International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 5, Issue 7, pp 9-11, July-2021

https://doi.org/10.47001/IRJIET/2021.507002

Smart Assistant System for Driver

[1]S.G. Watve, [2]Shubhada Sapkal, [3]Pooja Garud, [4]Sneha Makote

[1]Asst. Prof., B.E., E&TC Engineering, Progressive Education Society's Modern College of Engineering, Pune, Maharashtra, India
[2,3,4]B.E., E&TC Engineering, Progressive Education Society's Modern College of Engineering, Pune, Maharashtra, India

***Abstract* - One of the main reasons of accidents in the world is driver fatigue. Survey of traffic shows that driver drowsiness may be a contributory factor, around 31% of all road accidents are causes due to drink and drive. The development of new technologies for detecting driver drowsiness is a major challenge in the field of accidents avoidance systems. Detecting the drowsiness of the driver is one of the assured ways of measuring driver fatigue. In this project we aim to develop a prototype drowsiness detection system. This system operates by monitoring the eyes of the driver and sounding an alarm when driver is drowsy. The principle of the proposed system in this paper is based on the real time facial images analysis for warning the driver of drowsiness or in attention to prevent traffic accidents. Present paper gives the overview of the technique for detecting drowsiness of the driver and impact of the problem, face detection technique, alcohol detection technique, drowsiness detection system and alcohol detection structure, system flowchart. The proposed system may be estimated for the effect of drowsiness and alcohol consumption level by warning under various operation conditions.**

Keywords: Alcohol detection, drowsiness, Technology.

I. INTRODUCTION

Introduction deals with the important reason for accidents and how we can stay away from accidents, various techniques developed to avoid accidents. The goals and motivations for this proposed project is to develop cost effective system that can be implement in all range of cars and it should save people. The term drowsiness can be considered as the state of unconsciousness usually convoyed by performance and psycho physiological changes that result in loss of alertness. Road accidents cause damage to property as well as life. Thus, there is need of development of methods for avoiding hazardous effects of drowsiness on roads while driving and alcohol consumption while driving. In the trucking industry, 54% of fatal truck accidents are due to driver's drowsiness. It is the prime reason of heavy truck crashes. The NHTSA (National Highway Traffic Safety Administration) estimates that there are 110,000 crashes that are caused by drowsy drivers and result in more than 2000 fatalities and 70,000 injuries.

This problem will increase day by day. The aim of this system is to detect the human behaviors and mood like eye blinking and the alcohol consumption level. There are mainly three parts in this system. (1) Detection of the eye portion. (2) Detection of the closed or open eye. (3) Detection of alcohol. (4) Detection of obstacle.

II. DESIGN SPECIFICATION

ESP32-CAM Board

ESP32-CAM is a low-cost ESP32-based development board with onboard camera, small in size. It is an ideal solution for IoT application, prototypes constructions and DIY projects. The board integrates Wi-Fi, traditional Bluetooth and low power BLE, with 2 high performance 32-bit LX6 CPUs. It adopts 7- stage pipeline architecture, on-chip sensor, Hall sensor, temperature sensor and so on, and its main frequency adjustment ranges from 80MHz to 240MHz.

Figure 1: ESP32-CAM Board

MQ3 Sensor

Detection Gas: Alcohol
Gas Concentration: 0.4mg/L-4mg/L
Supply Voltage: <24V
Heater Voltage: 5.0±0.2V(High), 1.5±0.1V(Low)
Load Resistance: Adjustable
Heater Resistance: 31Ω ±3Ω
Heater Consumption: <900Mw

The enveloped MQ-3 have 6 pins,4 of them is used to fetch signals, and other 2 are used for providing heating current. Resistance value of MQ-3 is difference to various kinds and various concentration gases. So, when using this component, sensitivity adjustment is very necessary. The detector for

International Research Journal of Innovations in Engineering and Technology (IRJIET)
ISSN (online): 2581-3048
Volume 5, Issue 7, pp 9-11, July-2021
https://doi.org/10.47001/IRJIET/2021.507002

0.4mg/L (approximately 200 ppm) of Alcohol concentration in air and use value of Load resistance that (RL) about 200 KΩ (100KΩ to 470KΩ).

