IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

Vehicle Crash and Stealing Identification using Arduino

Mr. Y. Maheswar Reddy[1], M. Poorna Chandrika[2], T. Harshitha[3], V. Mounika[4], N. Jyothish[5], B. Harshavardhan[6]
Associate Professor, Dept. of ECE[1]
Students, Dept. of ECE[2,3,4,5,6]
Sri Venkatesa Perumal College of Engineering and Technology, Puttur, AP, India

Abstract: *Human life is more valuable than anything else, timely help is more important than lending a helping hand. This article is one among those which is designed in a way to save human lives in a timely manner. In modern day vehicles, vehicle anti-theft system is of prime importance and traffic accidents are one of the leading causes of fatalities. An important indicator of survival rates after an accident is the time between the accident and when emergency medical personnel are dispatched to the accident location. By eliminating the time between when an accident occurs and when the first responders are dispatched to the scene decreases mortality rates, we can save lives. There are two main modules discussed in the article. In this article the first module is password-based security system to access the vehicle. And the second one is accident location intimation through SMS by using GSM module.*

Keywords: Vehicle Theft, Arduino, GSM, GPS, LCD

I. INTRODUCTION

In the present growing economy of India, the country also faces the uprising of crime rate. The offense has generated losses in properties, valuables and money. Car theft, which is the main concern for the conduct of this article, is one of the biggest crimes which is hard to eliminate. On the other hand safety has also become a major factor that is to be taken care of which numbers of accidents have rapidly increased day by day, many lives are lost due to improper post-accident signaling and tracing out the exact location. Our articleprovides solution for the above stated problems which involves intimating the authorized person in advance about the current status ofthe vehicle if it is being intruded by a unauthorized person or an accident using GSM and GPS based technology.The sensor in the vehicle is used to detect the accident happened. The sensor then sent the control to microcontroller. The microcontroller is used to send the alert message to respective members. They track the location where the accident has occurred using GPS and directs the alert message to the respective authorities using GSM. The microcontroller retrieves this message from the modem by issuing certain AT and T commands to the modem.

II. LITERATURE SURVEY

Shuang Liu et.al.,[1] Intelligent Vehicle Tracking System and accident Based on GPS, GSM Vehicle theft has become a matter of concern these days. The GPS satellites transmit signals at L1 and L2 frequencies containing the ephemeris data, navigation data, codes etc which are used to determine the location of the vehicle in three-dimensional coordinates i.e., latitude, longitude, and altitude along with the precise time. Dr. P. A. Nageswara Rao et.al.,[2] Tracking system with theft control and accident intimation through sms As the usage of vehicles is increasing rapidly with the growing population the number of vehicle thefts are also increasing day by day. And also the number of deaths due to the accidents in the remote areas are also increasing. S. Jogleka et.al.,[3]. As accidents are one of the major causes of deaths the road safety has also became a challenging task. And hundreds of people are losing their lives everyday due to the accidents as there are not getting help at the right time. This article is used to provide solution for the vehicle theft situations and also to prevent the loss of lives due to accidents in the remote areas.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

III. EXISTING SYSTEM

There are some existing methods which is used for primary use. The existing system consists of alarming system. If someone touches the vehicle then the alarm gets ON, then the owner become cautious. By using this theft can be controlled over a small range.

3.1 Disadvantages of Existing Method

- In the existing system, vehicles are tracked by persons manually.
- In this system we cannot monitor the location of the vehicle remotely.
- We cannot find the status of the vehicle.

