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Vehicle Accident Detection

Abhishek Tripathi , Abhisar Malviya , Saurabh Mehra , Saurabh Singh , Mohit Kumar Saxena

Department of Electronics & Communication Engineering at United College of Engineering & Research, Prayagraj which is Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow, Uttar Pradesh, India.

ABSTRACT

The accident vehicle system is the combination of the Global Positioning System (GPS) and the Global System Mobile communication (GSM) technologies via the microcontroller. It is used to detect the location of vehicle accident to which it is attached. The designed system make use by linking smartphone messaging service with arduino nano. GPS is a satellite-based navigation technology that provides accurate location and information . The transmission and receiving process from the location is done by GSM module. Data is received on GPS receiver from numerous satellites which are located in the atmosphere in the form of National Marine Electronics Association (NMEA) protocol . The SMS contains coordinates of longitudes and latitudes of the location of accidents. The National Marine Electronics Association code contain information. Arduino is connected to the GPS and the GSM module in the successive inter-connection. The GPS receiver sends data to Arduino. Then , arduino give command to the GSM module which send the coordinates to the device in the form of SMS. Thus by using this proposed system we can easily detect the accident location so that help can be reached in short duration of time.

Keywords: GSM module , GPS , Arduino Nano.

I. INTRODUCTION

Vehicle Accidents holds a major portion of discussion in india and todays world. Safety of the driver and the co passengers can be threatened because of various reasons that lead up to an accident and moreover there is a major time gap in accidents and help arrival. Many soul can be rescued if proper emergency services reach at the location in short span of time. With the help of the designed system not only accidents are known but also SMS is sended to emergency contacts , police station and hospital. According to the recent surveys and study of last 5 years the total road accidents are 2363031 out of which 747361 persons were killed in road accidents. From the above data we can see deaths in road accidents are a major concern in india . The National Crime Record Bureau (NCRB) states that road collisons and railway related collision are the major source. Highest number of death rates were reported in Uttar Pradesh , Maharashtra and Tamil Nadu which contributed to 33% of total accidents which is a major concern.In this project Arduino Nano which is a micro controller along with GPS , GSM module and accelerometer along with a Display is used. The GPS (Global Postioning System) is a satellite-based navigation system that sends data from satellites. Orbiting Earth to GPS receivers on the ground that can use that data to determine position and the current time anywhere on Earth. GPS module is used to find out position of desired location. It measures the correct distance with help of satellites and the receivers determine the position of the accidents and records its coordinates. By using four or more satellites, the receivers can determine the three-dimensional position of the user which consists of altitude, latitude and longitude.

II. SYSTEM MODEL

BLOCK DIAGRAM:-

In the given block diagram we can see arduino Nano is the basic building block of this project. Arduino is interfacing with GPS module , GSM Module , Accelerometer and LCD display .

