

# Car Accident Location Tracking System

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**Abstract:** Now a days, the total number of vehicle accidents in India is all time highest in whole world. One of the leading factor that leads to these accidents is the response of the emergency service such as ambulance, fire brigade or police van which is not notified in the sufficient time as the victim may not be in state to make any emergency call or raise siren for help.

Our system will detect the occurrence of an accident and then notify it to the emergency vehicle with the perfect location of the incident occurred and also inform to the selected contact of your family members or the friend circle, the message is send through the text messaging service.

The developed system will detect the incident through the triggered switch and notify the location of the vehicle with the use of GPS Ublox neo 6m module and send the argent signals or message to the emergency vehicle or family, friends where the victim is not in a state to send any message or raise a call. This message or signal will be send through the GSM Sim 900A. A google map link is provided so that the address received from the GPS is in longitude and latitude form so it will automatically convert them, into the perfect address. This google map link is useful for both the emergency vehicle service center as well as friends and family members.

**Keywords:** Arduino UNO, GSM Sim 900A, GPS Ublox neo 6m, Switch, Jumping cables, Google Application, Text message.

## Introduction

According to a survey of 2013, the SaveLIFE foundation found at that the 74% of the Indians are unable to help the accident victim. With the fear of falsely judged, people are also worried about being trapped as a witness in a court case or legal proceedings can be notoriously protracted in India. In case if they help the people suffering from accident to reach hospital they are feared for high fees of hospital treatment. A member of foundation brought out the contrast in the reluctance of people beside the accident to help the person meat with an accident with their response to blasts or crashes of train. In such cases, "before the media or police could arrive the victims are been admitted in the hospital". One of the huge difference among road accidents that there are less number of victims.

The main motive behind developing this device and system is that there's no need of any ones help after an accident has occurred because in such situation the victim gets scared and his mind actually does not work calmly so they get totally confused what to do in such situation, if they are in the state to intimate because usually after accident the victim is not in state to make a call to the relatives or any concerned person even raise alarm

## Principle

There are two essential components in car accident location tracking system. The hardware and software. The hardware consists of elements such as Arduini UNO, GSM Sim 900A, GPS Ublox Neo 6m, jumping cables, Switch, Adapter 5v etc. The software would consist of website or application of google map as well as text messaging service.

## Objectives

The main objective for developing this system is:

- To provide emergency service for the people suffering from accident.
- To help the victims who cant raise alarm in too critical situation.
- To provide the emergency service as fast as possible to the victims.
- To track the car after accident in the areas such as forest or ghats.
- To decrease the number of deaths from accidents occurred due to unavailability of the emergency services whether hospital services, fire brigade services or police services.

## Previous work

According to the previous researchers there are some existing research that perform similar activity but are not much developed. In the existing system or previous work the system was developed only for alerting the owner or the family member so there were not much advantages. The existing system was too lengthy as the victim should wait for the owner or family member to inform the nearest hospital then the hospital would take some emergency action so there were plenty of risks of deaths. As in accidents not much time should be wasted as this could cause even death.

The previous system wasn't working sufficiently as it was too time consuming as well as harmful to the victim. The previous system was too costly and its architecture was too difficult.

Block Diagram

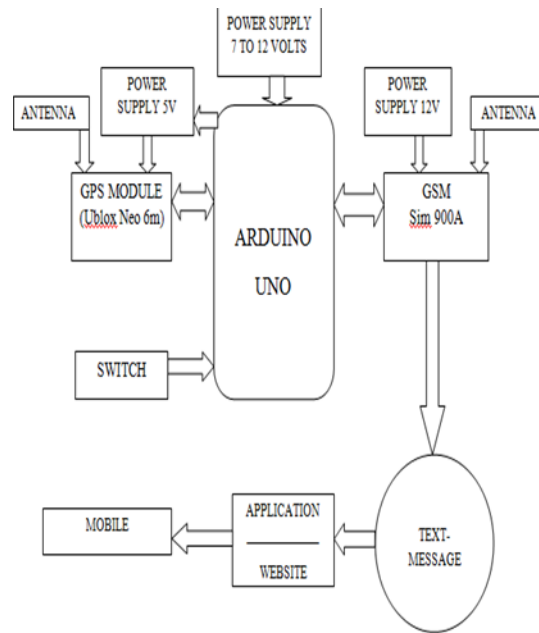


FIG:- BLOCK DIAGRAM OF SYSTEM

The block diagram consist of:

❑ **Power supply:**

It is connected to the Arduino UNO as power input. As well as GPS and GSM module.

