IOT Based Driver Drowsiness Detection System

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Abstract-
In recent years, drowsiness is the main cause of the accidents in India due to lack of sleep, tiredness and soon. In order to reduce the case of vehicle accidents caused by drowsiness of the driver is to detect them and warn them using an alarm. Many techniques, such as eye retina detection, have been used to detect sleepiness by facial features. Here in this paper, we propose a method for detecting the driver's drowsiness by detecting the person's closed eye for a few seconds. In this report, we propose a more accurate method for detecting drowsiness, by. The main contribution for this project is the drowsiness detection and warning, which is based on the person's open or closed eye. This project discuss on how to detect the eyes of the driver from the real time environment using the webcam represents the dashboard camera in a car. By using the real time detection, author use the built-in laptop webcam to detect the eyes of the demonstrator. The drowsiness detection system will detect the open and closed eye. The designed system will detect the face area and the coordinate of the eye. Detecting the face area is narrow down to detect eyes within face area. Both left and right eyes will be framed out once it found. The parameters of the eyes the eyes will be captured, whether it is closed or open. If the eyes are found closed for 4 consecutive frames, it is confirm that the driver is in drowsiness condition.

Keywords: Open CV, Tensor Flow, Detection, Drowsiness System, Machine Learning system.

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I. INTRODUCTION

Drowsiness is the state where person have strong desire to sleep. It is the state where person has the high desire to sleep. It has two definite meanings, referring both to the state foregoing falling asleep and chronic condition referring to being in that state independent of the daily rhythm. While performing the tasks that needed the constant concentration such as driving can be dangerous if it is done in a drowsiness state. Per- son can experienced drowsiness if they had a sufficient fatigue and this can leads to road accidents.The major challenge in the field of accident avoidance system faced by the developer and researcher is in developing the technologies for detecting or preventing drowsiness among the drivers. Solutions need to be done in order to counteract the presence hazards of drowsiness on a road.

II. LITERATURE SURVEY

1. Tianyi Hong; Huabiao Qin [1], It is a difficult problem to make drivers drowsiness detection meet the needs of real time in embedded system; meanwhile, there are still some

unsolved problems like drivers' head tilted and size of eye imagenot large enough. This paper proposes an efficient method to solve these problems for eye state identification of

2. drivers' drowsiness detection in embedded system which based on image processing techniques. This method break traditional way of drowsiness detection to make it real time, it utilizes face detection and eye detection to initialize thelocation of driver's eyes; after that an object tracking method is used to keep track of the eyes; finally, we can identify drowsiness state of driver with PERCLOS by identified eye state. Experiment results show

3. Is a root Tipprasert; Theekapun Charoenpong; Chamaporn Chianrabutra; Chamaiporn Sukjamsri [2], A challenge of research in area of the driver drowsiness detection is to detect the drowsiness in low light condition. In this paper, wep roposed a method to detect driver's eyes closure and yawning for drowsiness analysis by infrared camera. This method consists of four steps, namely, face detection, eye detection, mouth detection, and eyes closure and yawning detection. 3,760 images were used to test the performance of the proposed method. The accuracy rate of eyes closuredetection, and yawning detection were 98, and 92.5, respectively. The experimental resulted show that the proposed method performed effectively.

4. RBelal Alshaqaqi; Abdullah Salem Baquhaizel; Mohamed El Amine Ouis; Meriem Boumehed; Abdelaziz Ouamri; Mokhtar Keche [3], Drowsiness and Fatigue of drivers are amongst the significant causes of road accidents. Every year, they increase the amounts of deaths and fatalities injuries globally. In this paper, a module for Advanced Driver

5. Assistance System (ADAS) is presented to reduce the number of accidents due to drivers fatigue and hence increase the transportation safety; this system deals with automatic driver drowsiness detection based on visual information and Artificial Intelligence. We propose an algorithm to locate, track, and analyze both the drivers faceand eyes to measure PERCLOS, a scientifically supported measure of drowsiness associated with slow eye closure.

