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Accident Alert and Tracking Using Arduino

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ABSTRACT: Vehicle accidents are one of the most leading causes of fatality. The time between an accident occurrence and the emergency medical personnel are dispatched to the accident location is the important factor in the survival rates after an accident. By eliminating that time between an accident occurrence and the first responders are dispatched to the scene decreases mortality rates so that we can save lives. One approach to eliminate that delay between accident occurrence and first responder dispatch is to use An Accident Alert and Vehicle Tracking System, which sense when a traffic accident is likely to occur and immediately notify emergency occurred. In this paper, that system is described the main application of which is early accident detection. In this system, initially the GPS continuously takes input data from the satellite and stores the latitude and longitude values. If we have to track the vehicle, we need to send a message to GSM device, by which it gets activated. It also gets activated by detecting accident on the shock sensor connected to Arduino Uno. Parallely activates GPS with the help of relay .Once GSM gets activated it takes the last received latitude and longitude positions values from the buffer and sends a message to a central emergency dispatch server which is predefined in the program. This system uses the things i.e. Arduino, Vibration Sensors, GPS and GSM modules to detect traffic accidents.

KEYWORDS: Arduino, Accident alert, GPS, GSM.

I.INTRODUCTION

The high demand of vehicles has also increased the traffic hazards and the road accidents. Life of the people is under high risk. This is because of the lack of best emergency facilities available in our country. An automatic alert system for vehicle accidents is introduced in this paper. The proposed system which can detect accidents in significantly less time and sends the basic information to first aid centre within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had occurred. This alert message is sent to the central emergency dispatch server in a short time so that the emergency dispatch server will inform to the ambulances which are near to that location, which will help in saving the valuable lives. A Switch is also provided in order to terminate the sending of a message in rare case where there is no casualty, this can save the precious time of the ambulance. When the accident occurs the alert message is sent automatically to the central emergency dispatch server. The message is sent through the GSM module and the location of the accident is detected with the help of the GPS module. The accident can be detected precisely with the help of vibration sensor. This application provides the optimum solution to poor emergency facilities provided to the roads accidents in the most feasible way

II.EXISTING SAFETY MEASURES

Presently a lot of methodologies are available in vehicles that allow vehicle protection and tracking. Airbags are one of the most mandatory elements in vehicles. Front airbags have been standard on all new cars since 1998 and light trucks since 1999. Seat belts are also available in four wheelers. tire-pressure monitoring system (TPMS) is an electronic system designed to monitor the air pressure inside the pneumatic tires on various types of vehicles. TPMS report real-time tire-pressure information to the driver of the vehicle, either via a gauge, a pictogram display, or a simple low-pressure warning light. An anti-lock braking system or anti-skid braking system (ABS) is an automobile safety system that allows the wheels on a motorvehicle to maintain tractive contact with the road surface according to driver inputs

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while braking, preventing the wheels from locking up (ceasing rotation) and avoiding uncontrolled skidding. Traction control and electronic stability control go hand in hand and is designed to prevent loss of traction of driven road wheels. The latest implementation techniques move along the lines of providing help to the driver even if he is trapped in a remote location unable to respond.

III.CONCEPT AND OVERVIEW

This vehicle tracking system takes input from GPS and send it through the GSM module to desired mobile/laptop using mobile communication. Vehicle Tracking System is one of the biggest technological advancements to track the activities of the vehicle. The security system uses Global Positioning System GPS, to find the location of the monitored or tracked vehicle and then uses satellite or radio systems to send to send the coordinates and the location data to the monitoring center. At monitoring center various software's are used to plot the Vehicle on a map. In this way the Vehicle owners are able to track their vehicle on a real-time basis. Due to real-time tracking facility, vehicle tracking systems are becoming increasingly popular among owners of expensive vehicles

