Car Safety System Enhancements using Internet of Things (IoT

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Car Safety System Enhancements using Internet of Things (IoT)

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Abstract - Nowadays a lot of accidents happen on highways as a result of an increase in traffic and put together as a result of rash driving of the drivers. Many accidents are happening as a result of the alcohol consumption of the driving force or the one person is driving the Car. Thus drunk driving is also a significant reason for accidents in most countries within the world. Alcohol Detector in Car system is meant for the protection of the people seating inside the vehicle and in many things, the relations or the ambulance and police authority is not hip in time. This lead to delaying the help reached to the person suffered as a result of an accident. My research is concerning Alcohol Detection in the car and additionally an Accidental Location Detection using IoT. Once an accident happens, an Emergency message with location details is sent for the protection of the people seating inside the Car. These systems have to be compelled to be fitted / place in inside the car. As well as also include proper car seat-belt detection if driver car seat-belt activated then the car can ready for drive otherwise not drive.

Key Words: Car Safety system, Sensors, Actuators, Microcontroller, IoT, cost, Communication Medium.

1. INTRODUCTION

The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. [7]
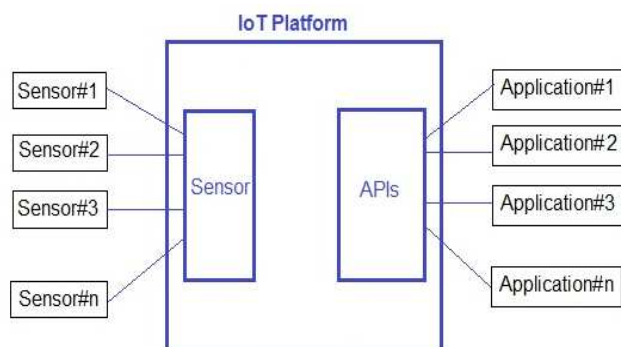

Fig -1: IoT Platform [8]

2. RELATED WORK

A car safety system is planned here; it will facilitate to supply safety for car users furthermore as people. There is such a large amount of car users who drove a car with Consumption of alcohol, which was the reason for a most of car accidents. Also once Associate in an accident happens at non-residential space or highways, in this condition most demand is to offer primary aid (healing) service to injured human by the support of ambulance.

So it was also necessary to include accident detection as well as location detection and this info given to the closest ambulance/police emergency service center (e.g. 108 in INDIA) help of wireless media like SMS (Short Message Service). This can help to reduce the number of accidents occur due to alcoholic drink consumption; additionally find the precise place wherever an accident occurred.

Proper seat belt detection is better than traditional seat belt detection. During this seat belt detection technique, any person doesn't miss use of this safety harness technique. Sometimes there is a possibility of misuses safety harness lock using directly attach of extra safety harness buckle without pull of safety harness by a driver. Therefore vehicle system detects attach the safety harness. By reducing this sort of miss use of safety harness detection within the vehicle, I find the correct detection. When safety harness buckle is hooked up with pulling of safety harness belt, then system checks safety harness is hooked up or not hooked up.

3. PROBLEM STATEMENT

3.1 Problem Identify

In this continues world, day by day several cars are invented and being employed by each individual. As a result of an oversized variety of cars, traffic will also increase and rash driving of cars will also increase. In results of that scenario, accidental condition also increases rapidly. By analyzing a number of the accidental reports most of the accidents occur as a result of rash driving of the car by alcoholic drunk driver.

In accident detection construct to assume regarding one full proof system that can't be plagued by accident, associate additionally detects accidental condition by analyzing car

position and use location instrument to provide data regarding the place at wherever an accident has occurred. For sending that data to health aid center or emergency service supplier, van needed communicating media.

Also In accident detection case, the seat belt is most important for human life safety. During this idea considered one full proof system that can't be plagued by accident, and also observe correct seatbelt detection within the car.

3.2 Problem Definition

To build proper and full proof system that can't be plagued by accident. It provides more accuracy in detection of alcoholic person and detection of an accident situation to save people's life in the situation of an accident.

3.3 Problem Solution

Better alcohol detection with car ignition system.

For a car, accident detection will be simply dropped by using GSM (SIM 900 A) module and GPS module. If any state of affairs is formed by the car is tilting of its position therefore at the time send the message to closed 108 (Ambulance) Service center urgently with its accident location.

