**ARDUINO BASED ACCIDENT ALERT SYSTEM**

**ABSTRACT:**

In our busy life most of the fatal accidents occur due to over speeding. Faster vehicles are more prone to accident than the slower one’s and the severity of accident will also be more in case of faster vehicles. Thus we have prepared a device to reduce accidents and sends the information to the registered number and police station.

Our device is fixed for every vehicle that should control speed , speed limit and alert us when accident takes place.

On daily basis we are listening that , an unknown person has been hit by an unknown vehicle at the city outskirts or on the roadside. In case the vehicle hits any obstacle like dividers or an unfortunate accident occurs this device gives a beep sound and sends the location with exact lattitude and longitude in the form of google maps URL to registered number. When we install this on the vehicle , GPS location is automatically sent to registered numbers and police station for help Then the person’s concerned family members would be knowing the information that so and so person met with an accident at this particular place , by this information we hope we can save that person as well as find the vehicle’s location also .

And if proper action is not taken to reach out to victims on time when an accident takes place can lead to severe circumstances one of the reason could be that we don’t know the exact location of the accident spot.

Hence , as a solution for this problem we made this project which sends an SMS and location to registered mobile number which guides us to the spot where the accident took place so that proper help could be provided on time.

**COMPONENTS REQUIRED:**

1. Arduino UNO board
2. GSM SIM800C module
3. GPS NEO6Mv2 sensor
4. Vibration Sensor (SW-420)
5. Connecting wires
6. Bread Board
7. Charging adaptor

**DESCRIPTION:**

1. **Arduino UNO Board:**

* It is a microcontroller where the program is uploaded.
* It acts as the brain of the project which connects and enables all the sensors and modules
* All the connections are to be made to this Arduino Board itself.

1. **GSM SIM800C Module:**

* GSM stands for “Global System for Mobiles”
* GSM SIM800C is a module in which the sim card is to be inserted
* The work of this module is to send /receive SMS .
* In this system it sends an SMS to the registered mobile number which has location of the accident spot which is provided by GPS sensor.
* It has totally 4 pins : Vcc (+5V) , Tx , Rx ,GND.

1. **GPS NEO6Mv2 Sensor:**

* GPS stands for “Global Positioning System”.
* GPS NEO6Mv2 sensor is a sensor which senses the latitude and longitude of the position of device through which the location can be extracted.
* In simple words this sensor gives us the location of the vehicle/device.
* It has totally 4 pins : Vcc (+5V) , Tx , Rx ,GND.

1. **Vibration Sensor (SW-420):**

* As the name suggests this sensor senses the vibration around the device.
* If the vibration value is greater than the threshold value then it triggers GPS and GSM sensor to send the location as SMS .
* It has 3 pins : Vcc(+5V) , GND , A0(Analog output)

