INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Automobiles Based Black -Box System Using IOT

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ABSTRACT: Automobiles and computing technologies have created a new level of data services in vehicles. The Automobile Black Box has functions very similar to an airplane black box. It is used to analyze the cause of vehicular accidents and to prevent the loss of life and property arising from the vehicle accidents. This project proposes a prototype of an Automobile Black Box System that can be installed into vehicles. The system aims to achieve accident analysis by objectively tracking what occurs inside the vehicles. The system also involves enhancement of security by preventing tampering of the recorder data. The Arduino controllers are used to regulate the sensors. The main purpose of this project is to develop a prototype of the vehicle black box system that can be installed into any vehicle all over the world. This prototype is often designed with minimum number of circuits. This results in constructing safer vehicles, improving the treatment of crash victims, helping insurance companies with their vehicle crash investigations, and enhancing road status so on decrease the death rate. This project discusses the configuration and functions of the Car Black Box System. It also focuses on monitoring of real-time driving and also records and saves the monitored data for further investigation in the case of an accident. This system helps the accident investigators as well as insurance companies to find out the cause of the crash. Other features such as navigation, and Alcohol detection are also provided in the system. The perspective of this project is to form the user feel more safety about the car and to assist knowing the particular explanation for accidents if any.

KEYWORDS: IOT,Automobile Based Black-Box System,Sensor,GPS,GSM.

I.INTRODUCTION

India has one of the highest motorization growth rates in the world accompanied by poor infrastructure and a congested transport network. This has led to an increase in the number of road accidents. The death rate on the road has increased all over the world due to accidents in the recent years hence road safety has been greatly concerned. To provide safety to the vehicular system as well as to the driver and to reduce the damage an accident avoidance system has been developed.Speed is one of the most important and basic risk factors in driving. It not only affects the severity of a crash, but also increases risk of being involved in a crash. Despite many efforts taken by different governmental and non-governmental organizations all around the world by various programs to aware against careless driving, yet accidents are taking place every now and then. However, many lives could have been saved if the emergency service could get the crash information in time. A study by Virtanen et al. shows that 4.6% of the fatalities in accidents could have been prevented only in Finland if the emergency services could be provided at the place of accident at the proper time . As such, an efficient automatic accident detection with an automatic notification to the emergency service with the accident location is a prime need to save the precious human life.

The number of vehicles on Indian roads are rising exponentially since a past few decades. Government statistics suggest that the number of registered vehicles on Indian roads have increased by sumptuous 273% since 2000. The

rising number of vehicles has resulted in increased vehicle density on roads and this in turn has resulted in the increased requirement on the driver to be alert while driving. With such large number of vehicles on road the probability of meeting with an accident also increases. India ranks first in the frequency of vehicle collisions across the world.
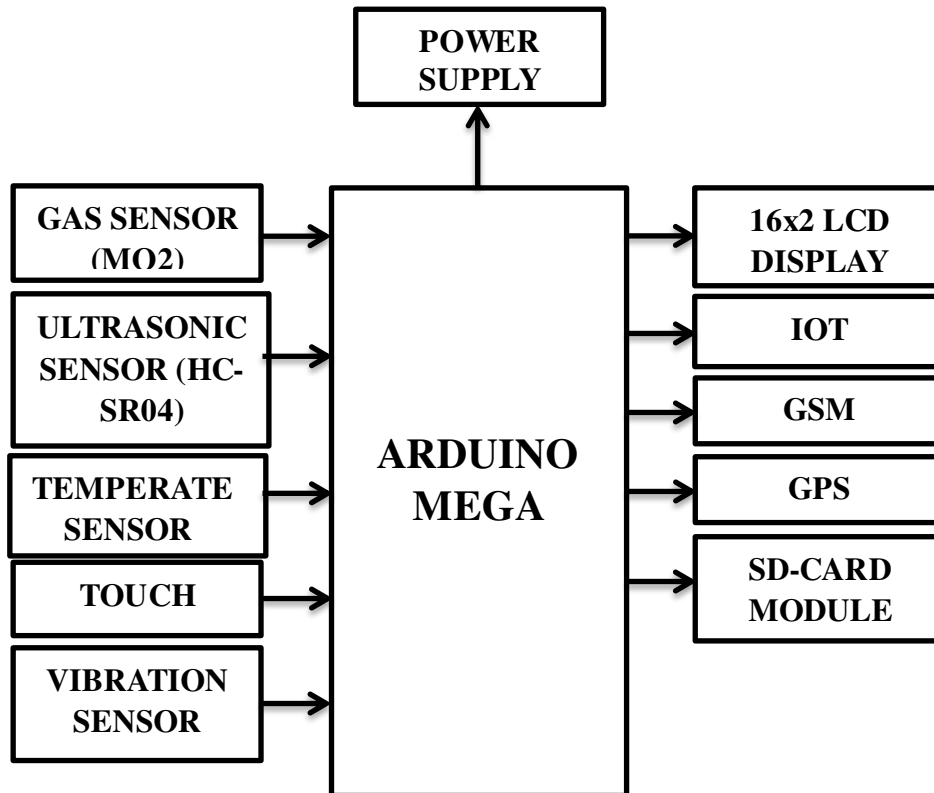
II.RELATED WORK

