

Advancement in Safety of Vehicle Mechanism using Wireless Sensor Networks

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Abstract

This paper deals with problem which cause accident and also to ensure safety. A mechanism involves to confirm the assurance of locked seat belt. Through this driver safety is ensured through the automotive mechanism. It deals mutually pressure switch to notice the accident over this a alert announcement to the idol person which study GPS location. And it further ensure the traveller is not gain drunken over The Alco sensor-iii to calculate BAC_(Blood Alcohol Concentration (BAC) is a means to measure the alcohol concentration in a driver's blood. More to the point, it is a way to measure a person's judgment abilities, reflexes and moods). It helps new drivers to be more aware of the affects of alcohol and to what degree intoxication impairs their ability to drive responsibly. Through this city worker safety is ensured over the automotive mechanism. We can monitor all the things using thing speak application via cloud as a interfacing medium.

Keywords: Recognizing Technology, GPS module, Pervasive Computing, Cloud Computing, Wi-Fi module, Smart Mobility, Arduino Uno.

1. Introduction

In this modern era transportation is becoming as one of the important need of human. Though it has numerous need, we face lot of problem in it which cost human life. Motorized vehicular accidents are among the major causes of human injury or death and damage of goods with financial consequences. According to 2016 real time traffic accident statistics, all over the world, 853.849 was the number of people Killed in vehicular accidents,

24.100.573 was the number of injured people in traffic accidents. Ubiquitous computing is the major solution to solve this one. In most cases, vehicular accidents are caused by avoidable human errors and improper driving practices due to alcohol drinking. Sometimes death may be the result of improper seat belt insertion. With recent advances in sensing technologies allows drivers to improve their driving experience. In this regards, a great progress of technologies makes Vehicular safety more and more desirable.

Internet of things is a computing concept that describes connection of every physical object to internet and it leads to improve the capabilities of the object .Things in IoT can refer to wide variety of devices ,as of now they refer to the parameters in the current safety proposed system. Here we are using Automation process in order to actuating the process. Automation can be defined as the technology by which a process or procedure is performed without human assistance. Automation has been achieved by various means like computers and electronic devices and combining of all these. The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Devices and objects with built in sensors are connected to an Internet of Things platform, which integrates data from the different devices and applies analytics to share the most valuable information with applications built to address specific needs. The term is closely identified with RFID as the method of communication, although it also may include other sensor technologies.

The IoT Cloud system is aimed at traffic monitoring and alert notification for drivers. Mobile sensors are represented by GSM/GPRS/GPS TK103

tracker based systems installed in vehicles that collect geo-localization and speed data that are sent to a OpenGPS server that stores them in a SQL database, providing a real-time OpenStreetMap visualization of traffic scenario. Another micro-service has the role of querying how the positions of vehicles change in a given area close to drivers who come from neighbor locations in order to notify their mobile APPs with alert messages related to possible sudden traffic slowdown events. The data transfer is performed by means of a 4G network connection. In order to take the advantage of a scalable Cloud- based infrastructure both Open GPS server and micro-

services are deployed by means of audunio containers so as to take the advantages of resource virtualization.

The rest of the paper is organized as follows. Section II presents literature survey along with the disadvantages of existed system. In Section III, we motivate our work by describing about current methodology . A description of our hardware implementation and IoT Cloud system architecture is provided in Section IV. Outcomes of this process are discussed in Section V. Conclusion and lights to the future are summarized in Section VI.

2. Literature Survey

The existing method has three main blocks those are

- i. Sensing
 - ii. Processing block
 - iii. Indication block via cloud as data storage medium
- The sensing block has only one sensor named vibration sensor to monitor the vehicle accident detection and the Processing block consisting of Arduino ,GSM and the indication block consists of LCD display , smart mobility system to alert the person who are tracking gps location. But it did not provide the exact location of the user.

