WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

DRIVER DROWSINESS DETECTION

Prajwal B S

MCA, NMAMIT NITTE
Email ID: prajwaljhon@gmail.com

ABSTRACT

This research report is a review of my study "Driver Drowsiness Detection". The motivation behind this project is the accidents that are happing because of drivers dozing while driving. In my paper, I have conducted a full study regarding how to handle this issue so that we may put an end to these kinds of problems. I have established good answers for these kinds of difficulties by constructing my project which gives a true sense of how the system operates and improvements can be made to improve the quality of the system.

1. INTRODUCTION

Humans are tending to make mistakes and we will recover from that mistake ultimately with time. We develop the things that are not conceivable at some period like travel we invented planes, cars, trains, metro, and even electric vehicles nowadays. Humans are also affected by this technology. Like if we want to travel to another place we can go within a certain time, but if compare to the past it would have been dream come true. At that time only rich people can travel that far but nowadays everyone has a vehicle for travelling purposes.

However, there are some standards to be followed for those who drive even for the rich as well as the poor. Everyone must observe the regulations, disregarding our responsibility towards safer travel end in tragedy. On-road vehicle's hold the power of transport. In non-responsible hands, it can be bad and maybe, that recklessness is not acceptable when we are too weary to drive. To watch and alarm a destructive effect from such neglect.

Other scholars have studied written articles on driver sleepiness detection yet at times, some of the findings may be not reliable enough. So, to improve the quality of project and work well we used the some of technology and implemented using old research papers and the data provided by them. So I developed new with my idea and techniues.

2. LITERATURE SURVEY

Research survey which is done incorporates the existed technology and research accessible related to the subject of our project. It is an attempt to better grasp the efforts that have gone into this field of research, and also determine where our efforts should be concentrated. This literature survey has been done on the issue of the existing sleepiness detecting methods for landmarks detection on face. Around several techniques to carried out sleepiness detection.

The created system is a real-time system. It employs image processing for eye detection. 68 landmarks dataset used as a classifier for eye detection. An algorithm to track things is employed to track the eyes continually. To identify the drowsy state of the driver we employed Euclidian distance based on that we construct the ratio. Using ratio we determine the distance, and based on the distance we assess if the driver is asleep or not. The paper focuses on designing a non-intrusive system that can detect weariness and provide a warning on time. This survey research has been done on EAR systems for blink detection. The eyes aspect ratio was utilized to find out if the eyes are close or open.

The constraints of the paper include the normal camera was utilized which was not good enough at night. A night-vision camera should have been employed. In some papers there some smart features are there which is not up to the developer because he doesn't know which features are used by the driver.

In another study, there is a driver monitoring system that monitors the driver. It monitors the tiredness of the driver combined with numerous kinds of information from other vehicle-based sensors.

3. OBJECTIVES

Key purpose is to build a project system that is correct to find out a driver's sleepiness based on eyelid aspect ratio and is dependable to give necessary notifications as well as emailing emergency contacts over the web. The other aim establishing a system that identifies weariness in drivers by monitor the eyes of the driver periodically, especially the inner eye area. The proposed project should provide a alarm to the drivers when the driver progresses to the drowsy stage.

4. METHODOLOGY

At first, the face is located in the picture using face landmarks detection. Then, the algorithms are utilized to discover crucial aspects on the face. Face detection is done using OpenCV. In the following phase, to estimate the position of 68 landmark datasets that map to face anatomy, a facial landmark detector is added in the dlib package. The EAR is determined employing the ratio of the distance between the vertical and horizontal ocular landmarks for sleepiness detection. An alarm system is implemented for generating suitable voice notifications when the driver is growing weary.

5. SOFTWARE REQUIREMENT SPECIFICATIONS

The established system must be able to identify tiredness given a real-time driving environment. Then performance it'll rely on the quality of the camera. The proposed system must be nicely developed and convenient to use day and night as well. The system must be able for employed anytime it is required for the driver and it must meet the set specifications. The system must be able to recover whenever it gets crashed due to failure and become ready to use after recovery.

