System for Driver Drowsiness Detection Utilizing Facial Features

[1]Ms. Nikam Pratiksha, [2]Ms. Magar Pooja, [3]Ms. Gaikwad Mayuri, [4]Ms. Jamdar Vaishnavi, [5]Prof. Dhobale Mandar

Department of Computer Engineering
SND Polytechnic, Yeola

***Abstract*: as of late, sluggishness is the primary driver of the mishaps in India because of absence of rest, sleepiness, etc. To lessen the instance of vehicle mishaps brought about by tiredness of the driver is to recognize them and caution them utilizing an alert. Numerous strategies, like eye retina location, have been utilized to distinguish drowsiness by facial elements. Here in this paper, we propose a technique for distinguishing the driver's tiredness by identifying the individual's shut eye for a couple of moments. In this report, we propose a more precise strategy for identifying sleepiness, by. The fundamental commitment for this task is the sleepiness location and cautioning, which depends on the individual's open or shut eye. This venture examine on the most proficient method to distinguish the eyes of the driver from the constant climate utilizing the webcam addresses the dashboard camera in a vehicle. By utilizing the continuous location, creator utilize the underlying PC webcam to identify the eyes of the demonstrator. The tiredness recognition system will recognize the open and shut eye. The planned framework will recognize the face region and the direction of the eye. Identifying the face region is restricted down to distinguish eyes inside face region. Both left and right eyes will be built out once it found. The boundaries of the eyes the eyes will be caught, whether it is shut or open. Assuming the eyes are seen as shut for 4 successive edges, it is affirm that the driver is in sluggishness condition[1].**

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

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. Person 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.

MOTIVATION

The purpose of this project is to develop the simulation of drowsiness detection system. The focus of the project is to design a system that will detect the drowsiness by detecting the closed eyes of the driver. By monitoring the state of the eyes, it is believed can detect the early symptom of the driver's drowsiness, to avoid car accidents. The process of detecting the drowsiness between drivers is to detect the open and closed of the eyes.

PROBLEM DEFINATION

- Current drowsiness detection caused a problem to the driver because it is so troublesome because of its size such as Electroencephalography (EEG) and Electrocardiography (ECG).
- It is also need complex algorithm to be developed by the developer
- The increases of the road accidents caused by the drowsy driver while driving.

LITERATURE SURVEY

This chapter contains the existing and established theory and research in this report range. This will give a context for work which is to be done. This will explain the depth of the system. Review of literature gives a clearness and better understanding of the exploration/ venture. A literature survey represents a study of previously existing material on the topic of the report. This literature survey will logically explain this system.

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 image not large enough. This paper proposes an efficient method to solve these problems for eye state identification of 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 the location 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 that it makes good agreement with analysis.

2. Wisaroot 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, we proposed 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 closure detection, and yawning detection were 98, and 92.5, respectively. The experimental resulted show that the proposed method performed effectively. The advantage of this work is that this method can detect eye closure and yawning in low light condition.

3. 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 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 face and eyes to measure PERCLOS, a scientifically supported measure of drowsiness associated with slow eye closure.

4. 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 used to 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.

5. Yuvraj Suryawanshi; Sushma Agrawal [5], This paper Present the Drowsiness is one of the main reasons for road accidents in 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.

6. 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 for the 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.

7. Ms. Suhail Razeeth; Rkar. Kariapper; S. Sabraz Nawaz, [7] Accidents are unavoidable with population growth around the world. There have been numerous researches conducted to preserve both life and morals. Drowsiness and fatigue have been consistently 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 drowsiness detection; 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.

PROPOSED SYSTEM

A large number of the mishaps happen because of tiredness of drivers. It is one of the basic reasons for streets mishaps now-a-days. Most recent insights say that a considerable lot of the mishaps were caused on account of languor of drivers. Vehicle mishaps because of tiredness in drivers are causing demise to large number of lives. Over 30the anticipation of this, a framework is required which identifies the languor and alarms the driver which saves the life. In this task, we present a plan for driver languor location. In this, the driver is ceaselessly observed through webcam. This model uses picture handling procedures which mostly centers on face and eyes of the driver. The model concentrate the drivers face and predicts the flickering of eye from eye area. We utilize a calculation to follow and investigate drivers face and eyes to gauge Perclos. If the flickering rate is high then the framework cautions the driver with a sound