**PROGRAM:**

**#include <Wire.h>**

**#include <TinyGPS.h>**

**#include <SoftwareSerial.h>**

**unsigned long fix\_age;**

**SoftwareSerial GSM(2,3);**

**TinyGPS gps;**

**void gpsdump(TinyGPS &gps);**

**bool feedgps();**

**void getGPS();**

**long lat, lon;**

**float LAT, LON;**

**long measurement;**

**char inchar; // Will hold the incoming character from the GSM shield**

**int vs = A0;**

**int buz = 13;**

**int stop = 0;**

**const char \*phone\_no[] = {**

**"+91XXXXXXXXX"**

**};**

**void setup(){**

**pinMode(vs, INPUT);**

**Serial.begin(9600);**

**Wire.begin();**

**pinMode(buz, OUTPUT);**

**GSM.begin(9600);**

**Serial.begin(9600);**

**Serial.println("Initializing....");**

**initModule("AT","OK",1000);**

**initModule("ATE1","OK",1000);**

**initModule("AT+CPIN?","READY",1000);**

**initModule("AT+CMGF=1","OK",1000);**

**initModule("AT+CNMI=2,2,0,0,0","OK",1000);**

**Serial.println("Initialized Successfully");**

**GSM.print("AT+CMGS=\"");GSM.print(phone\_no[1]);GSM.println("\"\r\n");**

**delay(1000);**

**GSM.println("Welcome to Arduino Based Vehicle Accident Alert System using GPS, GSM, Shock Sensor.");**

**delay(300);**

**GSM.write(byte(26));**

**delay(3000);**

**getGPS();**

**}**

**void loop(){**

**long measurement = vibration();**

**delay(1000);**

**Serial.println(measurement);**

**if(measurement > 2000){**

**sms();**

**Serial.println("SMS SENT SUCCESSFULLY");**

**}**

**if(GSM.available() >0){inchar=GSM.read();**

**if(inchar=='R'){inchar=GSM.read();**

**if(inchar=='I'){inchar=GSM.read();**

**if(inchar=='N'){inchar=GSM.read();**

**if(inchar=='G'){**

**GSM.print("ATH\r");**

**delay(1000);**

**getGPS();**

**GSM.print("AT+CMGS=\"");GSM.print(phone\_no[1]);GSM.println("\"\r\n");**

**delay(1000);**

**GSM.println("RING Reply");**

**GSM.print("http://maps.google.com/?q=loc:");**

**GSM.print(LAT/1000000,7);**

**GSM.print(",");**

**GSM.println(LON/1000000,7);**

**delay(300);**

**GSM.write(byte(26));**

**delay(5000);**

**}**

**}**

**}**

**}**

**}**

**long lat, lon;**

**unsigned long fix\_age, time, date, speed, course;**

**unsigned long chars;**

**unsigned short sentences, failed\_checksum;**

**// retrieves +/- lat/long in 1000000ths of a degree**

**gps.get\_position(&lat, &lon, &fix\_age);**

**}**

**long vibration(){**

**long M = pulseIn(vs,HIGH);**

**return M;**

**}**

**void sms(){**

**getGPS();**

**GSM.print("AT+CMGS=\"");GSM.print(phone\_no[1]);GSM.println("\"\r\n");**

**delay(1000);**

**GSM.println("Emergency.Please reach out to this location right away...");**

**GSM.print("http://maps.google.com/?q=loc:");**

**GSM.print(LAT/1000000,7);**

**GSM.print(",");**

**GSM.println(LON/1000000,7);**

**delay(300);**

**GSM.write(byte(26));**

**delay(5000);**

**}**

**void getGPS(){**

**bool newdata = false;**

**unsigned long start = millis();**

**// Every 1 seconds we print an update**

**while (millis() - start < 1000){**

**if (feedgps ()){**

**newdata = true;**

**}**

**}**

**if (newdata){**

**gpsdump(gps);**

**}**

**}**

**bool feedgps(){**

**while (Serial.available()){**

**if (gps.encode(Serial.read()))**

**return true;**

**}**

**return 0;**

**}**

**void gpsdump(TinyGPS &gps){**

**//byte month, day, hour, minute, second, hundredths;**

**gps.get\_position(&lat, &lon);**

**LAT = lat;**

**LON = lon;**

**{**

**feedgps(); // If we don't feed the gps during this long routine, we may drop characters and get checksum errors**

**}**

**}**

**void initModule(String cmd, char \*res, int t){**

**while(1){**

**Serial.println(cmd);**

**GSM.println(cmd);**

**delay(100);**

**while(GSM.available()>0){**

**if(GSM.find(res)){**

**Serial.println(res);**

**delay(t);**

**return;**

**}else{Serial.println("Error");}}**

**delay(t);**

**}**

**}**

**CIRCUIT DIAGRAM :**

**TX**

**RX**

**3**

**2**

**A0**

**GND**

**VCC(+5V)**

**Vcc A0 GND**

**SW -420**

**Vcc Tx Rx GND**

**Vcc Tx Rx GND**

**GPS 6Mv2**

**GSM SIM800C**

**ARDUINO UNO**