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Alcohol Detection System in Vehicles

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***Abstract* - This system is designed to detect the alcohol level in the body of the person who is driving car and avoid accidents occurring due to drunk and driving. The system uses raspberry pi with alcohol sensor, dc motor. System uses alcohol sensor with, raspberry pi with dc motor to demonstrate as vehicle engine. System constantly monitors the sensitivity of alcohol sensor for drunk driver detection. If driver is drunk, the processor instantly stops the system ignition by stopping the motor. If alcohol sensor is not giving high alcohol intensity signals, system lets engine run. The raspberry pi processor constantly processes the alcohol sensor data to check drunk driving and operates a lock on the vehicle engine accordingly. We proposed to reduce the number of accidents caused by driver fatigue and thus improve road safety. This system treats the automatic detection of driver drowsiness based on visual information and artificial intelligence. We locate, track and analyze both the driver face and eyes to measure PERCLOS (percentage of eye closure) with Softmax for neural transfer function. it will be also uses alcohol pulse detection to check out the person is normal or abnormal. Driver's fatigue is one of the major causes of traffic accidents, particularly for drivers of large vehicles (such as buses and heavy trucks) due to prolonged driving periods and boredom in occupied conditions.**

Keywords: Alcohol detection, Raspberry pi, alcohol sensor MQ3.

1. INTRODUCTION

According to the survey conducted every year, drunken driving resulted in 3,314 deaths in India. This drinking and driving are already a serious public health problem, which is likely to emerge as one of the most significant problems in near future. Also, driver fatigue is when a driver's ability to drive safely is reduced as a result of being physically or mentally tired or sleepy. This paper presents the progress in using an alcohol detector a device that senses alcohol content in surrounding air.

The system detects the presence of alcohol in vehicle and immediately locks the engine of the vehicle. Also, studies have shown that fatigue is one of the leading contributing factors in traffic accidents worldwide. It is particularly critical for occupational drivers, such as drivers of buses and heavy trucks, due to the fact that they may have to work over a prolonged duration of the driving task, during the peak drowsiness periods. The system implemented is used to detect drowsiness and alcohol detection.

2. LITERATURE REVIEW

In this paper the author describes the alcohol detection system for vehicle by using alcohol sensor, camera and a buzzer. Many states require offenders to install ignition interlock devices at the drivers own expense. An ignition interlock device is a breath test device connected to a vehicle's ignition.

The vehicle cannot be operated unless the driver blows into the interlock and a BAC below a pre-set low limit, usually, 0.2 g/dl. This keeps drunk drivers to stop driving the vehicle and avoid accidents. This paper introduces methods such as alcohol detection, face monitoring that can detect driver hypo vigilance (both fatigue and distraction) by processing of eye and face regions, since sleepy drivers often do not take correct action prior to a collision.

For this reason, developing systems for monitoring driver's level of vigilance and alerting the driver, when he is drowsy and not paying adequate attention to the road, is essential to prevent accidents. In our paper we discuss about the alcohol detection system for vehicle using alcohol sensor MQ3 and buzzer using raspberry pi.

3. PROBLEM STATEMENT

Driving after drinking is deadly. Yet it still continues to happen across the world. Drivers under the influence of alcohol shows a clear failure of perception recognition and vehicle control. So, by this accident occurs. Also, when it comes to knowledge of the risk of falling asleep, the drivers were confronted with several statements concerning characteristics of drivers who fall asleep (age, sex, physical condition, sleeping problems) in addition to a statement that falling asleep can happen to anyone.

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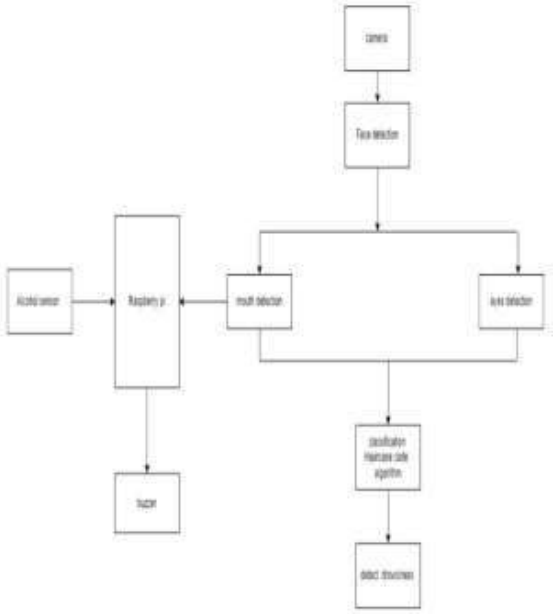
4. HARDWARE MODULES



The core functions module are raspberry pi, alcohol sensor, buzzer, camera and dc motor(as an engine).