SYSTEM ARCHITECTURE

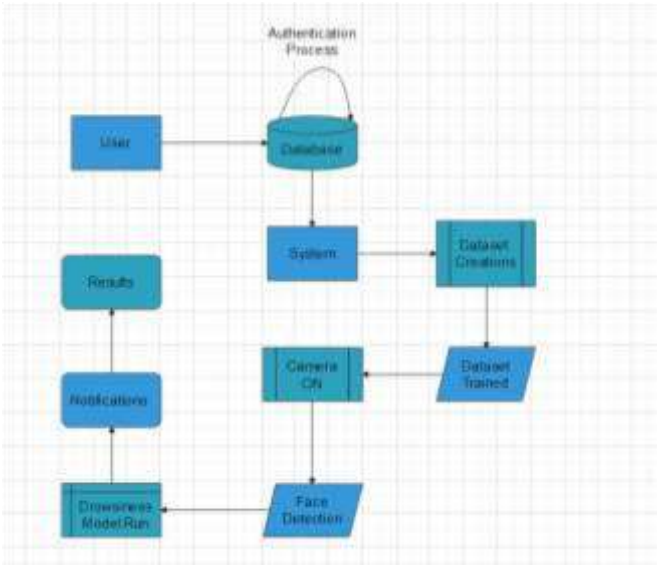


Fig -1: System Architecture Diagram

ADVANTAGES

- Cost Effective solution
- Better performance
- Using this system will avoid the chances of road accident

LIMITATIONS

- Internet Problem
- Dataset issues

APPLICATIONS

- Car: Drowsy driving is the dangerous combination of driving and sleepiness or fatigue. This usually happens when a driver has not slept enough, but it can also happen because of untreated sleep disorders, medications, drinking alcohol, or shift work.
- Buses: Drowsy driving is a problem in the India, and it can be especially dangerous when it involves truck drivers. In most drowsy driving
- Trucks: rowsy driving is an issue in the India, and it very well may be particularly perilous when it includes transporters. In most tired driving

CONCLUSION

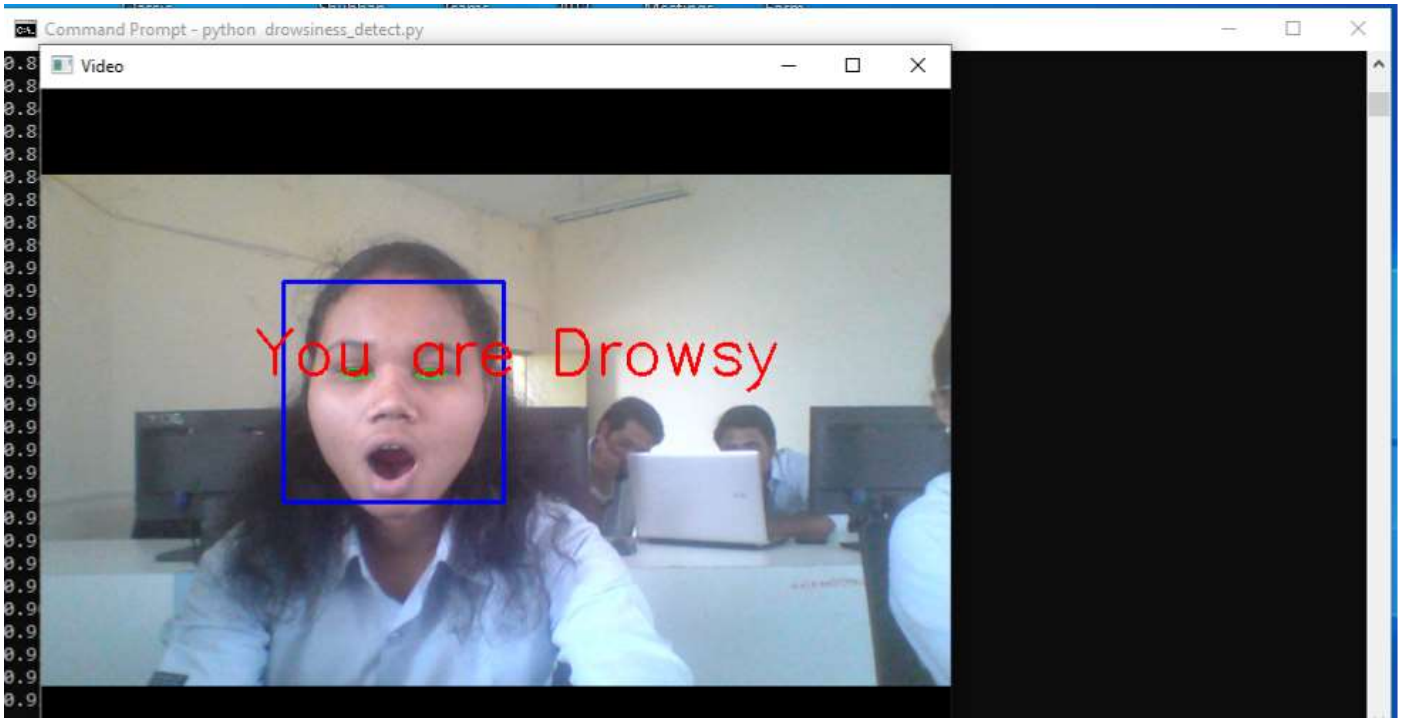
A non-invasive system to localize the eyes and monitor fatigue was developed. Information about the head and eyes position is obtained though various self-developed image processing algorithms. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been 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:

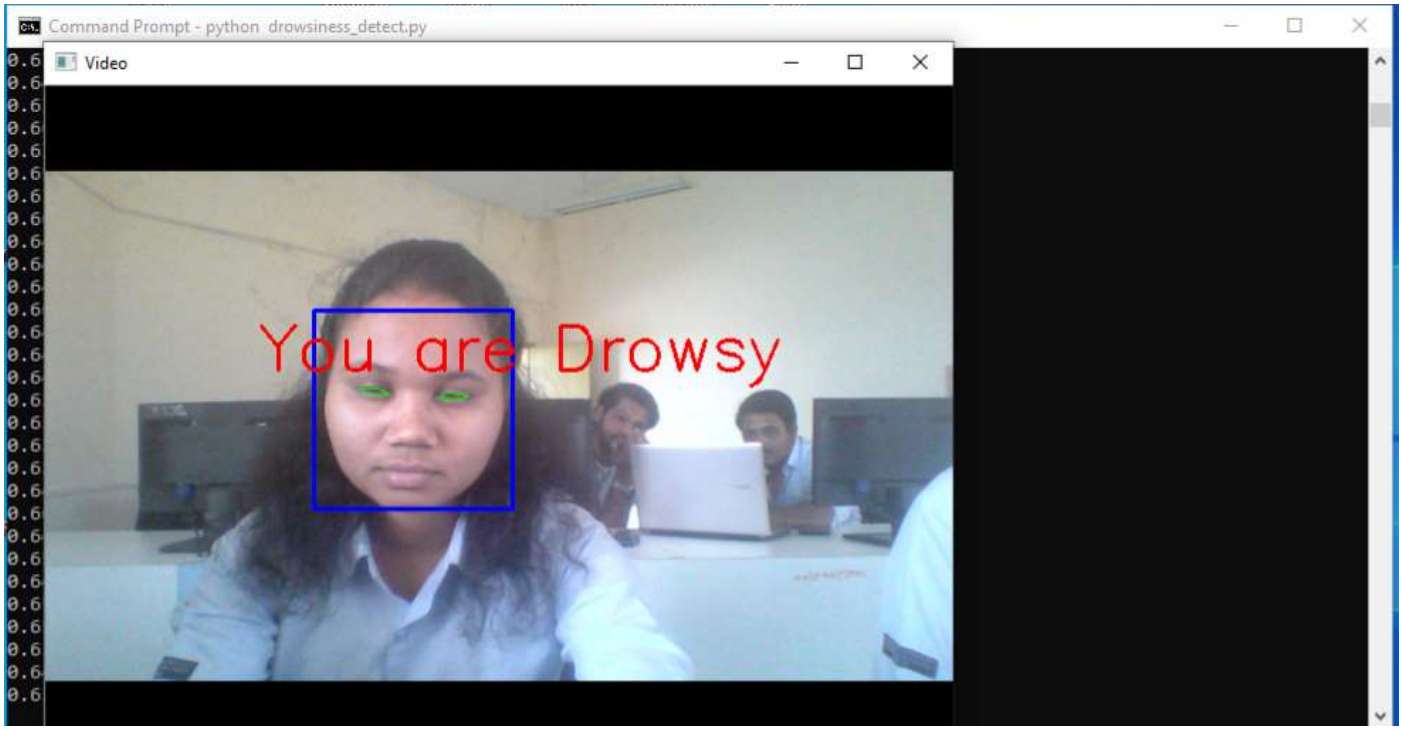
- Image processing achieves highly accurate and reliable detection of drowsiness.
- Image processing offers a non-invasive approach to detecting drowsiness without the annoyance and interference.
- A drowsiness detection system developed around the principle of image processing judges the driver's alertness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

FUTURE WORK:

Now-a-days, there is huge increase in private transportation day by day in this modernize world. It will be tedious and bored for driving when it is for long time distance. One of the main causes behind the driver's lack of alertness is due to long time travelling without sleep and rest. Tired driver can get drowsy while driving. Every fraction of seconds drowsiness can turn into dangerous and life-threatening accidents may lead to death also. To prevent this type of incidents, it is required to monitor driver's alertness continuously and when it detects drowsiness, the driver should be alerted. Through this we can reduce significant number of accidents and can save lives of people.

OUTPUT:


Command Prompt - python drowsiness_detect.py
Video
You are Drowsy


Command Prompt - python drowsiness_detect.py
Video
You are Drowsy

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