System Requirements:

Python: Python 3.6 and above version

Libraries:

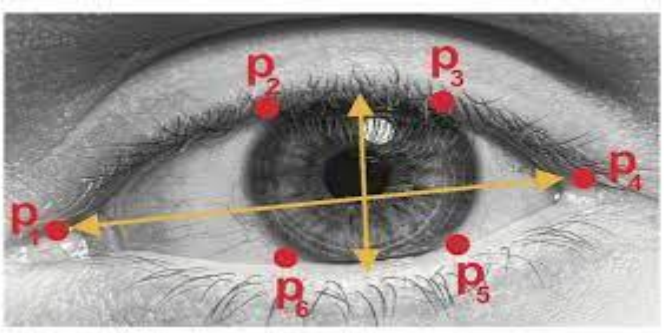
- SciPy: It contains more utility functions for optimization, analytics, and signal processing. We utilized this to compute the distance between eyelids..
- Imutils: This package includes OpenCV+ convenience functions that perform simple actions like as translation, rotation, and scaling.
- Dlib It's a package with a C++ toolkit containing machine learning algorithms and tools to address real-world situations. We utilized this to locate the front humans facial expressions and to calculate its picures by using 68 landmarks of face.
- Twilio: It's a library for sending messages through the web. It's a third party where we use API keys to do the messaging process.

6. SYSTEM DESIGN

After the detailed study of different research paper.we come with idea to develop the perfect system with perfect technology. We used some of old ideas with newer technology and enhanced their capability.

System Architecture:

After exchanging video feed to the dlib using frame by frame, we can find the right eye and left eye features of the face. Now we drew dots around it using OpenCV. Using SciPy's Euclidean function, we calculated the sum of 2 eyes' aspect ratio which is the sum of 2 distinct vertical distances between the eyelids divided by their horizontal distance

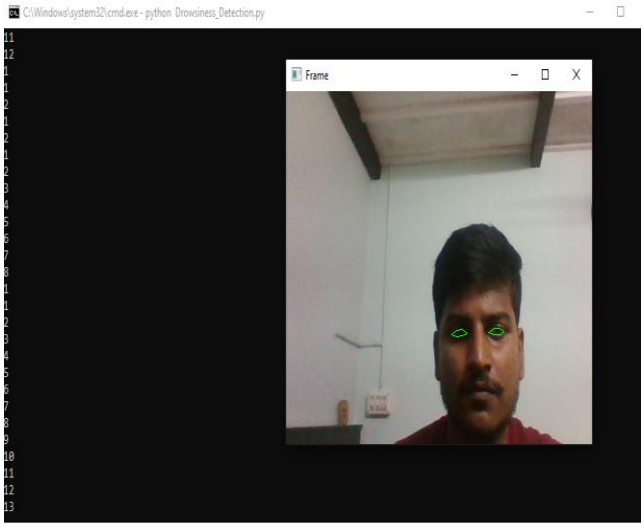


Now using aspect ratio, we calculate the frame check value through which we decide whether either driver is sleeping or not. We decide based on frame check with its value of 30 as a minimum if it's greater than the minimum distance it'll trigger an alarm as we as start to send messages such as text messages, WhatsApp messages, and also email.