Raspberry pi:

Raspberry Pi (/pa/) is a series of small single-board computers (SBCs) developed in the United Kingdom by the Raspberry Pi Foundation in association with Broadcom. It is widely used in many areas, such as for weather monitoring, because of its low cost, modularity, and open design. It is typically used by computer and electronic hobbyists, due to its adoption of HDMI and USB devices. he Foundation was rededicated as an educational charity for promoting the teaching of basic computer science in schools and developing countries. In this paper we used it for working system that connects the alcohol sensor, camera, buzzer and dc motor (vehicle engine) to process the instructions.

Specifications:
Quad core 1.2 GHz Broadcom BCM2837 64 bit CPU 1 GB RAM
100 Base Ethernet
BCM43438 wireless LAN and Bluetooth Low Energy (BLE) on board
40-pin extended GPIO
4 USB 2 ports
4 Pole stereo output and composite video port
Full size HDMI

Alcohol sensor (MQ3):

An alcohol sensor detects the attentiveness of alcohol gas in the air and an analog 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 breath-analysers.

Specification:
Heating consumption ¡800mw
Sensing Resistance 1 M – 8 M
Concentration Scope 25 – 500 ppm
Preheat Time Over 24 hour

Buzzer:

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). ... Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Specification:
Operating Voltage 4 8 V
Max Rated Current 32 mA
Min. Sound Output at 10cm 85 dB
Resonant Frequency 2300 ±300 Hz

Webcam: -

This device is used to take frames of photo i.e. video in BGR format and frame will pass through raspberry pi and computer vision algorithm through it and so that if the contour sensed with drowsiness then the person is being notified with buzzer signal given from raspberry pi.

5. ADVANTAGES

Our proposed method is able to distinguish the simulated drowsy and sleepy states from the normal state of

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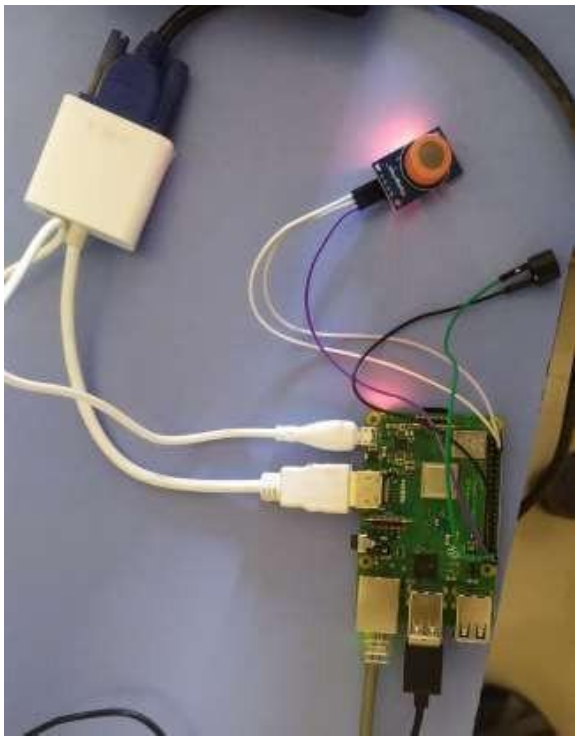
driving on the low resolution images of faces and eyes observed from an oblique viewing angle. Hence, our system might be able to effectively monitor bus driver's attention level without extra requirement for cameras. Our approach could extend the capability and applicability of existing vision- based techniques for driver fatigue detection.

6. APPLICATIONS

- "Alcohol detectors project" can be used in various vehicles for detecting whether the driver has consumed alcohol or not and to avoid road accidents.
- It also can be used to avoid driver fatigue.
- This project can also be used for driver safety.

7. RESULTS & DISCUSSION

When the drunken driver enters in the vehicle and turns on the ignition, the alcohol sensor senses the alcohol, therefore buzzer rings that alcohol is detected as shown in fig.1 and ignition of vehicle automatically turns off by relay. Also, the computer vision is used in the paperwork. The camera used in the device gives a constant flow of frames i.e. video streaming. Every frame is fixed with contours at the face, detection driver's face and eyelids position, for the detection of the drowsiness during the driving. So, by this the purpose of our project succeeds.



8. CONCLUSION

Towards Detection of Bus Driver Fatigue Based on Robust Visual Analysis of Eye State is very useful for users. 2. This system automatically analyses the driving characteristics and if they indicate possible fatigue, recommends that the driver takes break. 3. This system treats the automatic detection of driver drowsiness based on visual information and artificial intelligence.

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