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Accident Detection for Automobiles Switch and Buzzer

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Abstract:
The objective of this paper is to detect the accident of an automobile. Where the module is integrated inside the automobile to detect the accident and reduce the major injuries and loose of life. The accelerometer sensor detects the accident. If an automobile is met with an accident then, sensor will be activated and the location of the accident will be sent to emergency stations.
Keywords: accident detection, accelerometer sensor, Panic Switch, GPS and GSM.

1. Introduction
There is a significant growth in automobiles day by day and also accidents have also been increased in daily life. An efficient automotive security system is implemented for accident detection using an embedded system consisting of Global Positioning System(GPS) and Global System for Mobile Communication(GSM). When accident does takes place, the Accelerometer's reading's will t rigger the system to start to start sending the coordinates of accident site to the law enforcement authorities and hospitals, in response to which emergency action can taken by them immediately.

2. Existing System
In the existing system only the buzzer will raise during any accidents, and hence the patrol cannot exactly locate the accident spot. Sometimes, the alarm siren does not even attract the attention of most of the pubic because of the mentality of people nowadays that intend to ignore such alarms. In previous methods only after the theft of the vehicle the location can be traced. There is no preventive measures. The present security system is not efficient due to the following reasons:

- Distance- Cover Area, the siren cannot be heard over a long distance
- Same sound (siren) for most of the vehicles
- False Alarm
- Cannot be heard in buildings
- Cannot identify exact accident locations during accidents.

3. Proposed system
The proposed system aims to detect the accident the accident location. In this system we use Arduino UNO open source micro controller board based on the ATmega328p micro controller. The board is equipped with sets of digital and analog input/output(I/O) pins that may be interfaced to the various expansion boards and other circuits. The board features with 14 digital pins and 6 analog pins. It is programmable with Arduino IDE (Integrated Development Environment).

The system will consisting of Arduino UNO board, GPS, GSM, LCD, buzzer, panic switch, DC Motor and DC Motor Driver, Accelerometer sensor and Amazon Cloud Servers.
The proposed system is not only efficient but also worthy to be implemented. Accident detection system can be fitted in vehicle (Ambulance & Police) and they are informed about any such untoward incident at the go. Accident detection and messaging system is execution simple as the system makes use of GPS and GSM technologies. GPS is used for taking the coordinate of the site of the accident while GSM is used for sending the message to phone.

Accelerometer sensor
Accelerometer sensor is used to check weather a automobile is meet with an accident with or not. As the automobile is inclined with road with 0 or 180 degrees. As the inclined angle changes the probability of accident increases and accelerometer sends information to the Arduino UNO ATmege328p micro controller.

GSM and GPS modules
The Arduino GSM shield allows an Arduino board to connect to the internet, to send and receive SMS using GSM Library. GPS is used to detect the Latitude and Longitude of any location on the Earth, with exact UTC time (Universal Time Coordinated). Whenever there is an occurrence of an accident, GPS Receiver used for detecting coordinates of the vehicle, and GSM module is used for sending the coordinates to rider's emergency server stations by SMS.

Buzzer and Panic Switch
Buzzer is used to emits the sound in the automobile, because the accident may be major or minor so in order to detect the accident condition of automobile. Buzzer is connected with Arduino kit which is also inter connected with Panic Switch.

Panic switch plays more important role it determines weather accident is major or minor. It operates when accident is occurred ,if accident is major than people in that automobile will be unable to touch so within few seconds the conformation of major accident will be sent to emergency stations else if panic switch is pressed within a stipulated time than there will be no confirmation message sent to the servers so that it determines that accident is minor so that no assistance will be provided at that time

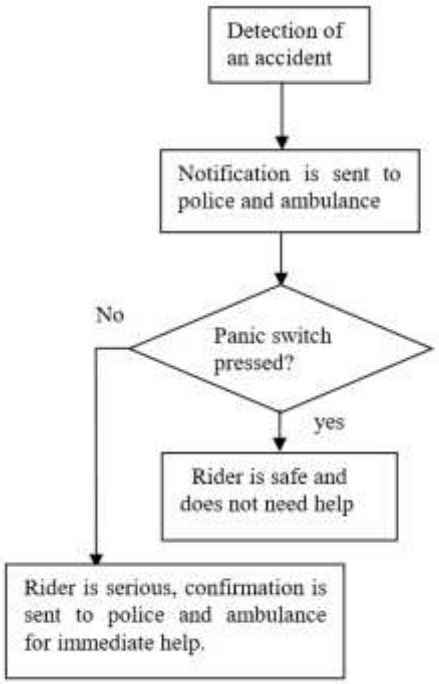

Figure: Data flow of proposed system.

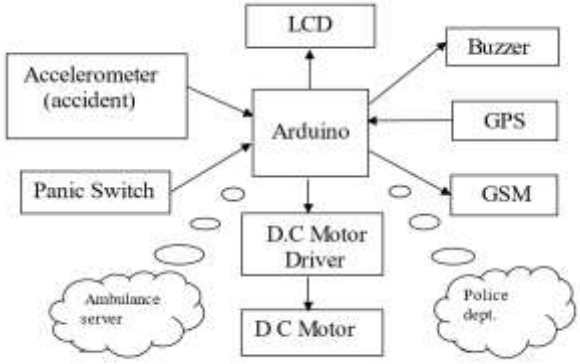

Figure: Architecture of the proposed system

4. Conclusion

This project presents vehicle accident detection and alert system with SMS to the user defined mobile numbers. The proposed vehicle accident detection system can track geographical information automatically and sends an alert SMS regarding accident. This vehicle accident detection and alert systems provide emergency responders with crucial information at the earliest possible time. Reducing the time between when an accident takes place and when it is detected can reduce mortality rates. Conventional in vehicle accident detection and notification systems are effective in reducing the time gap before first responders are sent to the scene. These systems, however are expensive and not available in all vehicles. To further increase the usage of automatic accident detection and notification systems, this system can be used to indirectly detect accidents through sensors such as accelerometers.

5. Future work

In future we can interface different sensors such as alcohol detector, drowsiness detector, heart rate detector etc. In terms of these we can really prevent accident and save life. This can also be developed by interconnecting to controller module that takes the photographs of the accident spot that makes the tracking easier.

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