

## Internet of Things (IoT) Based Alcohol Sensing and Accident Alert System

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### ABSTRACT

Nowadays, lots of accidents happened 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 driver. 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 car and in many situations, 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. This research is concerning Alcohol Detection with car ignition system 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. This system has to be installed inside the car.

Date of Submission: 10-02-2018

Date of acceptance: 28-02-2018

### I. INTRODUCTION

A car safety system is planned to facilitate safety for car users. 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 is also necessary to include accident detection as well as location detection and this info given to the closest ambulance/police emergency service centre (e.g. 108 in INDIA) with the help of wireless media like SMS (Short Message Service). This can help to reduce the number of accidents occurs due to alcoholic drink consumption; additionally find the precise place wherever an accident occurred.

### II. PROBLEM STATEMENT

#### A. Problem Identification

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 analysing 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 analysing car position and use location instrument to provide data regarding the location where an accident has occurred. For sending that data to health aid centre or emergency service supplier, van needed communicating media.

#### B. Problem Definition

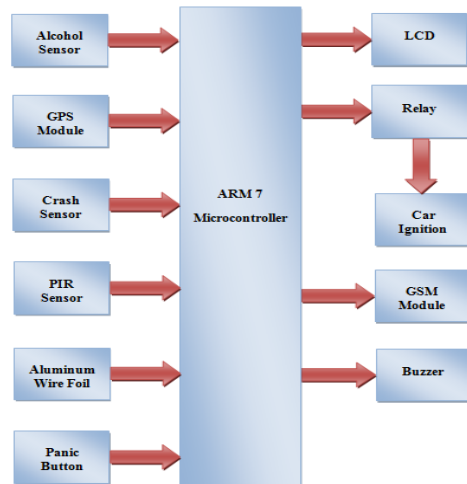
To build proper and full proof system that can't be plagued by accident. It provides more accuracy in detection of alcoholic person and save people's life that seat in the car in the situation of an accident.

#### C. Problem Solution

Better alcohol detection will be simply dropped by using MQ-135 alcohol sensor 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 crash or collision by any angle, the system sends the message to closed 108 (Ambulance) Service centre at the moment with its accident location.

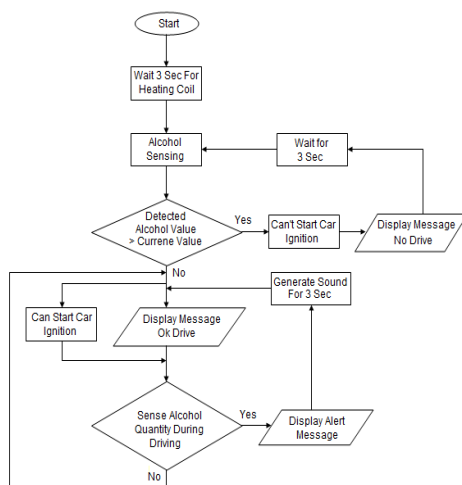
### III. SYSTEM METHODOLOGY

According to problem solution, the equivalent block diagram of car safety system enhancements as shown below in fig 1.



**Fig.1:** Block Diagram of System Methodology

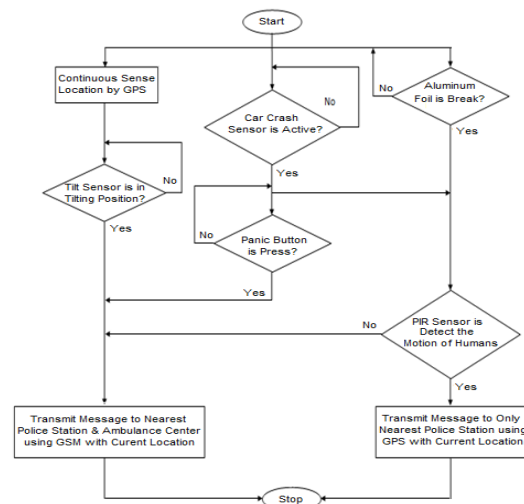
#### A. Alcohol Detection With Car Ignition System



**Fig.2:** Alcohol Detection with Car Ignition System <sup>[7]</sup>

Here MQ-135 sensor is used which detects alcohol vapor or air. If driver of 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. <sup>[7]</sup>

