An IOT Based Alarm System in Car for Traffic, Alcohol and Drowsiness Detection and Accident Prevention

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---ABSTRACT--

 Ever increasing number of accidents while driving can be significantly reduced if modern technology is introduced within the automobile to monitor the physical condition of the driver at every instance during the movement of the vehicle and precautionary measures are taken for the safety of the driver. In this paper, a design of drowsiness detector system and pedal mix-up avoidance is presented. Detection of drowsiness is introduced which can monitor the eye movement and eye blinking of the driver at regular intervals during his/her driving and, if required, can provide an audible alarm when Seatbelt and alcohol sensor detects within the vehicle to alert the driver. Under such situations, unintended acceleration avoidance system decides the correct pedal and raise the brake whenever mistakenly accelerator is been raised. The design of the system has been successfully implemented which produces an outcome that such a system can help in avoidance of sudden unintended acceleration and also help in keeping the driver awake while driving. Thus, this system facilitates in avoidance of any traffic accidents. Finally all data will be stored in sever (mysql) and the data will be displayed using JSP & CSS. Raspberry Pi controls the vehicle and sensor by using python language.

Keywords - **Drowsiness detection, pedal mix-up avoidance, alcohol detection, traffic detection, Raspberry Pi and sensor.**

I. INTRODUCTION

The development of technologies for preventing drowsiness of the driver is a major challenge in the field of accident avoidance systems. The main aim of this paper is to develop a non-intrusive system which can detect driver's drowsiness and prompt a timely warning. An accident resulted due to driver's drowsiness has a high fatality rate, because the perception, recognition, and vehicle control abilities reduces immediately while falling asleep. Driver drowsiness detecting technologies reduces the risk of an accident by warning the driver of his/her drowsiness. Drowsiness preventionof drivers during driving requires a method to detect a decline in driver alertness accurately and a method to alert and refresh the driver immediately. Thus by observing the eyes of the driver constantly, one can detect the sleepy state of driver early enough to avoid accident. Here we are also using Ultrasonic, Seat Belt Remainder and Alcohol Sensors to avoid road accident. Alcohol Sensor notice whether the driver had drunkard and if the driver had drunkard, the Sensor sends an alert. Seat Belt Remainder sensor senses whether the seat belt is locked when the car is switched on. If not, car ignition slowly drops down. Ultrasonic sensor senses the distance between car and other objects or person. If the distance fall below the fixed value, it alerts the driver.This paper illustrates the methods to detect the drowsiness of the driver, alcohol consumption and save the life of the driver and also the persons travelling in that car. Finally, all the sensor values are collected and stored in server.

II. RELATED WORK

Current systems have IR sensors directly placed near the eye for fatigue detection which makes user aiding complex.This system is slow in detecting the drowsiness and consumes more time to give the output and warn the driver accordingly. The existing system which is utilized is also very costly and is implemented only in high class and very expensive vehicles. Because of which, the normal vehicles lack such safety ensuring systems. The system is GPS based location sharing services, so that when accident happened with GSM module, the status about the vehicle is analyzed when the vehicle accident detected. The major disadvantage is that the performance depends on compiler. It also has poor code density, RISC having fixed size of instruction format and small number of instructions.
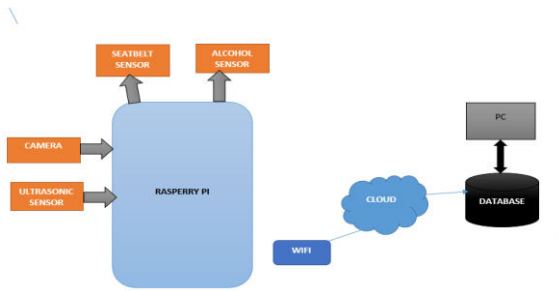
Fig. 1 System model

III. HARDWARE AND SOFTWARE

- **Raspberry Pi :** Raspberry Pi is a credit/debit card sized small and single board computer. The board is cost effective while comparing an actual computer, uses power rating of 5V, 700mA and it weighs not more than 50g. The processor at the heart of the Raspberry Pi system is a Broadcom BCM2837 system-on-chip (SoC) multimedia processor. It indicates that the vast majority of the system's components, which includes its central and graphics processing units along with the audio and communications hardware, are built onto that single small sized component hidden beneath the 256 MB memory chip at the centre of the board.

- **Python :** There are considerable numbers of programming languages which have been adapted for Raspberry Pi. Python is recommended by The Raspberry Pi foundation.

- **HTML** : HTML - HyperText Markup Language, used for structuring and presenting content on WWW - World Wide Web.

- **CSS** : Cascading Style Sheets (CSS) is a style sheet language which is used to describe the look and formatting of a document written in a markup language. CSS is a latest standard of CSS.

- **JavaScript** : JavaScript is a dynamic programming language that, when applying it to an HTML document, provides dynamic interactivity on websites which is very useful. It is not as similar as Java language.