In this method It integrates only one application in order to monitor the accident detection using sensing technology along with GPS module. In this method arduino acts as a interfacing medium between input and output. Here Vibration sensor is used to detect the accident occurring ,But the disadvantage of existing method is vibration sensor alerts the GPS tracker even if vehicle identify the small obstacles .Hence it is somewhat expensive. Some times it may give wrong sensing hence it is one of the time consuming processes as well as there is a chance to decay the life span of the devices because they are continuously monitoring the system. It is the main reason to go for further advancement in this method.

3. Methodology

The proposed method is developed with three major blocks.

- i. sensing block
- ii. processing block
- iii. indication block

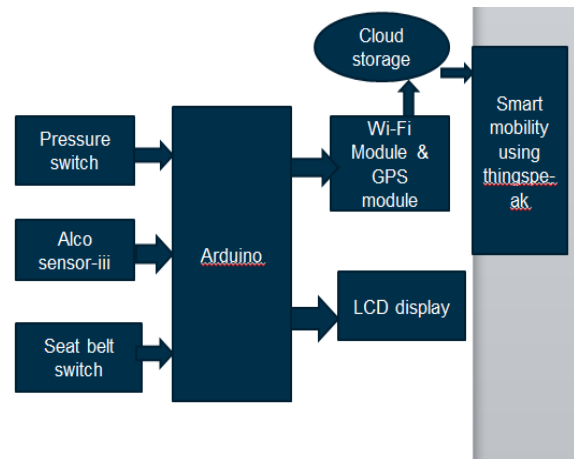


Fig.3.1: Proposed Method Block Diagram

i. The sensing block is used to sense the current condition of the vehicle and it provides sufficient information to the main processor block for processing .It has mainly three components.

- i. Pressure switch
- ii. Seat belt switch
- iii. Alco sensor-iii

Pressure switch is used to detect the major accidents and it alerts the processor only when it detects high amount Pascal's of pressure. Seat belt switch is used to detect whether the user wear seat belt or not. Finally Alco sensor is place a key role to identify the blood alcohol concentration.

ii. Processing Block consisting of mainly arduino uno which acts as a interfacing between input and output and it process the information and sends the required information to the destination .Here we are using embedded c-language as a code language to actuate the arduino uno. And it also contains self micro

controller unit and memory unit to store the data for given amount of time.

Along with the main processing block it contains some further units.

- i. GPS module
- ii. Wi-Fi Module

GPS module uses the gps antenna to track the location of the user and provides the information to the idol person who is tracking location. It covers the range with in the meters i.e short distance communication

Wi-Fi module plays a vital role in storing the information in cloud and accessing the information through smart mobile system. Wireless internet access interface to any arduino based design on its simple connectivity through Serial Communication or UART interface.

iii . Indication block has liquid crystal display which provides output information regarding three objectives namely pressure in terms of Pascal's, blood alcohol concentration, seat belt switch threshold value. LCDs allow displays to be much thinner than cathode ray tube (CRT) technology. LCDs consume much less power than LED and gas-display displays because they work on the principle of blocking light rather than emitting it. This is used for checking the values whenever accident happened. Along with that smart mobility system is used for alerting the user which is accessing the information from cloud provided by Wi-Fi module using thingspeak application in terms of field labels.

The final integrated circuit by using all of these components as shown below, Which contains all of the three blocks such as sensing block , processing block and indication block.

