

Tracking down the Vehicle Collision Detection and Messaging System using GPS and GSM

S.Suganya¹, T.Divya², M.Subha Sankari³, Dr.P.Gomathi⁴

^{1,2,3}Department of Computer Science and Engineering, N.S.N college of Engineering and Technology, Karur-639003,TN, INDIA

⁴Department of Electrical and Electronic Engineering, N.S.N college of Engineering and Technology, Karur-639003,TN, INDIA

Abstract— Security in travelling is a primary concern for everyone. Rising demand for automobile has increased the traffic, thereby causing more accidents on the road. People often lose their lives because of poor emergency facilities in the case of unattended accidents. Pre-emption of the accidents taking place on the roads is not possible, but at least the after effects can be minimized. The proposed system ensures making emergency facilities available to accident victims as early as possible by letting relatives; by the way of monitoring the car using its number plate recognizes the camera. Before that it can act through the tollbooth, the vehicle number plate was captured by this camera and stores it in a database. It will check out that the vehicle was authorized or not, if the number plate was registered one, then it passes the entry to the vehicle, otherwise buzzer alarm will rise. When the car met an accident sense by vibration sensor making an alert to hospital or a rescue team knows the accident spot with the help of this module embedded in the vehicle. Sensors are attached to the ARDUINO-Controller. In the event that there is a mishap, the sensor gets enacted and the GSM framework will send notices to the closest doctor's facility, police headquarters or sort of the casualty with the area organizes where the mischance has happened. With the assistance of room route framework GPS finds the position of the vehicle where a mischance has happened.

Keywords— Collision Detection, messaging system, GPS, GSM, mobile communication, security issue, sensors, GSM framework.

I. INTRODUCTION

The popularity for automatic has likewise expanded the movement perils and the street mishaps. The life of the general population is under high hazard. This is a result of the absence of best crisis offices accessible in our nation. A programmed caution gadget for vehicle mishaps is presented in this paper. This outline is a framework which can distinguish mis-chances in fundamentally less time and sends the essential data to the medical aid focus inside a couple of moments covering topographical directions, the time and edge in which a vehicle mishap had happened. This alarm message is sent to the safeguard group in a brief span, which will help in sparing the profitable lives. A switch is likewise given with a specific end goal to end the sending of a message in the uncommon situation where there is no loss, this can spare the valuable time of the restorative save group. At the point when the mischance happens the alarm message is sent consequently to the save group and to the police headquarters. The message is sent through the GSM module and the area of the mischance is recognized with the assistance of the GPS module. The mishap can be distinguished definitely with the assistance of both Arduino controller and vibration sensor. The Angle of the moves over of the auto can likewise be known by the message through the vibration sensor. This application gives the ideal answer for poor crisis offices accommodated the street mishaps in the most possible way.

II. LITERATURE SURVEY

Proposes a develop once a vehicle meets with associate accident straight off Vibration device can set the signal or if an automobile roll over, and small Electro system (MEMS) device can detect the signal and sends it to ARM controller. Microcontroller sends the alert message through the GSM electronic equipment as well as the situation to police room or a rescue team. Therefore, the police will straight off trace the situation through the GPS electronic equipment, when receiving the data[1]. Proposes this paper implies a system that may be an answer to the present downside. The measuring device sensing element is utilized in automobile security system to sense vibrations in the vehicle and GPS to grant location by car, thus dangerous driving is detected. Once accident happens, measuring device can notice signal send signal to microcontroller will modify airbag to blow and message with accident location is shipped with pre-programmed numbers love automobile, station house, GSM[2]. Proposes a system consists of 2 units, particularly, Crash Detector Embedded Unit and automaton

