VEHICLE ACCIDENT PREVENTION & REPORTING SYSTEM USING GSM & GPS.

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ABSTRACT

With the growing population the use of vehicles has become superfluous and this has led to increase the hazards and the road accidents, which causes huge loss of life because of the poor emergency facilities. The purpose of the project is to find the vehicle where it is and locate the vehicle by means of sending a message using a system which is placed inside of vehicle system, Most of the times we may not be able to find accident location because we don't know where accident will happen. When a vehicle meets with an accident immediately Vibration sensor will detect the signal, and sends it to Arduino microcontroller traffic. Microcontroller sends the alert message through the GSM modem including the location to the police station or a rescue team. So the police can immediately trace the location through the GPS modem after receiving the information.

Keyword : - *Accident Protection, GSM Modem, GPS Modem, Sonar System, Vibration Sensor.*

1. Introduction

Background With the growing population the use of vehicles has become superfluous and this has led to increase the traffic hazards and the road accidents, which causes huge loss of life because of the poor emergency facilities. The purpose of the project is to find the vehicle where it is and locate the vehicle by means of sending a message using a system which is placed inside of vehicle system, Most of the times we may not be able to find accident location because we don't know where accident will happen. When a vehicle meets with an accident immediately Vibration sensor will detect the signal, and sends it to Arduino microcontroller. Microcontroller sends the alert message through the GSM modem including the location to the police station or a rescue team. So the police can immediately trace the location through the GPS modem after receiving the information.Throughout The development of transport system, though being one of the biggest revolutions of human inventions, it also brings disasters to human race by accidents. Road accidents have been the foremost cause of unexpected fatalities for decades [1]. The causes of road accident with accident rate are shown in the Figure 1.

Reasons for Accident
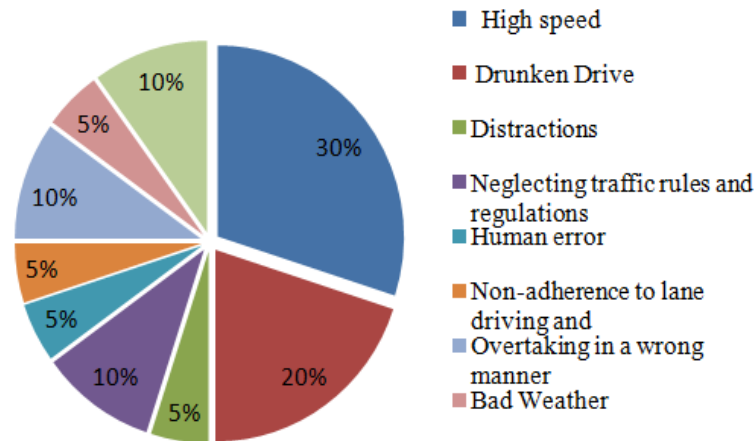
Even though advised and regulated by government, the control of road accidents had always been a tedious task. Despite these causes, if the accident information could reach the emergency services much faster and their response in return, lot of fatalities could have been reduced. According to the statistical approach, more than 50% fatalities are due to the time delay of the injured user to the hospital. As of now, detecting accident at the instant of occurrence and reporting the same to the emergency services is very important to save the life of a human being.

2. Literature Survey

In 2014, a smart phone is used based on android application for direct phone-to-phone communication employed for both accident and observing the traffic system. Here, the components used are Bluetooth, sensors and Wi-Fi used for wireless connection. The main problem in using Wi-Fi is that it consumes more power compared to Bluetooth. Here, the biggest advantage which over-weighs the disadvantage is that Wi-Fi provides a bigger range when compared to Bluetooth and this is the reason that Wi-Fi module is used to communicate with the help centre and also this information can be taken for analysis to avoid accidents, if it is frequent in a particular location and certain steps can be taken to avoid future accidents [3, 4].

In present situation, it is not possible to detect the accident occurred location and impossible to detect the accident occurred location. So, it is not to predict the accident occurred location of an individual causing death of an injured person caused due to accident. In recent days, the embedded system also uses sensors and interface components like GPS, GSM are used to track the accident occurred location and indicate the zone to the system. In addition to this, different techniques are also used to track the data and importing the data is shown with valuable results to predict crash accidents. The Bluetooth based traffic monitoring is also used to indicate the accident location by employing unsupervised analogy. There are different analysis is done in intelligent transport systems [5-9].

Thus, the vehicle accident indication system is anlaysed and a proposed system is highlighted. The research work is afoot on positioning the location of the vehicle in all environmental conditions even though, if there is no network for receiving the signals [10-17]. The major shortcomings of the above mentioned review of the existing approach are shown in the Table 1 and implies the analysis.

