Accident Prevention Information System By Using Alcohol And Obstacle Detection

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ABSTRACT - This report presents the accident prevention with security and safety techniques used by using IoT. Device fixed in the vehicle. The objective behind this proposed system is to reduce the number of count of accidents, also avail the help to the victims of the accidents in alone place or no-man place. The person with whom accident happens is not in a condition to call for help, the vehicle automated system will call to the nearest emergency services like police, ambulance as well as it will inform to the relative of the owner of vehicle, the GSM and GPS module is used to perform that operation. In this project the automated system will detect the obstacles in the road which cannot be seen by the driver or maybe it was mistakenly missed by the driver then system will detect and reduce the speed of the vehicle with the help of RF or PIR sensor. If driver is drunk it will be detected with the help of Alcohol detection sensor MQ3, then the alert message will be sent to the device, and device will send the alert message to relatives of the owner of the vehicle it sound the alert alarm to the driver.

*Key Words***:** Arduino ATmega328, Ultrasonic Sensor, IR Sensor, Alcohol MQ3, VSS, GSM (Global system for mobile communications), GPS.

1. INTRODUCTION

Road accidents are a big problem on road, most of the accidents are happen due to the rash as well as irresponsible driving, if the drivers the vehicle irresponsibly the accident happened and someone dies in that accident .The driver droves the vehicle after drinking is very irresponsible, the drive will lose his concentration, and the accident will happen. The accident, which are happen in the no-man area the help not available to the victim, there is system needs to call emergency services in a nearby location, which can available help to the victim. Sometimes the driver cannot see the objects or obstacles in the path of the vehicle, that time smart system will identifies the obstacle and reduces the speed of the vehicle and stops the vehicle until it passes away from the path of the vehicle. The victim cannot send or call for help at that time the smart system can inform to their relatives as well as emergency services.

2. LITERATURE SURVEY

[1]   In this paper author developed a system by integrating alcohol sensor with Arduino board. Arduino processor ATmega328 is able to handle more functions than conventional micro-controllers.

[3]   The author designed a system implements using Arduino to derive the condition of driver in real time, he tries to detecting alcohol consumption if it crosses the permissible limit then vehicle ignition system will turn off and capture present location through GPS module which can then send message to relatives and police.

[4]   In this paper author uses to take precaution using IoT Device for protection of driver from accident. An individual device is analyzing drunk, drowsy state of driver and take precautions based on that analysis as speed reduction, triggering an alarm, informing traffic control, activation of autopilot.

[5]   In this paper, the author used Atmega328P to communicate with vehicle machineries as well as hardware parts of device to achieve appropriate goal. She also used smoke sensor, alcohol sensor and eye sensor piezoelectric sensor for achieving his goal to contact emergency services as well as relatives of victim through GPS locator and GSM module. However, in this paper author is not used provision for obstacle sensing.

[6]   The author focuses of road safety by wearing seat belt to reduce the effect of accidents to prevent driver.

[7]   The state of driver is monitored i.e. drunken or drowsy and alert the driver by continuously playing voice messages where system needed after analyzing the risk conditions and if driver is not following those rules then the system will send the location of the vehicle with the vehicle details to the nearest police control room for taking further action by the police on the driver for safety of driver as well as co-passengers.

[8]   This system is monitoring and designed for two wheelers by designing smart helmet which detects the alcohol monitoring and the helmet wearied by driver or not.

[9]   System provide alert message by alarm, system gives alert message to the driver if driver stops the vehicle then alert message will stops in 12 seconds. If the driver not following this precautions on alert message the system will stops the engine of vehicle

for saving driver from accident. It is monitoring drowsy state, head tilt and alcohol detection.

[10]   The system will measuring the velocity of the vehicle and tilting position of the vehicle in case of the vehicle struck on something. The warning message will give to the driver when the velocity of vehicle is more than defined, it will also sends the message to the relevant peoples who are related to the driver or owner of the vehicle.

PROBLEM STATEMENT

Drunken drive is the major reason of accidents worldwide. In the influence of Alcohol driver does not have perception recognition and vehicle control, and in night sometimes driver who does not consume alcohol are also failed vision (having poor vision) in dark.

PROPOSED SYSTEM

IoT is continuously growing over years, which use in developing automated analysis system to visualize and control vehicle in unclear vision to prevent from accident.

3. TECHNOLOGIES RELATED TO ACCIDENT PREVENTIVE SMART VEHICLE

1. ARDUINO BOARD:

The Arduino board is the central unit of the system.The Arduino uno iss the microcontroller board based on the ATmegha 328. It Is a programmable microcontroller for prototyping electromechanical devices. It has 14 digital input/output pins,6 analog input.