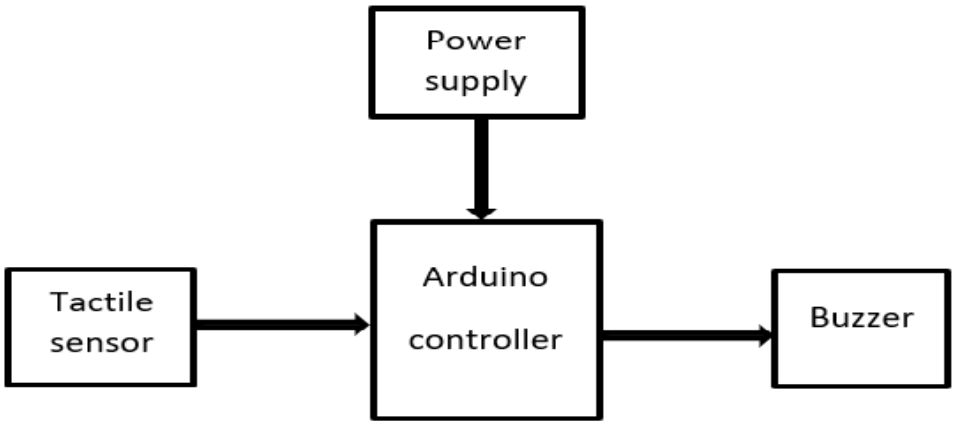

Fig 1 : Block Diagram Of Existing Method

IV. PROPOSED METHOD

In the proposed method we are using Keypad and MEMS sensor which are interfaced with Arduino controller. Here initially to turn on the ignition key we need to enter the password through keypad if the password is correct then only the motor will ON which is represented the engine otherwise it won't turn ON. MEMS sensor will detect whether the accident occurred or not, if accident occurs the GSM will send message to parents or doctor along with Location.

4.1 Block Diagram

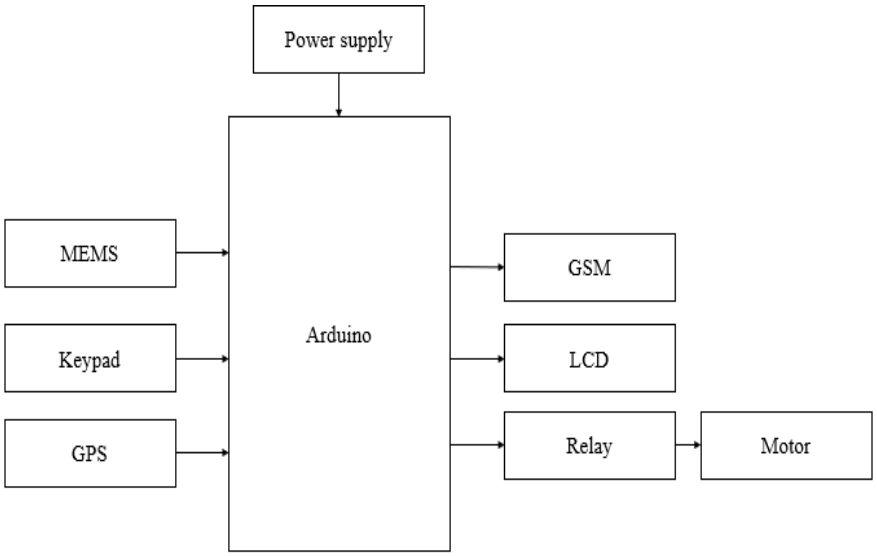

Figure 2: Block Diagram of proposed system

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

4.2 Main Components Description

A. Arduino Mega

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports),reset button.

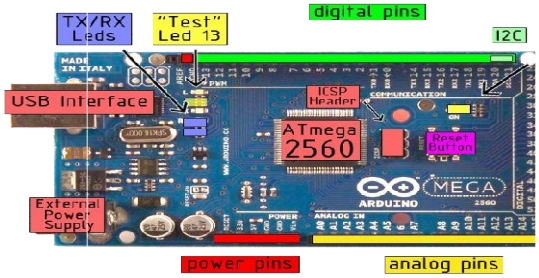

Figure 3: **Arduino Mega 2560**

B. MEMS Sensor

MEMS are low-cost, and high accuracy inertial sensors and these are used to serve an extensive range of industrial applications. This sensor uses a chip-based technology namely micro-electro-mechanical-system. These sensors are used to detect as well as measure the external stimulus like pressure, after that it responds to the pressure which is measured pressure with the help of some mechanical actions.