Figure 2: Gas sensor

Ultrasonic Sensor

Ultrasonic sensors are devices that generate or sense ultrasound energy. Systems typically use a transducer which generates sound waves in the ultrasonic range, above 18 kHz, by turning electrical energy into sound, then upon receiving the echo turn the sound waves into electrical energy which can be measured and displayed.

Ultrasonic sensor (hc-sr04) is used to detect the obstacles and avoid the accident. It has 4 pin VCC, GND, trig and echo. It gives up to 4meter information and need to stop our vehicle at the distance of 1 meter before any vehicle which is ahead.

Features:

Supply voltage: 5V(DC)
Supply current: 15mA
Modulation frequency: 40Hz
Output: 0-5v (output high when obstacle detected in range)
Distance: 2cm-400cm

LCD Display

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Block Diagram

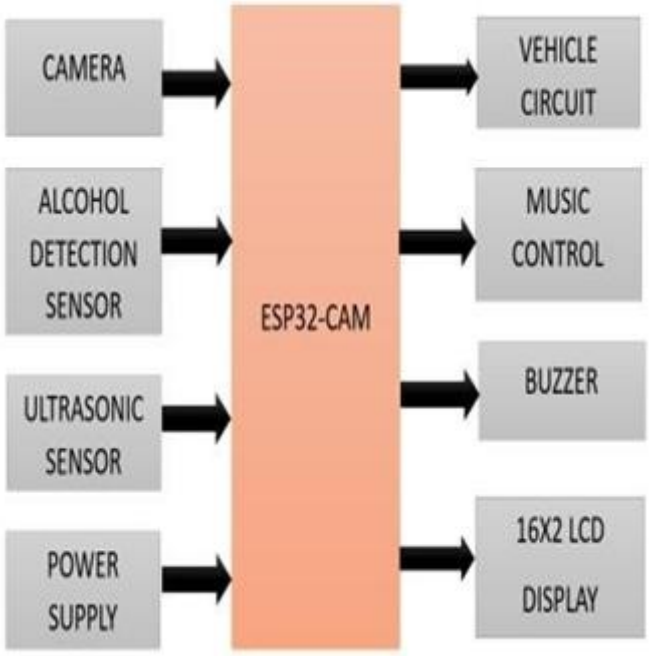

Figure 3: Block diagram of smart assistant system for driver

Power supply 5V 2.5A is given to the ESP32-CAM board. There is inbuilt camera in this board which is used to capture the live photo of driver to detect drowsiness. After detection of drowsiness, vehicle circuitry is used for various purposes like speed control, car locking system, etc. Also, music control system is used to play songs with higher beats which will help the driver to control his/her drowsiness. Buzzer is used to alert the driver as well as passengers. Ultrasonic sensor is used to control the speed of car. Alcohol detection Sensor is used to detect alcohol consumption level by the driver. After the detection of alcohol content, the alert will be generated and displayed on LCD display.

III. ALGORITHM AND FLOWCHART

Steps of algorithm:

Step 1: System will start and initiate function as soon as the car is unlocked.
Step 2: ESP32 will be initiate the camera and it will start recognizing face and eye movement of driver. And at same time alcohol sensor will start sensing the level of alcohol after every 30min.
Step 3: LCD will Display Status and User Can set- reset System.
Step 4: In event of alcohol detection or eye shut more then 10sec Buzzer will start Beeping and music will turn on in full volume and immediately the ultrasonic sensor starts detecting obstacle.

International Research Journal of Innovations in Engineering and Technology (IRJIET)

ISSN (online): 2581-3048

Volume 5, Issue 7, pp 9-11, July-2021

https://doi.org/10.47001/IRJIET/2021.507002

Step 5: If stop button is pressed by the driver then timer will reset and process will continue from step 2.

Step 6: If alarm remains on for certain time and if obstacle is detected car will switch off.