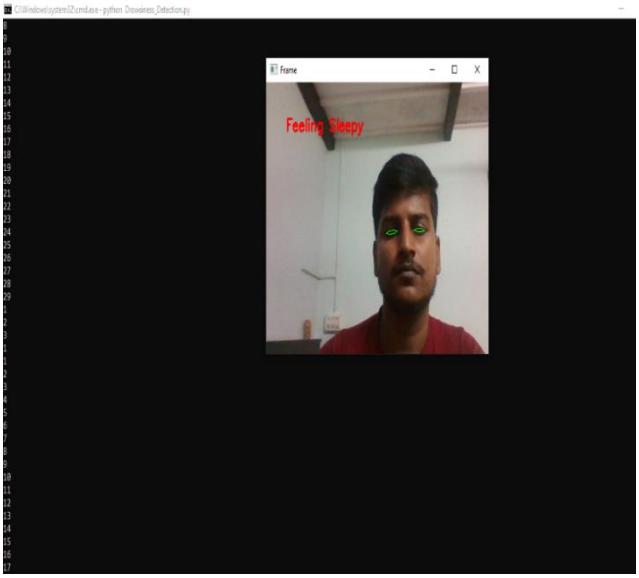
7. DETAILED DESIGN

The project has been developed so that the eyes of the driver are always watched and if the established levels of alert is found to be defaulted and compromised, then an appropriate alarm is issued with SMS and email, and consequently, action is made to prevent any deaths. The camera is situated at top of the car opposite the face of the driver, to continually observe the driver. Upon the detection of tiredness or sleep, the tools in the car generates an alarm with extra processes to notify the driver.

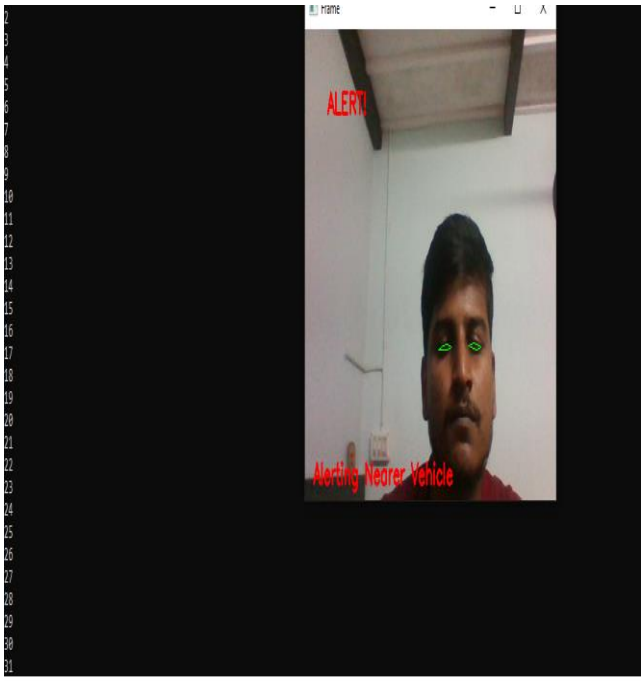
8. EXPERIMENTAL RESULTS



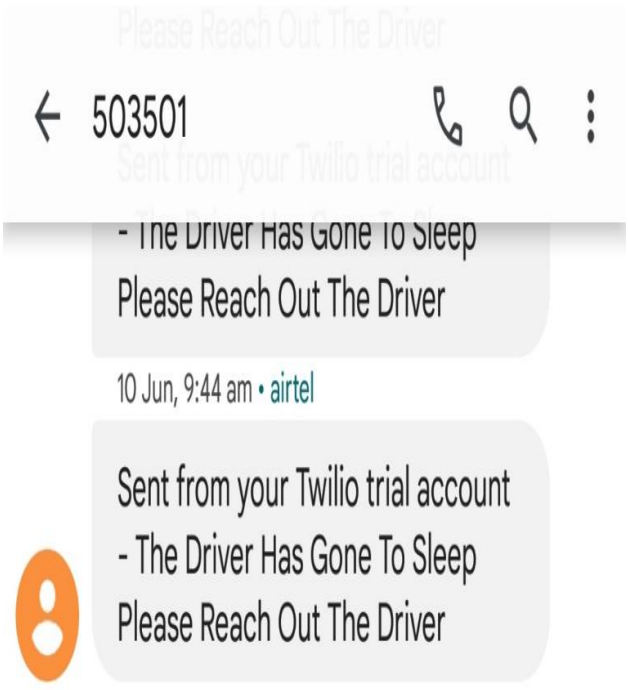
Result 1: The face Is Properly aligned and we can see green marks around the eyes.