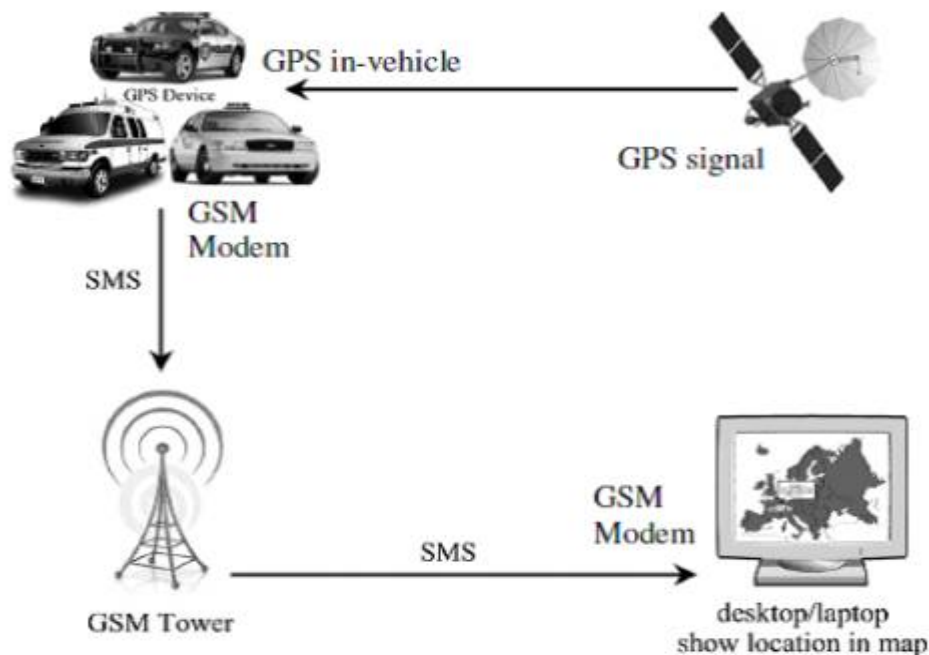


Fig. 1 Overview of vehicle tracking.

IV.PROPOSED METHODOLOGY AND DISCUSSION

This system is very efficient and hence worthy to be implemented. Accident detection and messaging system can be fitted in vehicle (Ambulance, Police or to the communication device of the near and dear) and they are informed about any such untoward incident at the go. Accident detection and messaging system is execution simple as the system makes use of GSM & GPS technologies. GPS is used for taking the coordinate of the site of the accident while GSM is used for sending the message to phone. To make this process all the control is made using Arduino whereas LCD is used to display the accident.

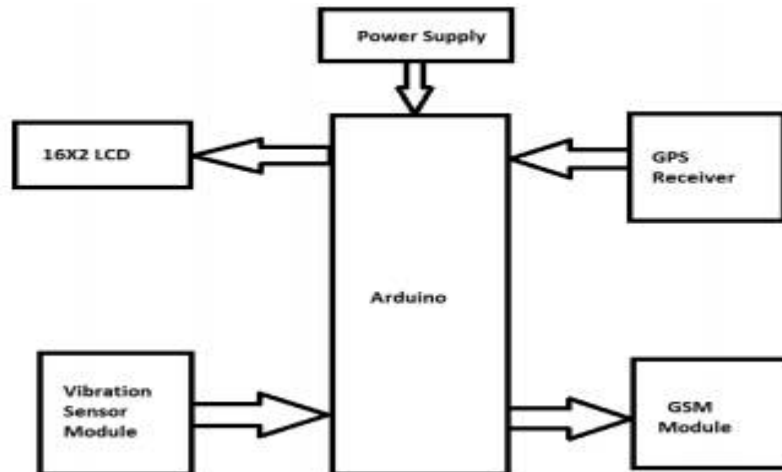


Fig. 2 Block Diagram of the proposed system.

1. The Arduino UNO is a widely used open-source microcontroller board based on the ATmega328P microcontroller and developed by Arduino.cc.¹The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board features 14 Digital pins and 6 Analog pins. It is programmable with the ArduinoIDE(Integrated Development Environment) via a type B USB cable. It can be powered by a USB cable or by an external 9 volt battery, though it accepts voltages between 7 and 20 volts.
2. A power supply is an electronic device that supplies electrical energy to an electrical load. Here Arduino Uno, sensor, GPS, GSM operates with DC 12V supply.
3. Vibration Sensor: Vibration sensor SW18010P is used for measuring and analyzing linear velocity, displacement or acceleration. Features of SW18010P. This is spring type directional vibration sensor. Which can detect vibration in any angle.
4. GSM: There are different GSM modules available in the market. SIMCOM developed different frequency modules. The module includes 800MHz, 850MHz, 900MHz, 1800MHz, 1900MHz. We select SIM900a module for the proposed work. It is compact easy plug-in module. The baud rate of the GSM 900a module is 9600-115200. Initially, the modem is in auto baud mode. The modem needs only two wires (Tx, RX).
5. GPS: Global Position System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil, commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver.
6. 16x2 LCD: 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD, each character is displayed in a 5x7 pixel matrix. This LCD has two registers, namely, command and data. The command register stores the command instruction given to the LCD. A command is an instruction given to the LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display, etc. The data register stores the data to be displayed on the LCD.

