Smart Accident Detection and Alert System

1.M.Ramya sree ,2. Mettu Siddhartha,3. Poli Vamsi Vardhan Reddy
Department of Computer Science and Engineering
Amrita School Of Engineering, Bengaluru

Abstract-

Health is one of the most important factors in one's life. Car accident is a serious social problem which often results in both life loss and financial loss. Most of car accidents are caused by a lack of safe distance between cars. To relieve this problem, in this paper we propose a real-time car detection and safety alarm system. The proposed system consists of two modules: real-time car detection module and safety alarm module. The proposed system is supposed to apply in a normal highway driving scenario. In the car detection module, the Google Tensor flow Object Detection (GTOD) API is employed. The function of GTOD API is to detect frontal cars in real-time and then mark them with rectangular boxes. As for the safety alarm module, it consists of three phases: to calculate the box width of detected cars; to calculate the safety factor; to determine the driving state. To justify the proposed system, a real highway experiment is conducted. The results show that the proposed system is able to appropriately indicate driving states: safe, dangerous and warning. By the given experimental results, it implies that the proposed system is feasible and applicable in the real-world applications.

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1.INTRODUCTION

The Now a day's foundation has grown however the quantity of accidents are additionally getting increased despite the fact that numerous accidents are minor however because of absence of medical aid and the range of rescue vehicle to the spot is late so there is countless individuals are losing the life consistently. Twenty people die on every hour in street accidents in India - times India reports on 2012. In the current framework just, the human sees that the accidents has happened and they will call to the rescue vehicle and the reach of rescue vehicle to the spot is late because of that there is enormous loss of human life, and also in some of the system they only provided to send the alert message to the ambulance but not the location of victims. And also, as per the World Health Organization, an expected 1.2 million individuals lose their life every year because of car accidents. Commonly appropriate medical facilities are not given due to lack of communication thus lead to serious injuries. Our framework help common people as a wellbeing measure in brutal condition scope. To decrease the number of people losing the life in the proposed system, we are sending automatic information (i.e., location and alert message) to the ambulance, and the ambulance will arrive at the spot as soon as possible and can save human life and decrease number of individuals die every day. The proposed framework is to reduce the death race of human every day because of accidents by sending automatic location to the ambulance thus can save human life. And also the issue of vehicle theft has increased tremendously, mostly at gunpoint or car parks. In view of these, there is a need to recover theft vehicle, identified and recovered vehicles which are not readily available in our society and as such very important. We are going to add in proposed so that we can get the location of vehicle. In our proposed system, we are sending the live location of victim through damage of the cars, if somewhere accident happen then then there must be damaged in the cars so we are going to detect the damage of the car through using CAN module or we are using SensEC sensor after detecting the damage the data, data send to the microcontroller that the accident has occurred and the GPS modem continuously receives the co-ordinates and gives the data to microcontroller after that information obtained from GPS module sends to the operating center, basically operating centre used to detect the spot and search for nearby ambulance and send the location to the ambulance and also sending the location to family members and nearby police station and also sound release after the accidents so that ambulance, police, and family member easily locate the place. From this module we can also detect the theft vehicle through GPS modem and microcontroller and easily locate the theft vehicle. From this proposed system we can save many lives everyday by providing timely aid to the victims if accidents has happened.

2. WORKING

This chapter just gives the overview of the methodology that was used to implement this project. The following figures shows the block diagram of how the accident takes places and how the notification system sends the information related to the accident.

The proposed system follows the methodology as follows: A vibration sensor is utilized to quantify the vibration prompted by the vehicle's crash. An ultrasonic sensor will recognize the presence of an individual inside the vehicle. The whole system won't be set off if the sensor doesn't detect the presence of an individual. A micro-controller that reads the vibration frequencies will set the GPS module to get the mishap's coordinates. The GPS component gives the coordinates to the micro-controller, which uses the GSM module to transmit the coordinates to the emergency contacts by SMS as a Google Maps URL. The following figure depicts the block diagram of the proposed system. The envisioned system's block diagram IV. WORKING. depicts the proposed system's working flow to provide an overview of the project.

Vibration Sensor (SW-420)
The SW-420 is a seismic detector that features an LM393 comparator and a potentiometer for sensitivity adjustment. This sensor module produces a low logic if no vibration and a high logic ranging from 2.5 to 5 volts when there is vibration. Our device detects vibrations caused by a collision in the event of an accident.

