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Accident Detection and Alert System using Arduino

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ABSTRACT: In today's world accidents are major concern. Safety of driver and passengers are big issue, we can save many lives if we give proper treatment and care at the right time. This system not only detects accident but also notification alerts are sent to the nearby hospital and emergency contacts (family and relatives) using GSM module. Accidents are detected using Vibration sensors so as to get accurate results. This sensor forms the part of the IoT system which has an Arduino. On identification of an accident, a message is sent to the nearest hospital, ambulance and emergency contacts along with the current position of the GPS. The Arduino continuously receives the sensor data and concurrently it also provides real time GPS location. After detecting accident it processes sensor data and sends notification through GSM module to emergency contacts including ambulance services.This process can appreciably reduce the number of losses because of delay in getting proper medical care. Also in order to diminish false positives, so this paper will dealt with accident's problem, and it will detect accident through this system and save lives as many as possible.

KEYWORDS: Accident Detection, Vibration sensor, Arduino, GSM, GPS.

I.INTRODUCTION

There is an extreme rise in the use of cars and motors in this day and age. Such considerable automobile use has increased operation and along these lines contributes to an rise in road accidents. This causes significant property harm and also causes human life misfortune as a result of the inaccessibility of fast well-being facilities. We are going to make system to avoid accident's major cases and provide health care services through the system. Systems major components are an Arduino, Vibration sensor, GSM, GPS. Arduino is hardware and software based open-source platform. Arduino board is used as hardware and minicomputer, And Arduino IDE used as software for programming. Inputs - light on a sensor, a finger on a button, or a Twitter message - can be read by Arduino boards and converted into an output. By using GPS (Global Positioning system) module, We can track the exact the location of an object (vehicle).

GPS give us the detail of the road we might be traveling on, but many GPS systems can also give us the real time latitude and longitude of where you are positioned.
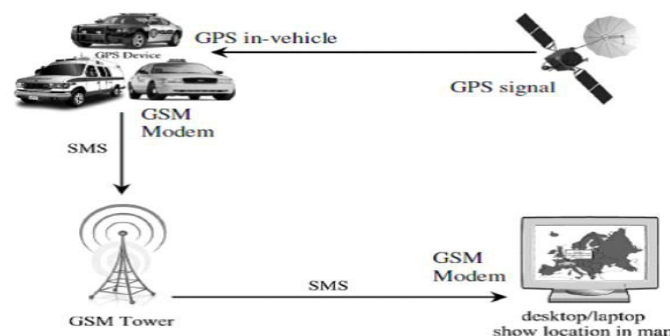
1.Fig –Over view Of The System

And GSM (Global System for Mobile Communication)module connectedto Arduinofor communication.Using GSM module get notify message to the nearest location hospital, and stored emergency contact.

II. LITERATURE SURVEY

According to literature review there are n numbers of research are available for detection accidents and give emergency health services.

- In [2]In order to detect injuries, the authors used a shock sensor and sent additional passenger details, such as full name, blood type, telephone number, medical history, and telephone number, to the headquarters of the Public Safety Organizations.The main drawback of the system is that all passengers and vehicles need to be pre-registered with their details, which is not realistic.

- In [5] The Wireless SensorNetwork and Radio Frequency Identification Technologies were proposed for use in this paper.Sensors will be installed in a vehicle that will detect the location of the vehicle's accident and speed.These sensors will then send a alert signal to a monitoring station and monitoring station, in turn, will track the location where the accident has occurred.

- The other current framework uses the cloud storage system and IOT.Where the id of the vehicle is detected by the SVM (support vehicle machine) developed by the Ant Colony Algorithm Using magneto resistive sensors, the IOT will track vehicles here.The main goal of this project is to distinguish between traffic accidents and non-traffic accidents.

- In another proposed system which collected information and number of passengers in the vehicle, although the number of passengers in the vehicle does not need to be collected?Four crash sensors were mounted on the four corners of the vehicle in this system, which made the system less lightweight.

Therefore the major contribution made in this research is the development of an intelligent vehicle accident detection, location monitoring and warning device of a lightweight compact nature that sends a location to the nearest hospital and police station from Google map. This link on the Google map shows the location of the accident and also helps to find the optimal route to reach the location.

III. METHODOLOGY

In Methodology block diagram shows in fig-2
The components and parts of the system or it can say over view of structure i.e.
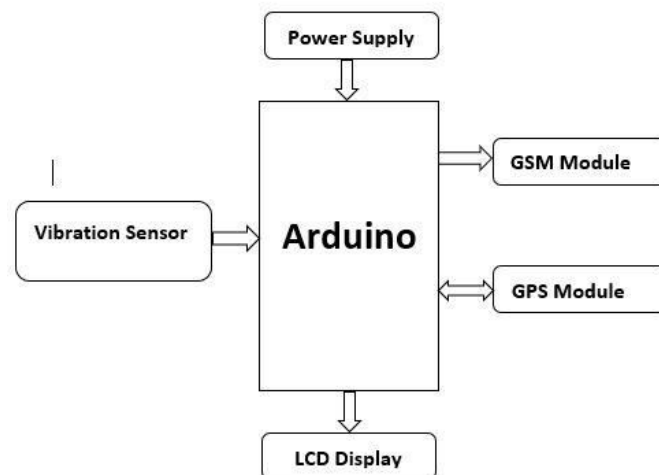
2. Fig- Block diagram for Accident detection