6. B. N. Manu ; Nidhi Raghuwanshi ; Sanjay Singh [4] ,This paper describes an efficient method for drowsiness detection by three well defined phases. These three phases are facial features detection using Viola Jones, the eye tracking and yawning detection. Once the face is detected, the system is made illumination invariant by segmenting the skin part alone and considering only the chromatic components to reject most of the non face image backgrounds based on skin color. The tracking of eyes and yawning detection are done by correlation

coefficient template matching. The feature vectors from each of the above phases are concatenated and a binary linear support vector machine classifier is usedto classify the consecutive frames into fatigue and nonfatigue states and sound an alarm for the former, if it is above the threshold time. Extensive real time experiments prove that the proposed method is highly efficient in finding the drowsiness and alerting the driver.

7. Yuvraj Suryawanshi; Sushma Agrawal [5] , This paper Present the Drowsiness is one of the main reasons for road accidentsin the last few years. With the improvement in technology, various accident prevention technologies are evolving. The primary objective of avoidance of road accidents can be achieved through real-time drowsiness detection of a driver using video capturing with face detection. After capturing and detecting the drowsiness by using a camera, the alarm will buzz. The position of head and blinking of eyes are used as the features to detect whether the driver is drowsy or not. The camera captures the real-time drowsiness by using Local Binary Pattern to detect the face and Haar cascade to detect the eyes. A custom eye blinking file has been developed for eye blinking detection and AdaBoost is used to focus on eye movements at the same instant of time.

8. Luis Dar´ıo Sinche Cueva; Jorge Cordero [6] , This paper presents the development of a solution to detect a driver's drowsiness in real time and issue alerts to avoid possible traffic accidents. In particular, an analysis of the methods used forthe detection of drowsiness by computer vision is performed, focusing on the use of facial reference points. Distraction, drowsiness, tiredness, speeding and fatigue are the main causes of accidents and, precisely, advanced driver assistance systems ADAS help reduce these serious human errors.

9. Ms. Suhail Razeeth; Rkar. Kariapper; S. Sabraz Nawaz , [7] Accidents are unavoid- able with population growth around the world. There have been numerous researches conducted to preserve both life and morals. Drowsiness and fatigue have been con- sistently identified as significant causes of accidents. Instead of relying on limited methods to detect drowsiness and tiredness, this study incorporates deep learning in conjunction with IoT. This study focuses on developing a prototype to minimize road accidents due to drowsiness, fatigue, carelessness, and other reasons. The CNN algorithm handled drowsinessdetection; drivers will be notified as soon as they fall asleep. This study takes a novel approach by combining machine learning with drunk avoidance, direction control, speed control, and distance preservation. When paired with proper guidance, the said hybrid approach would produce the best solution to the accident issues without suspects.

III. PROPOSED SYSTEM

The designed system deals with detecting the face area of the image captured from the video. The purpose of usingthe face area so it can narrow down to detect eyes and mouth within the face area. Once the face is found, the eyes and mouth are found by creating the eye for left and right eye detection and also mouth detection The parameters of the eyes and mouth detection are created within the face image. The video were change into images frames per second. From there, locating the eyes and mouth can be performed. Once the eyes are located, measuring the intensity changes in the eye area determine the eyes are open or closed If the eyes are found closed for 4 consecutive frames, it is confirm that the driver is in drowsiness condition.

