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## EMERGENCY INFORMATION SHARING VIA MOBILE ALERT USING ARDUINO

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### Abstract

In recent days kidnapping, robbing and accident happen very common due to ignorance of people, heavy traffic and increase in vehicle level and bad drivers. Emergency services cannot help the people on right time because of the difficulty in predicting location exactly. Hence it requires a device to inform the service center for instant help to save life of the people. So our motivation is to develop a device which is very helpful, when a person in emergency situation. Aim of our project is to reduce the severe loss due to injury and fatality rate in any critical or danger situation.

**Keywords:** Arduino, GSM (Global System for Mobile Communication), GPS (Global Positioning System).

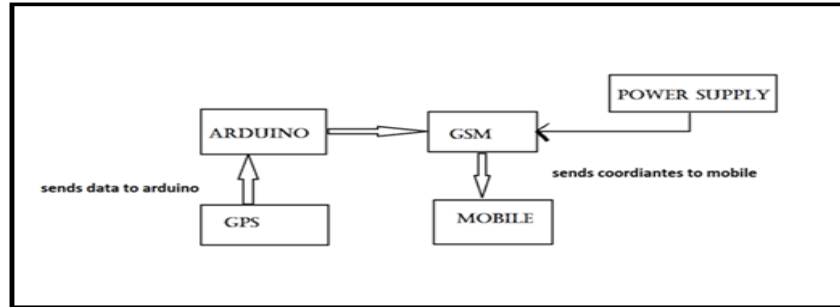
### 1. Introduction

This system needs Arduino, GPS, and GSM. Arduino is best board to get started with electronics and coding. It is the most robust board. The Global Positioning System is a space-based navigation system that provides location and time information in all weather conditions. Global System for Mobile communications is an open, digital cellular technology used for messaging and to make call. In proposed system once the button is pressed at that time Arduino pick the longitude and latitude information from the string given by GPS. Then Arduino send the message about the critical situation with location information to mobile phone by using GSM. This system is very useful to the person in need of any emergency or danger. The project eliminates any communication between the victim and the personnel which leads to confusion.

### 2. System Overview

In fig.1 Block diagram three main Components used. These are Global Positioning System(GPS), GSM Module and Arduino. GSM module's Rx pin is connected to Tx pin of Arduino and Tx pin of GPS is connected Rx pin of Arduino. Once power supply given to GSM, the Arduino gets started and then GPS started to give location information to Arduino

continuously. Once the button is pressed at that time Arduino pick the longitude and latitude information from the string given by GPS. Then Arduino send the message about the critical situation with location information to mobile phone by using GSM.



**Fig-1: Block Diagram.**

### 2.1 Arduino Uno

The Arduino Uno is a best microcontroller board. It is ATmega328 model. It has fourteen digital input/output pins (0-13), and six analog pins(0-5), sixteen MHz ceramic resonator, USB connection, power jack, ICSP header, and a reset button. It has everything needed to support the microcontroller. Arduino board can be used in all the platforms.It can be used with mostly all the devices.

### 2.2 GSM Module

The technology used in GSM is especially for mobile communication and we are using GSM module works on simple AT commands which can be implemented by interfacing it to the arduino Rx and Tx pins. The GSM module used is SIMCOM 900 which uses SIM memory to store the number of emergency station or housematesto whom the messages have to be forwarded.

### 2.3 GPS

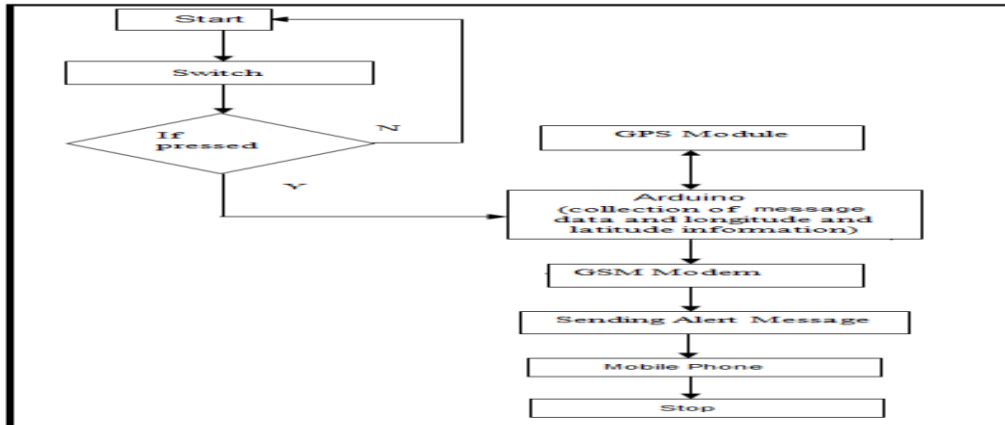
GPS module which stands for Global Positioning System is a radio navigation system that is used to determine location.The GPS continuously gives the information like humidity, latitude, longitude, etc., 24 hours a day. The TX pin of GPS connected to RX pin of Arduino. Through this connection, the arduino can receive the location tracked by the GPS.

