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IoT Based Accident Detection and Emergency Message Dissemination System

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Abstract—In this project, an IoT based vehicle accident detection and rescue information system is developed in order to detect vehicle accidents and send the location information of the accident place to vehicle owner, nearest hospital and police station via a web service. The communication between the web server and hardware device is established via GSM/GPRS shield, and the location is traced by using the GPS shield. The accident is detected through vibration sensors, keypad and buzzer. The project is developed for real time data fetching from the hardware device using sensors and store in the web server, and send notification to different users either through web application, android mobile application or SMS. This project approximately provides the accurate detection of the location of accident occurred, and send notification to the nearest police station and hospital

Keywords— IoT, accident detection, GSM/GPRS, GPS shield, rescue information system.

I. INTRODUCTION

With the advancement in the automobile industry, the accidents and other hazards are also increasing due to the huge number of traffic. Our lives are under high risk. In our country, with the lack of emergency rescue service, many people lose their lives because of accident.Our project will help solve this problem by ensuring immediate emergency service after an accident. Our system uses a GPS module to detect the accident spot and uses the GSM module to pass the message to rescue teams and relatives. Since, it is a real time application and it would save valuable lives.Our project helps in detecting and tracing an accident. The mechanism is installed on the car.When the car is running normally i.e. no accident has yet occurred then no information is sent to the emergency team. In the occurrence of an accident, the vehicle changes its orientation and produces a different spectrum of waves and consequently increasing the frequency. MEMS sensor identifies the abnormality within the car. The controller receives data from a large number of sensors, then sends the alert message to the recovery group and the emergency contacts which are preconfigured along with the location where the accident has occurred, this is done through the GPS module. The System identifies the closest hospital and provides guidance through IOT.

II. METHOD

A. Product Testing:

It is an important factor in the project and it's specially required when the ail is tracking the vehicle and if an accident occurs communicate with nearest hospital and police station and suggest the shortest route to reach the accident prone area.

B. Embedded device :Circuit connection andArduino programming

The project is developed by using GSM/GPRS/GPS/Bluetooth Shield SIM808 directly connected to all the pins of Arduino.Arduino IDE is used to write programs for Arduino Uno Board and to upload the program to the board.

C. Configuration of Database:

A web database is configured to store the data that are being sent from the embedded devices. phpMyAdmin application is used to configure the MySQL database. There are 7 tables:

1. user: Store user information.

2. police station: Store Police Station information, location.

3. hospital: Store Hospital information, location.

4. vehicle: Store each device installed in a different vehicle.

5. location: Store vehicle location on demand of the user.

6. accident: Store location information after accident detection.

7. rescue: Store which police station and hospital is involved in rescue.

D. Web Application

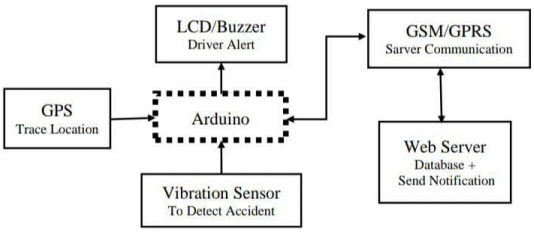
A web application has been developed to receive data from embedded devices through GSM shield using GPRS connection. Using this application one user can monitor his/her vehicle. Using google API the web app can show the location of a vehicle. If an accident occurs, this system will notify the owner and show the accident spot as well as the nearest hospital or police station and a way to the nearest police station and find three nearest hospitals using google maps.

E. Security

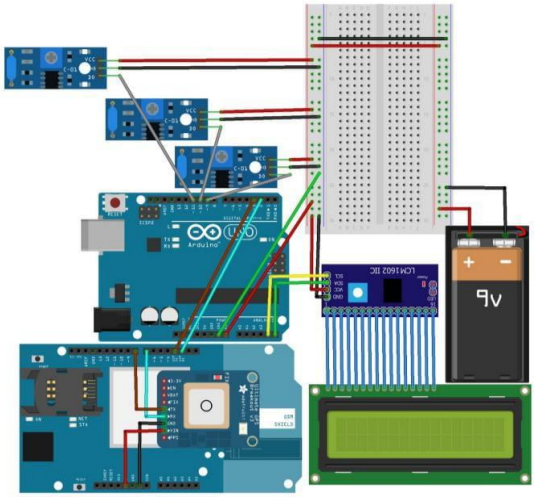
To access the website, the user has to go through a login page. There is a table "user" stored in the database with username and password. After the user input the username and password, it matches the fetched data from the database and if it matches, it will log the user in and a new session will be started.

III. RESULT

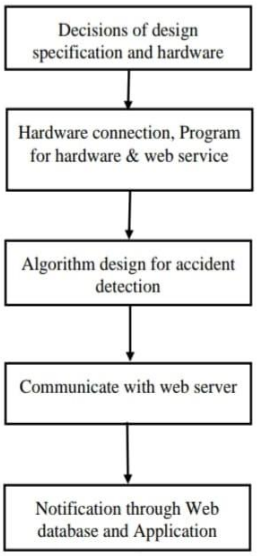
Block Diagram of IoT Based Vehicle Accident Detection & Rescue Information System



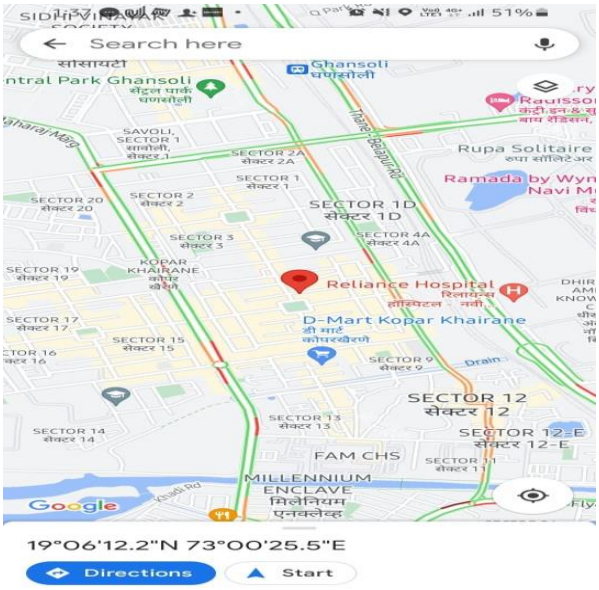
Block Diagram of hardware of IoT Based Vehicle Accident Detection & Rescue Information System:



Flow chart for complete design and methodology:



Working of system:



IV. CONCLUSION

The IoT Based Vehicle Accident detection and rescue system is successfully implemented using database server and API and fulfills all the requirements to be an IoT based framework. This device is capable of reading and collecting the required data and sends them securely to the database stored in the server. This system can do tracking of a vehicle which has this device. Besides, if an accident occurs this system can communicate with the nearest hospital and police station. Police stations and hospital's authority can see the shortest route to reach the accident spot using this system which has a web application and mobile application. Web based real time data visualization makes this system more convenient to see all the data in a clean, formatted and user friendly way.

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