Arduino UNO R3
The brain of our project is the Arduino UNO R3. It's a microcontroller with a set of given input-output pins on a single board. It is in charge of receiving input from vibration and ultrasonic sensors, reading coordinates from the GPS module, and sending this information to emergency contacts via a GSM module in this system.

GPS Module (NEO-6M)
The Neo-6M is a low-cost, high-performance device. It has a ceramic patch antenna, a standby battery, and an onboard storage chip, and it works with a wide range of microcontrollers. This module is responsible to retrieve and return the accident's coordinates to the microcontroller in our project.
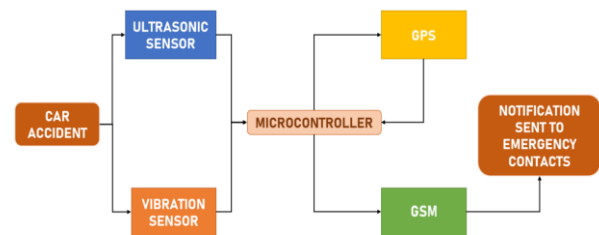
GSM Module
The dual-band GSM (SIM900A) is a module that supports GSM/GPS 900/1800 MHz for phone calls, SMS, and internet browsing. The tiny form factor consumes relatively less power and operates at a voltage range of 3.5 to 5 volts. This module is in charge of transmitting the coordinates through SMS to emergency services in our project.
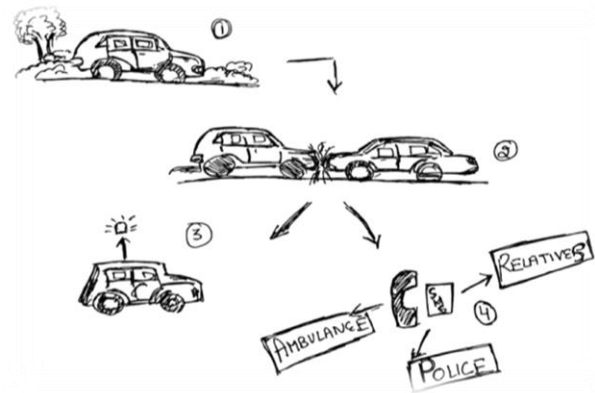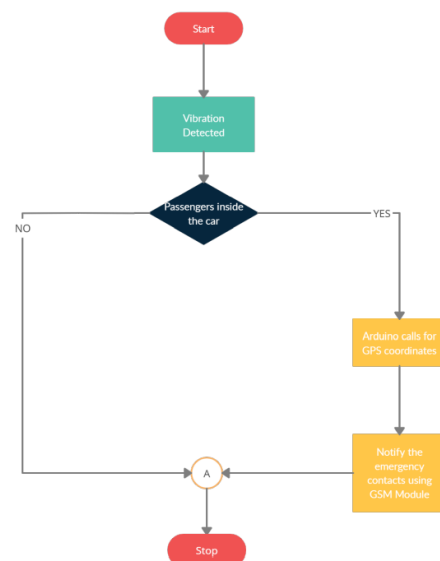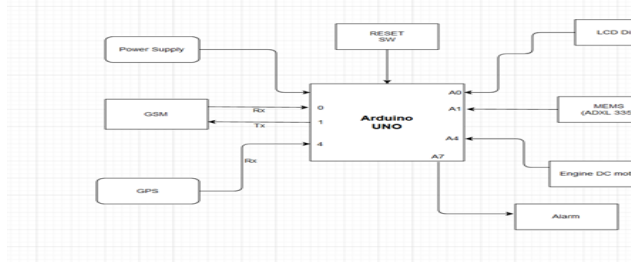

When the car is moving
If suddenly any accident takes place anywhere.
Our project helps in notifying about the accident by its sound system.
Then our accidental and informer system will notify to person's family / relatives, to police & to ambulance or nearby hospital.

