

Survey on Driver Drowsiness and Alcohol Intoxication Detection System using Arduino

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Abstract: Drowsiness and drunken driving leads to the road accidents. This paper briefly explains a real time detection of Driver's Drowsiness and Alcohol consumption of drivers and alerting the driver who is drowsy state. The main goal of this development system is to reduce the number of road collisions. Driver's Drowsiness and alcohol Intoxication are the main reasons for Road accidents, Personal injury and some times leads to Human death. The driver Drowsiness are determined from Facial Expression like Yawning Eye closure, and head movements. This Developed system contains camera, alcohol sensor (MQ3) - is used to detect alcohol consumption. We use Facial Landmark algorithm for localizing points on face and Euclidian method. Eye detection will be done using OpenCV. OpenCV is a computer vision involved with all programming functions.

Keywords: IoT, ML, AI.

I. INTRODUCTION

Drowsiness is a one of the feature that the analyzer found hard to define. Indeed, it has become contributing factor for road accidents. Resolving the problem became critical when the design of earlier accident prevention systems was found less accurate for alerting the driver. As the technology improves, we can find Innovation and modeling of the vehicles. Cars evolves capabilities like sensing pothole on roads, external environment, drivers actions, alcohol Intoxication. Car manufactures are implementing additional safety features. Driver drowsiness cause many accidents every day.

Driver drowsiness cause many accidents every day. According to the Traffic Survey more than 1,670 people are killed and around 80,000 are injured each year on the National Highway as a direct result of drowsy driving. Traffic survey shows that the driver fatigue may contributes 23% and alcohol drinking around 38% of road accidents. The main factors due to which driver gets drowsiness. They are asleep, work day and night, Psychological and physical condition. According to our body condition, a normal human being should work 8 hours a day, work during day and sleep in the night. If the car driver works day and night it will affect the human system. It will be more stressful for the drivers. Many drivers force to do this work to earn for their bread and butter. Due to the such physical conditions drivers fall sick. The driver take medicine which gives adverse effect on the body for this reason driver becomes drowsy.

II. LITERATURE SURVEY

Brandy Warwick¹, Nicholas Symons, Xiao Chen, Kaiqi Xiong ¹Department of Computer Science, Texas State University, San Marcos have developed Detecting Drowsy state of driver using Wireless components. The wearable device is placed closer to driver or inserted on the shirt or on a holder while driver moving the vehicle. The BioHarness Sensor which Extracts Physiological features of the driver. Extracted information is transmitted to the cellphone through wireless media. Cellphone consists of Drowsy detection application. This application is built on drowsiness detection algorithm. It alerts the driver through Buzzer or alarm. This application proved less effective since the driver can't wear the device all the time. [1]

Mohammed Amin Assari, Mohammad Rahamati have developed the Driver Drowsiness Detection system Using Facial Expression Recognition. It explains the detail features of facial Detection system, firstly it checks for Background Image, If it is detected, checks for facial features based on Facial components like Eye, mouth, eyebrow. Through this features drowsiness is detected. In Intrusive method, An sensor is kept close to the driver and then values are tabulated and validated for further use. The arduino board checks for alcohol detection. Arduino board is interfaced with sensor called MQ-3. This sensor will efficiently works to detect the alcohol Intoxication. However,

these Intrusive approach has a high accuracy rate, they are considered as person inconvenience and low acceptance of the methods. [2]

Omar Rigane, Karim Abbes, Chokri Abdelmoula and Mohamed Masmoudi have developed Driver Drowsiness Detection using Fuzzy based System. In this paper, they detect the drowsiness or fatigue through Haar Cascade Classifiers. The Haar cascade is used to detect the face related features. Eye features or movements are extracted for detection. The authors are tried to Implement the solution for drink and drive. Though people are punished for drink and driving not properly analysed. The Fuzzy System is very beneficial. This System is used to check and validate the Fatigue. The system has not shown accurate results in all the conditions and the cost is high. [3]

GaoZhenhai, DinhDat, Hongyu, Ziwen, Wu Xinyu have developed Driver Drowsiness Detection Based on Interval Set of Analysis of Steering Wheeling Intersection Velocity. Advantages are No use of external equipment is required, Dependably realistic. Support vector machine is used to extract the eye features. The timing between eyebrows and eyelids finds the eye status. The Minimum threshold level is maintained. Geometry of Iris is also considered. Alcohol detection tests are done. [4]

Bagus Pratama, Igi Ardiyanto, Teguh Adji have developed a survey on Driver Fatigue on parameters like Image Processing, Bio-Signal and Driver Actions performed. They includes various properties like visual, non-visual, and vehicular-based. Visual properties are taken from Facial Expression of driver which is loaded by camera. They use sensors like smartwatch, gyroscope and accelerometer to find the Fatigue of driver drowsiness. Even, they have constructed a mobile component and electrocardiogram which passes the signals to the connected device. This application proved less effective since the driver can't wear the device all the time. [5]