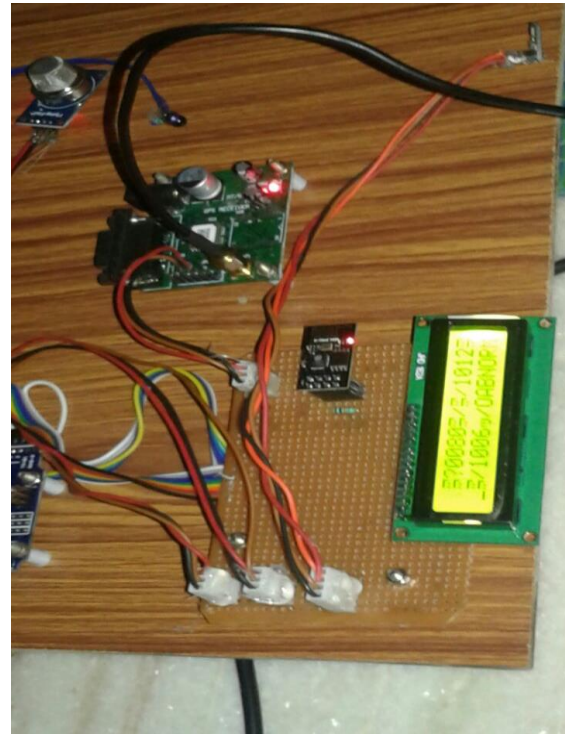


Fig.3.2. Circuit Diagram of Advancement in safety of vehicle mechanism using wireless sensor networks

The power supply for this circuit is provided either by personal computer (pc) or by data connector. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise. Hence it is the description regarding proposed method.

4. Comparison between previous method and proposed method

Description	Previous method	Present Method			
No.of.components	5	7			
No.of.applications integrated	1	3			
Cost of the equipment	Very less	Very less			
Carrying Capability	Less flexible	More flexible			
Accuracy	less & wrong prediction	Highly accuracy			

5. Result

The following figures depict the result of proposed method .

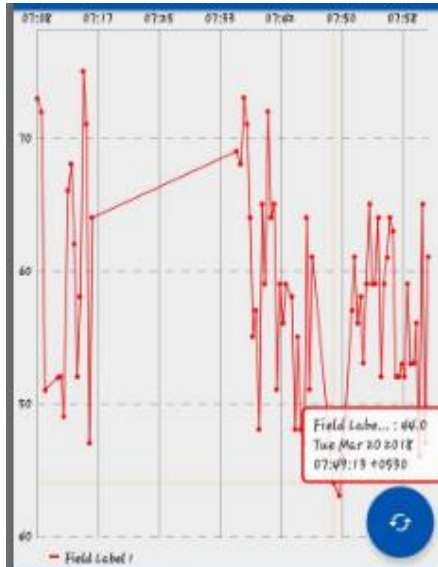


Fig.5.1 Field label -1(Blood alcohol concentration)

Above figure corresponds to blood alcohol concentration .whenever it reaches the threshold value of 70 then only it will update the gps tracker and gives the location of the user. This result is recorded by Alco sensor-iii.

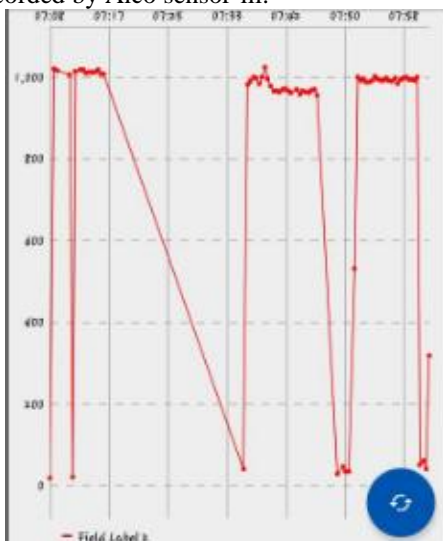


Fig.5.2 field label -2(Pressure in terms of Pascal's)

Field label -2 corresponds to pressure values recorded by pressure switch and it gives the abnormal condition whenever it exceeds more than 1000 Pascal's. Even it gives all the pressure values but the

difference is, it goes to abnormal condition when it exceeds the threshold value otherwise it shows normal condition in smart mobile system as well as in lcd display.



Fig.5.3 field label-3(Seat belt switch values)

Field label-3 shows graphical representation of seat belt sensor values .It shows higher values when driver does not contains seat belt and it goes to low values when driver having the seat belt.

Above all field labels can be represented in lcd display which is given below.



Fig.5.4Field labels representation using LCD display

Hence it is about results regarding all the sensing things.

6. Conclusion & Future Scope

Hence cost of human life not measure with money since it is precious in the world. Hope our proposed

method has large scope to save the human life to large extent. As the smart technology is increasing day by day, this technology is easily reached to common people also. And the major advantage of this technology is, it adds lights to the future. It has availability to extend further in coming days because it can easily update with future technologies.

7. References

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