## 3. System Operation

**3.1 Flow Diagram:** Here in this system the GSM module for send message to mobile phone.GPS sends the coordinates

in the form of string. After reading the string from GPS, using Arduino split the required data from the string and then sends that information to mobile phone using GSM module via SMS. This information is called latitude and longitude.

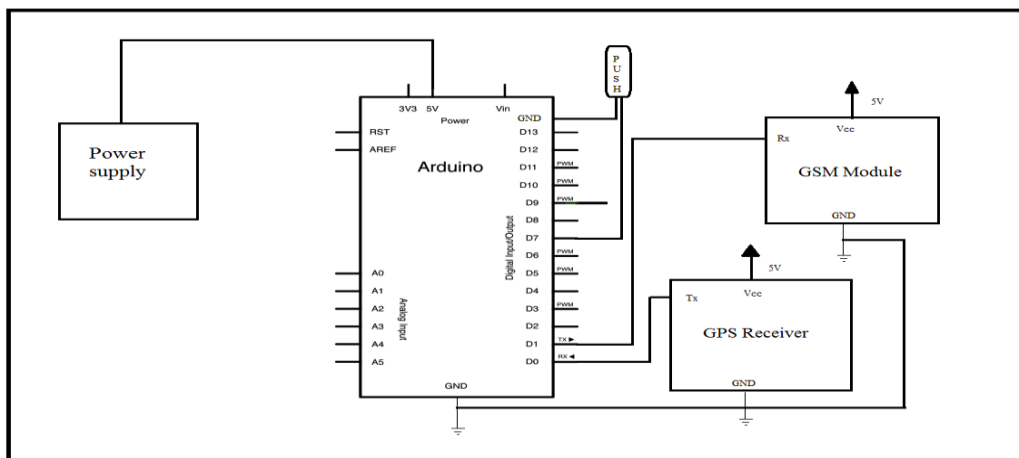
This is represented in Fig 2.



**Fig 2: Flow diagram of the system.**

### 3.2 Circuit Diagram

In Fig 3 Circuit diagram has three main components. Such as Global Positioning System(GPS), GSM Module and Arduino. GSM module's Rx pin is connected to Tx pin of Arduino, Tx pin of GPS is connected Rx pin of Arduino, and ground of GSM, GPS, Arduino are connected. The power supply is given to GSM. Push button is attached with Arduino board. The Arduino gets started and then GPS started to give location information to Arduino continuously.

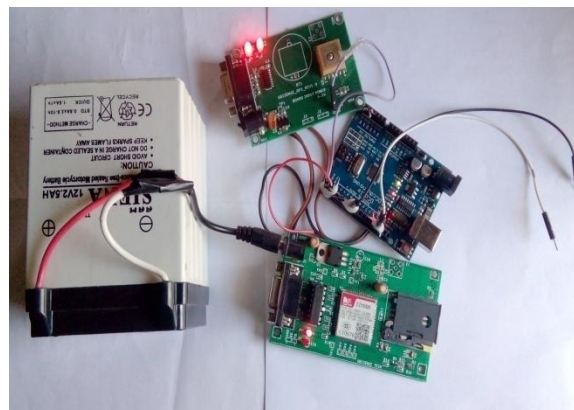


**Fig3: Circuit Diagram.**

### 4. System Implementation

First we have to use USB cable to connect with system. After doing some kind of system configuration (checking port and language) we have to upload the program from Arduino IDE to Arduino board. If it is successfully uploaded and

verified, then it shows that uploaded and verified otherwise it shows Error. Put the SIM card into GSM. To ensure whether the SIM card is working or not just make the call to that SIM. If it is ringing, then it is confirmed that the SIM card is working properly. Connect the RX pin of Arduino with TX pin of the GPS. Connect the TX pin of the Arduino with RX pin of the GSM module. We cannot have the above mentioned connections while uploading the program. Give the power supply to GSM. This power supply is enough for whole system. Wait for the GSM to connect with mobile network. Checking the connection to the mobile network shows that whether the GSM get connected to the mobile network or not.GSM is connected to the mobile network means the network LED will blink continuously for every 3 seconds .Push button shows that once it is pressed, message will be sent to the mobile if not pressed, message will not sent to the mobile. The message will be sent to the mobile phone and serial monitor at the same time.Message contains information about emergency situation, longitude, and latitude.The below diagram Fig 4 shows connection of Arduino, GSM, and GPS.This is to send the message to mobile phone with the location information.