ARDUINO

Arduino is an Open Source Digital Appliance.Which makes it easy for us to use hardware and software.On sensors and finger prints, etc., Arduino boards can read Inputs-light.Arduino uno boards are an ATmega328 based microcontroller.There are 14 digital input/output pins in Aurdino, 6 of which can be used as PWM outputs, a 16 MHz

ceramic resonator, an ICSP header, a USB port, 6 analogue inputs, a power jack and a reset button.And it provides aexcellent start and speed.

3. fig-Arduino

VIBRATION SENSOR MODULE

A piezoelectric sensor is also called a vibration sensor.Such sensors are versatile instruments used to test different processes.The piezoelectric effects are used by this sensor when calculating changes in acceleration, friction, temperature, force strain by switching to an electrical charge.
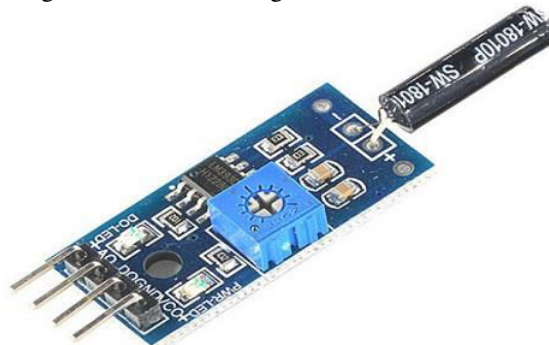

4. fig-Vibration sensor module

The sensitivity typically ranges from 10 mV/g to 100 mV/g for these sensors, and lower and higher sensitivities are also possible.Based on the application, the sensitivity of the sensor may be chosen.It is therefore important to consider the vibration amplitude range levels to which the sensor will be exposed during the measurements.

GPS MODULE

The whole is divided into certain coordinates to find the position on the earth where a module called the GPS module can easily capture the location.the GPS SIM28ML is used here.The location of the vehicle will be identified by this GPS module and the information obtained by the GPS receiver will be received via the coordinates and the received data will first be sent to Arduino and the information will be transmitted to the saved contact via the GSM module.

IV. ALGORITHM OF ACCIDENT DETECTION AND HEALTH CARE SERVICE

The flowchart is describing the proposed system Operations as shown in below
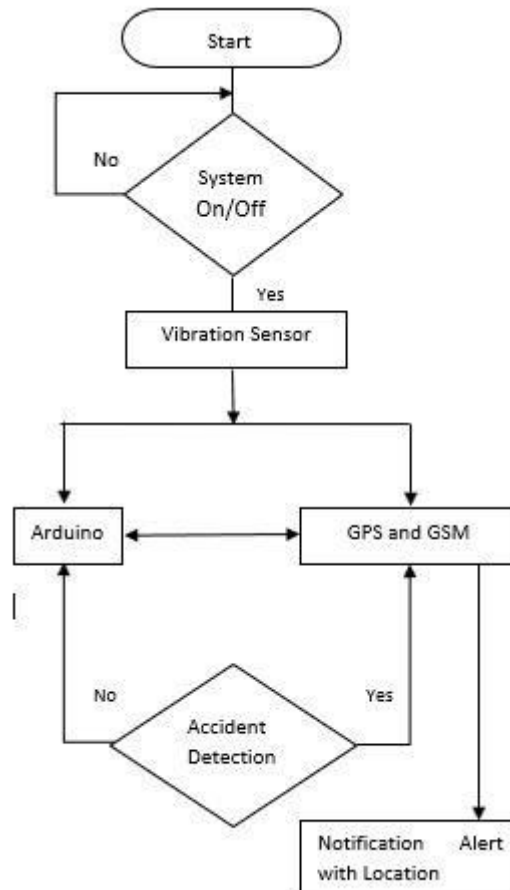
In above flowchart describing the working of our device so.

* START: In first step start the device, device will automatically connect once vehicle start.

* System On/Off : In this section,System will turn On after starting the vehicle. All devices like power supply for modules like GPS, GSM and Vibration Sensor. When vehicle get stopped by user then system will turn Off.

* Vibration Sensor : After System turn On Vibration sensor plays important part starts collecting data and it set to default threshold frequency, which is required for detecting accident.

* Accident detection: In this section If incase accident will detect with the help of vibration sensor then Arduino sends message with position as alert notification to the emergency contact, nearest hospital, ambulance with the help of GSM module and rescue team will track accident location via GPS module.

V. CONCLUSION

Hence the proposed system will detect accidents and alert notifications to the registered numbers via GSM module. Through this proposed system hospitality service (i.e. ambulance) can reach at the accident point or location as early as possible and inform to their family, friends through message and can give patient to the proper treatment at the right time so that we can avoid death cases or losses. And saves many lives through this proposed device.

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