

Automatic Drivers Drowsiness and Alcohol Detection System based on IoT

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Abstract— In this modern world driver’s drowsiness and alcohol consumption while driving has become a major problem which leads to number of accidents. This results in number of deaths and major injuries. Where another issues of human violation and environmental damage has become primary focus for government to solve. Continues driving on long routes and ignoring the personal health issues increases the drowsiness. The solution can be obtained by using IoT devices with new era techniques to make prediction of drowsiness. New technologies and new devices are now considerably reducing human efforts, the devices will help to lessen the number of injuries due to drivers fatigue and hence increase the transportation protection; this system deals with automatic motive force drowsiness detection primarily based on visible facts and artificial intelligence. The aim of this project to develop a device which predicts drowsiness and detects the alcohol consumption level. The device consists of the all gas sensor which will detects the alcohol consumption level and web cam monitors the facial expressions. The working of device is handled by raspberry pie and powered by car batteries.

Key words: IoT Devices, Raspberry Pie, All Gas Sensor, HD Web Cam

I. INTRODUCTION

Sleepiness and Fatigue of drivers are among the huge reasons for street mishaps. Consistently, they increment the measures of passings and fatalities wounds universally. In this paper, a module for Advanced Driver Assistance System (ADAS) is displayed to decrease the quantity of mishaps because of drivers weariness and thus increment the transportation wellbeing; this framework manages programmed driver sluggishness location dependent on visual data and Artificial Intelligence. We propose a calculation to find, track, and dissect both the drivers face and eyes to quantify PERCLOS, an experimentally upheld proportion of sleepiness related with moderate eye conclusion.

Presently, transport frameworks are a fundamental piece of human exercises. We as a whole can be casualty of tiredness while driving, basically after too brief night rest, adjusted physical condition or amid long adventures. The vibe of rest decreases the driver's dimension of watchfulness creating unsafe circumstances and builds the likelihood of an event of mishaps. Driver sleepiness and exhaustion are among the critical reasons for street mishaps. Consistently, they increment the number of passings and fatalities wounds all around. In this unique circumstance, it is vital to utilize new advances to structure and manufacture frameworks that can screen drivers and to gauge their dimension of consideration amid the whole procedure of driving.

In this task, a module for ADAS (Advanced driver help System) is displayed so as to diminish the quantity of

mishaps caused by driver weakness and accordingly enhance street wellbeing. This framework treats the programmed recognition of driver laziness dependent on visual data and man-made brainpower.

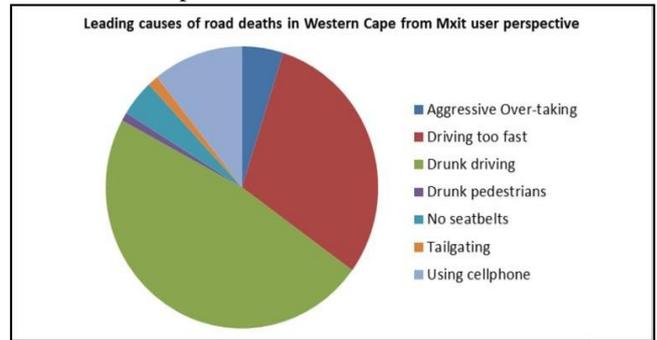


Fig. 1: Ratio of road Death's

Module consist of three parts:

- 1) Alcohol Detection Unit
- 2) Face Detection Unit
- 3) CPU

All the above mention units have independent task, alcohol detection unit and face detection unit is handled by centralized processing unit.

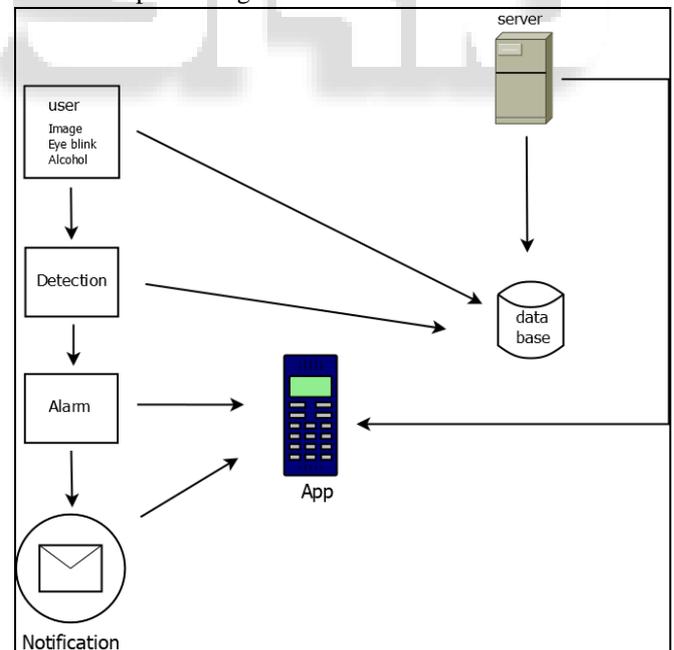


Fig. 2: System Architecture.