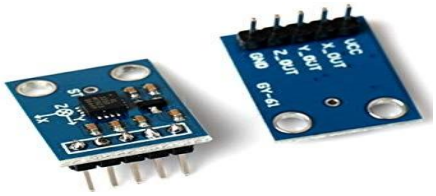

Figure 4: MEMS Sensor

C.GSM:

GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). It is widely used mobile communication system in the world. A GSM modem is a device which can be either a mobile phone or a modem device which can be used to make a computer or any other processor communicate over a network.

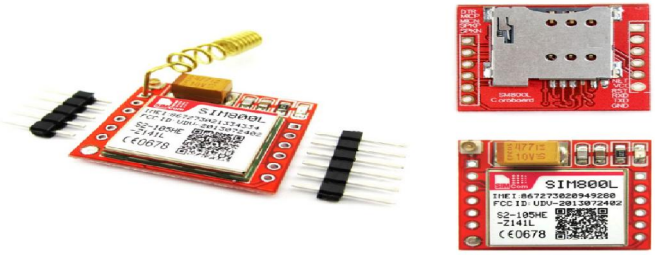

Figure 5: GSM

D.LCD

LCD (Liquid Crystal Display) is the innovation utilized in scratch pad shows and other littler PCs. Like innovation for light Emitting diode and gas-plasma, LCDs permit presentations to be a lot more slender than innovation for cathode beam tube (CRT).It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

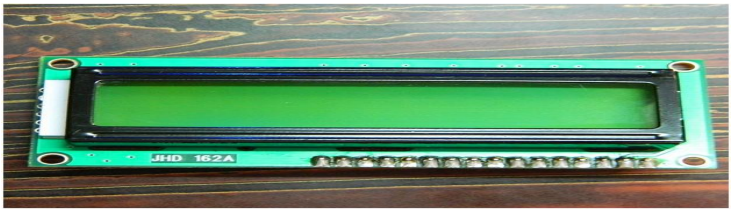

Figure 6: LCD

E. DC Motor

A direct current (DC) motor is a type of electric machine that converts electrical energy into mechanical energy. DC motors take electrical power through direct current, and convert this energy into mechanical rotation

Figure 7: DC Motor

F. Relay

A relay is an electromagnetic switch that is used to turn on and turn off a circuit by a low power signal, or where several circuits must be controlled by one signal. The main operation of a relay comes in places where only a low-power signal can be used to control a circuit.

Figure 8: Relay

G. GPS

GPS means Global Positioning System. GPS is a Global Navigation Satellite System (GNSS) developed by the United states Department of Defense.GPS is a US based radio navigation system that is used to provide positioning, navigation. It is used to find the accurate and three dimensional location in terms of latitude, longitude and altitude. In this project GPS is used to find the exact location of the vehicle in terms of latitude and longitude.

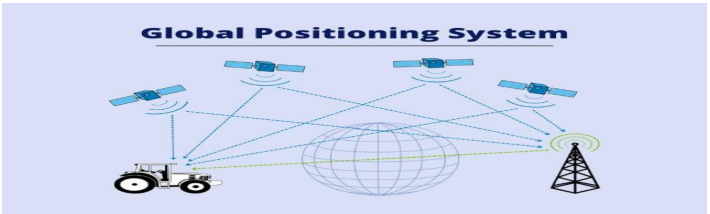

Figure 9: GPS

H. Arduino IDE

Arduino IDE where IDE stands for Integrated Development Environment – An official software introduced by Arduino.cc, that is mainly used for writing, compiling and uploading the code in the Arduino Device. Almost all

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

Arduino modules are compatible with this software that is an open source and is readily available to install and start compiling the code on the go.