IV. METHODOLOGY AND IMPLEMENTATIONS

The Arduino UNO is a popular microcontroller board that serves as the core component in numerous electronic projects, including the Hand Gesture Control Wheelchair (HGCW) system. Developed by Arduino LLC, the UNO board is based on the ATmega328P microcontroller and features a simple yet powerful design, making it ideal for prototyping and experimenting with various sensors and actuators. In the context of the HGCW system, the Arduino UNO serves as the control unit responsible for processing sensor data, interpreting hand gestures, and generating commands to drive the wheelchair motors. Through its flexible I/O capabilities and extensive community support, the Arduino UNO facilitates the seamless integration of various components and enables the realization of a reliable and efficient control system for individuals with mobility impairments

Figure 1 Arduino UNO

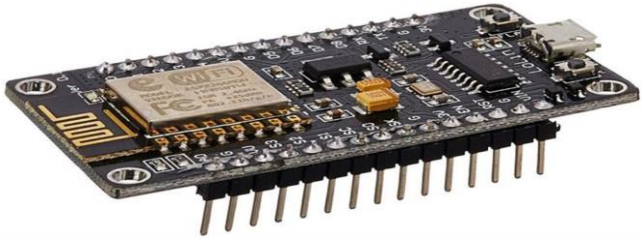
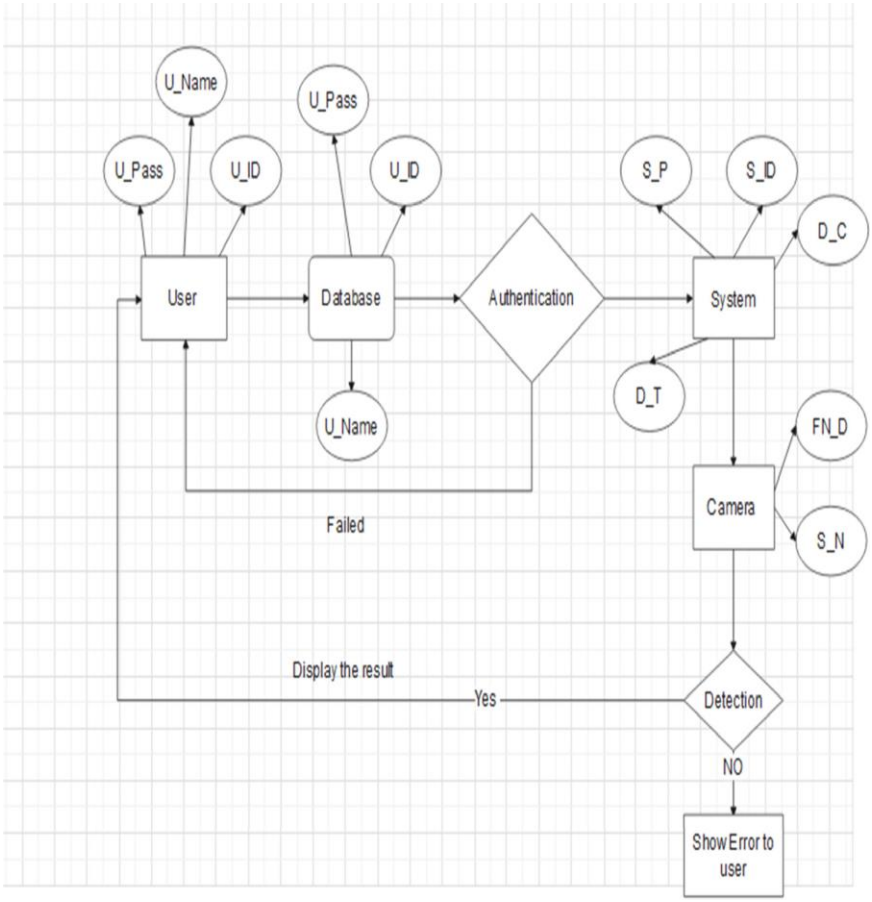