3. Proposed Methodology

Proposes combine independent and complementary solutions in a global accident detection system to provide stable and accurate positioning of car accident even in severe urban environments. The proposed solutions consist

of augmenting the navigation solution exploiting the inertial sensor to estimate the dynamics of vehicle to extract the accident.
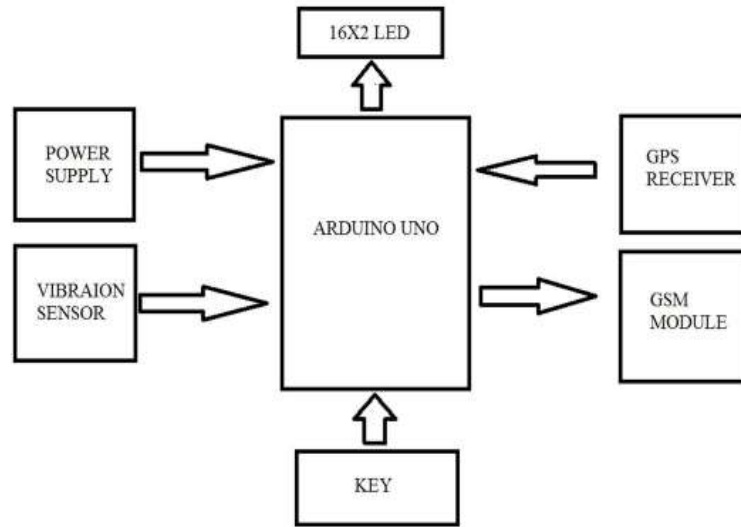

3.1 Flow Chart:
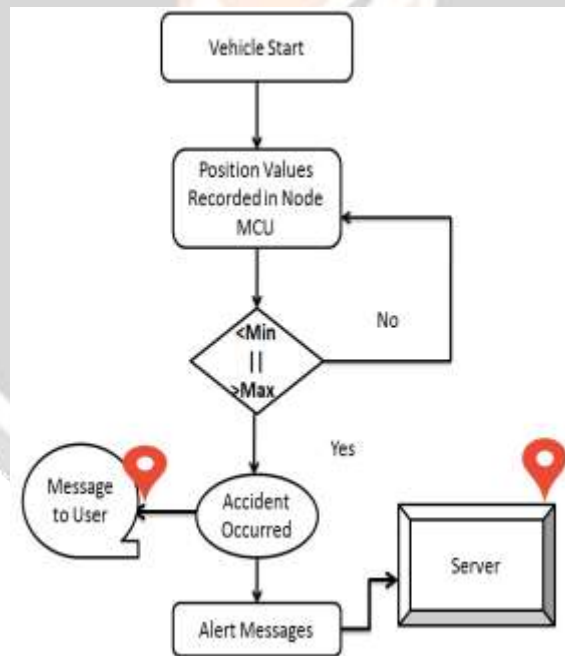
Working:

The automatic accident indication and reporting system for road ways using Internet of Things system uses a MEMS ADXL335 (Micro-Electro-Mechanical-Systems) device called Accelerometer to detect sudden changes in a moving vehicle, and report such accidents with the corresponding location through a GSM network [5-9]. In addition to that, the location data is stored in the server. When the accident occurs, the accelerometer changes its co-ordinated axis. Now, the change in value is fed to the controller. The controller will check for the limit value for the proposed algorithm. When the deviation between the proposed value and the actual value then the signal is fed to the user and AMRSC centre. If there are no serious injuries, to the user, the user can respond to the message and it will not be indicated to the AMSRC Centre. Then AMRSC will neglect the message once it is ignored by the