Also in seat belt detection system, twin detection technique is used for checking of safety harness is properly attached or not. After pulling of safety harness and check seat belt buckle is attached or not. If each detections unit proper, system understands the safety harness is correctly connected otherwise if safety harness isn't properly connected then alert sound continuously ringing till the proper safety harness isn't connected.
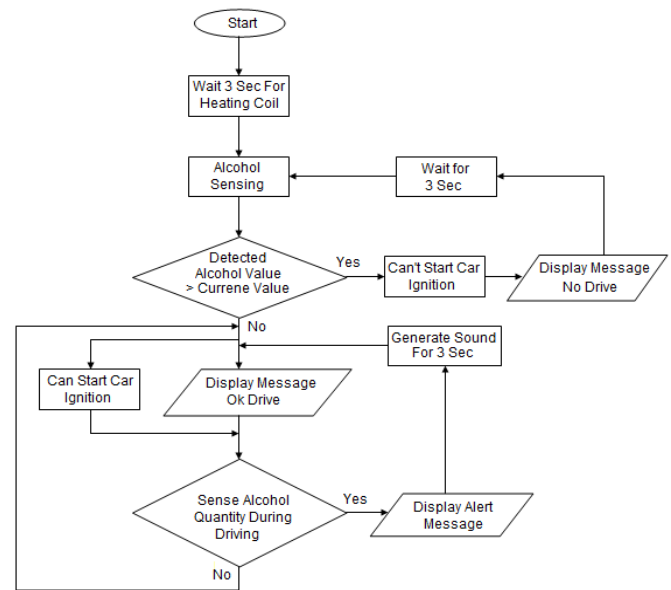
4. SYSTEM METHODOLOGY

First studied all data and after studying data to create an equivalent block diagram of car safety system enhancements as shown bellow in fig 2.
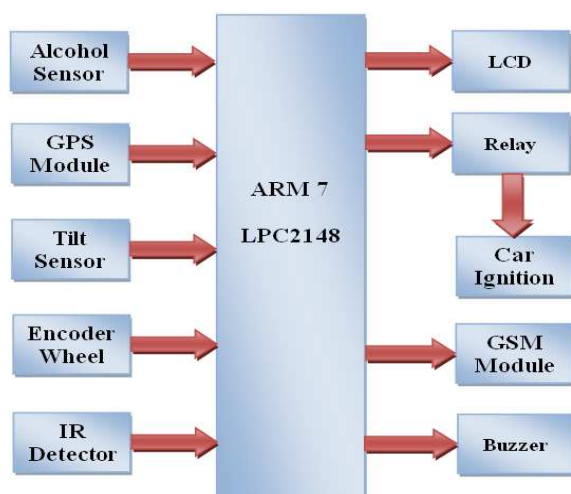

Fig -2: System Methodology

4.1 Alcohol Detection with Car Ignition System

Fig -3: Alcohol Detection with Car Ignition System

Here use MQ-135 sensor which detects alcohol vapor or air. If the person on driving seat inside the car has consumed alcohol then it is detected by the sensor. Sensor gives this signal to the ARM-7. The Microcontroller is the heart of this system. It is the CPU of the complete circuit. If the driver is drunk then the vehicle ignition will not start (relay is off) and wait till the exchange of driver. If driver is not drunk, then the system will allow to start the vehicle ignition (relay is on). During on road driving condition if the driver is drunk then the system will show alerting message on display and buzzer will be on.
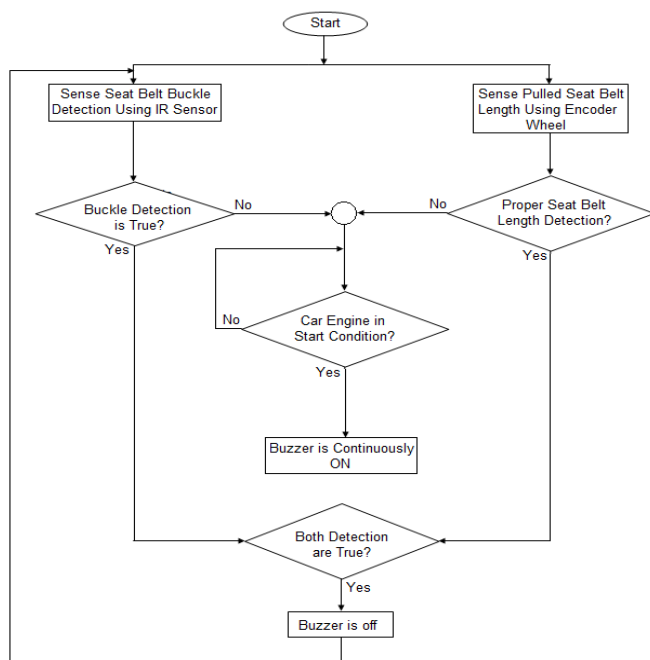
4.2 Car Tilting System
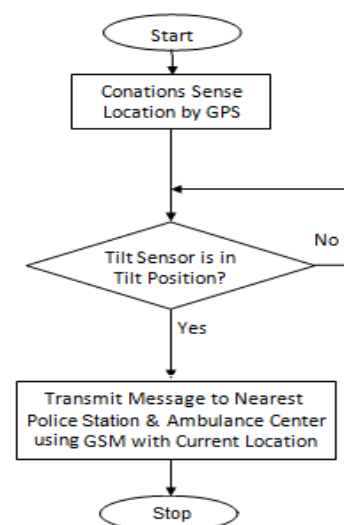
Fig -4: Car Tilting System

