



DRIVER ALERTNESS DETECTION SYSTEM (DADS)

Mr.N.Mathavan¹, Dr.S.SivaRanjani²

*Assistant Professor, Dept. of ECE, Nadar Saraswathi College of Engineering and
Technology¹,*

*Professor, Dept. of CSE, Sethu Institute of Technology²,
Theni¹, Virudunagar², India.*

Abstract- EMBEDDED based applications are becoming trend and they are providing the solutions for lot of real time problems. In this project we explain about common problem that we face in our day to day life. In the modern lifestyle we are facing a many accidents due to drunk & drive, drowsiness and crashing with obstacle on road. A new approach towards automobile safety and security with autonomous region based automatic car system is proposed in this concept in recent times automobile fatigue related crashes have really magnified. In order to eradicate this issue we come up with drowsiness driver detection system.

Keywords: *drowsiness, obstacle detection, alcohol detection*

I. Introduction

An embedded system is a special-purpose computer system designed to perform one or more dedicated functions and often with real-time computing constraints. It is usually embedded as part of a complete device. In contrast, a general-purpose computer, such as a personal computer, can do different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices.

Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability, performance and so on. Some embedded systems are mass-produced and benefiting from economies of scale.

In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Hand Held computers share some elements with embedded systems like the operating systems and microprocessors, which power them but are not truly embedded systems, because they allow different applications to be loaded and peripherals to be connected.

Embedded systems provide several functions.

- Monitor the environment and embedded systems read data from input sensors. This data is then processed and the results displayed in some format to a user or users
- Control the environment; embedded systems generate and transmit commands for actuators.
- Transform the information; embedded systems transform the data collected in some meaningful way, such as data compression/decompression

Face recognition is nothing but detecting the real time faces. Web cameras were used to capture faces of the person. With the help of software domain such as open CV (python), the face image is recognized by Haar cascade algorithm. As image processing develops, face detection is becoming renowned in many applications such as face tracking, facial expression detection, video surveillance, security systems etc. Haar cascade algorithm is proposed by Viola-Jones. This algorithm is used to find the human faces by certain features such as nose, eyes and upper cheeks etc.

The alcohol detection is done through the MQ2 type of gas sensor. By using this gas sensor, if the threshold level is reached means the alert signal will be produced. Then the speed of the vehicle will be reduced automatically. So that the alcohol consumption will found. This gas sensor will detect the alcohol in Driver's breath. It is used as a breath analyzer's or breaths tester for the detection of ethanol in human breath and has a good resistance to disturb of gasoline, smoke and vapor. The obstacles that are present in front of the vehicle will found through the Ultrasonic sensor. The HC-SR04 type of ultrasonic sensor is similar to the IR sensor. Here the sensor will produce the sound waves. If there is any barrier is found in the way of propagation of sound wave, the alert signal will be provided. By this way the crashing of vehicles will be avoided.

Ultrasonic sensor work based on ultrasound. An ultrasound is an acoustic wave with very high frequency, beyond human hearing. The ultrasonic sensor is a speaker that emits or receives ultrasound. It can handle both emission and reception. This is the principle behind ultrasonic sensor.

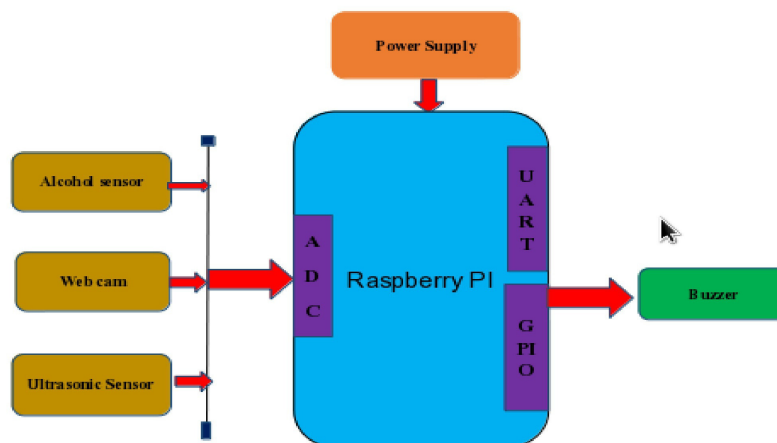


Fig 1. Block diagram

II. Working

a. Alcohol detection:

- Here we are using MQ4 gas sensor along with the Raspberry Pi.
- The gas sensor will check the gas concentration.
- If the concentration of the gas reaches the threshold value (400 gas

concentration of alcohol) means the sensor will produce the alert signal.

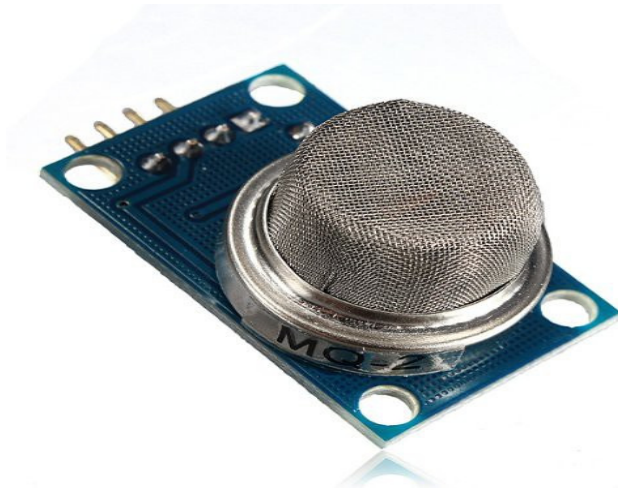


Fig 2. Gas sensor MQ-4



1 = GND
2 = DOUT
3 = AOUT
4 = VCC

(bottom view)

Fig 3. Pin diagram of Gas sensor

b. Obstacle detection:

If the concentration of the gas reaches, the threshold value means the sensor will produce the alert signal. It can be used to detect the obstacle, which is present in front of the vehicle.