management Unit. Crash Detector Embedded Unit is liable to detection the accident condition victimization three-axis measuring system detector, position encoder, bumper detector and one warning switch [3]. A road accidents represent the main a part of the accident. The purpose of the project is the vehicle wherever it's and finds the vehicle by means that of causing a message employing a system that is placed within the vehicle system. Most of the day could not be ready to find accident location as a result of don't grasp wherever accident can happen[4]. The numerous techniques that are contributed from the electronic systems are embedded in automobile industry to minimize the accidents caused by the vehicles. It's focused on the automatic collision detection and warning system depending on the GPS and GSM. The vehicle secured is to be mounted with the system firmly confirming good mechanical oriented with the complete framework [5]. A framework guarantees making crisis offices accessible to mishap casualties as right on time as conceivable by letting relatives, healing centre or a protest group know the mischance spot with the assistance of this module inserted in the vehicle. Sensors are appended to the microcontroller. On the off chance that there is a mishap, the sensor gets initiated and the GSM framework will send notices to the closest healing centre, police headquarters or sort of the casualty with the area arranges where the mischance has happened[6]. Proposes a road accidents represent the key a part of the accident. The purpose of the project is to search out the vehicle wherever it's and find the vehicle by means that of causing a message employing a system that is placed within vehicle system, most of the day not be able to notice the accident location as a result of don't recognize wherever accident can happen[7].

2.1 Block Diagram

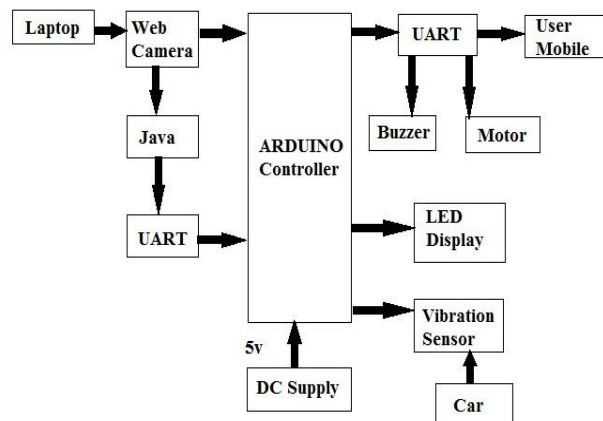


FIG.1.ARTCHITECTURE OF VEHICLE COLLISION

2.2 Existing System

About 1.3 million people kick the bucket in street crashes each year, on the normal three, 287 passing is every day. A further 20-50 million are debilitated or crippled. A very large portion of all street activity passing is happen between youthful grownups age's 15-44. Activity is on the expansion on the grounds that the interest in vehicles is getting higher step by step. In this way, transportation wants change as, since requests are expanding, there will be extra odds of auto crashes. Vehicle mishaps are one among the main sources of the casualty. Normally experience the established truth that once A mishap happens the people close got to physically choose the car that winds up in misuse of your chance.

A substantial assortment of valuable lives is a unit lost on account of streetcar crashes a day. The basic reasons are a unit driver's misstep and late reaction from crisis administrations. There is a need to have a decent street mishap discovery and information, correspondence framework in situation to abstain from squandering lack persons. A framework that sends data messages to close crisis administrations concerning the mischance for auspicious reaction is absolutely in might want. In examination writing, assortment of programs mishap recognition frameworks is a unit anticipated by changing scientists.

2.3 Disadvantages

It will be a serious consequence if people can't get help on right time. Poor emergency incident is a major cause of death rate in our country. Hence there is a delay for emergency services to arrive at the location of the accident.

III. METHODOLOGY

Figure [1] shows that the block diagram for car accident detection and monitoring process. Here first of all we have used power supply of +5V for Arduino controller. Arduino controller is the heart of our project. The inputs are taken from various sensors which is given to Arduino controller. The main objective is to reduce the road side accident, while the vehicle enter into toll booth its need a pass entry to move out.

