a basic necessity for the urban population and also everyone. In recent days vehicle security and accident prevention are more challenging. The proposed system gives an alarm which represents vehicle tracking and accident detection when theft and accident identifying. Raspberry-pi is the heart of the system, which is connected to any moving vehicle, these make an easy option to track any moving vehicle for that it matters in real time on Google-maps. An alert will be received to the authorized person, the vehicle will be moved to stop mode through the GSM-GPRS connected to the raspberry-pi kit which is kept on inside of the vehicle. Which consist of rasp-pi-camera, sensors, and android phone. The camera is used to take pictures when the vehicle is open or closed mode. This system helps find-out the exact location of an accident with the server and sent the information to an authorized person, give an alarm signal to save the human life. This system also detects the behavior of the driver through the sensors whether he/she drowsy/drun, the speed vehicle is stopped. This system more securable reliable and economical.

Keywords: GSM, GPS, GPRS, TWILIO, LED, RAM.

1. INTRODUCTION

In today's world populations as increases day by day while the numbers of vehicles also increases on the roads and highways, despite the vehicles have most essential element in our everyday life, here every individual person preferring to use own vehicle for transportation rather than public transportation because of flexibility in schedule, theft is happening on parking and sometimes driving insecurity places like highways. The safe of vehicles is extremely important for the public.

These day's vehicle thefts are increasing to high as compared to other. In the automobiles, industries thefts are expanding at an alarming rate in all over the world. For examples, a Thousands of automobiles are lost each year in the state and half of that vehicles are recovered by the Police when they catch the from thieves.

Usually, the problem occurred in recovering of the vehicle reaching the actual owners is not the same jurisdiction as a compliant registered. Usually, the vehicles are recovered by the Police. They have traced the actual owner of the vehicle from license is given by RTO office based. But this method is a lengthy and time-consuming process for RTO officers to

trace out the actual owners from the records and inform to the Police stations. From these delays, require more time to vehicles recovery to the actual owner.

Hence, to give the security to the vehicle from these thieves most of the vehicle owners have started using a theft control systems. Many of the different technology has developed for vehicle security and tracking the location of the vehicles. Despite the development of these security systems, according to National crime information center (NCIC), in 2006, 1,192,809 motor vehicles were reported as stolen, here the losses were 7.9\$ billion. Several security and tracking systems are designed by many companies.

These developed systems are failure in securing the vehicle was recovered theft vehicles, they do not let owner communicate with its vehicle online even if the owner is certain that his vehicle has been theft, also the user cannot find out the current status of his vehicle when his vehicle is being used by some other third party. These are increases in a metropolitan area such as Delhi, Mumbai, Kolkata, Bengaluru etc. the automobiles accidents and hazards are really difficult to solve the problem. In these cities, the accidents have been crossed a level of the expectations and are causing hazards and human loss.

All over the world major deaths occurred due to the road accidents. From the recent surveys, IHS it is stated that these can be reduced by proper implementation by embedded system and based on notification also. It can only reduce the deaths after accident but it cannot manage the behaviour of person.

2. PROBLEM STATEMENT

A vehicle was stolen/theft in every 13 minutes in the capital in the first three months of the year, marking a sharp 44% rise over the same period last year. Only around 4% of these cars are recovered. Delhi saw 9,714 vehicle thefts in the the first quarter of 2016, up from 6,724 in the first three months of last year. By April 13, the number had crossed 11,000, according to police figures.

STOLEN AND RARELY FOUND											
City	Thief vehicle	Motor cycle, Auto	Bus	Trucks	Others	Total	Thief vehicle	Motor cycle, Auto	Bus	Trucks	Others
Delhi	9,714	1,700	4,100	299	20	14,833	9,714	1,700	4,100	299	20
Mumbai	2,400	720	1,900	240	0	5,260	2,400	720	1,900	240	0
Kolkata	110	80	120	60	2	372	110	80	120	60	2
Chennai	100	250	60	30	0	440	100	250	60	30	0
Bangalore	4,410	1,140	300	130	0	6,980	4,410	1,140	300	130	0
Hyderabad	1,300	300	120	20	0	1,740	1,300	300	120	20	0

Fig. 1 vehicle stolen details

The second most common accidents are drunk and drive, here almost youths were died from these. The South Africa is one of the most dangerous countries worldwide for road accidents with 25.1 deaths per 100,000 people every year according to the WHO's Global Status report on Road Safety for 2015. These incidences were very shocking 6 out of every 10 fatalities on the country's roads are caused by alcohol impairment. Canada has seen its fatal road accidents fall 43% since 2000 but the rate of death from alcohol consumption remains high for a developed nation at 34%. The United States also has a high rate of road accident fatalities through alcohol at 31% while the rate of Germany is only 9%.

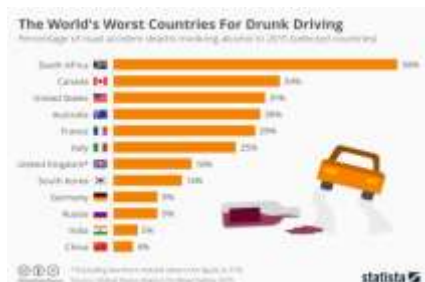


Fig. 2 statics of vehicle accidents

3. OBJECTIVES

- Track/stop the vehicle when unauthorized person theft the car.
- Capture the image of an unauthorized person when any pressure applied.
- The speed vehicle reduced/ stop when the person drowsy/drunk.
- Reduce the death after the accident by using the alarm.

