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# VEHICLE ACCIDENT DETECTION AND REPORTING SYSTEM USING ARDUINO UNO, GPS, GSM, MEMS

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***Abstract:*** The rise of technology and infrastructure has made our lives easier. The entrance of technology has also increased the traffic business hazards and also the road accidents be constantly which causes huge loss of life and property due to the poor exigency installation. This design is a many system which is developed automatically to detect an accident and alert the closest exigency services. This fashion may detect the place of the accident so the medical services is directed incontinently towards it. The system comprises of MEMS,GPS,GSM GPS and GSM module support in transferring communication. GSM module sends the alert communication to mobile with unforeseen change within the axes of auto. Position of accident is consigned within the kind of Google chart link, deduced from the latitude and longitude from GPS module. Also after attesting the situation necessary action are going to be taken and this can help to achieve the deliverance service in time and save the precious motal life.

## *I. Introduction*

Traffic is on the increase because the demand for vehicle is getting higher day by day. So transportation needs improvement as, since demand are increasing, there'll be more possibility of car accident. Vehicle accident are one in every of the leading causes of the facilities. It'll be a heavy consequence if people can't get assistance on right time. Poor emergency incident may be a major reason for death rate in our country. Crash analysis studies have shown ,traffic accident could are prevented with the utilization of this advance life saving major. The design focuses on providing basic information on the accident site to the emergency contact. As a result of the sudden help, precious life may get saved. During this work,

accelerometer and GPS tracking system work for accidental monitoring. This design accident in less time and send this information on the specified authorities. This project is to employ proposes to advance the potential of a GPS receiver to detect the speed of a vehicle and detect an accident basing on the supervises speed and send the placement and time of the accident from the GPS data processed by a microcontroller by using the GSM network to the Alert Services Center.

## *II. Literature Review*

**Ashish Kushwaha et al.[1]** In have proposed GPS and GSM grounded accident alarm system. The purpose of this work is to find the vehicle accident position by means of transferring a communication using system which is placed inside the vehicle system Author has used assembly. programming for better delicacy along with GPS and GSM In this design whenever a vehicle meets with an accidents incontinently vibration detector will descry the signal and shoot it to the microcontroller. Microcontroller sends the alert communication through the GSM to an authorized mobile no. An alternate condition can be allowed by pressing a switch, in order to intrude the inflow of transferring the communication in case of no casualty.

**C.Prabha et al. in [2]** have presented Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS. In this paper an accelerometer can be used in a auto alarm operation so that dangerous driving can be detected. This paper is useful in detecting the accident precisely by means of both vibration detector and micro electro mechanical( MEMS) or accelerometer. In this design GPS is used for swerving the position of the vehicle, GSM, ARM regulator is used for saving the mobile number in EEPROM and transferring the communication to it when an accident has passed.

**S.Mutharasu [3]** Arduino grounded vehicle alert system using GPS, GSM and accelerometer. Accelerometer notice the unforeseen variation within the axes of auto and GSM module shoot the active communication on your ambulatory with the situation of the accident. The propel technology has made our day to day lives easier. Since every coin has two sides also technology has it's benefits also as its disadvantages. The increases in technology has increased the speed of road accident which causes huge loss of life. The poor exigency installations available in our country just this problem.

**S. Mohanaram [4]** Now a days we are able to track vehicle using many application which helps in securing personal vehicle, public vehicle , feet units et al. furthermore there's a rapid increases within the occurrence of the road accident. This paper is a couple of system which is developed to automatically detect an accident and alert the closet hospital and medical services about it. The technique also can locate the place of the accident in order that medical services may be directed immediately towards it. The goal of this paper is to make up a vehicle accidental monitoring system using MEMS, GPS, GSM technology. The system involves of accelerometer ,MCU,GPS,GSM module support in sending message. The accelerometer is employed to detect fall and threshold algorithm are accustomed detect accident. Short message will involve GPS[Latitude, Longitude] which helps in locating the vehicles.

**Rajvardhan Rish ,Sofiya yade, keshav kunal, Nutan V Bansode[5]** Proposed system which status that the ledding cause of death in road accident is due to delay in medical help. This can be prevented contacts too on time. The system consists of GPS,GSM. Using this module a message is sent to the nearest relatives and friends and the location of the accident via sent through a map link.