FIG 1:- Block Diagram

CIRCUIT DIAGRAM : -

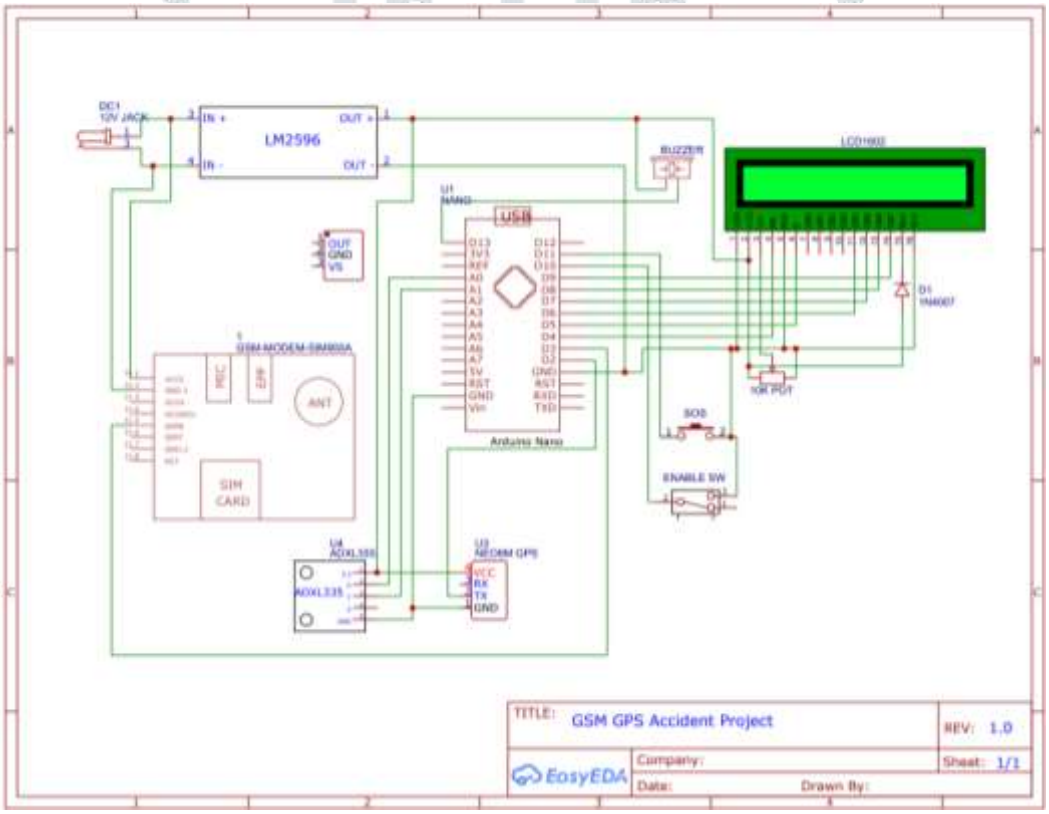

Fig 2:-Circuit Diagram

COMPONENTS USED :-

1. **U3 NEO6M GPS-**
   The NEO-6M GPS module is a complete GPS receiver with a 25 x 25 x 4mm ceramic antenna which is built in,it also provides strong satellite explore capability.With the signal and power indicators, we can observe the status of the module

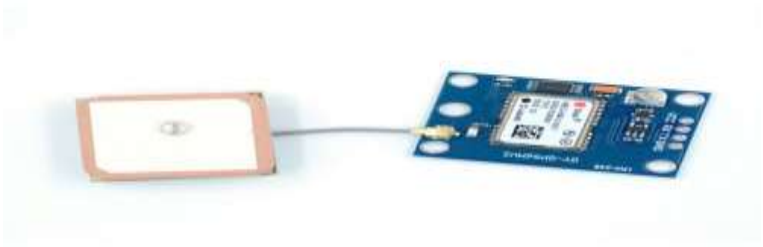

Fig 3:-U3 NEO6M GPS

2. **SIM 900A GSM MODULE-**
   SIM900A GSM Module is the module for GPRS/GSM communication. It is common with microcontroller in most of embedded systems. The module has GPRS/GSM technology for communication by the use of mobile sim. It uses a 900 and 1800MHz frequency band has capabilities to send and receive messages and calls.

Fig 4:-SIM 900A GSM MODULE

3. **LCD 16*2 DISPLAY :-**
   An LCD (Liquid Crystal Display) screen is a type of electronic display that can be used in a variety of ways. A 16x2 LCD display is a relatively basic module that can be found in a variety of devices and circuits. A 16x2 LCD can display 16 characters per line, and there are two of them. The 224 distinct characters and symbols can be displayed on the 16 x 2 intelligent alphanumeric dot matrix display.

WORKING :-

The AC supply is converted to 12 volts 2 Amperes through adaptor. This 12 Volts supply is given simultaneously to SIM900A GSM module and LM2596. SIM 900A has internal mechanism for stepping down 12 v to 5 v and LM2596 is a step down voltage which convert 12 volt dc to 5 volt dc. Now the sim is inserted inside GSM module, the module checks for signal and when it gets stable signal connectivity the device is ready to work. Arduino NANO controls all the working of the embedded system. The GPS module NEO6M is used to get the coordinates that is latitude and

longitude by the various satellites and the data is continuously sended to arduino for proper functioning. The accelerometer is used for detection of accidents. When there is change in the shape of piezoelectric material a signal is generated which is sended to arduino there after a message is sended to the emergency contacts through GSM module.