IV. PROPOSED WORK

This paper approaches a system towards automobile safety with autonomous region based automatic car system. We propose three distinct concepts namely, a Drowsy Driver Detection system, a traffic detection system with external vehicle intrusion avoidance based concept and alcohol consumption detection system. In recent time's automobile fatigue related crashes have really magnified. In order to minimize these issues, we have incorporated driver alert system by monitoring the driver's drowsiness and sensing external traffic, lockage of seat belt and consumption of alcohol. This is implemented using an IoT - Internet of Things based system which uses Raspberry Pi. ML - Machine Learning is applied for the eye detection and region classification. It also has Driver Assistance system with camera and an Alarm.
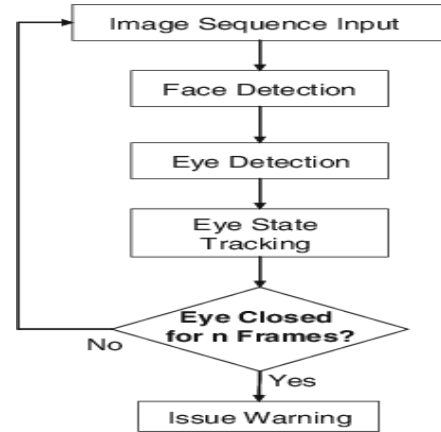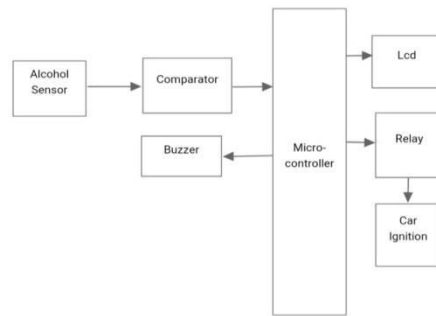

Fig. 2 Drowsiness Detection System Model
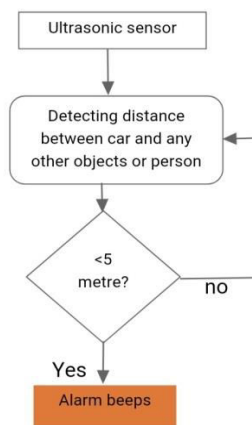

Fig. 3 Alcohol Detection System Model

Fig. 4 Traffic Detecting model

4.1 Drowsiness Detection System

Driver drowsiness detection technologies can reduce the accident by warning the driver of his/her drowsiness. It works by constantly observing the eyes of the driver which helps in detecting the sleepy state of driver early enough to avoid accident. To achieve this, Machine Learning is used for eye detection.

4.2 Alcohol Detection System

It is implemented by using an "Alcohol sensor". The sensor senses for alcohol detection and if the person inside car had consumed alcohol then sensor gives this signal to a comparator IC. The output from the comparator is connected to the microcontroller. Microcontroller is the heart of this experimental kit. It is the NODE MCU of the complete circuit. Microcontroller gives high pulse to the Speech recognition circuit and the Speech recognition is turned on and at the same time a relay is turned off which in turn deactivates the ignition of the car. Alcohol Detection System in Cars provides an automatic safety system for persons inside the car and others as well.

4.3 Seat Belt Remainder System

Passive seat belt is costly and needs skilled person for installation purpose. Automatic seat belt systems offers an inferior occupant crash protection. Seat Belt Remainder sensor senses whether the seat belt is locked when the car is switched on. If not, sensor sends a signal to comparator IC. The output from the comparator is given to the microcontroller which is further used to control vehicle system. As a result, car ignition slowly drops down.

4.4 Ultrasonic Sensor

This Driver Assistant System controls the distance between the car and other vehicles or obstacles to come. Esp8266 microcontroller performs all operations. If the obstacle is in the sensing zone Speech Recognition sounds to give a warning. In this measurement application of the distance of an obstacle the apparatus such as a digital ultrasonic transmitter, the receiver module and a microcontroller are used. The ultrasound view considered here is suitable for measuring the distance between 4 metre and 5 metre.

4.6 Server creation

Admin has to create the profile in cloud. Admin will monitor the sensor data which we are getting from micro controller. If the sensor value flow is high, admin will take necessary action in cloud. We are using MySQL database for storing the sensor value. From there, admin will get all the data. User has to create one profile in cloud. User they can keep the data's securely. After login, user also can see the data from database which we are getting from micro controller.

4.6 Web server

A Web server is a program that uses HTTP - HyperText Transfer Protocol to serve the files that form Web pages to end users, in response to the requests, that are forwarded by their computers' HTTP clients. Dedicated computers and appliances can be referred to as a Web server as well.

V. CONCLUSION

This paper represents a systemthat has a value added in bringing the safety features to fatigue drivers. The system ensures that all car drivers gives their full attentiveness while driving on the road and not to take safety systems provided for granted as it will not only caused their lives but others too. This system act as a reminder to all drivers that they should be in alertwhen they are behind the wheels for their own safety.

VI. FUTURE ENHANCEMENT

This system can be interface with vehicle airbag system that avert vehicle occupants from getting injured. This can also be improved by adding a camera to the controller module that captures the accident spot and share its location which makes the tracking easier. In Existing we are collecting data from a single car. In future we are going to collect data and sensors values from various cars and storing the data in server. By analyzing the collected data we going to find why accidents occur and provide ways to reduce the road accidents in future.

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