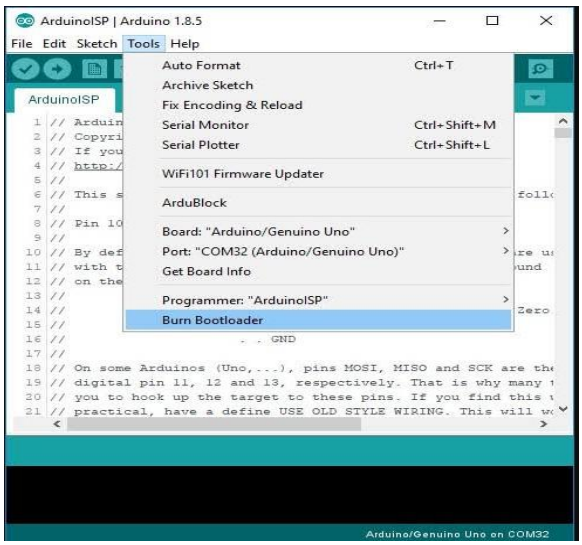

Figure 10: Arduino IDE

I. Keypad

A matrix keypad consists of a set of push button or switches which are arranged in a matrix format of rows and columns. A Matrix keypad is the most commonly used input device in many of the application areas like digital circuits, telephone communications, calculators, ATMs.

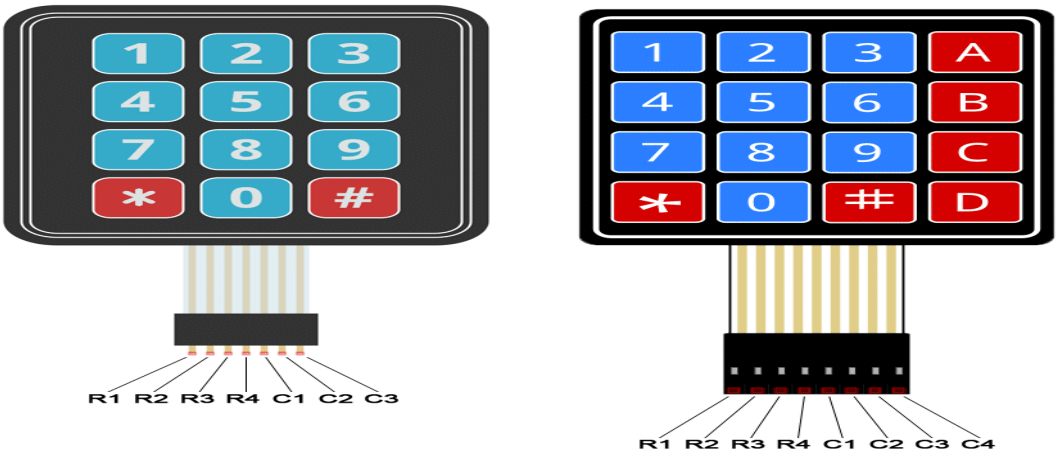

Figure 11: Key pad

V. RESULTS AND DISCUSSION

Initially the owner of the vehicle must set a password. The GSM modem was used to send and receive the messages to the owner. To start the engine of the vehicle one should enter the correct password. If anyone enters the wrong password, the owner will immediately receive the alert message.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