Result 2: In this one, we can see the driver feeling bit sleepy



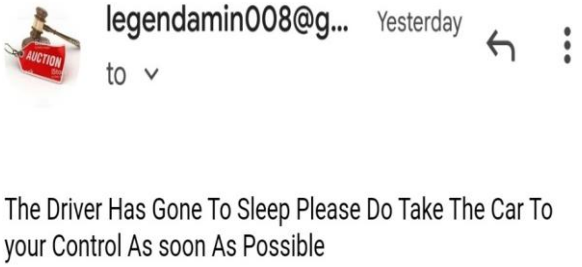
Result 3: Showing the driver is a completely asleep and alert message.



Text Message

Result: Messages that are triggered due to sleepiness of the driver

WhatsApp Message



Email Message

Performance Analysis

I/P	SLEEPNESS ACTION
Result 1	Not detected
Result 2	Feeling Sleepy Stage
Result 3	Completely in Sleep

9. CONCLUSION AND FUTURE SCOPE

The established system is able of detecting tiredness by watching the eyes.68l face landmarks are utilized to find import features on the face. The inputs given to these systems are face landmarks which are collected from face landmarks detection. This model deals with the EAR function which computes the ratio of distances between horizontal and vertical eye landmarks. An alert module is additionally implemented with messaging features as well. The complete initiative is meant to lessen the accidents and contribute to the technology to prevent fatalities caused due to traffic accidents. The future work of this paper can be focused on the use of outside factors for evaluating exhaustion and drowsiness. The exterior influences may be weather conditions status of the car, time of sleeping, and, mechanical data. One of the main elements of preventive measures that are needed to fix the problem is by continuously observing the driver's state and sending information about their status to the driver so that they may take necessary action. In the future, further work can be done to automate the zoom on the eyeballs after they are localized.

LIMITATIONS:

The actual output of the model declines if the number of frames is increased and not recognizes correctly owing to any form of barriers such as goggles or glasses. Camera automatically won't adjust we have adjusted it ourself zoom and rotation are not possible conducting trials. Once the eye is located, zooming in automatically will help boost accuracy. It is not possible to detect the eyeballs if they are not facing the camera.

REFERENCES

[1] "EEG-BASED DROWSINESS DETECTION FOR SAFE DRIVING USING CHAOTIC FEATURES AND STATISTICAL TESTS," Z. MARDI, S. N. ASHTIANI, AND M. MIKAILI, JOURNAL OF MEDICAL SIGNALS AND SENSORS, VOL. 1, PP. 130–137, 2011.

[2] "SQUEEZENET: ALEXNET-LEVEL ACCURACY WITH 50X FEWER PARAMETERS AND 0.5MB MODEL SIZE," F. N. IANDOLA, S. HAN, M. W. MOSKEWICZ, K. ASHRAF, W. J. DALLY, AND K. KEUTZER, PROCEEDINGS OF THE INTERNATIONAL CONFERENCE OF LEARNING REPRESENTATIONS, PP. 1-13, 2017.

[3] BOOK- COMPUTATIONALLY EFFICIENT FACE DETECTION; B. SCHLKOPF-A. BLAKE, S. ROMDHANI, AND P. TORR.

[4] BOOK- JAIN, "FACE DETECTION IN COLOR IMAGES; R. L. HSU, M. ABDEL-MOTTALEB, AND A. K. JAIN.

[5] BOOK- OPEN/CLOSED EYE ANALYSIS FOR DROWSINESS DETECTION; P.R. TABRIZI AND R. A. ZOROOFI

[6] PAPER -DRIVER DROWSINESS DETECTION SYSTEMS AND SOLUTIONS; ALEKSANDAR ČOLIĆ, OGE MARQUES, BORKO FURHT

[7] PAPER - DRIVER DROWSINESS DETECTION USING ANN IMAGE PROCESSING; T. Vesselenyi, S. Moca, A. Rus, T. Mitra and B. Tătaru 2017