Step 7: After parking engine will shut down till driver is replaced or driver is in good condition.

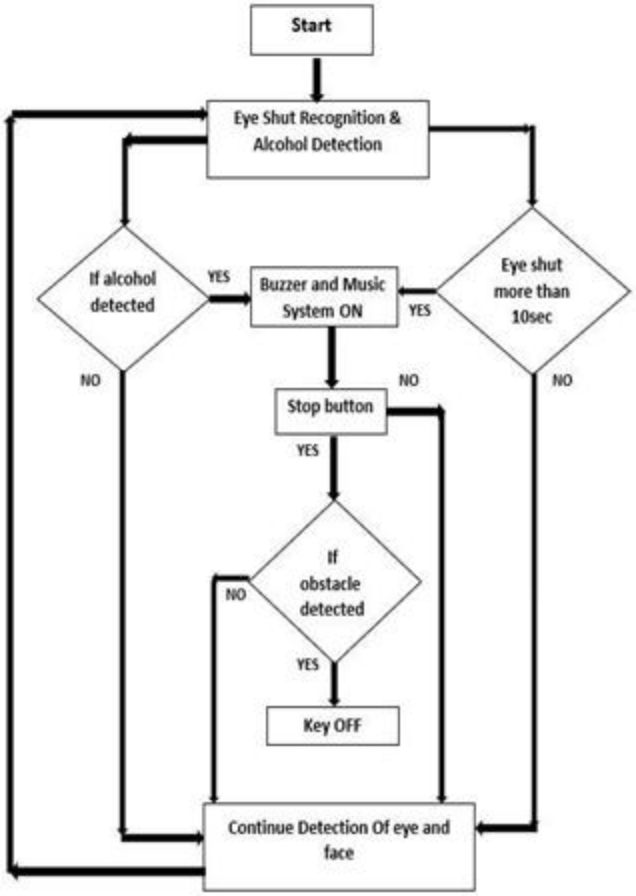

Figure 4: Flow chart

IV. RESULTS AND DISCUSSIONS

The result shows the working of proposed algorithm. The program is built using c language which can be transferred to ESP32-CAM board. At this moment the program can detect eye region. On the other hand, alcohol sensor detects the alcohol concentration on the basis of this information an alert message is given by controller along with that buzzer will beep and music will on with full volume that helps driver to wakeup suddenly from drowsiness.

V. CONCLUSION

In this study, finally it concludes that it is very difficult to avoid accidents but somehow that accident ratio or percentage can be reduced to some less number by using these types of new technologies, by using this method accurate test results will get and driver get some alert while driving regarding drowsiness. The goal at the end of this project is the practical demonstration of an alcohol detection system which is suitable for following installation in a vehicle. The universal public fully understands the dangers of drinking and driving, having lack of sleep. In this when the eyes will be closed for too long, a warning signal will be given in the form of alarm signal and also make the driver aware by playing high beat music.

Also, the alcohol detection sensor mounted on the steering of vehicle will detect the alcohol level of driver. When alcohol level will be more than the threshold level then driver will face difficulties to start the vehicle.

REFERENCES

[1] International Research Journal of Engineering and Technology (IRJET), Volume: 05, Issue: 04, Apr-2018.

[2] International Research Journal of Engineering and Technology (IRJET), Volume: 07, Issue: 02, Feb 2020.

[3] International Journal of Engineering Research & Technology (IJERT), Vol. 3, Issue 7, July – 2014.

[4] Vehicle-Ship IT Convergence Research Department, ETRI (Electronics and Telecommunications Research Institute).

[5] Smita Desai et al, International Journal of Computer Science and Mobile Computing, Vol.6, Issue.9, September- 2017.

Citation of this Article:

S.G. Watve, Shubhada Sapkal, Pooja Garud, Sneha Makote, "Smart Assistant System for Driver" Published in *International Research Journal of Innovations in Engineering and Technology - IRJIET*, Volume 5, Issue 7, pp 9-11, July 2021. Article DOI https://doi.org/10.47001/IRJIET/2021.507002

****