❑ **Microcontroller Arduino UNO:**

Arduino UNO is the Microcontroller board based on ATmega328(datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHz ceramic resonator (CSTCE16M0V53-R0), a UBC connection, a power jack, an ICSP header and a reset button.

❑ **GPS Ublox Neo 6m:**

The GPS module is actually used to access the actual location of the module. The current location is accessed by the longitude and latitude format.

➤ **GSM Sim 900A:**

The GSM module is used to provide the network to the module. Even if the data is collected it requires connection to transfer the data to the end user via internet or message.

➤ **Switch :**

The switch is a button type device which intimates the Arduino Uno when it gets triggered/pressed. This is the main component of project.

➤ **Antenna:**

The antenna is used to receive or transmit its electric connection to the electromagnetic fields.

➤ **Text –message:**

The text –messaging system is a system where the data is directly send on the mentioned mobile number here the data is send directly without the use of internet.

➤ **Application / website :**

The application or website is the output source where the actual data is displayed using internet. The application or website is of google maps

➤ **Mobile / Computer / Laptop:**

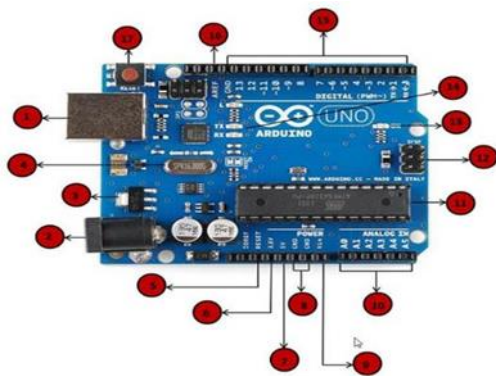
These are the devices where the data is been displaced the application or website could be used through any of the above mentioned source and the text message is directly send to the mobile phone so these are the outputs.

**Detail Description of Hardware components**

### ➤ **Arduino UNO:-**

Arduino UNO board is the Microcontroller board based on ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button.

It contains everything needed to support the microcontroller, simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started and used.



**Fig: ARDUINO UNO**

#### **1. Power USB:-**

Arduino board can be powered by using the USB cable from computer. All you need to do is connect the USB cable to USB connection.

#### **2. Power (Barrel jack):-**

Arduino UNO board can be powered directly from the AC mains power supply by connecting it to the Barrel jack.

#### **3. Voltage regulator:-**

The function of voltage regulator is to control the voltage given by the Arduino board and stabilize the DC voltage used by the processor and other elements.

#### **4. Crystal oscillator:-**

The crystal oscillator helps Arduino board in dealing with time issues.

#### **5. Arduino reset:-**

You can reset your Arduino board i.e start your program from beginning.

#### **6. Pin 3.3v:-**

Supply 3.3 output volt.

#### **7. Pin 5v:-**

Supply 5 output volt.

#### **8. GROUND pin:-**

There are several ground pins in the Arduino board any of which can be used to ground your circuit.

#### **9. Vin pin:-**

This pin also can be used to power the Arduino from an external power source, like AC mains power supply.

#### **10. Analog pins:-**

The Arduino board has six analog input pins A0 through A5. This pins can read the signal from analog sensor like humidity sensor and convert it to digital value that can be read by microprocessor

#### **11. Main microcontroller:-**

Each Arduino has its own microcontroller. Can assume it as the brain of your board. The main IC is slightly different from board to the board.

#### **12. ICSP pin:-**

Mostly, ICSP(12) is an AVR, a tiny programming header for the Arduino board consisting of MOSI, MISO, SCK, RESET, VCC and GND.

#### **13. Power LED indicator:-**

The LED should light up when you plug your arduino board into a power source to indicate that your board is powered up correctly.

**14. TX and Rx LEDs:-**

On board, you will find two labels: TX (transmit) and RX (receive). They appear in two places on the Arduino board. First, the digital pins 0 and 1, to indicate the pins responsible for serial communication. Second, the TX and RX led .

**15. Digital I/O:-**

The arduino board has 14 digital I/O pins.