Figure 2 node

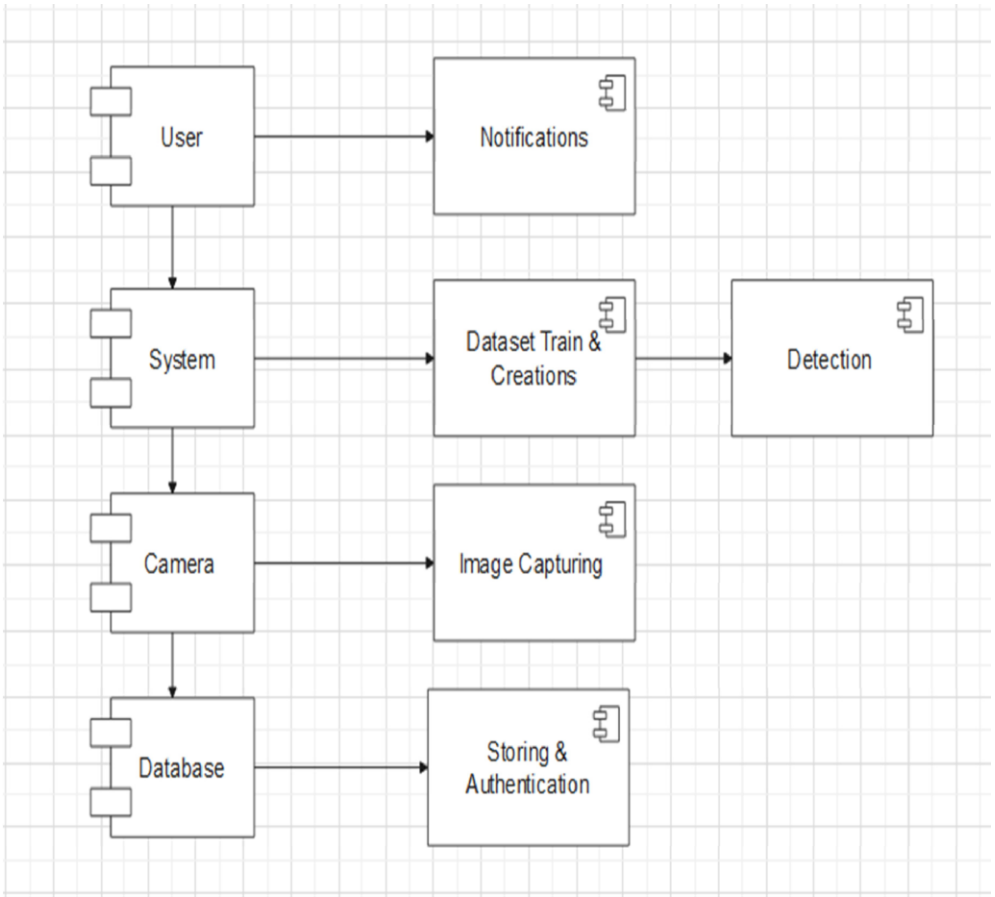
Test Cases And Test Results

Test Case Id	Test Scenario	Test Data	Excepted Result	Actual Result	Pass/Fail
T1	To check whether usersuccessf ully connected in network	User shouldsucc essfully con nected in network	User has successfull yconnected in network	As Expected	Pass
T2	Check User Message	User shouldrecei ve the message	user has receive themessag e	As Expected	Pass
T3	Notificationt o user on display	System should able to give notification to user on display	System is givingnotificati on to user on display	As Expected	Pass
T4	Drowsiness Detection	System should detect drowsiness based on camera	System is detecting drowsiness	As Expected	Pass
T5	System performanc e	System shouldperfor m as per requirements	System able perform as per requirements	As Expected	Pass