V.RESULT

The system detects an accident from a vehicle and sends a message through a GSM module. The message is received by another GSM module. Google Map Module It displays a Google map showing you the exact location of the accident and it

details. It gets detail SMS from the location of the accident. Hence there is small variation in the coordinates, initial value of latitude and longitude are same but fractional value changes with small difference.

VI. SIMULATION

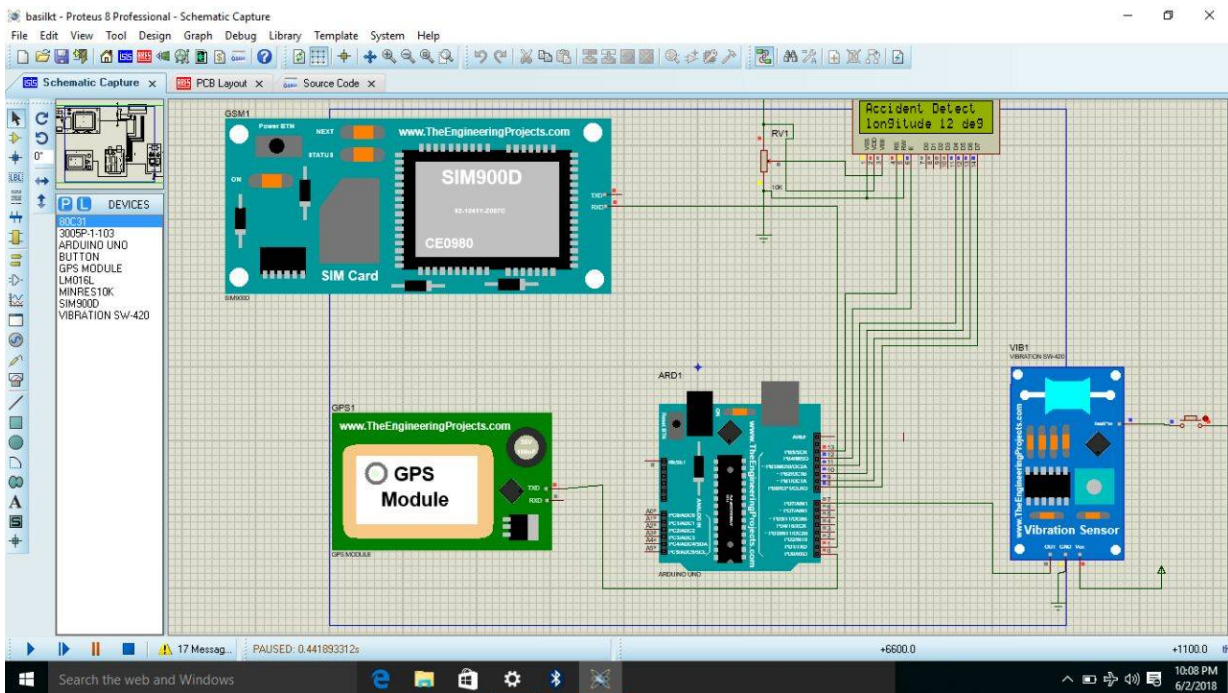


Fig3:Proteus Simulation of Accident alert system

VII.CONCLUSION AND FUTURE SCOPE

The proposed system is developed to provide the information about the accident occur and the location of the accident. It helps to easily provide the assistant and help to the victim of the accident. This system uses GPS module to locate the vehicle. GSM is used to provide the information of accident. The results of the proposed systems are satisfactory. Further this system can be implemented by using sound sensor, in order to make it more accurate and efficient to detect an accident. This is extended with alcoholic detection also. If the person took alcohol who is driving then the vehicle will be stopped immediately by giving alarm. This can also be developed by interconnecting camera to the controller module that takes the photograph of the accident spot makes tracking easier.

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