**16. AREF:-**

AREF stands for Analog Reference. It is some times used to set an external reference voltage as the upper limit for the analog input pins.

**➤ GSM SIM 900A module :-**

SIM900A GSM Module is the smallest module for communication. It is common with Arduino and the microcontroller in most of the embedded application. The module offers GPRS technology for communication with the uses of a mobile sim card. It uses a 900 to 1800MHz frequency band and allows users to receive and send mobile calls or SMS.

Some important pins required for the project.

- Rst :- Reset the Sim 900 module.
- P :- Power switch of SIM900 module.
- Tx :- UART data output.
- Rx :- UART data in.
- DT :-Debug UART data output.
- DR :- Debug UART data input.
- RTS :- To send the request of data transmission
- CTS :- To clear the send request
- RI :- Ring indicator
- DSR :- To indicate that data set ready
- DCD :- To indicate data carry detect
- DTR :- To indicate data terminal ready

➤ **GPS ublox neo 6m:-**



The NEO 6M GPS Module is a good and well performing complete GPS receiver with an antenna. It provides a strong satellite search capability with the power and signal indicators.

Some important pins required for the project.

- ✓ GND :- It can be used to ground the circuit
- ✓ VCC :-It can be used to provide the power supply to the module.
- ✓ RX :- Used for receiving the data.
- ✓ TX :- Used for transmitting the data.

☐ **Limit Switches :-**



Limit switch also known as micro switch. In 3D Printing and RepRap Printers these switches are used as End Stops and to detect max and min limits of the axis.

☐ **Jumping cables:-**



Jumper cable is a smaller and more bendable corrugated cable which is used to connect components.

Flow Diagram

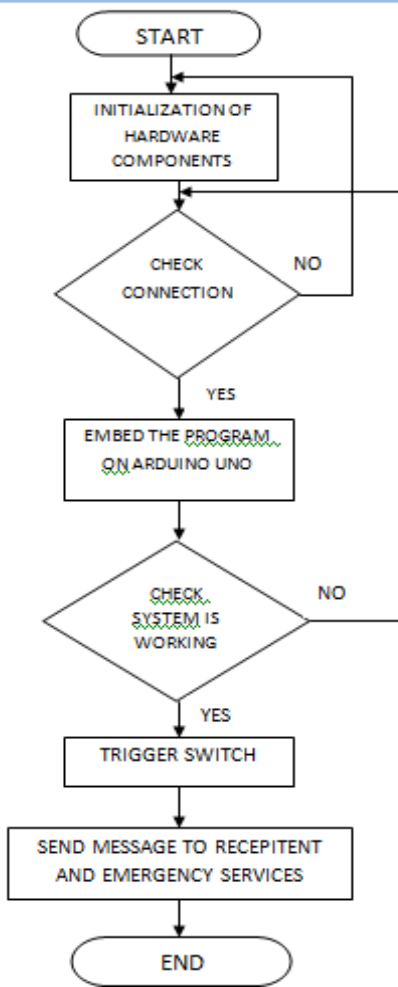
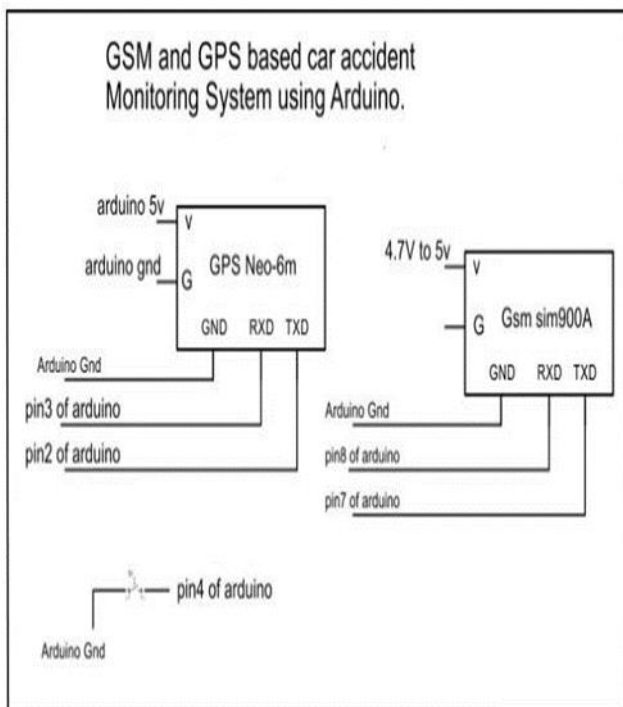
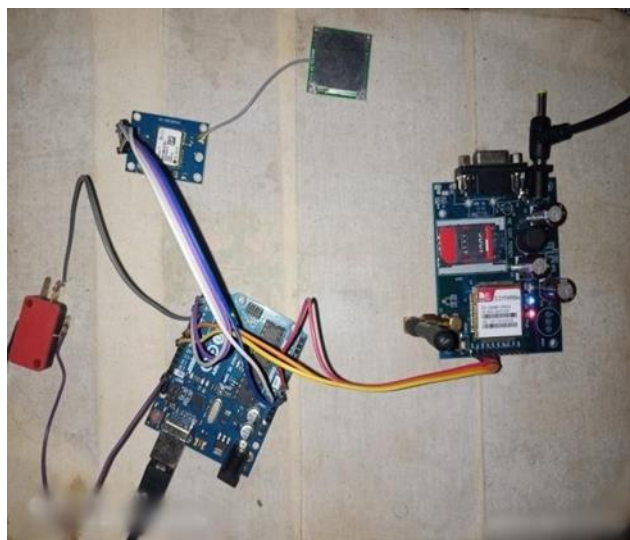