The web camera capture the image of the number plate the way of conversion of java. That move a Universal Asynchronous Receiver/Transmitter(UART). UART transmit into the Arduino controller handle the power from the DC supply; transmitter can act as in two different paths as authorized and unauthorized vehicle alert it's like to monitoring about buzzer and motor for entry. After passing the booth, whether the accident occurred, they can sense by vibration sensor pass the information with a second. Displays the accident detection using the LED display. Finally, its pass into the emergency service and relatives.

IV. PROPOSED SYSTEM

Consistently around the globe, a huge level of individuals kicks the bucket from car crash wounds. A successful approach for diminishing movement, casualty is first building programmed auto collision location framework, second, decreasing the time between when a mishap happens and when first crisis responders are dispatched to the scene of the mishap. Late methodologies are utilizing are working in vehicle programmed mishap discovery and warning framework. While these methodologies work fine, they are costly, upkeep complex errand, and are not accessible in all autos.

The proposed framework comprises of two stages; the identification stage, which is utilized to identify fender bender in low and high speeds. The notice stage, and quickly after a mishap is shown, is utilized to send definite data, for example, pictures, video, mishap area, and so on to the crisis responder for quick recuperation. The framework was essentially trying in genuine reproduced condition and accomplished very great execution comes about. It is a need of acquainting a framework with diminished the death toll because of mishap and the time taken by the rescue vehicle to achieve the healing centre.

To conquer the downside of existing framework will execute the new framework in which there is a programmed recognition of mishap through sensors gave in the vehicle. A primary server contains a rundown of all doctor's facilities in the city. The principle and sends the exact accident location to the emergency vehicle.

4.1 Flow Chart

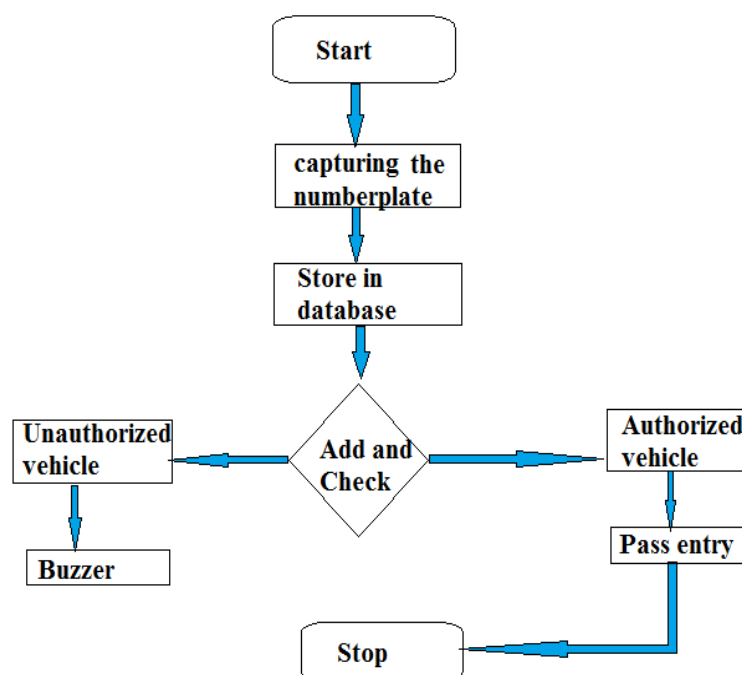


FIG.2. TOLL BOOTH ENTRY

V. LIST OF MODULES

5.1 Checking Number Plate

The ETC (Electronic Toll Collection) aims to eliminate the delay on toll roads by cashless tolling and it is rapidly becoming the most innovative technology for the commuters who pass through the toll plaza. Focuses on an ETC system using ANPR (Automated Number Plate Recognition) technology. The Automated Number Plate is used for detecting crime through intelligence monitoring.

5.2 Vibration Sensor Analysis

Vibration sensor (Piezo elements) comes in handy when you need to detect vibration or a knock. Can use these for tap or knock sensors pretty easily by reading the voltage on the output. Vibration sensor helps to send the signal to Arduino controller. Arduino controllers send the alert message through GSM modem with location. If the person meets a small accident, the driver can inform attention is not required by terminating the message using switch. This is to avoid wasting the time of the medical and police team.