### *III. Propose work*

Here in this project, we are going to build a Arduino Uno based vehicle accident alert system using GPS,GSM and MEMS. MEMS detect the sudden change in the axes of vehicle and GSM module sends the alert message on your mobile phone with the location of the accident. Location of accident is sent in the form of Google map link, derived from the latitude and longitude from GPS module.

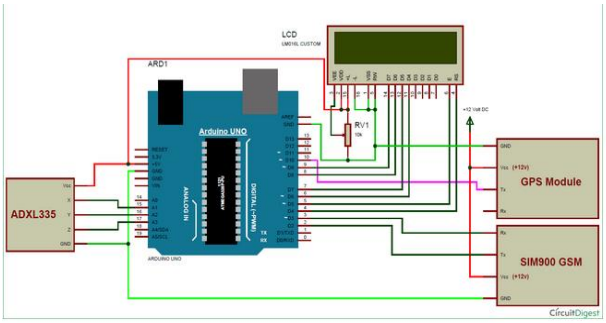



*Fig 3.circuit diagram of vehicle accident prevention and reporting using GPS,GSM,MEMS,ARDUINO UNO*

In this project arduino is used for entire the process with a GPS and GSM module. GPS module is used for detecting location of the vehicle and GSM module is used for sending the alert message with the location and link to Google map. MEMS is used for detecting accident or sudden change in nay axis. And optional 16x2 LCD is also used for displaying status message or location. We have used GPS module SIM28ML and GSM module SIM900A.

When we are ready with our hardware after programming, we can install it in our vehicle and power it up. Now whenever there is accident, the car overturned and MEMS changes his axis values. These values read by arduino and checks if any change occurs in any axis. If any changes occurs then arduino reads location by extracting $GPGGA string from GPS module and send message to the predefined number to the police or ambulance or family member with the location of accident place. The message also contains a Google map link to the accident location, so that location can be easily tracked. When we receive the message then we only need to click the link and we will redirected to the Google map and then we can see the exact location of the vehicle. And also in the message and displayed on the LCD panel.

### *IV. Components used*

- Arduino uno
- MEMS
- GPS
- GSM
- IR sensor
- LCD
-

### *V. Description of hardware*

**1. Arduino uno:** Arduino/ Genuins Uno could be a microcontroller board supported the ATmega32"( datasheet) 14 digital input/ output pins( of which are frequently used us WM labors), 6 analog inputs, 10 MHz quartz, a Us connection, an

significance jack, an ICSP title and a drive. It accomodate everything demanded to backing the microcontroller simply connect it to a computer with a USB string or power it with a AC to DC adapter of battery bring out started. “Uno” means one in alien and was chosen to maximum the discharge of Arduino Software( ICE)1.0 The Uno board and interpretation1.0 of Arduino Software( IDE) me the reference performances of Arduino, now evolved to newer releases The Uno board is that the fest in an exceedingly neriss of USB Arduino boards, and thus the citation model for the Arduino platform for an in depth list of current, once and outdated boards see the arduino index of boards.

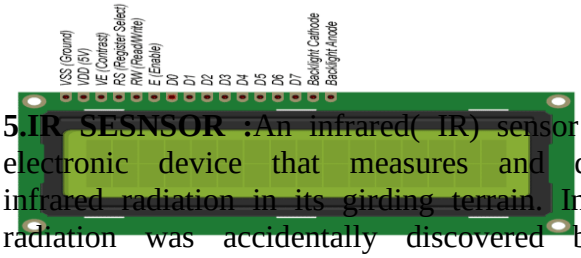

**2.GPS MODULE:** Abbreviates global positioning system and this can be habituated descry the latitude and longitude of the factual position and it also shows the precise time it detects these values anywhere on the world in our design it plays main part and it's the most source of the latitude and longitude of the vehicle to grasp the accident passed position or maybe for theft shadowing of the vehicle. This contrivance gets the equals from the satellite for every and each alternate. This device is that the main element of auto swerving design. The Global Positioning System( GPS) may be a satellite grounded navigation system that sends and receives radio signals. A GPS receiver acquires these signals and provides the stoner with information Using GPS technology, one can determine position haste and time, 24 hours daily at any rainfall anywhere within the world at no cost the most application of this fashion in track the vehicle Using the OPS receiver. This receiver gives the data about its position whenever needed within the variety of latitude and longitudes. This can be finished the backing of the GPS satellite and also the GPS module attached to the vehicle which must be tracked.

