

# IoT Based Automatic Vehicle Accident Detection and Rescue System

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**Abstract:** With rapid growth of population the need of technologies also increased. Automobiles are one among them. Increase of vehicles has also increase the number of road accidents. These accidents may also result to loss of life of people due to late information reaching to the rescue team. This paper presents an IoT Based Automatic Vehicle Accident Detection and Rescue System that will detect accidents and pass the information to the rescue team. Vibration sensor, Wifi Module and Global Positioning System are used in here. With the help of vibration sensor signal, a severe accident can be easily detected and the message can be easily passed to required people with the help of micro controller. The system consists Atmega 328 microcontroller along with display.

**Keywords:** Accident detection system; human rescue system; global positioning system

## I. INTRODUCTION

IoT or internet of things is one of the most emerging technology. It is the network of physical object connected via network and communicate with each other without any human interaction. In this paper, we can clan the mess with the help of IoT. Accidents are one of the major cause for creating trouble. So it is very important clera these problems due to accidents and should be properly monitored. This system can be used avoid accidents and also can reduce the risk of peoples life.

## II. EXSISTING SYSTEM

There are some already created devices and products in the market that are related to our research. These systems detect the impact of accident, collects the data and send it to the rescue team and hospital service along with coordinates of the location of accident. GSM module is used in the system inorder to inform others.

## III. DISADVANTAGE

Time consuming and less effective.

GS module is costly and maintaining the connection is not applicable in the real time

## IV. PROPOSED SYSTEM

We have developed a prototype that is a smart device that can be worn by any individual on their vehicle. After implementation, the device will start sending the current latitudinal and longitudinal co-ordinates. The aim of this system is to be able to detect the occurrence of an accident and subsequently send a message with the GPS location to the victim's emergency contacts, and notify the Ambulance and hospital services simultaneously.

## V. MODULES

The proposed systems are classified into the following parts:

### 1. Collection

This module deals with the collection of data from the outside world. The device which comes under this phase/module is as follows:-

a) **Vibration Sensor:** The main purpose of this sensor is to detect the variation or changes in the vibration frequency and checks whether it exceeds the "Threshold Vibration Frequency".

**2. Triggering**

- i. Hardware Side:** This module deals with the processing or triggering of the data which is being collected in the first phase/module. The devices which comes under this phase/module are:-
- ii. ESP8266 WIFI Module:** his is a low cost Wi-Fi chip with full TCP/IP capability and it also includes an integrated MCU(Micro Controller Unit). This device connects to a Wi-Fi network and provide access to "ThingSpeak" IOT platform.
- iii. GPS Module:** This device is used to detect the current location and also points out the exact address of the location.
- iv. Arduino UNO:** The Microcontroller used here is an Arduino UNO. The UNO is a Microcontroller board based on ATMEGA 328P.The ATMEGA 328P has 32kB of flash memory for storing code. The board has 14 digital input and output pins, 6 analog inputs, 16 MHz quartz crystal, USB, an ICSP circuit and a reset button. The UNO can be programmed with the Arduino software.

**VI. SOFTWARE SIDE****ThingSpeak**

This is an Open Source IOT application and API to store and retrieve data from devices. ThingSpeak enables the creation of sensor logging applications, location tracking applications etc. It is also useful when there is a need of the details about an early occurred incident as it stores data permanently.Sensors, or things, sense data and typically act locally. ThingSpeak enables sensors, instruments, and websites to send data to the cloud where data get stored in either a private or a public channel. ThingSpeak stores data in private channels by default, but public channels can be used to share data with others. Once data is in a ThingSpeak channel, you can analyze and visualize it, calculate new data, or interact with social media, web services, and other devices.

**VII. ANALYZE AND VISUALIZE YOUR DATA WITH MATLAB**

Storing data in the cloud can easily access the data. Using online analytical tools, you can analyze the data. You can discover relationships, patterns, and trends in data. You can calculate new data. And you can visualize it in plots, charts, and gauges.

**Thingspeak Provides Access To Matlab To Help You Make Sense Of Data. YouCan:**

- v.** Convert, combine, and calculate new data
- vi.** Schedule calculations to run at certain times
- vii.** Visually understand relationships in data using built-in plotting functions
- viii.** Combine data from multiple channels to build a more sophisticated analysis

**Thingspeak Provides Tools That Enable Device Communication For All Of These Actions And More. You Can:**

- a) React to data—both raw data and new data that you calculate—as it comes into a channel
- b) Queue up commands for a device to execute

