

Accident Detection and Alert System Using Arduino

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Abstract- The Rapid growth of technology and infrastructure has made our lives easier. The advent of technology has also increased the traffic hazards and the road accidents take place frequently which causes huge loss of life and property because of the poor emergency facilities. Our project will provide an optimum solution to this drawback. According to this project, when a vehicle meets with an accident, the Micro electro mechanical system (MEMS) sensor will detect the signal and this signal will be analyzed by Arduino. The Arduino sends the alert message through the GSM Module including the location to police control room or a rescue team. So, the police can immediately trace the location through the GPS Module, after receiving the information. Then after confirming the location necessary action will be taken. The aim of this work is to automatically detect an accident and alert the nearest hospital or medical services about the exact location of the accident.

Keyword- GSM, GPS, Arduino, Ultrasonic sensor.

1. Introduction

Right now pace of accidents can be expanded quickly. Because of business the utilization of vehicles like autos, bicycles can be expanded, as a result of this explanation the mishaps can be occurred due to over speed. Individuals are going under chance as a result of their over speed, because of inaccessibility of propelled methods, the pace of mishaps can't be diminished. To

decrease the mishap rate in the nation this paper presents an ideal arrangement. Programmed alert framework for vehicle mishaps is presented; the principle objective is to control the mishaps by making an impression on the enrolled versatile utilizing remote correspondences procedures. At the point when a mishap happens at a city, the message is sent to the enrolled versatile through GSM module in less time. Arduino is the core of the framework which helps in moving the message to various gadgets in the framework. Ultrasonic sensor will be enacted when the mishap happens furthermore, the data is moved to the enrolled number through GSM module. GPS framework will help in finding the area of the mishap spot. The proposed framework will check whether a mishap has happened and informs to closest clinical focuses and enlisted versatile numbers about the spot of mishap utilizing GSM and GPS modules. The area can be sent through following framework to cover the land organizes over the territory. The accident can be recognized by a Ultrasonic sensor which is utilized as major module in the framework.

2. Literature Review

The advent of technology has also increased the traffic hazards and the road accidents. Due to the lack of best emergency facilities available in our country the lives of the people are under high risk. An automatic alarm device for vehicles is introduced in this paper which sends the basic information to the medical rescue team within a few seconds of an accident. This device can detect accidents and sends an alert message to rescue

teams in significantly less time which will help in saving the lives of the people. The alert message contains the geographical coordinates, time and angle in which the accident has occurred. In cases where there is no casualty the message can be terminated with the help of a switch in order to avoid wasting the valuable time of the rescue team.

3. Function of the Key

We have provided a key in project. This key should be used by the driver. If the accident is very normal, or driver has just hit the wall in some situations like parking then driver will press the key. This will inform the microcontroller that this is a very normal accident and then system will not send SMS. But if driver is not in situation to press the switch or if the accident is really a major accident then driver will not press the key and then system will send SMS.

Microcontroller receives the coordinates from the GPS modem. Then it will send this information to the GSM modem. The GSM modem is used to send this information via SMS. SMS will be sent to the nearest Police Station and family member of the driver, so that they can take immediate action to help the persons suffering due to this accident.

4. COMPONENT DESCRIPTION

(i). Arduino Uno: The **Arduino Uno** is an open-source microcontroller based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The 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 has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and

20 volts. It is similar to the Arduino Nano and Leonardo.



(ii).Ultrasonic Sensor: An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves.

An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.

High-frequency sound waves reflect from boundaries to produce distinct echo patterns.



(iii)GPS Module: One of the global positioning system (GPS) devices utilizes data from satellites to locate a specific point on the Earth in a process named trilateration. Meanwhile, a GPS receiver measures the distances to satellites using radio signals to trilaterate. And trilateration is similar to triangulation, which measures angles, depicted in this illustration (Tim Gunther, 2020). GPS modules contain tiny processors and antennas that directly receive data sent by satellites through dedicated RF frequencies. From there, it'll receive timestamp from each visible satellites, along with other pieces of data. If the module's antenna can spot 4 or more satellites, it's able to accurately calculate its position and time.



(iv) **GMS Module:** A **GSM modem** or **GSM module** is a device that uses GSM mobile telephone technology to provide a wireless data link to a network. GSM modems are used in mobile telephones and other equipment that communicates with mobile telephone networks. They use SIMs to identify their device to the network.



CONCLUSION

Vehicle tracking system makes better fleet management and which in turn brings large profits. Better scheduling or route planning can enable us to handle larger loads within a particular time. Vehicle tracking both in case of personal as well as business purpose improves safety and security, communication medium, performance monitoring and increases productivity. So, in the coming years it is going to play a major role in our day to day living. The main motto of the accident alert and detection project is to decrease the chances of losing life in Whenever accident is alerted the paramedics

can reach the particular location to increase the chances of life. This vehicle tracking and accident alert feature may play a more important role in day to day life in the future

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