injured user. If not, the AMRSC centre will send the data to the nearest hospitals and precautions will be made to the injured person. In addition to this, the message will also be sent to the linked mobile number like mother, wife, husband etc. The accelerometer senses the variation of the accelerometer sensor while hitting the object. This object may include hitting tree, hitting the pavement, hitting the transformer and hitting the other vehicle etc. The pictorial representation shows the planned system model as shown in the Figure 4.
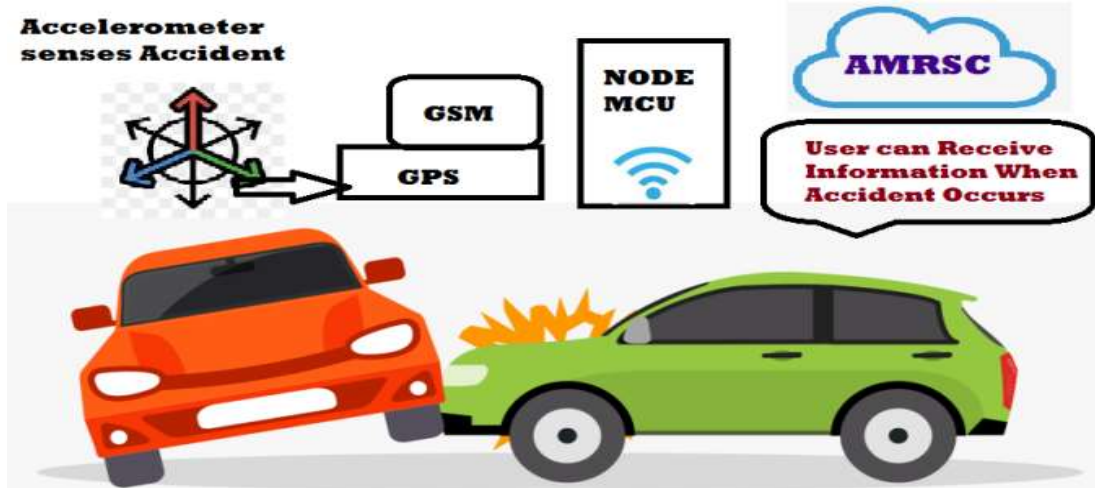
3.2 GPS module:

The Global Positioning System is a most popular component to track the location of the car and other location for various applications. It is embedded with the antenna to track the signals at a narrow band. The button cell used to redundant the last position. The antenna can be connected easily with GPS. The main four pins are T_X, R_X, VCC and GND connected.

The board application of GPS is position, navigation and pointing the time of a particular location. The receiver in GPS is used to receive signals to module and determine the vehicle present position and point the correct latitude, longitude and altitude of the vehicle [23, 24]. The pictorial representation of SIM28ML GPS is shown in the Figure.

3.3 GSM Module:

The Global System for Mobile communications (GSM) commonly available in India market with a flexible cellular network to transmit voice call and large data services. For transmitting signals, GSM uses narrow band TDMA.

This TDMA assigns on same frequency for different time slots for different users. Here, GSM is used to send the information regarding vehicle accidents via SMS using AT commands. The SIM900A GSM module is top-viewed as shown in the Figure

This SIM900A works with a set of AT commands. These AT commands usually operated using UART / Serial protocol. It has Tx, Rx, VCC and GND [25-27]. The interface of GSM module with the controller is shown in the Figure. This GSM is embedded with all hardware interfaces between the module and customer's boards. It is also easier to develop user's application using serial port, audio channel with microphone, receiver output, programmable general purpose input and output pins and debug port with keypad and SPI display interfaces [28]. The specification of SIM900A GSM Module is shown in the Table 5.

3.4 Controller:

The NODE MCU is a scorching open source development kit on Internet of Things platform. The main advantage of using NODEMCU is easily available in market with inbuilt- Wi-Fi module ESP8266 – 12E. Thus the Controller makes this system mores easier, smaller, less costly and low power consumer as compared to other methods as compared Figure 2 in comparison methods [28]. It is more powerful with high level I/O pins and Digital pins. The major parameter for NODE MCU controller is shown in the Table 6.

S. No.	Specification	Rang
1	Frequency Range	2.412 - 2.484 GHz
2	Wireless Form	On-board PCB
3	Operating Voltage	3.3 V Operated
4	IO Capability	UART, I2C, PWM, GPIO, 1 ADC
5	Working Current	12 - 200 mA
6	Operating Temperature	-40 to +125 ℃
7	Network	Protocol IPv4, TCP
8	Frequency Range	2.412 - 2.484 GHz

4. CONCLUSIONS & FUTURE SCOPE

4.1 Conclusion

The proposed system is developed to provide the information about the accident occur and the   location of the accident .It helps to easily provide the assistant and help to the victim of the accident. This system uses GPS module to locate the vehicle. GSM is used to provide the information of accident. The results of the proposed systems are satisfactory. Vehicle tracking both in case of personal as well as business purpose improves safety and security. Performance monitoring and increases productivity. So, in the coming year, it is going to play a major role in our day-to-day living. Main motto of the accident alert system project is to decrease the chances of losing life in such accident which we can't stop from occurring. Whenever accident is alerted, the paramedics are reached to the particular location to increase the chances of life.

4.2 Future Scope

We can reveal a few parameters of car like twist of fate area and most important damages. We can intimate pals or own circle of relative's man or woman if the car is going out of a certain/pre-determined tune with the assist of location. Video streaming enables to realize the precise twist of fate area and may be reached quickly to place.

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