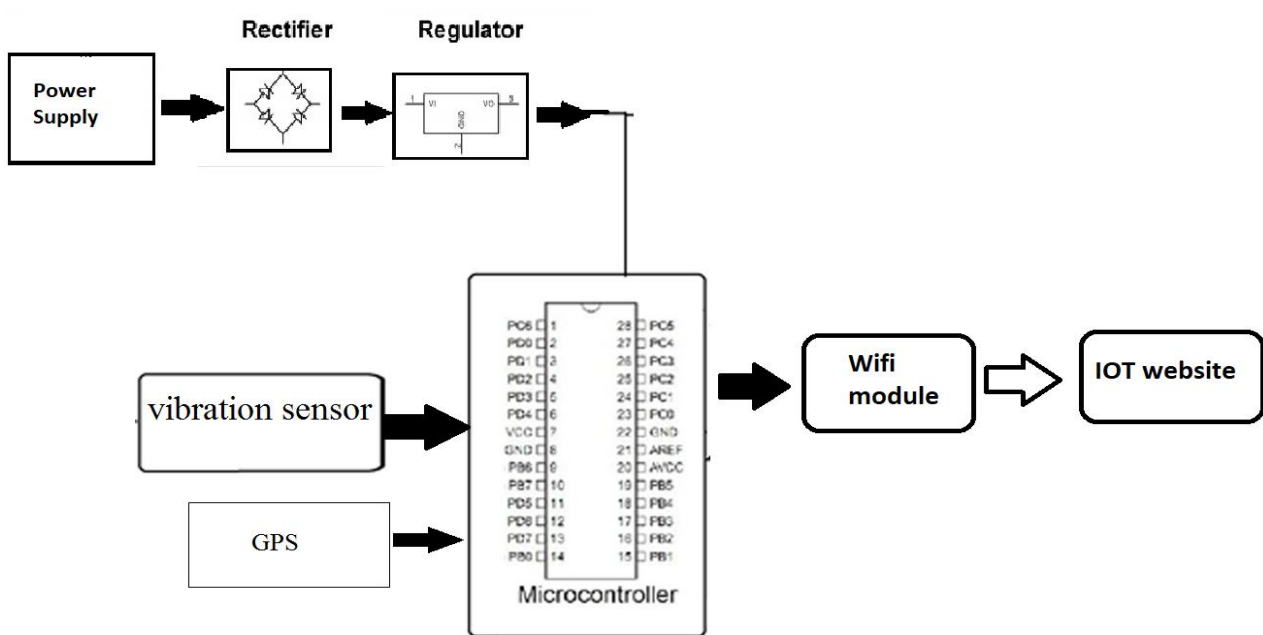
**VIII. SYSTEM SPECIFICATION****HARDWARE SPECIFICATION**

- Microcontroller
- Vibration Sensor
- GPS
- IoT Device
- Panic Button
- Transformer
- Resistors
- Capacitors
- Diodes

**SOFTWARE SPECIFICATION**

- Arduino Compiler
- MC Programming Language: C
- IOT Gecko

## SYSTEM BLOCK DIAGRAM

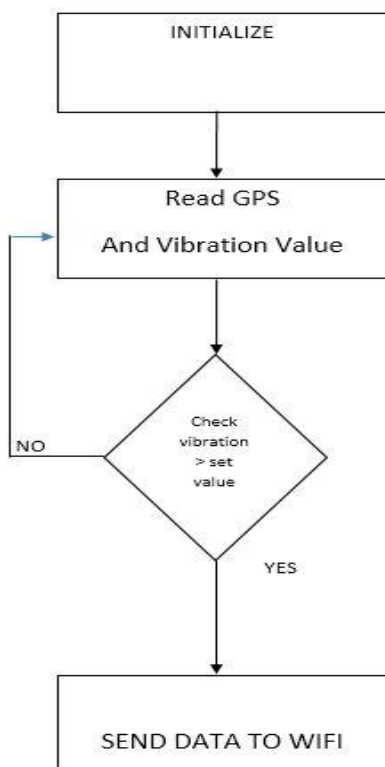


## Input Design

Input design is one of the most important phases of the operation of computerized system and is often the major problem of a system. A large number of problems with the system can usually create fault input design and method. Needless to say, therefore that the input data is the life block of a system and has to be analyzed and designed with utmost care.

The decisions made during the input design are:

- To provide cost effective method of input.
- To achieve the highest possible level of accuracy.
- To ensure that input is understood by the user.

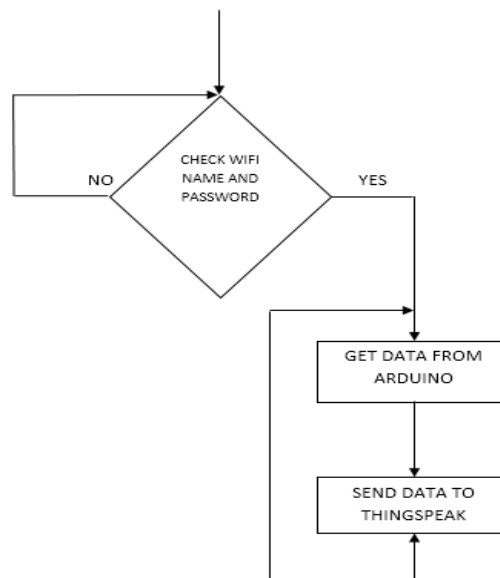


### Output Design

Output design generally refers to the results and information that are generated by the system. For many end-users, output is the main reason for developing the system and the basis on which they evaluate utility of the application.

The objective of a system finds its shape in terms of output. The effective analysis of the objective of a system leads to determination of outputs. Outputs of a system can take various forms. The most common are reports, screens displays printed form, graphical drawing etc. The outputs vary in terms of their contents, frequency, timing and format. When designing output, the system analyst must accomplish things like, to determine what information should be present, to decide whether to display or to print the information and select the output medium to distribute the output to intended recipients.

Internal outputs are those, whose destination is within the organization. It is to be carefully designed, as they are the user's main interface with the system. Interactive outputs are those, which the user uses in communication directly with the computer.



### Future Enhancement

Alerting the emergency contacts helps create awareness of the situation. The cost of actual implementation is also considerably less compared to other designs, due to the availability of low-priced sensors. Future work will look into the actual implementation of the system and recording of results with more efficiency. IR sensors can be added in order to avoid vehicle theft. Also heat sensors can be added to identify and rectify any circuit break related problems. The system can be further improvised by adopting an accident prevention approach over accident detection.

## IX. CONCLUSION

The system provides the design which has the advantages of low cost, portability and small size. It consists of vibration sensor, GPS and IOT interfacing which reduces the accident. It also overcomes a lot of problems of automated system for accident location detection. Consequently, it reduces the time for searching the location as soon as possible the person can be treated immediately it leads to save many lives. Main motto of the accident system project is to decrease the chances of casualties in such accident. This device invention is much more useful for the accidents occurred in deserted places and those occurring at night time. This system will play an important role in day to day life in future.

## REFERENCES

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