ER Diagram HGCW



Component Diagram



RESULT

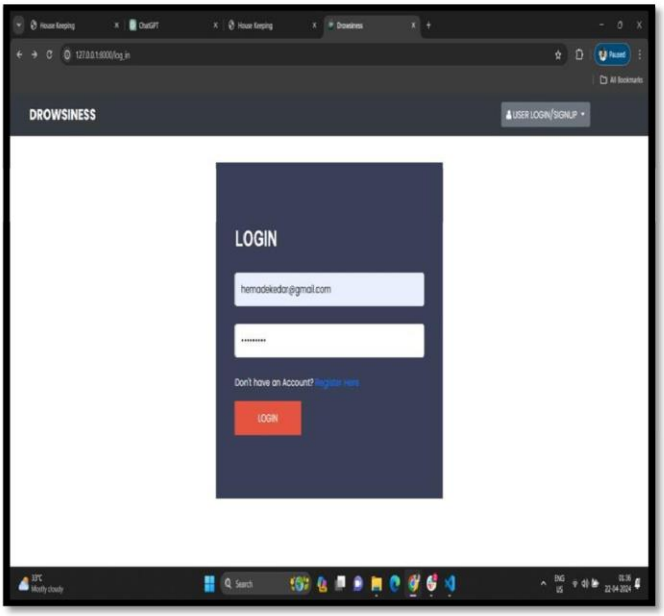
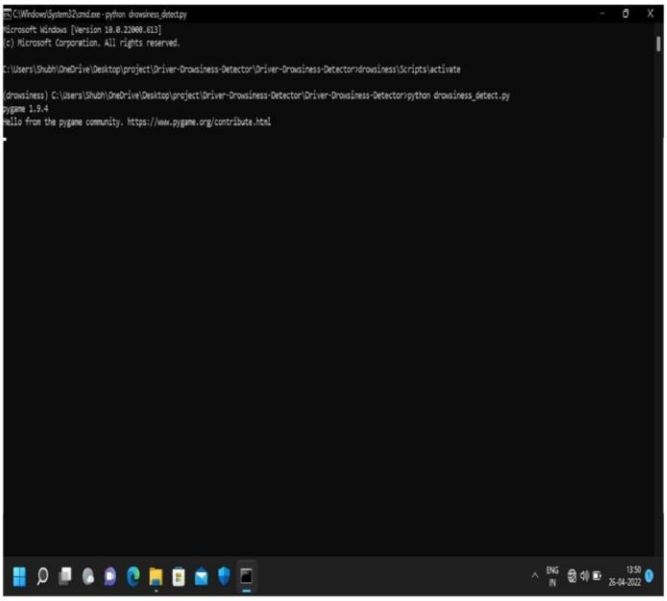
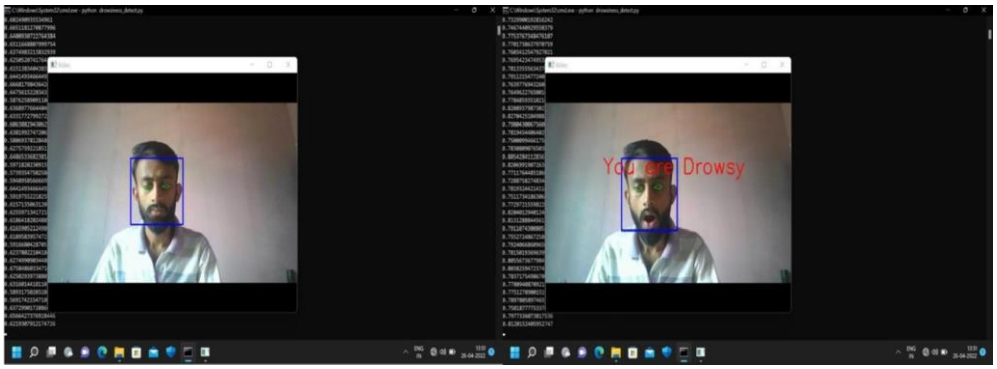


Figure:login Page





V. CONCLUSION

A non-invasive system to localize the eyes and monitor fatigue was developed. Information about the head and eyes position is obtained though various self- developed image processing algorithms. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been closed for too long, a warning signal is issued. In addition, during monitoring, the system is able to automatically detect any eye localizing error that might have occurred. In case of this type of error, the system is able to recover and properly localize the eyes.

The following conclusions were made:

- Image processing achieves highly accurate and reliable detection of drowsiness.
- Image processing offers a non-invasive approach to detecting drowsiness without the annoyanceand interference.
- A drowsiness detection system developed around the principle of image processing judgesthe driver'salertness level on the basis of continuous eye closures.

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