Accident And Alert Generation System Using Lora And Internet Of Things

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ABSTRACT:

The zoom of technology and infrastructure has made our life easier the coming of technology has also enlarged the traffic threats and therefore the road accidents occur frequently which causes huge loss of lives and property due to the poor emergency facilities. Our project will provide an optimum solution to the current balk. An accelerometer are often employed in an exceeding car alarm application so as that dangerous driving are often detected. It'll be used as a crash or rollover detector of the vehicles during and after a crash. With signals from an accelerometer, a severe accident is also recognized. With this project when a automobile meets with an accident closely Vibration sensor will sense the signals or if a car rolls over. Microcontroller directs the attentive message through the GSM MODEM including the case to the police room or a rescue team. that the police can instantaneously trace the site through the GPS MODEM, after receiving the information's. Then after conforming the location necessary actions are visiting be taken. If the person meets with a little accident or if there isn't any serious threat to anyone`s life, then the alert message is terminated by the driver by a switch provided on avoid wasting of the precious time of the medical rescue team. This method is supportive in identifying the accident exactly by means of both vibration sensor and accelerometer.

1.INTRODUCTION

The extraordinary demand of automobiles has also enlarged the traffic threats and the road accidents. Life of the people is under high danger. This is for of the absence of best alternative facilities available in our country. An programmed alarm device for vehicle accidents is introduced in this paper. This proposal is a method which can notice coincidences in significantly less time and sends the basic information to first aid center within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had happened. This aware communication is sent to the rescue team in a short time, which will help in saving the valuable lives. A Modification is also provided in order to terminate the sending of a message in rare case where there is no casualty, this can save the precious time of the medical rescue team. When the accident occurs the focused message is sent automatically to the rescue team and to the police station. The communication is sent through the GSM module and the location of the accident is sensed with the help of the GPS module. The accident can be noticed exactly with the help of vibration sensor. This application offers the optimum solution to poor emergency facilities provided to the roads accidents in the most feasible way. The Internet of Things (IoT) is an organization of consistent computing gadgets, mechanical and digital machines, objects, animals or individuals that are given one kind of an identifiers and the volume to conversation data over a system without requiring human-to-human or human-to-PC communication. IoT is a new idea that has progressed from the convergence of wireless technologies. Wireless communication is the transmission of data or signal between two or more points that are not connected by an electrical conductor. In IoT devices furnished with Wi-Fi permit the machine-to-machine communication.

2.LITERATURE SURVEY

The beginning of technology has also improved the traffic dangers and the road accidents. Due to the absence of best emergency facilities available in our country the lives of the people are under high risk. An automatic alarm device for vehicles is introduced in this paper which sends the basic data to the medical rescue team within a few seconds of an accident. This device can spot accidents and sends an alert message to rescue teams in significantly less time which will help in saving the lives of the people. The attentive message comprises the geographical coordinates, time and angle in which the accident has occurred.

In cases where there is no fatality the communication can be ended with the help of a switch in order to avoid wasting the valuable time of the rescue team.

Prevention System:

In this project work, we've got studied and implemented a whole working model employing a Microcontroller. The program design and interfacing of microcontroller has been grasped during the implementation. This effort includes the study of GSM and GPS modems using sensors. The largest advantage of using this project is, whenever the sensor is activated we are going to be getting the acknowledgement from GSM modem to our mobile numbers which are stored in EEPROM and GSM network operators have roaming facilities, and finding the placement and sending information to user so they will often still use their mobile phones after they jaunt other countries etc.