Fig-1: Arduino uno Board

FEATURES

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage	7-12V
Input Voltage(limits)	6-20V
Digital I/O Pins	14

Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA

2. ULTRASONIC SENSOR:

Ultrasonic sensor makes use of high frequency ultrasonic waves to detect any movement within limited space. The range of frequencies between 25 kHz and 75 kHz, which are the inaudible to human ears. These frequencies are hit the obstacles in a frequent area .Ultrasonic sensor used for measuring distance by using ultrasonic waves. An ultrasonic sensor emits ultrasonic waves for the emitter .These waves hit the obstacles and receive wave back from obstacle. Ultrasonic sensor measure distance up to the obstacle by measuring time between emission and reception.

Fig -2: Ultrasonic Sensor

APPLICATION OF ULTRASONIC SENSOR:

1. Distance measurement

2. Ultrasonic sensor in motion detection

3. ALCOHOL DETECTING SENSOR (MQ3):

An alcohol sensor detects the attentiveness of alcohol gas in the air and an analogue voltage is an output reading. The sensor can activate at temperatures ranging from -10 to 50° C with a power supply is less than 150 Ma to 5V. The sensing range is from 0.04 mg/L to 4 mg/L, which is suitable for breathalysers. The MQ-135 gas sensor senses the gases like ammonia nitrogen, oxygen, alcohols, aromatic compounds, sulphide and smoke. The boost converter of the chip MQ-3 gas sensor is PT1301. The operating voltage of this gas sensor is from 2.5V to 5.0V. The MQ-3 gas sensor has a lower conductivity to clean the air as a gas sensing material. In the atmosphere, we can find polluting gases, but the conductivity of gas sensor increases as the concentration of polluting gas increases. MQ-135 gas sensor can be implementation to detect the smoke, benzene, steam and other harmful gases. It has potential to detect different harmful gases

Fig -3: Alcohol Detecting Sensor

APPLICATION OF ALCOHOL DETECTING SENSOR:

1. Air quality monitor
2. Detection of harmful gases
3. Domestic air pollution detection
4. Industrial pollution detection
5. Portable air pollution detection

4. GSM MODULE

The GSM net used by cell phones provides a low cost, long range, wireless communication channel for applications that need connectivity rather than high data rates. The protocol used by GSM modems for setup and control is based on the Hayes AT-Command set. The GSM modem specific commands are adapted to the services offered by a GSM modem such as: text messaging, calling a given Phone number, deleting memory locations etc.

Applications: Machinery such as industrial refrigerators and freezers, HVAC, vending machines, vehicle service etc.

Fig -4: GSM Module

5. GPS MODULE:

The Global Positioning System (GPS) is a space based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver.

Fig -5: GPS Module

APPLICATIONS:

1. Maps, including streets maps, displayed in human readable format via text or in a graphical format turn-by turn navigation directions to a human in charge of a vehicle or vessel via text or speech.
2. Directions fed directly to an autonomous vehicle such as a robotic probe.
3. Traffic congestion maps (depicting either historical or real time data) and suggested alternative directions.

6. LIQUID CRYSTAL DISPLAY

Liquid crystal display screen is the electronic display module and find a wide ranges of application. A 16*2 LCD display is very basic module and it is very commonly use in various devices and circuit.

The command registers stores the command instructions given to the LCD.

Fig -6: Liquid Crystal Display

7. BUZZER

Fig-7: Buzzer

APPLICATION:

1. Novelty uses
2. Judging panels
3. Educational purposes
4. Electronic metronomes

4. SYSTEM ARCHITECTURE:

We describe architecture and various components used for implement the Accident prevention information system by using alcohol and obstacle detection.

In this project, we have use   alcohol sensor module (MQ3) for detecting alcohol , LCD display used for display the notification, buzzer is used for alert the message , GSM module is used for sending the message, GPS module is used for sending the location of vehicle and Ultrasonic sensor is for detecting the obstacle .
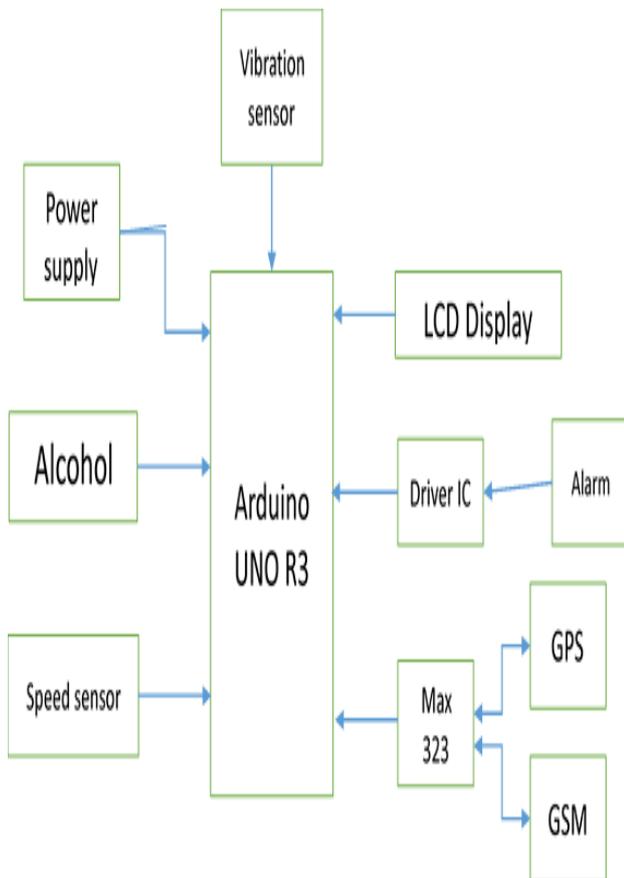