5.3 Sending the Message

GPS stands for Global Positioning System and used to detect the Latitude and Longitude of any location on the Earth, with exact UTC time (Universal Time Coordinated). GPS module is used to track the location of accident in our project. This device receives the coordinates from the satellite for each and every second, with time and date. Previously extracted string in Vehicle Tracking System to find the Latitude and Longitude Coordinates. GSM modem is similar to mobile phone without any display, keypad and speakers. This accepts a SIM card, and operates over a subscription to a mobile operator.

5.4 Tracking Location

Automatic vehicle location could be suggests that for mechanically decisive and transmittal the geographic location of a vehicle. This vehicle location knowledge, from one or a lot of vehicles, could then be collected by a vehicle following system to manage a summary of auto travel. As of 2017, GPS technology has reached the purpose of getting the transmittal device is smaller than the dimensions of an individual's thumb ready to run half-dozen months or a lot of between batteries charging, straightforward to speak with smart phones merely requiring a replica SIM card from one's. Most commonly, the location is determined using GPS and the transmission mechanism is SMS, GPRS, or a satellite or terrestrial radio from the vehicle to a radio receiver. A single antenna unit covering all the needed frequency bands can be employed. GSM most common services applied, because of the low data rate needed for AVL, and the low cost and near-ubiquitous nature of these public networks.

VI. HARDWARE DESCRIPTION

6.1 Arduino

Arduino controller is the brain of our project. UNO SMD R3 used. It is a 14 digital pin and 6 analog pin that may be interfaced to various expansion boards and other circuits. Arduino is Associate in Nursing open supply component and code organization, and client group that styles and fabricates single-board microcontrollers.

6.2 Vibration Sensor

Vibration sensor is used to detect the particular environment area. The three parameters representing motion detected by vibration monitors are displacement, velocity, and acceleration.



FIG.3.ARDUINO UNO

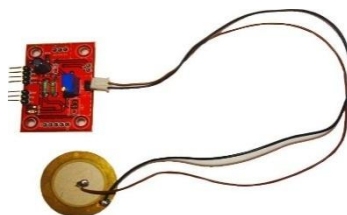


FIG.4.VIBRATION SENSOR



FIG.5.RELAY

6.3 Relay

A relay is an associate magnetic attraction switch operated by a comparatively tiny current that may activate or off a far larger current in our project. The center of a relay is associate magnet. Relays are switches that open and shut circuits electromechanical or electronically. Arduino is controlling a 5V Relay to operate high voltage AC appliances and devices.

6.4 Buzzer Alarm

A buzzer or pager is AN audio signalling device, which can be mechanical, mechanical device, or electricity. Typical uses of buzzers and beepers embrace alarm devices, timers, and confirmation of user input reminiscent of a depression or keystroke.



FIG.6.BUZZER ALARM



FIG.7.GSM



FIG.8.GPS MODULE

6.5 GSM Module

GSM is employed as a medium that is employed to manage and monitor the electrical device to load from any place by causation a message.M95 QUECTEL Modem used. It's own settled character. Thereby, here GSM is employed to watch and manage the DC motor, Stepper motor, Temperature detector and Solid State Relay by causation a message through GSM electronic equipment.

6.6 GPS Module

GPS is employed in vehicles for each trailing and navigation. SIM900A Modem used. Trailing systems alter a base station to stay track of the vehicles while not the intervention of the driving force wherever, as navigation system helps the driving force to achieve the destination.

VII. RESULT AND DISCUSSION

In proposing system it enhances this problem by using messaging and tracking system. First, it is used to manage the vehicle number plate in a toll booth. If it is authorized there if capture the number plate and store it in a database. After that, if the accident was occurring in-between booths, the message alert is intimated to the nearby police station and hospital using GSM, by using GPS location is tracked.