Project Paper Analysis:

The following is the list of patents investigated before designing the Accident Alert System. It assisted us to know the interfacing of various components used in the project, such as GSM and GPS modems, and also the practical implementation of such projects in real life. The investigation of these Research Papers helped to understand the current technologies predominant in the field of accident notification system and to find better yet simpler alternatives to modernize such notification systems. The subsequent estimation related work show papers analyzed along with the names of their inventors, applicants and publication number.
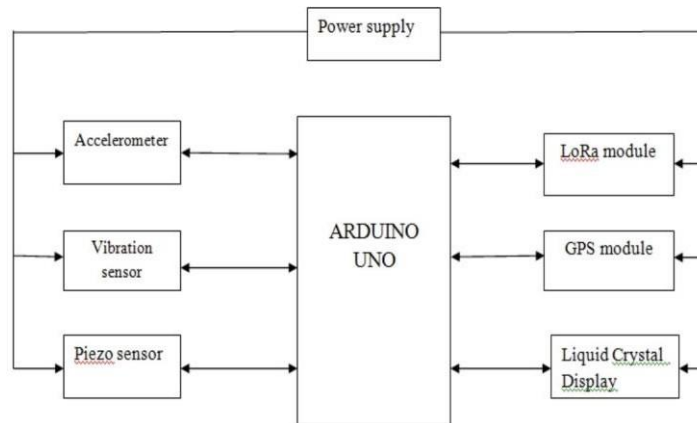
2. BLOCK DIAGRAM

Figure 1 Block Diagram

3. ARDUINO AS CONTROLLER UNIT

Fundamentally Arduino contains two microcontrollers. One of the microcontrollers is the ATmega328P and it is the core of the Arduino board. The other microcontroller is the ATmega16 for IC or USB controller and it has inbuilt RC stage move oscillator and it can produce two to eight MHz frequency. Suddenly when somebody met with a mishap then the Arduino is the significant control unit to recognize when it happens. After the vibration sensor, GPRS and GSM it will collect the data and the yield will get through a message or in presentation system. In every one of these modules vibration sensor plays a significant role. Arduino assembles the information from all modules and through LoRA module it will sends the packets to the collector.

4. LoRa MODULE

Semtech LoRa transceivers have a wireless modem with a long range that provides high interference resistance and high connectivity over a awfully long range while increasing current demand. Our original modulation technology permits transceivers to realize -137dBm and -148dBm respectively sensitivities during this product family. In terms of blocking furthermore as selectivity LoRa offers significant advantages over conventional modulation methods, overcoming the quality range-to-range model compromise, storage resistance and consumption of energy. The LoRa RF system supports M2 M cellular networks and offers a cheap solution for battery powered devices to be connected to the network infrastructure.

5. LCD MODULE

LCD implies Liquid Precious stone Presentation which is utilized to show the numbers, exceptional characters and letter sets. The 16x2 LCD has sixteen sticks in two columns and the higher piece information lines of these pins, for example, 11, 12,13 and 14 are interfaced to advanced pins of Arduino in the bit method of the pins are 8,9, and 10. Reset and Empower pins are associated with the 12 and 13 of the Arduino pins. Read and compose pins are associated with the ground to play out the compose activity on the LCD.

6. VIBRATION SENSOR

Sensors for vibration are sensors that operate consistent with different mechanical or optical principles to detect vibrations of an observed system. The measurement of vibrations is done using various types of sensors. Although there are not any direct vibration sensors, vibrations will be measured indirectly, deducing values from classic mechanical or optical quantities.

7. PIEZO SENSOR

Piezoelectric sensor may be a device that uses the piezoelectricity to live changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge. Piezoelectricity is that the charge created across certain materials when a mechanical stress is applied. Piezoelectric pressure sensors abuse this result by measuring the voltage across a piezoelectric element generated by the applied pressure. They are very robust and are utilized in a large range of business applications. The piezoelectric sensor will generate an voltage when it is deformed. Thus when an accident occurs, the piezoelectric sensor will generate an output voltage. Microcontroller continuously scans the piezoelectric sensor and accordingly checks the brink levels. When a sensor works on the principle of Piezoelectricity, it is called as Piezoelectric Sensor. Piezoelectricity may be a phenomenon where electricity is generated if mechanical stress is applied to a fabric. A sensor that employs the piezoelectricity, to live variations in acceleration, strain, pressure, and force by converting them into electrical charge is known as a piezoelectric sensor. This piezoelectricity produced is proportional to the strain given to substrates of the strong crystal.