Fig -8: Architecture Diagram

The entire system adopted the Arduino uno microcontroller board (ATmega 328) is the central unit of the system. All the components are interface to the board and programed as per their functionality to operate in synchronization.
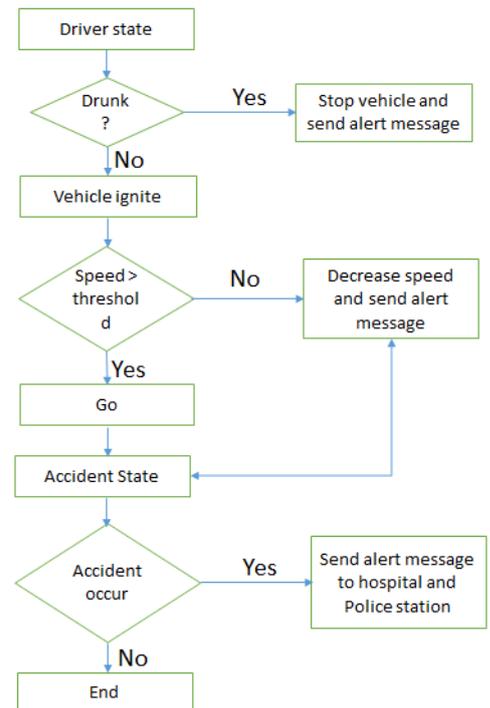
5. SYSTEM FLOW CHART

Fig-9: FLOWCHART

➢ Starting vehicle by driver.
➢ Check speed of vehicle.
➢ If it is zero then start sensing by various sensor & notify detection .In this   case alcohol is mainly checked if it detected then stop ignition.
➢ If the speed is greater than threshold value then again sensing started. Detection of various parameter will be sense by sensor & will be notify.
➢ At a same time if alcohol is detected then speed is decreased and vehicle is stop.
➢ Vehicle will stopped & notify detection to relative .

ADVANTAGES

1. To prevent accident due to drunk and driving.
2. Easy and efficient to test the alcohol content in the body.
3. Quick and accurate results.

APPLICATIONS

1. "Alcohol detection project" can be used in the various vehicles for detecting whether the driver has consumed alcohole or not.
2. This project can also be used in various companies or organizations to detect alcohol consumptions of employees.

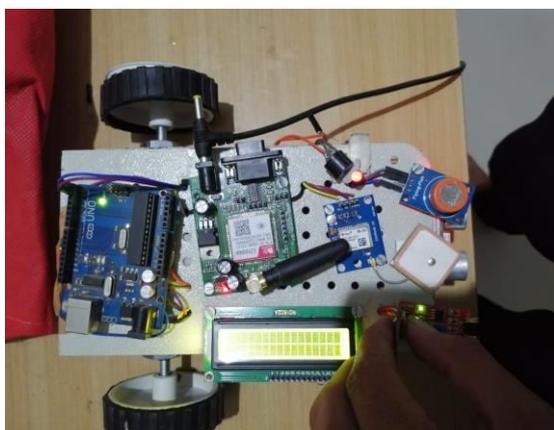## 6. IMPLEMENTATION

Fig-10: Hardware setup

Fig-11: Implementation

Whene the drunken driver enters in the vehicle alcohol sensor senses the alcohol, therefore buzzer ringes and LCD displays that alcohol is detect.

If obstacle is detect then control the speed of vehicle and LCD displays that obstacle is detect. And also send message to the relative.

7. CONCLUSIONS

Therefore, our survey concludes that using such sensors as mentioned above we can create many useful application for security, automation and many other fields. Here we conclude that the smart car system used that Alcohol detecting sensor MQ3 for detecting the alcohol in gas and Obstacle Detection using IR and Ultrasonic Sensor.

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