For detection of an accident, Tilt sensor, this can detect angular movement of the device. An output of this unit is given to the ARM-7. Microcontroller decides its accident when car is tilting. If an accidental situation is detected then it fetches data from the GPS about recent location. Then it gives the command to GSM module to send SMS to nearest Ambulance center and Police station.

4.3 Seat Belt Detection

Fig -5: Seat Belt Detection

For detection of proper seat is put on or not, for this purpose used IR sensor (for seat belt buckle detection) and encoder wheel for counting pulses of sensing how much length is pulling of seat belt. An output of these both sensors is given to the ARM-7. Microcontroller decides the seat belt is properly attached or not. If both sensor outputs are properly so microcontroller decides the seat belt is properly attached otherwise seat belt alert sound continuously ringing.

5. SENSORS IMPLEMENTATION IN THE CAR

Fig -6: Sensors Implementation in the Car

A	Alcohol Sensor
B	GSM Module (SIM 900A)
C	GPS Module
D	Tilt Sensor
E	Encoder Wheel
F	IR Sensor Detection

Table -1: List of Sensors Used in System
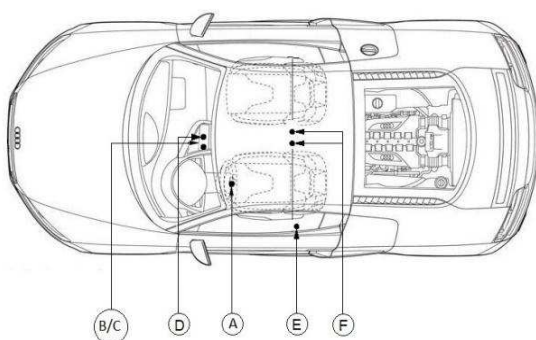
6. CONCLUSION AND FUTURE WORK

From research of this type of safety system enhancements, can decrease number of accident which is occurring due to alcohol consumed drivers and save human's life because of accidental situations. The proposed car safety system is based on different types of sensors to collect the car parameters conditions, process it to take the corrective decision at anytime and anywhere and transmitted with current location using wireless communications elements GSM and GPS modem. However this proposed system has fulfilled challenges in terms of cost, energy, communications technology.

Try to implementation of the proposed system and testing the safety system with proper and correct outputs. The comparison of the proposed system with the existing system will help to prove the best enhancements of the proposed system.

REFERENCES

Papers:

[1] Tushara, D. B., & Vardhini, P. H. (2016, March). Wireless vehicle alert and collision prevention system design using Atmel microcontroller. In Electrical, Electronics, and Optimization Techniques (ICEEOT), International Conference on (pp. 2784-2787). IEEE.

[2] Anil, B. S., Vilas, K. A., & Jagtap, S. R. (2014, April). Intelligent system for vehicular accident detection and notification. In Communications and Signal Processing (ICCSP), 2014 International Conference on (pp. 1238-1240). IEEE.

[3] Jeong, W. J., Lee, J. M., Park, K. T., & Moon, Y. S. (2014, January). Car accident detection in parking lots. In Electronics, Information and Communications (ICEIC), 2014 International Conference on (pp. 1-2). IEEE.

[4] Amin, M. S., Jalil, J., & Reaz, M. B. I. (2012, May). Accident detection and reporting system using GPS, GPRS and GSM technology. In Informatics, Electronics & Vision (ICIEV), 2012 International Conference on (pp. 640-643). IEEE.

[5] Tushara, D. B., & Vardhini, P. H. (2016, March). Wireless vehicle alert and collision prevention system design using Atmel microcontroller. In Electrical, Electronics, and Optimization Techniques (ICEEOT), International Conference on (pp. 2784-2787). IEEE.

[6] Bhavthankar, S., & Sayyed, H. G. (2015, August)Wireless System for Vehicle Accident Detection and Reporting using Accelerometer and GPS. .In Electronics and Communication Engineering (ECE). IJ.

Websites:

[7]   http://www.rfwireless-world.com/IoT/IoT-Platform-basics-and-IoT-platform-Vendor-Companies.html

[8]   https://www.quora.com/What-is-IOT-and-its-scope-in- future