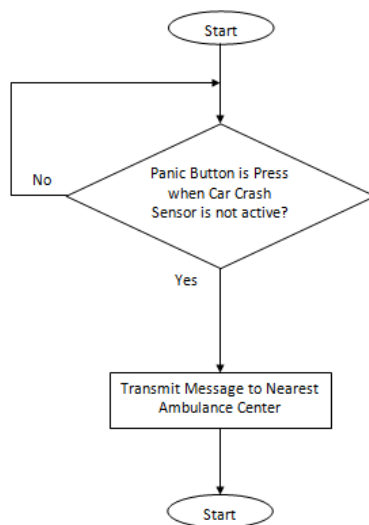
#### B. Crash or Collision Detection



**Fig.3:** Crash or Collision Detection

For other accident situation, car crash sensor as well as aluminum foil is used to detect accident happened in any direction. The car crash sensor is installed in all corner regions in the car to sense any car body part crash or not. Also aluminum foil is used to detect any outer side of car body part is crashed or not, this foil is properly attached within the car body. This foil is attached in zigzag form to cover whole car body. Aluminum foil provides continuity path of its foil. If collision detects at any side of the car then this foil is break and this broken foil is sensed by the microcontroller to understand that an accident has occurred. So it immediately sends the emergency message with accidental location to nearest police station. PIR sensor detects the human body movement and checks whether the human inside the car is alive or not. And if human is alive, it will not send information to nearest medical emergency centre. And if there is no movement found, then it will send information nearest medical emergency centre

### C. Emergency Panic Button Detection

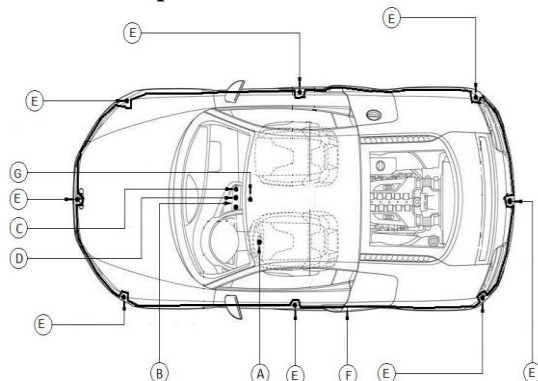


**Fig.4:** Emergency Panic Button Detection

In any other emergency situation, there is a need of medical emergency services. So, for this purpose I have used panic button function. This button sends emergency medical help message to nearest ambulance or health care centre with current location.

## IV. IMPLEMENTATION

### A. Sensor Implementation in the Car



**Fig.5:** Sensor Implement in the Car

A	Alcohol Sensor
B	GSM Module (SIM 900A)
C	GPS Module
D	Panic Button
E	Car Crash Sensor
F	Aluminum Foil Strip
G	PIR Sensor

**Table.1:** List of Sensors Used in System

### B. Get Alert Messages When Accident Occurs

- 1) When any crash or collision at any body part of the car, the system immediately sends the

emergency message with accidental location to nearest police station.

Accident Occur At this place  
Degrass for Latitude is:  
23° 11' 25" N  
Degrass for Longitude is:  
072° 38' 15" E  
Driver Name  
Car Num.: GJ-XX-XX-XXXX

**Fig.6:** Received Messages for Accident Detection

- 2) If the Emergency Panic Button is pressed for medical help, then the system immediately sends the emergency message to nearest Medical or Ambulance Centre with accidental location.

Medical Emergence At this place  
Degrass for Latitude is:  
23° 11' 24" N  
Degrass for Longitude is:  
072° 38' 15" E  
Driver Name  
Car Num.: GJ-XX-XX-XXXX

**Fig.7:** Received Messages for Medical Emergency

Above received messages with current location, driver name and its car number. Generally GPS gets value in DDMM.MMMM format 2311.41666 N (latitude) and 07238.2558 E (longitude), But in this system, it converts accurate location in form of DMS (Degree Minuit Second) with latitude and longitude 23° 11' 25" N (latitude) and 072° 38' 15" E (longitude).



**Fig.8:** Traced Location using DMS Location <sup>[8]</sup>

This DMS value is inserted in Google map to trace perfect location of an accident.

## V. CONCLUSION

In this safety system enhancements, the number of accident is decreased 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.

## VI. FUTURE WORK

The implementation of the proposed system and testing the safety system will be done with proper and correct outputs.

## Acknowledgements

We are thankful to Director, BISAG for providing infrastructure and encouragements.

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Viral M. Vyas "Internet of Things (IoT) Based Alcohol Sensing and Accident Alert System  
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pp. 46-49