**Fig 4: Hardware Implementation.**

**5. Result**

Once the pushbutton is pressed, message will be sent to the mobile. If not pressed, message will not send to the mobile.

It is represented in Table 1.

**Table 1: Push Button**

Status of push button	Pressed	Not Pressed
Arduino	Yes	No
GPS	Yes	Yes
GSM	Yes	No
Message to Mobile	Yes	No

When the user presses the push button, the message will be sent to the mobile phone from Aduino using GSM. GPS

continuously sends streams(information like latitude, longitude , time, altitude etc) to the Arduino. Once the push button is pressed, arduino extracts the latitude and longitude values only from streams and sends it to the GSM

The program is written such a way that Arduino sends only longitude and latitude values to the GSM. GSM sends the latitude and longitude values with the emergency message to the mobile.The controlling commands of the GSM are also sent from the microcontroller like:

AT to wake up the GSM

AT+CMGF=1 for set the GSM to text mode

AT+CMGS="91\*\*\*\*\*"

These three commands will enable the GSM to start and is switched to the text mode and send message to the specific number respectively.

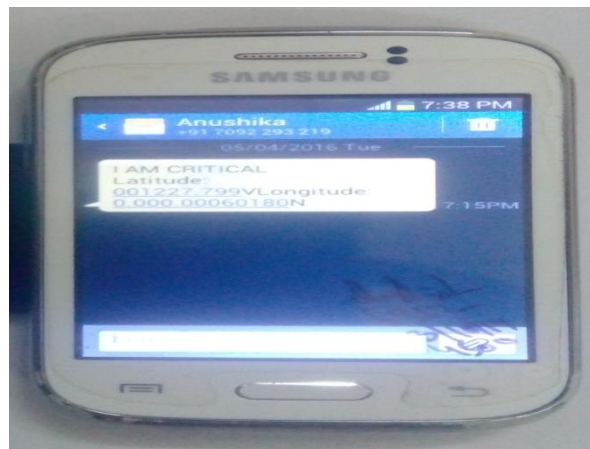


Fig 5: Message on mobile.

We can see the result on the system using serial monitor. It is shown in Fig 6.

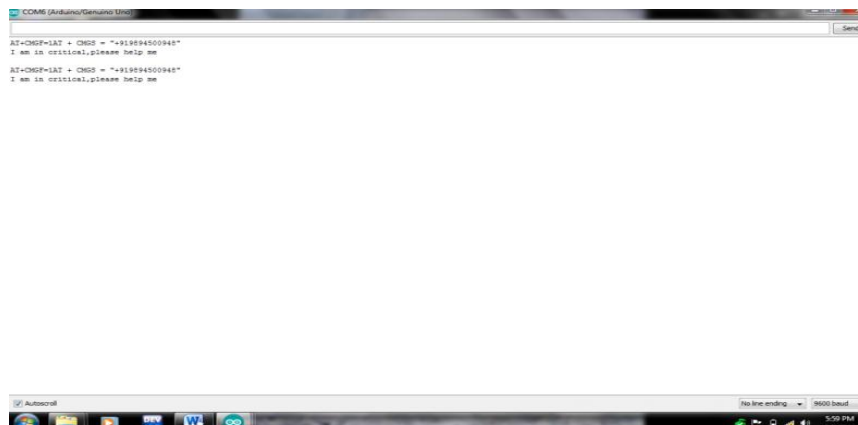


Fig 6: Output on Serial Monitor.

## 6. Conclusion

Emergency alert system via mobile using Arduino for emergency alert text messaging to the particular services and find the particular area where the emergency situation occurs by GSM has been implemented successfully. It reduces the severe loss during the time of kidnapping, robbing, and some other emergency situations. It can inform about the critical situation faster. Software requirement is very less. Hence it can be easily implemented. No conversation is needed between victim and emergency service. It reduces the confusion and helpful to the user to report the problem without any tension. Even the affected person can inform about the emergency using the proposed system.

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