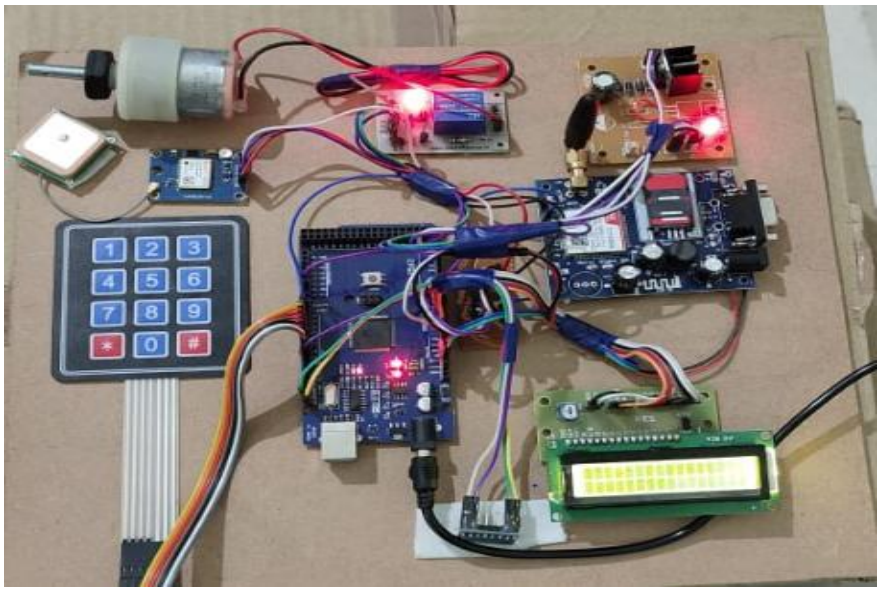

Figure 12: Proposed System

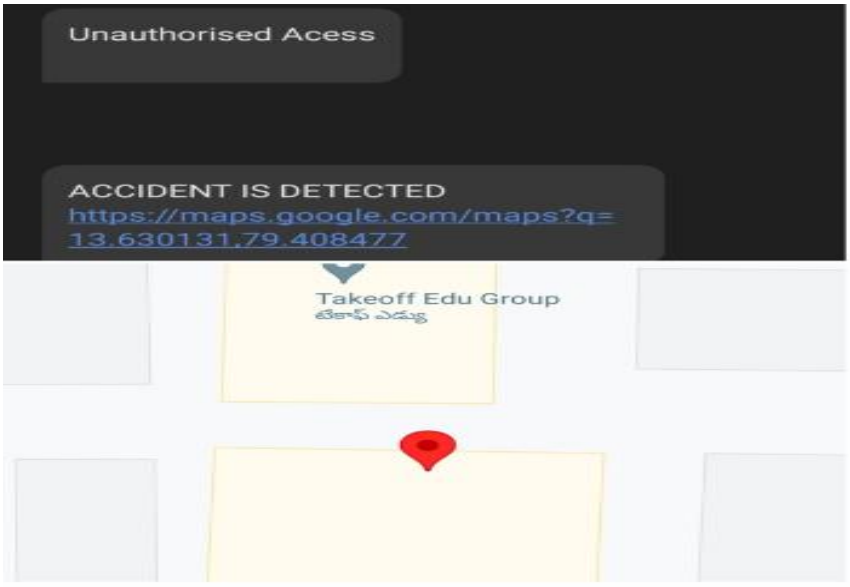

Figure 13: Received Message

If the vehicle met with an accident then immediately the information message will be sent to the family members or doctor along with location. The coding was written in embedded c language using "ARDUINO IDE".

VI. CONCLUSION

The article designing a low-cost, compact theft control system for a vehicle was designed &demonstrated. This work is an ultimate threat for vehicle thieves. Nowadays, the vehicles are least secured when it is stolen by thieves. By this work which is presented in this article, it is very easy to track the vehicle at a higher degree of accuracy, since it is based on GSM Technology, which is very developed now. So, it is very much easy to get back the vehicle. Thus the article tracking system with theft control and accident intimation through sms is obtained and have observed the performance of the system. With the help of this article the increase in the theft of the vehicles can be controlled and the rapid increase in death rate due to the accidents occurring in the remote areas can be reduced

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 2, January 2023
Impact Factor: 7.301

VII. FUTURE SCOPE

In the future this article can be developed to make it best than present ,In order to use it in several application such as can be used for disclosure of liquor, which checks if the person has consumed alcohol or not. The eye sensor makes sure that the person in driver seat does not falls asleep. Thus this system ensures the life securityIn case of vehicle theft situations the owner can know the vehicles current location and based on that he can stop the vehicle by sending a predefined SMS message to this system. After receiving SMS message from owner this system automatically stops the ignition system hence the vehicle will not function any more. By using these types of applications, up to some consistent accidents can be reduced and many life's can be saved.