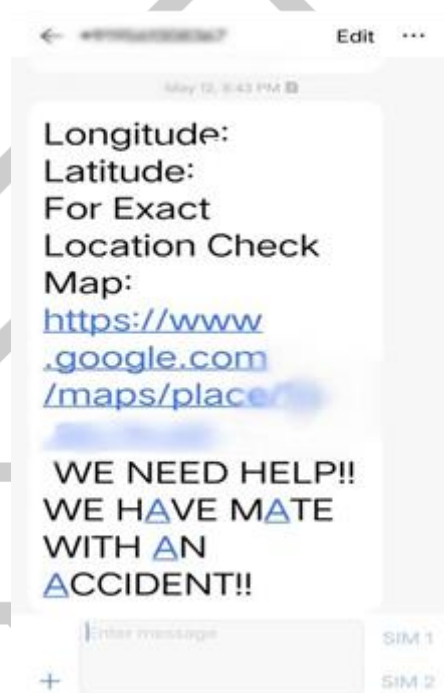
Fig: flowchart

System Connection Picture

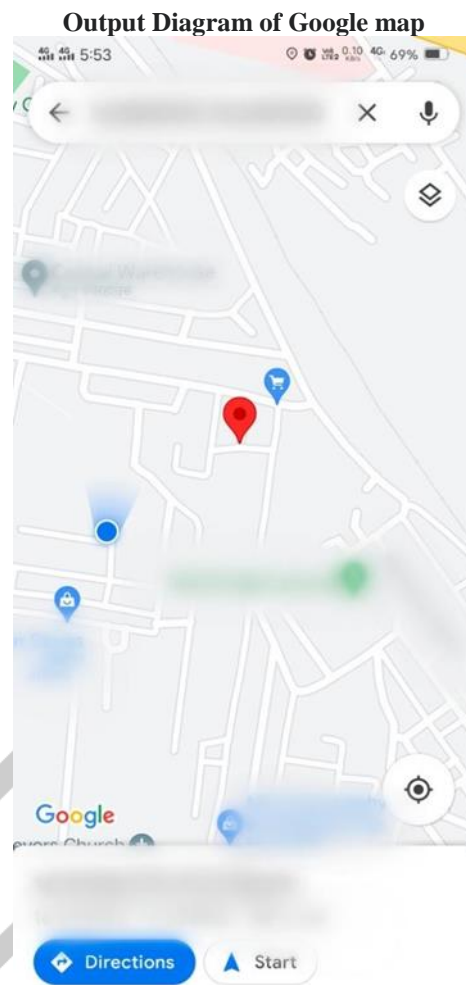




System Connection Pindigram



Output Diagram of Text-Messaging



### Conclusion

A major factor that leads to these accidents becoming fatal is the response of the emergency services which in most cases are not notified sufficiently within time as the passengers of the vehicle may not be in a state to make calls, raise alarms or notify. Our systems will detect the occurrence of an accident, notify to the emergency services with the exact location of this collision and also inform a select number of emergency contacts that have been set by the user during installation process.

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