As shown in the figure 2 it’s our overall working of device, as you can see the users(driver) eye blink rate and facial movements will be detected and are stored and compared with threshold values defined in database.

A. Alcohol Detection:

The construction of this alcohol system consists of two parts which is hardware development and software development.

Hardware development involved the designing the circuit of the project. While the software developments are focused on simulating the circuit before test to the real component and also designing coding to be embedded in the hardware.

1) *Hardware Components*

a) All Gas Sensor.

All Gas sensor works as alcohol sensor in our project. The main function of this module is to detect the level of the alcohol present in the human body, if the level is high then the message will send to processor and car will not start at any condition. The MQ-135 gas sensor detects the gases like alkali nitrogen, oxygen, alcohols, sweet-smelling mixes, sulfide and smoke. The lift converter of the chip MQ-3 gas sensor is PT1301.



The working 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 detecting material. In the climate we can discover contaminating gases, yet the conductivity of gas sensor increments as the convergence of dirtying gas increments. MQ-135 gas sensor can be usage to identify the smoke, benzene, steam and other hurtful gases. It can possibly recognize diverse unsafe gases. The MQ-135 gas sensor is ease to buy.

b) Buzzer:

A bell or beeper is a sound flagging gadget, which might be mechanical, electromechanical, or piezoelectric. Run of the mill employments of ringers and beepers incorporate alert gadgets, clocks, and affirmation of client information, for example, a mouse snap or keystroke. At the initial phase web cam will compare initial and the recent image of the driver if the driver is feeling drowsy webcam will detect the facial variations of the driver and if he is sleepy then buzzer will alert driver and it will send notification to the registered mobile number.

B. *Face Detection:*

The symmetry is a standout amongst the most critical facial highlights. We demonstrated the symmetry in a computerized picture by a one-dimensional flag (gatherer vector) with a size equivalent the width of the picture, which gives us the esteem relating to the situation of the vertical hub of symmetry of articles in the picture. The conventional rule to compute the flag of symmetry is for every two white pixels which are on a similar line we augment the incentive in the medium between these two pixels in the gatherer vector. (The calculation is connected on an edge picture, we called a white pixel: the pixel with esteem1) We present enhancements for the computation calculation of symmetry into a picture to adjust it to the identification of face, by applying a lot of principles to give a superior figuring of symmetry of the face. Rather than figuring the symmetry between two white pixels in the picture, it is determined between two windows.



Fig. 3: Face Detection Architecture

For every window Z1, we clear the window Z2 in the territory dictated by the parameters S_min, S_max, and H. We augment the flag of symmetry between these two windows if the whole of white pixels is situated between two limits S1 (most extreme) and S2 (least). At that point we separate the vertical area of the picture forms (Region of Interest ROI) relating to the greatest record of the acquired flag of symmetry. Next, we take a square shape with an expected size of face (Because the camera is settled and the driver moves in a constrained zone so we can gauge the extent of the face utilizing the camera central length after the progression of camera alignment) and we check the ROI via looking through the locale that contains the most extreme vitality relating to the face.

C. *CPU:*

Our primary CPU unit is Raspberry pi 3 demonstrate B. The Raspberry Pi 3 Model B is the latest adjustment of the \$35 Raspberry Pi PC. The Pi isn't like your ordinary machine, in its most affordable shape it doesn't have a case, and is only a Mastercard evaluated electronic board - of the sort you may find inside a PC or workstation yet significantly more diminutive. The Raspberry Pi is a progression of little single-board PCs created in the United Kingdom by the Raspberry Pi Foundation to advance instructing of fundamental software engineering in schools and in creating nations. The first model wound up definitely more prominent than foreseen, moving outside its objective market for utilizations, for example, mechanical technology. It does exclude peripherals, (for example, consoles and mice) and cases. Be that as it may, a few adornments have been incorporated into a few official and informal packs.

The association behind the Raspberry Pi comprises of two arms. The initial two models were created by the Raspberry Pi Foundation. After the Pi Model B was discharged, the Foundation set up Raspberry Pi Trading, with

Eben Upton as CEO, to build up the third model, the B+. Raspberry Pi Trading is in charge of building up the innovation while the Foundation is an instructive philanthropy to advance the educating of essential software engineering in schools and in creating nations.

As indicated by the Raspberry Pi Foundation, in excess of 5 million Raspberry Pis were sold by February 2015, making it the top rated British PC. By November 2016 they had sold 11 million units, and 12.5m by March 2017, making it the third top of the line "universally useful computer". In July 2017, deals achieved about 15 million. In March 2018, deals achieved 19 million.

II. CONCLUSION

We built up a framework that limited and track the eyes and head developments of the driver so as to recognize sluggishness. The framework utilizes a mix of layout based coordinating so as to confine the eyes. Amid following, framework will most likely choose if the eyes are open or shut and whether the driver is looking in front. At the point when the will be shut for a really long time, a notice flag will be given as ringer or alert unit message.

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