4. LITERATURE REVIEW

A. In the paper, "Embedded Based Vehicle Security using GSM -and GPS System" represents the security using password system.

B. In the paper, " A real-time GSM/GPS based tracking system based on GSM mobile phone" M. A. Al-Rashed, Ousmane Abdoulaye Oumar, Damanjit Singh Faculty of Engineering, Science and the Built Environment, London South Bank University, London, The system is able to provide real-time text alerts for speed and location.

C. In the paper " Advanced Vehicle Security System" Pritpal Singh, 2Tanjot Sethi Department of Industrial design National Institute of Technology Rourkela, India, advance vehicle security system that uses GPS and GSM system to prevent theft and to determine the exact location of the vehicle using a microcontroller.

D. In the paper" Design of an Anti-theft vehicle Tracking System with a Smartphone Application" Manipal University DIAC, Dubai, UAE. Using smart phone application the user can track the stolen vehicle with a click of a button.

E. In the paper "intelligent vehicle theft control using the Embedded system", Volume 107-no. 19 dec. 2014, using this Vehicle security enhancement and accident prevention system can be developed through tracking and locking, fuel theft, accident detection and prevention, driver fatigue, pollution control and speed limiting with efficient vehicle management system.

F. In the paper, "raspberry pi based vehicle tracking and security system for real-time applications" Design of Vehicular monitoring and tracking system using RASPBERRY PI are proposed. The vehicular module is used to track, monitor, and surveillance and finds the accident spot and intimate to the monitoring station. The proposed design provides information regarding vehicle Identity, speed, and position on real-time basis.

5. PROPOSED MODEL

Different methods are done by many authors to provide better security for vehicles.



Fig.3 Proposed model

Fig. 3 represents the model of the proposed system. In this system raspberry-pi is heart of the system. Most of the model use a raspberry-pi in recent days. In the proposed system provides security and safety. This system consist of raspberry-pi, door lock sensor, alcohol sensor and pressure sensor are the input of the system. Here motor, motor drives, GSM with GPRS, buzzer is output of the system. During the normal operation of the vehicle is, when the authorised person open door of vehicle then motor of the vehicle as start to run. Here alcohol content is not detected, buzzer is on mode, there is no information are sent to authorised person. Hence these systems is sleeping mode in authorised person only and normal condition otherwise goes to active mode i.e. When the persons are drowsy/drunk, motor of the vehicle

start to reduced and come to off state. The SMS (Short Messaging Services) sent to preloaded number using GSM (Global System For Mobile Communication), location also shared by this message. image is captured by the USB camera connected to raspberry-pi. This images is stored on SD card of raspberry-pi. The door of the vehicle any interruption are occurred then the IR sensor senses and gives an information to raspberry-pi, to stop the vehicle, and SMS is sent to authorised person or owner with the location. And also the pressure is applied by unauthorised person on vehicle then vehicle stop to run slowly while message sent. Another most important is, when an accident occurred raspberry-pi gives an alarm using buzzer from these reduces the death after an accidents.

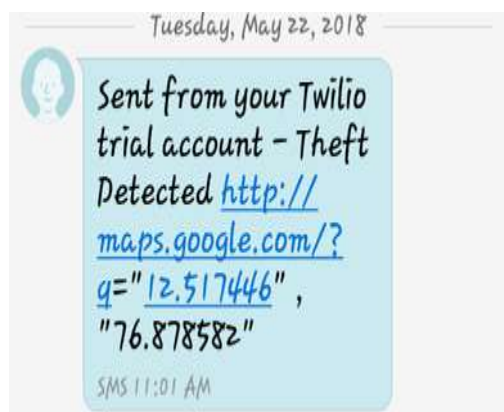
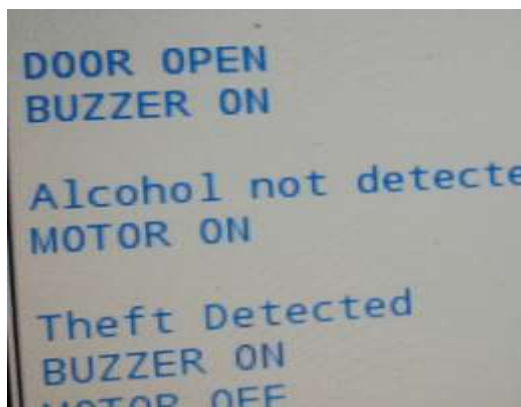
6. RESULTS AND DISCUSSION

Following results gives an working of proposed model.

During normal operation, when the authorized person open door of the vehicle then motor of the vehicle as a start to run. Here alcohol content is not detected, the buzzer is in mode, there is no information are sent to the authorised person.



When the pressure applied on the vehicle then theft is detected while vehicle speed reduces gradually and information sent to owner through the GSM from raspberry-pi of the system.



7. CONCLUSION

The proposed model consist of raspberry-pi, door lock sensor, an alcohol sensor and pressure sensor are the input of the system. Here motor, motor drives, GSM with GPRS, the buzzer is the output of the system. This system enhances the better vehicle security and safety for human life. It is reliable, securable and economical.

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