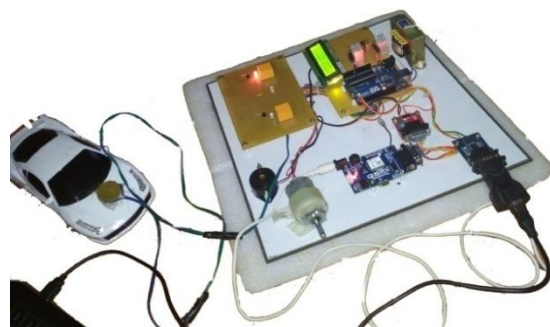


FIG.9. OUTPUT OF THE PROPOSED SYSTEM

VIII. CONCLUSION

In this mode, the modernizing supported the reduction of road facet accident. Ordinarily it has associate expertise concerning passing vehicle through the tollbooth, there it's want to pay a fee then our vehicle number plate was trying to next step of entry. Around this idea, modernizing was enhanced by the preceding session, if the accident arose in association spot there a

machine use to make a salve for the delay. However, here change return by the electronic messaging system to their relatives and machine by victimization GSM, to understand the position of the vehicle by victimization GPS.

IX. FUTURE WORK

In future, the public person can know to drive the car carefully, but if there is any unfortunate accident happens it is useful to find out the location and alert SMS send to a nearby police station and hospital within a second. It will decrease the death rate through the process of "Right Information at Right Time". While it works in every place definitely it's a peak achievement to save our people live.

REFERENCES

- [1] Khyati Shah, Vile Parle, Swati Bairagi, Vile Parle "Accident Detection and Conveyor System using GSM and GPS Module" International journal of Computer Applications (0975-8887) Vol.176-No.2, October 2017.
- [2] Pooja Shindalkar, Aasiya Fatema Shaikh, Chaitanya Mate, "Arduino Based Vehicle Accident Detection System", International journal of Innovative Research in Computer and Communication Engineering (An ISO 3297:2007 certified organization) Vol.5, Issue 4, April 2017.
- [3] E.Krishna Priya, P.Manju, V.Mythra, "IoT Based Vehicle Tracking and Accident Detection System" International journal of Innovative Research in Computer and Communication Engineering, (An ISO 3297:2007 Certified organization) Vol.5, Issue 3, March 2017.
- [4] Surekha Pinnapati, Manjunath Kamath K, Carmal Joseph, "Automatic Accident Detection and Alerting System Based on IOT" International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297:2007 Certified organization) Vol.5, Issue 5, May 2017.
- [5] Jazim Baramy, Pragya Singh, Aryasheel Jadhav, "Accident Detection & Alerting System", International journal of Technical Research and Application e-ISSN 2320-8163, March 2016.
- [6] A.Vairavan, S.Karalika, "An Automatic Warning Alert System for Accident Detection using GPS and GSM" SSRG International journal of Industrial Engineering (SSRG-IJIE)- Volume 3 Issue 6 – Nov to Dec 2016
- [7] Namrata H. Sane Damini S. Patil Snehal D. "Real Time Vehicle Accident Detection and Tracking Using GPS and GSM" International journal on Recent and Innovation Trends in Computing and Communication, Issue-4, Vol.4 April 2016.
- [8] Vikram Singh Kushwaha, Abusayeed Topinkatti, "Car Accident Detection System Using GPS and GSM", International journal of Emerging Trend in Engineering and Basic Science (IJEEBS) Vol.2, Feb 2015
- [9] Aboli Ravindra Wakure, Apurva Rajendra Patkar, "Vehicle Accident Detection and Reporting System Using GPS and GSM" International Journal of Engineering research and Development, Vol.10, Issue 4, April 2014
- [10] C.Prabha, R.Sunitha, R.Anitha, "Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem", International Journal of Advanced Research in Electrical and Electronic and Instrumentation Engineering (An ISO 3297:2007 Certified organization) Vol.3, Issue 7, July 2014.