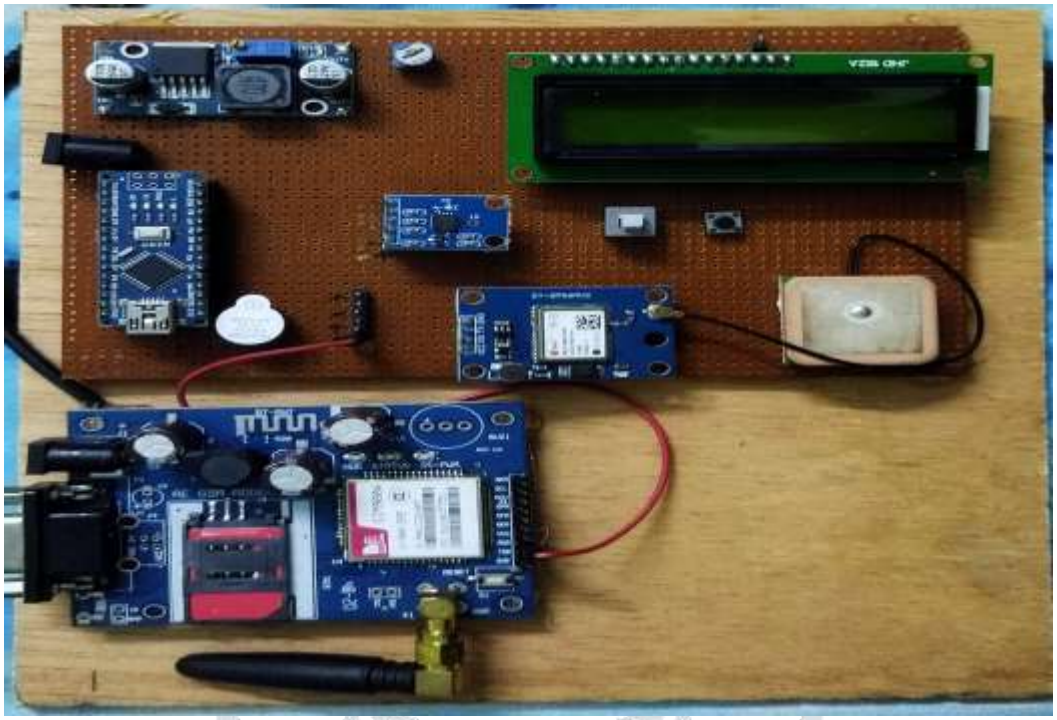

Fig 5 :- This is how our project look

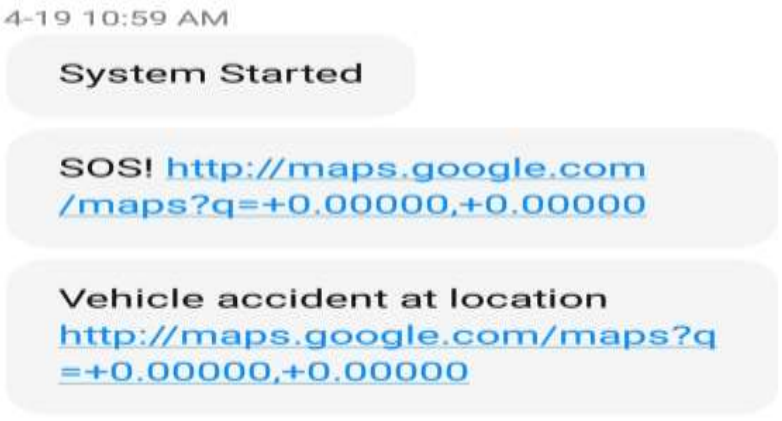

Fig 6:- Text message along with location

CONCLUSION:-

So now we can conlude that with the help of proposed system the accident can be detected and help can arrive in a short span of time to ensure no loss of lives.

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