**3.GSM MODULE:**GSM 65M is an open, digital cellular technology used for piecemeal mobile voice and data supply we will path the vehicle constantly and wisp instruct to the Original ambulance if the vehicle is mat with any accident using 65M automation this is frequently an affordable device which reduces the matter related to accident announcement and antitheft control If me stoner is nearly off from the vehicle and he wants to grasp where his vehicle is connect from the place he is standing, he needs to shoot a predefined communication to the modem The controlling unit are going to be fixed to the vehicle. The controlling unit contains the in microcontroller and also the GSM modem connived to that. The microcontroller continuously checks whether it's entered any communication from the modem. Eventually it receives the communication and transmits the data to proprietor of the vehicle. This a alternate generation( 2G) mobile network, this is frequently extensively employed in everywhere the factory for mobile communication. The SSM device counts of san squeeze which a sim ward

may be fitted which contains a unique number, thin unique number is employed for contact.

This BSM device consist Volume of acceleration because of staidness, an accelerometer can determine out the station it's long hauls listed at with respect to the earth. By seeing the volume of dynamic acceleration, the accelerometer can discover how speedy and in what route the tool is moving. Using those parcels, you could make all types of cool systems, from musical instruments (consider gambling and having the spare linked to the distortion stage or the pitch- bend) to a pace screen to your bus( or your children's bus). The accelerometer may be truly clean interface to an Arduino Micro- regulator the operation of three analog enters legs, and may be used with maximum different micro controllers, conforming of the snap or AVR

**4. Liquid Crystal Display(LCD):**TV is the show tool that is of 16x2 length and it has pusillanimous Background light. This television is attached to microcontroller. To permit terminal latch of television devilish to low pulsation is despatched and RS bit is enabled. Once the latch is enabled the information is transferred via the interfacing legs similar and the television suggests the show on it. These television are clean to software and they're nicely priced too. television uniting with microcontroller could be truly clean. also in our bus monitoring task television shows the affair Le, range and longitude of the bus. The following discern 3. sixteen suggests the television show of range and longitude.




**5.IR SESNSOR :**An infrared( IR) sensor is an electronic device that measures and detects infrared radiation in its girding terrain. Infrared radiation was accidentally discovered by an astronomer named William Herchel in 1800. While measuring the temperature of each color of light( separated by a prism), he noticed that the temperature just beyond the red light was topmost. IR is inconspicuous to the mortal eye, as its wavelength is longer than that of visible light( though it's still on the same electromagnetic spectrum). Anything that emits heat( everything that has a temperature over around five degrees Kelvin) gives off infrared radiation. There are two types of infrared sensors active and passive. Active infrared sensors both emit and descry infrared radiation. Active IR sensors have two corridor a light emitting diode( LED) and a receiver. When an object comes near to the sensor, the infrared light from the LED reflects off of the object and is detected by the receiver. Active IR sensors act as contiguity sensors, and they are generally used in handicap discovery systems( analogous as in robots).

### *VI. Advantages*

- The immediate medication will be provided to the accident victims in remote areas.
- We can change mobile number if required.
- This system monitors all hazards the threat.

### *VII. Disadvantages*

- In some places where there is no provision of GSM networks it is difficult communication.
- This sensor is a partial partial pressure sensitive of the system with change in attitude elevation.

### *VIII. Result*

First of all, the system is powered with the proper amount of power supply. If accident occurs, accelerometer detect the occurrence of accident and send signal to the microcontroller for further functioning. GPS module finds the location and GSM module send message with latitude, longitude and link of Google map to emergency number of ambulance and police. Once the system is on, it continuously checks all the sensor by the help of microcontroller (Arduino Uno) in order to perform all the prevention detection and reporting works.

### *IX. Conclusion*

Nowadays, to provide a sutaible safety of road accident prevention and detection system is becoming one of the most important things for the future generation . There is an increasing the death of people because of road accident. The demand for this process is to save life just on time after the accident has occurred. There are so many ways to know the location after the accident detection has occurred. This GPS and GSM based automatic accident detection system is also one of the less delay time and the most effective system for this project days.

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