8. GPS MODULE

The NEO-6 module series could be a family of stand-alone GPS receivers featuring the high- performance u-box 6 positioning engine. These flexible and cost-effective receivers offer numerous connectivity options in an exceedingly miniature 16 x 12.2 x 2.4 mm package. Their compressed architecture and power and memory options make NEO-6 modules ideal for battery operated mobile devices with very strict cost and space constraints. The 50-channel u-box 6 positioning engine boasts a TimeTo- First-Fix0(TTFF) of under 1second. The dedicated acquisition engine, with 2 million correlate's is capable of massive parallel time/frequency space searches, enabling it to search out satellites instantly. Innovative design and technology suppresses jamming sources and mitigates multipath effects, giving NEO-6 GPS receivers excellent navigation performance even within the most challenging environments. This GPS module will find the situation of the vehicle and also the information fetched by the GPS receiver is received through the coordinates and the received data is first send to Arduino and therefore the information is transmitted to the saved contact through GSM module.

9. GSM MODULE

GSM may be a mobile communication modem; it's stands for global system for mobile communication (GSM). The thought of GSM was developed at Bell Laboratories in1970. It's widely used mobile communication system within the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands. GSM system was developed as a digital system using time division multiple access(TDMA) technique for communication purpose. A GSM digitizes and decreases the information, then sends it down through a channel with two different streams of client data, each in its own particular interval. The digital system has a capability 64 kbps to 120 Mbps of knowledge rates. There are numerous cell sizes during a GSM system like macro, micro, Pico and umbrella cells. Each cell varies as per the implementation domain. There are five different cell sizes in very a GSM network macro, micro, Pico and umbrella cells. The coverage area of every cell varies in line with the implementation environment.

10. PROPOSED SYSTEM

Our project work on the principle of detection and tracking of accident. The system is on and initialization. If vehicle is normal, no information sends to rescue team. Whenever accident occurred, the vehicle changes it's direction randomly and vibrates with high frequency .The MEMS sensor detects the happening with vehicle. The controller get the input from sensor and send the accident alert information to rescue team and loved one and placement of the accident place through WIFI and GPS

.It can facilitate connectivity to the closest hospital and supply medical assistance through IOT technology.

11. RESULTS AND DISCUSSION

Whenever accident is occurred then this device sends messages to given mobile number, nearby Police station and Hospital. We will obtain the exact location of the vehicle live.

The hardware execution has also been done in a proper manner and the results have been verified. The hardware execution is shown in figure 3.
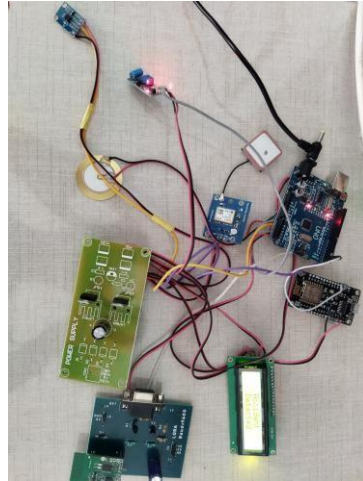

Fig : 2 Connection diagram

12. CONCLUSION

Speed is one amongst a mishap's most notable reasons. The GPS may screen the speed and distinguish a mishap, apart from using it for various purposes. GPS collector has now become a required tool. It's capable of sending the fault area to the Warning administration center by employing a modest and standard GSM modem. The last speed before the mishap can also be submitted to see the scope of the mishap and begin a voice call. Near the programmed location framework, the vehicle inhabitant will have the choice to physically send the mishap circumstance by squeezing the Manual Discovery Switch. In blast, rescue steps at the correct location can save a big number of lives. During this way, the proposed framework are often of great benefit to humanity, as human life is very important. The proposed system deals with the detection of the accidents. But this may be extended by providing medication to the victims at the accident spot. We are able to detect the vehicle's position and condition by increasing the technology and sensors like Gyroscope. We will also prevent accidents through the utilization of alerts systems that may detect the vehicle's over speed.

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