Fig 4. Ultrasonic Sensor

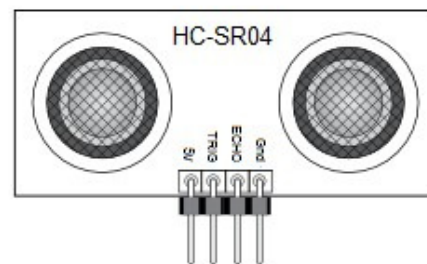


Fig 5. Pin description of Ultrasonic sensor

It detects the obstacles by the propagation of sound waves. It is mainly used to measure the distance of front vehicles as well as obstacles. If there is any vehicle or any obstacle found between 4 meters, it alerts the driver by the buzzer.

c. Drowsiness detection:

Adaptive Boost was used to a cascade of boosted classifiers based on Haar-like features.

Two training data sets, are taken as positive samples and negative samples for this construction. Face databases (9-11) are used and all of these sample data were prepared by using object marker, which is easy for cropping desired areas by using a mouse. Images of an eye with the eyebrow as the positive samples have been used because there are more detectable details than using only an eye. 3,327 positive image samples and 6,478 negative image samples for training were generated.



Fig 6.webcam

III. RESULT

Hence through continuously monitoring the driver by detecting drowsiness, alcohol detection and obstacle detection. And also alerting him when he is deviated from his normal circumstance , accident rate can be minimized. By using simple and cheaper components. Thus increasing safety and security of the driver, correspondingly the accident rate may be decreased.

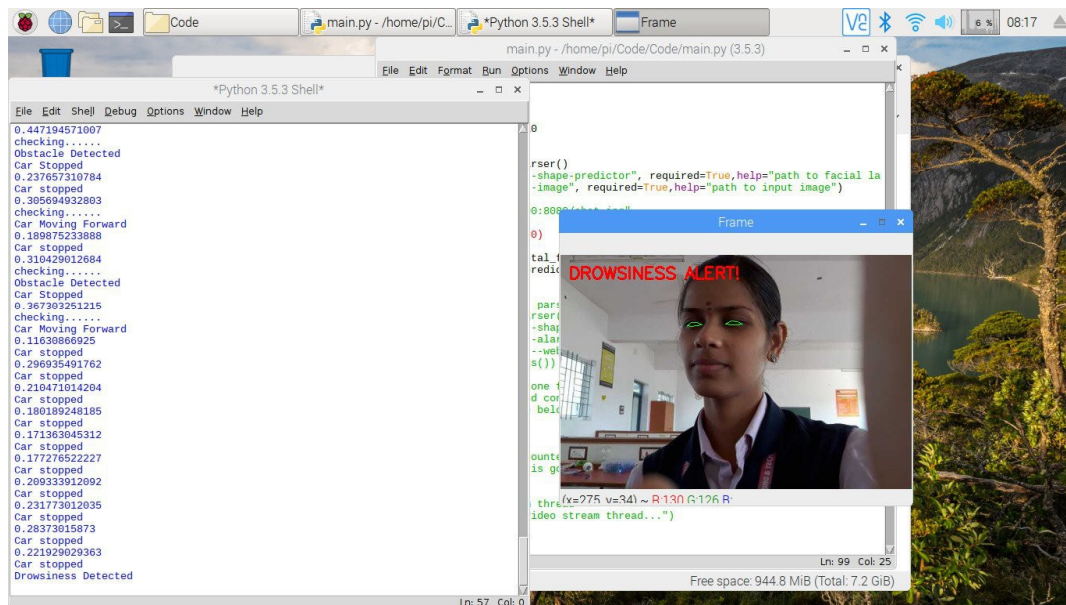


Fig 7.Result

IV. REFERENCES

- [1] Anilkumar C.V, Mansoor Ahmed, Sahana R, "Design of Drowsiness, Heart Beat Detection System and Alertness Indicator for Driver Safety" in IEEE.

- [2] Ishita Gupta, Varsha Patil, "Face Detection and Recognition using Raspberry Pi" in IEEE.
- [3] KONETI SANDEEP, PONNAM RAVIKUMAR, "Novel drunken driving detection and prevention models using Internet of things" in ResearchGate.
- [4] A .Malla, P. Davidson, P. Bones, R. Green, "Automated Video-based Measurement of Eye Closure for Detecting Behavioral Microsleep", in 32nd Annual International Conference of the IEEE, Buenos Arres, Argentina, 2010.
- [5] P. Viola and M. Jones, "Rapid Object Detection using a boosted Cascade of Simple Features", in Proceedings of the IEEE Computer Society Conference Vision Recognition, 2001.
- [6] S. Vitabile, A. Paola and F. Sorbello, "Bright Pupil Detection in an Embedded , Real time Drowsiness Monitoring Systems", in 24th IEEE International Conference on Advanced Information Networking and Applications, 2010.
- [7] Sundaram A, Ashenafi Paulo's Forsido, Dawid Adane, "ULTRASONIC SENSOR BASED OBSTACLE DETECTION FOR AUTOMOBILES".
- [8] Luciano Alonso, Vicente Milano, Carlos Torre-Ferrero, " Ultrasonic Sensors in Urban Traffic Driving-Aid Systems".