REFERENCES

[1]. GPS: Theory and Practice, B. Hofmann Wellenhof et al., Springer Verlag, 1992, ISBN 3-211- 82364-6 and 0-387-82364-6.
[2]. Understanding GPS: Principles and Applications (Artech House Telecommunications Library), Elliott D. Kaplan (Editor) / Hardcover / (1996), (USD 99).
[3]. GSM Networks: Protocols, Terminology and Implementation by Gunnar Heine.
[4]. GSM Switching, Services, and Protocols by Joerg Eberspaecher.
[5]. GSM System Engineering (Artech House Mobile Communications Series) by Asha K. Mehrotra.
[6]. Working with GSM Network By Cruis Leonardo.
[7]. Alzahri Fatin Balkis Binti, Sabudin, Maziani, "Vehicle Tracking Device" (2016). [IEEE 2016 International Conference On Advanced Informatics: Concepts, Theory And Application (ICAICTA) .
[8]. R. Rishi, S. Yede, K. Kunal and N. V. Bansode, "Automatic Messaging System for Vehicle Tracking and Accident Detection", 2020
[9]. Gokula Chandar ,Leeban Moses M; T. Perarasi M; Rajkumar; "Joint Energy and QoS-Aware Cross-layer Uplink resource allocation for M2M data aggregation over LTE-A Networks", IEEE explore, doi:10.1109/ICAIS53314.2022.9742763.
[10]. Dhuddu Haripriya, Venkatakiran S, Gokulachandar A, "UWB-Mimo antenna of high isolation two elements with wlan single band-notched behavior using roger material", Vol 62, Part 4, 2022, Pg 1717-1721, https://doi.org/10.1016/j.matpr.2021.12.203
[11]. Gokula Chandar A, Vijayabhasker R., and Palaniswami S, "MAMRN – MIMO antenna magnetic field", Journal of Electrical Engineering, vol.19, 2019.
[12]. Rukkumani V , Moorthy V, Karthik M , Gokulachandar A, Saravanakumar M, Ananthi P, "Depiction of Structural Properties of Chromium Doped SnO2 Nano Particles for sram Cell Applications", Journal of Materials Today: Proceedings, vol.45, pp.3483-3487, 2021. https://doi.org/10.1016/j.matpr.2020.12.944
[13]. S.Mohanasundaram et al., "Vehicle Theft Tracking Detecting and Locking System Using Open CV", 2019 5th International Conference on Advanced Computing and Communication Systems (ICACCS).
[14]. M. Eswar Kumar et al., "Vehicle Theft Identification and Intimation Using GSM & IOT", IOP Conference Series: Materials Science and Engineering, vol. 263, pp. 042062, 2017.
[15]. Mustafa and H. Jameel, "Vehicle Intrusion And Theft Control System Using GSM and GPS", Asian journal of engineering sciences & technology, vol. 2, no. 2, pp. 102-105, 2012.IEEE.
[16]. Liao, Y. Liu, Y. Hu and Z. Guo, "Intelligent traffic accident detection system based on Ati theft," 3rd IEEE International Conference on Computer and Communications (ICCC), Chengdu, 2017, pp. 2110-2115.
[17]. P. Parmar and A. M. Sapkal, "Real time detection and reporting of vehicle collision," International Conference on Trends in Electronics and Informatics (ICEI), Tirunelveli, 2017, pp. 1029-1034.
[18]. M. K. A. Mohd Rasli, N. K. Madzhi and J. Johari, "Smart helmet with sensors for accident prevention," International Conference on Electrical,Electronics and System Engineering (ICEESE),Kuala Lumpur, 2013, pp.