

ADVANCE CAR SECURITY SYSTEM VIA IOT

Dr. Narayana Swamy Ramaiah

Faculty of Engineering and Technology,

Jain (Deemed-to-be University), Ramnagar District, Karnataka – 562112

Email Id: r.narayanaswamy@jainuniversity.ac.in

Abstract: *The security of vehicles is extremely essential for vehicle owners especially to those whose hard-earned income was used to avail of one or simply, its loss would mean inconveniences to family and work. With these, each vehicle owner becomes the big issue. This study, Microcontroller-based Vehicle Protection System with GSM and GPS Tracking Capabilities, is systems that can be used to improve vehicle safety, as it can monitor the missing vehicle's location, and let's police have reliable evidence that the vehicle is stolen. The project uses Global Mobile System (GSM) and Global Positioning System (GPS) technologies, which include the primary components of the GPS receiver module, the GSM module, and the microcontroller. It also uses a vibration sensor that detects the movement of vehicles and a buzzer that, when sensors are activated, sends a warning. A confirmation message is sent to the vehicle owner of the vehicle by the device. The system also features capability of tracking the location of the vehicle with the help of the GPS receiver which gives data to the location of the vehicle by way of coordinates.*

Keywords: *GSM, GPS, IoT, Security, Vehicles.*

I. INTRODUCTION

Nowadays, the production of automobiles is increasing as well as theft of cars is also increasing it is a universal problem. To short out this issue of theft, most of the vehicle owners have started using the theft protection systems. An IOT based vehicle security system in which mobile communication is implemented to a proposed program. There are many car security systems that exist in which a car alarm is one of them and this car alarm security system has many disadvantages such as the sound of car alarms cannot be heard for a long distance. Sometimes it also provides false alarms so car alarm security systems are not more effective[1]. This paper discussed a car security system based on the Internet of things. Car security system based on the Internet of Things is an advanced security system. An alarm signal is produced by the security system and a notification sent to the mobile to which they are assigned if there is vibration in the car when the owner got the notification on their mobile they can easily supervise their vehicles and protect the car from anywhere remotely from theft. Global positioning system (GPS) is one of the most important electronics devices which provide actual tracking and monitoring of vehicles. GPS system provides actual coordinate mean accurate latitude and longitude geographical area[2]. GPS is placed in the car security system to track its position so when any theft takes place with the car then the owner of the car can easily track

the car with the help of GPS and take appropriate action by calling nearby police. If a car meets an accident then it also provides the location of the accident area. Most of the accidents occurred due to over speed driving, drink and drive, while driving using phones, breaking traffic rules and regulations. Most people lose their lives because they could not get quick treatment because they could not track accurate GPS coordinates of the accident area[3].

Presently in India every four minutes one death occurs due to road accidents. 25-30% road accidents took place by four wheeler out of total road accidents. According to a recent survey approx 80.6% of car drivers died who didn't wear a seat belt. Hence the government has made it compulsory to wear a seatbelt while car driving. The most popular explanation for the loss of a life during an accident is the lack of urgent assistance that can save the life of a person in a few seconds. The life of all people travelling in a car is at stake as soon as an accident happens. It all depends on the response time that a few minutes or seconds will save their lives. According to the estimates, it can save 6 percent of lives by reducing accident wait times by even 1 minute. This response time is therefore very critical and, in order to save their lives, it needs to be shortened or at least enhanced. Living in a tech world that is growing day by day with new technologies, we can apply these techniques in our society and help them overcome such problems[4].

The Vision of the Internet of Things (IoT) has come out to reach unexpected bounds of today's computing world. It is a concept that not only can impact a human's life but also how they function. Smart sensors are the core of the IOT, without which it would not have existed. For their contact, these sensors form a vast network. They capture minute descriptions of their surroundings and relay to each other this important information. Related acts are done accordingly, based on the information obtained. It is the new communication model that imagines the near future in which day-to-day artifacts will be integrated with digital communication microcontrollers with the help of suitable protocol stacks that will make them capable of interacting with each other. It is a technology that aims to provide devices with intelligence so that they can communicate smartly and perform the actions required to eradicate human labor. It offers a vision of the future in which non-living objects communicate with each other and do the necessary work. In this way, human work will be reduced to an extent and required acts will be carried out by the machines. For our culture, the importance of the accident detection and warning system is very important. Imagine a scenario where an accident happens and the emergency services are alerted immediately. This will result in the evacuation of those who involved in the accident that were wounded. It has the ability to bridge these two situations, as the Internet of Things has seen rapid growth these days. In order to be successful in the IoT paradigm, it should be able to monitor the position of objects (i.e. cars in our case), which can be useful for ambulances to reach the location on time[5].