Block Diagram

Flow chart

Arduino board is connected to the power supply, GSM and GPS modules, LCD display, Accelerometer, and DC motor. When the accident happens then the accelerometer gets alert and GSM module receives the input from the accelerometer and it activates through the help of GPS module the place where the accident happened is sent to the police station, hospital, or relatives. When the accelerometer activates the buzzer starts so the public near by can get to know about the accident.
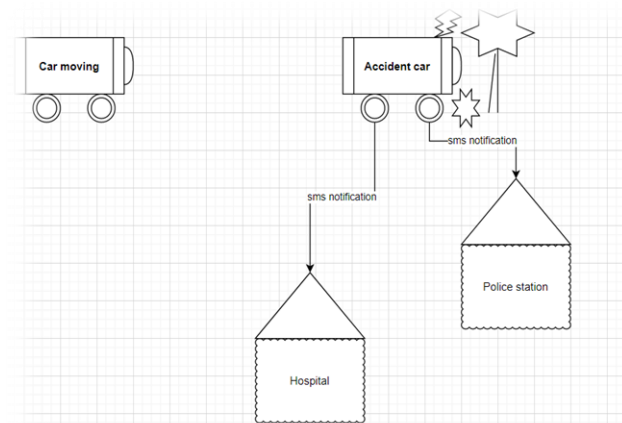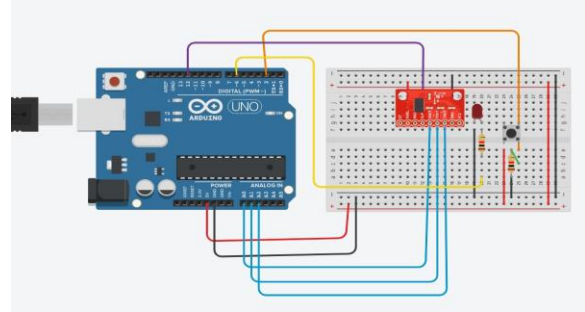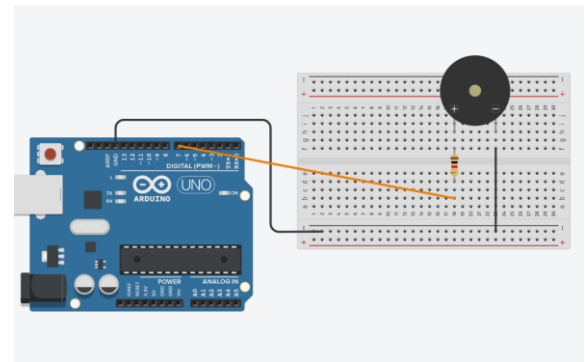

Simulation Circuit:

GLOBAL POSITIONING SYSTEM (GPS) CIRCUIT
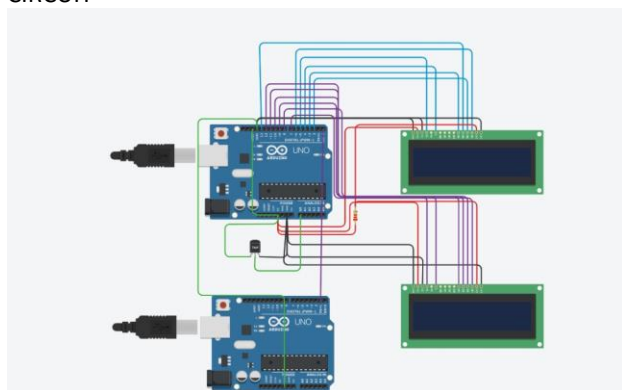
ACCELERO METER USING ADXL-335

BUZZER ALARM DETECTION

3.RESULT

The proposed system here detects the occurrence of an accident and sends an alert message to the emergency contacts containing the GPS coordinates and the Google Map link of the detected accident location. After performing various tests and adjusting the threshold value of the vibrations, whenever a vibration greater than the threshold value was detected the buzzer goes off alerting the passengers inside the car. A response time of 30 seconds is also added in a case where the passengers inside are safe and no urgent help is required they can prevent an alert message from being sent to the listed emergency contacts by pressing a button. In a situation where there was no response, the GPS Module provides the coordinates of the accident location and the GSM Module delivers the message to the listed emergency contacts. This was also tested multiple times and proved to be successful as the message was received on the provided emergency contact during all the tests. As a result, this system helps in providing quick medical help to the victims of the accident and thus increasing the chances of saving their lives.

4.CONCLUSION

This will reduce the no of deaths in accident cases and will help to track data of car. Also helps to solve various cases of road accident and will able to find the culprit. GPS tracking system to be enabled in car. Instant notification system to be enabled to notify hospital in alarming case. Sound notification in hospital and message notification with location. In case of lost car GPS will track car and detect the location. Recorded data of car movement will be maintained. GPS system to be attached with car no. and owner details. After accident sound alarm will be played and then will be cached by sound sensor which further will send notification. Notification will be sent with car number and owner details. After searching for car details will get actual location of cars and can contact owner.Mainly our project helps to save lives of many people.

5.REFERENCE

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