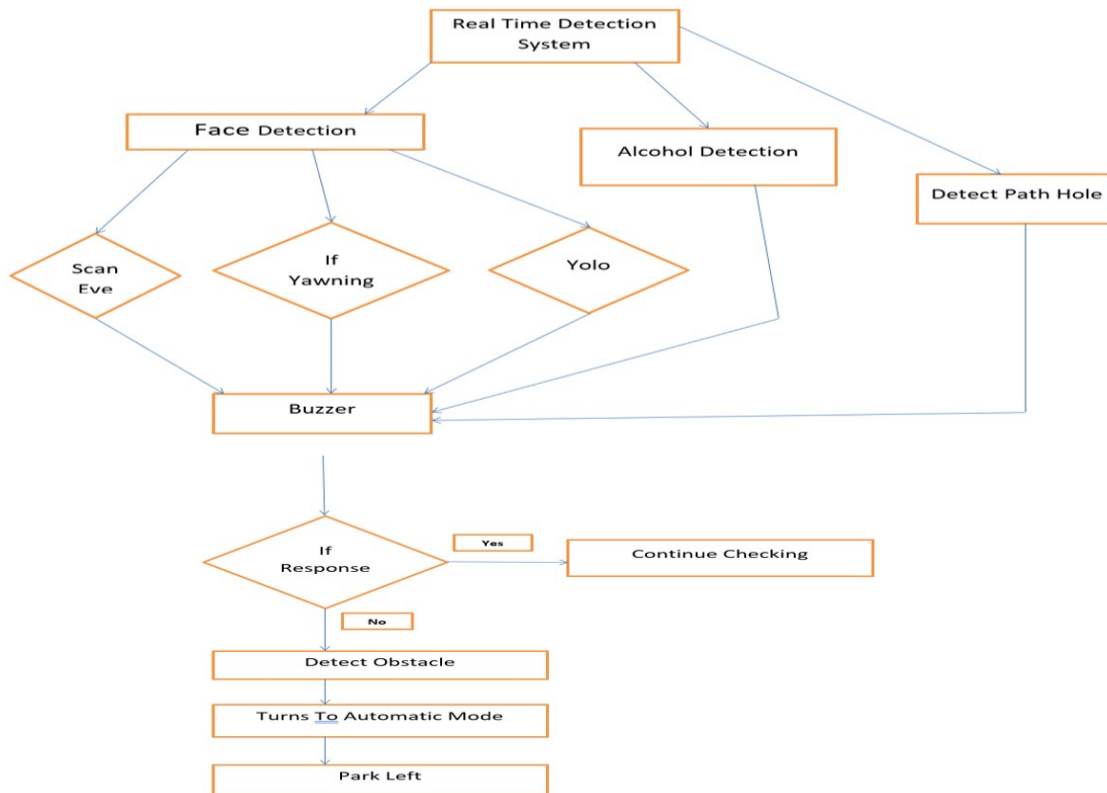
A. Deepa Lakshmi, B. Nivetha, A. Jaya Kumar, R. Malar have developed the some thesis Based On Car System Safety that finds Driver failures or defects. The Publisher developed a model using Image Processing system which alerts driver that he is in a drowsy state by warning system with neural network. This Images helps to reduce road accidents. The Facial Expression and Images are captured in the camera which is placed directly opposite to driver. The Algorithm used is Neural network for finding fatigue of Driver. The main reasons for Fatigue are long hours of working, Night shifts, Illness, Stress, Sleepless nights. Another way of determining is using Eye Closure (Opening/Closing). A Neural networks have a high level complex structure. [6]

Arun Sahayadhas, Kenneth Sundaraj and Murugappan have developed Driver Drowsiness detection system. In this paper, people haven't found the proper solution or approach for the Driver Drowsiness detection system. Since no proper documentation there is no universal acceptance for the drowsiness of a driver. This paper explains the different approaches in which drowsiness can be operated in a Real time environment. The different measures which is used to detect drowsiness involves vehicle-related measures, physiological measures and conceptual-behavioural measures. These measures includes advantages and disadvantages of each measure. Although the physiological measures has high accuracy rate, these are highly Intrusive. However, this approach has high accuracy, Due to person Inconvenience and low acceptance of this method considered as not useful. [7]

Chisty, Jasmina Gill have developed Driver Drowsiness Detection System. In this paper the survey is all about Non-Intrusive methods. The method mainly focus on Eye features, head movements for the detection of Driver Drowsiness. They have used FCM, Lab color. In India there is no such monitoring System found to detect driver drowsiness. Though the previously authors have tried to Implement solution to the problem due to some defects in the traditional system they couldn't find it. The hardware components cost is high. [8]

III.FLOW CHART

Figure 1:



As shown in the above Figure 1, Initially the camera detects the face through OpenCV. It checks for facial expressions like Eye movements, Yawning and sometimes Yolo. These are the factors play important role in the drowsiness detection. Some sensors are used for detect the alcohol and pot hole. If any one of the action occurs it alerts the driver through buzzer. If there is no response from the driver for the alarm then the vehicle turns car from manually to automatic mode, parks at the left and if it finds any obstacle, it senses and wait for random amount of time then moves towards left.

IV.CONCLUSION

As soon as car detects Alcohol consumption through Alcohol sensor MQ3, firstly it alert's the driver by giving buzzer and owner of the vehicle will get the alert message through GSM. If there is no response from the driver for the alarm then the vehicle turns car from manually to automatic mode, parks at the left and if it finds any obstacle, it senses and wait for random amount of time then moves towards left. It detects pothole by taking distance as consideration and give buzzer to driver.

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