Car accidents that happen daily are the major social problems towards which serious action must be taken. One of the solutions for this domain is the Internet of Things which is the current trend in technology. For this purpose, many authors have worked in this domain by applying this technology. Many tradeoffs, such as high cost, non-portability, false delivery, etc., when operating with the accidental management system Because of the lack of funding, the system faced many shortcomings. They used the severity scale in their approach to assess the effect of an accident. This lowered the cloud server's load by 30%. A system with two components was developed by the author. The first is the framework for accident detection and alerting. The second one is ambulance traffic control. To route the ambulance, an effective routing algorithm is used. For road junctions with signals, the technique is feasible. It is not, however, valid for

segments without signals[6]. By observing eye blinking with the assistance of IR sensors, the author discussed the actions of the driver. In order to determine the angles produced by the head, the head movements of the driver are controlled by the accelerometer mounted on the forehead. This strategy is not feasible since applying an accelerometer to the forehead each time would be painful for the driver. In addition, the only element that is considered for accident detection is driver behavior. A remedy for incidents mostly caused by drinking and driving has been implemented. For this reason, few sensors were used, such as a touch sensor, a heartbeat sensor, a Raspberry Pi interfaced alcohol sensor[7].

System designed that monitors the condition of the car during its journey. The parameters that are addressed in their work are, gas leakage which is monitored by using an MQ2 gas sensor, vehicle speed which is recorded by hall-effect sensors, GPS and GSM modules for communication and tracking location of vehicles. For an accident detection event, however, only speed was considered by using hall-effect sensors. In addition, the author suggested an algorithm for vehicle collision detection that works well for the design of T-intersection roads. For the design of the algorithm, the parameters considered are the curvature region of T-intersection junctions and the expected time at the junction for the two cars to meet. We feel that for the particular case of T-intersection and not for general road accidents, the algorithm is successful[8]. Therefore, in order to support general road injuries, there is a need to alter the current work performed by authors. By designing an IOT based vehicle, the device is implemented. As a development board that is interfaced with various sensors as mentioned above, the car is embedded in Arduino. It is managed using the HC05 Bluetooth module. Also, to look for performance, the car is checked for various conditions. The algorithm works on the data obtained by the ADXL345 accelerometer, vibration sensor, heart rate sensor, GPS and GSM module for this setup. There are configurations and threshold ranges for these sensors. The input range of the accelerometer may be 2g to 200g (negative and positive) and it can differ even more. Whereas, there are only two states of the vibration sensor, low and high[9].

II. CONCLUSION & DISCUSSION

In advanced security systems, firstly, vibration sensors are attached to collect the information and derive an output signal and PIC microcontroller collects these derived output information. PIC controls all the functionality of advanced security systems and acts as an electric brain. It also sends information to the mobile to which PIC microcontroller they are assigned with the help of GSM modem. GSM modem sends the information to the registered wireless mobile phone when GSM modem receives information from the PIC microcontroller. When the owner gets the notification on their mobile they can easily supervise their vehicles and protect the car from anywhere remotely from theft. The device also features the ability to monitor the vehicle's position with the aid of the GPS receiver, which provides data via coordinates to the vehicle's location. The exact location of the motor vehicle is given by these coordinates. For successful use and use of the four-character password followed by the instruction, the SMS message that the vehicle owner can send to the computer attached to the vehicle should follow the correct limitation format. The command is for automatic power switching or activation of the key switch, engine and alarm. The system does not work if not noticed. The project is intended to provide the safety of the vehicle to vehicle owners.

III. REFERENCES

- [1] K. Katta, I. Dutta, D. Gogoi, B. Gayan, and J. Rabha, "Review on Advanced Vehicle Security System with Theft Control and Accident Notification," no. 7, pp. 5–9, 2014.
- [2] P. R. . C. Vikhankar, A D, "Advanced Vehicle Security System with Theft," vol. 5, no. 7, July 2016, pp. 12881–12894, 2016, doi: 10.15680/IJIRSET.2016.0507149.
- [3] H. P. Han and H. M. Tun, "Advanced Car Security System Using GSM," vol. 4, no. 5, pp. 4–8, 2014.
- [4] T. Alwada, A. H. Mohammad, N. El-omari, and H. Aldabbas, "An Overview of an Advanced Vehicle Security System," *International Journal of Computer Science and Information Security (IJCSIS)*, vol. 12, no. 3, pp. 34–38, 2014.
- [5] J. Sayyad, M. Taha, and A. Sankpal, "Advanced Car Security System," *International Journal of Scientific Research in Network Security and Communication*, vol. 5, no. 3, pp. 165–169, 2017.
- [6] M. Pawar, S. Wakhare, A. Yewale, and H. Gawari, "Vehicle Security and Tracking System With Clash Driving Alert," *International Research Journal of Engineering and Technology (IRJET)* e-ISSN: 2395 -0056 p-ISSN: 2395-0072, vol. 4, no. 4, pp. 2168–2173, 2017.
- [7] R. Agarwal, "Vehicle Security System Using IoT Application," *International Research Journal of Engineering and Technology*, pp. 4–6, 2018.
- [8] V. K. Sehgal, S. Mehrotra, and H. Marwah, "Car security using Internet of Things," *1st IEEE International Conference on Power Electronics, Intelligent Control and Energy Systems, ICPEICES 2016*, pp. 1–5, 2017, doi: 10.1109/ICPEICES.2016.7853207.
- [9] O. F. Mendoza, "Microcontroller-based Vehicle Security System with Tracking Capability using GSM and GPS Technologies," *Asia Pacific of Multidisciplinary Research*, vol. 5, no. 2, pp. 114–120, 2017.