Wireless Vehicular Accident Detection and Reporting System notify emergency responders immediately by utilizing in-vehicle sensors, such as accelerometers and airbag deployment monitors to detect car accidents.By using vehicle-to-vehicle communication, it is possible to detect the movement and position of other vehicles. Now day's vehicles are fitted with a Global Positioning System (GPS) Technology, with which you will be able to know where the other vehicles are and other vehicles will also know where you are too, circumstances like blind spots, stopped ahead on the highway but hidden from view, around a blind corner or blocked by other vehicles.

The information sent as a GPRS data and SMS will be received by a GSM/GPRS modem connected to a computer. A middleware will be written to interpret the SMS and GPRS data. An appropriate program will be written so that the accident location is automatically plotted in the QGIS map utilizing the information from the interpreted SMS/GPRS data. It will also show the previous speed of the vehicle before committing the accident. This data will help the Alert Service Center to assess the severity of the accident basing on the speed.
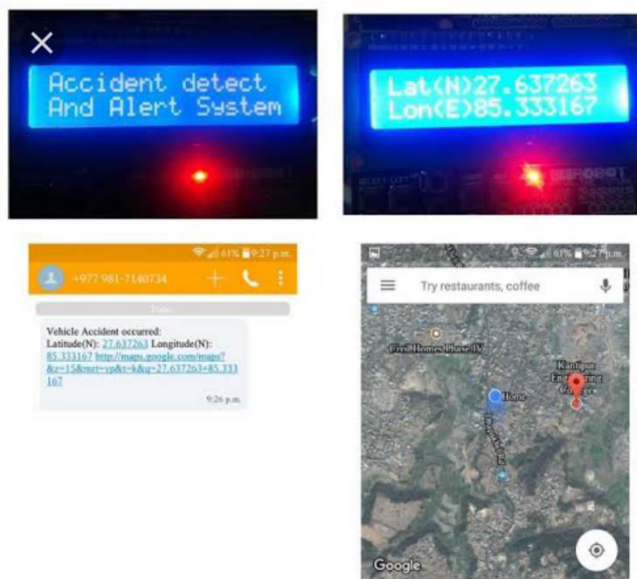
III. WORKING

In this system, we use ARDUINO MEGA (ATmega2560) microcontroller which acts as brain of the system, because the entire system program instruction stored in it. When the router receives a message, it distinguishes whether it is a "help" message, where the router sends the message immediately to the coordinator where the coordinator receives starts to process it and prepare the accident report. Otherwise, in normal mode of operation (no accidents happened) the node repeatedly send other type of message "I'm here" message that informs the system the last location of the vehicle. When the router receives this type of message, it simply buffers it and waits for the scan process completion of the received message from the coordinator to batch all buffered messages. An automated system that will accurately detect the accident and its intensity and send the information to the nearby hospital will save a lot of rescue time. The time taken to report the event to the authority is also reduced. This was necessary measure because it has been observed that witness to the crash often hesitate to help the victim because of the police reporting procedure involved. The automated system will be instrumental in increasing the chances of survival of the victim.

IV. SYSTEM ARCHITECTURE

V. EXPERIMENTAL RESULTS

ACCIDENT DETECT AND ALERT SYSTEM:

DATA STORED CLOUD:

VI. CONCLUSION

A system to detect an event of accident has been developed. The system, on occurrence of accident, reads the exact latitude and longitude of the vehicle involved in accident and sends this information to the nearest emergency service provider. It is necessary that the family be informed about the catastrophe. Keeping this in mind, the system also includes the feature of informing the family of the victim.

Speed is one of the most significant causes of an accident. Nowadays, GPS receiver has become an integral part of a vehicle. Besides using in other purposes, the GPS can also monitor the speed and detect an accident. It can use a very cheap and popular GSM modem to send the accident location to the Alert Service Center. It can also send the last speed before accident which will helps to assess the severity of the accident and can initiate a voice call. Beside the automatic detection system, the vehicle occupant will be able to manually send the accident situation by pressing the Manual Detection Switch. A rescue measures in time with sufficient preparation at the correct place can save many life. Thus, the proposed system can serve the humanity by a great deal as human life is valuable.

The wireless system for vehicle safety and communication is designed to ensure that the road safety measures are enhanced with a simple module and inter-communication between vehicles during emergency on the roads to pave way for immediate exit. The speed limit indication would help the driver/rider conduct to the safety regulations. The intercommunication between vehicles would provide better lane discipline and response to emergency situations.

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Impact Factor:
7.488

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