Driver Drowsiness System

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Abstract

Driver in-alertness is an important resulting from sleep deprivation or sleep disorders and is an important fac-tor in the increasing number of the accidents on today's roads. Driver Drowsiness System can form the basis of the system to possibly reduce the accidents related to driver's drowsiness.

According to the results of the study presented at the International Symposium on Sleep Disorders, fatigue of drivers is responsible for 35

1 Objective

The two main objectives for Driver Drowsiness System are as follow:

i: Detect the drowsiness of driver.
ii: Give alert to driver.

2 Development Platform

Tools:
I'd use Open source community version of VS Code platform but I'have used pycharm as main coding editor for this project.

OpenCV:
Open CV libraries and functions are highly optimized and can be used for real time image and video processing in this project.

Python:
Python language is used in project due to his cross platform compatibility as main coding language for al-gorithm. Open CV's libraries are integrated in python interpreter for using readymade optimized functions.

2.1 Techniques

Different techniques are used in driver-fatigue moni-toring systems.These techniques are divided into four categories:
i: Monitoring biomedical signals of driver
ii: Visual assessment of driver's behavior from face images.
iii: Based on driver's performance, which monitor moving course.
iv: Combines above three categories.

Drowsiness can be detected by observing the facial features and visual bio-behavior such as head position, gaze , eye openness , eyelid movements , and mouth openness . Proposed algorithm is based on computer vision method. The main focus is on the detection of blinks by estimating the EAR(Eye Aspect Ratio) And Face Detection.

This is achieved by monitoring the eyes of the driver throughout the entire video sequence.Camera will be used for capturing live video of driver eyes in all light conditions and frames will extracted for image processing scheme of video capturing.

3 Algorithm And Flow Of Work

There are different algorithms are available for face detection and eye prediction.I have used Face Detection using Haar-Cascades and eye prediction like blinking,sleeping I have use EAR (Eye Aspect Ratio) using OpenCV because EAR can be easily measured from eye coordinates returned from OpenCV.

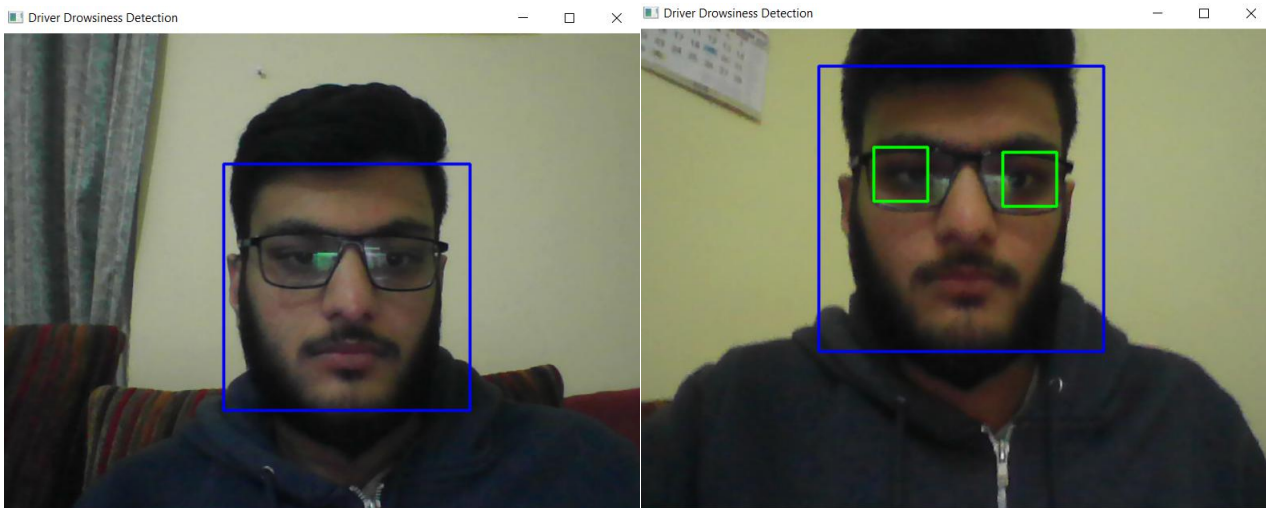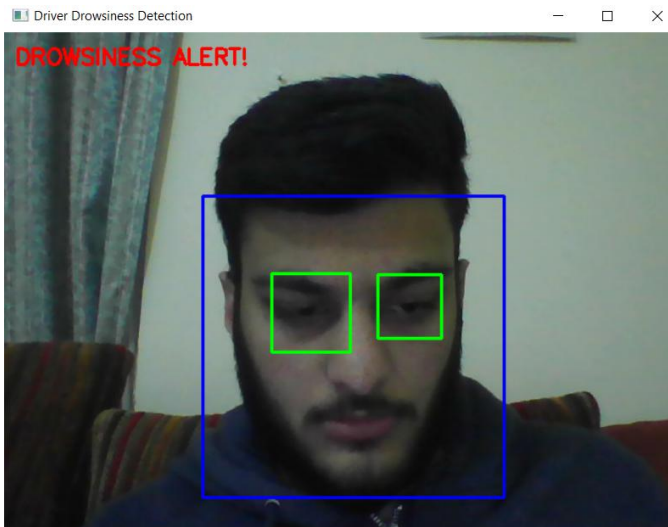Flow Of Work As Follow:
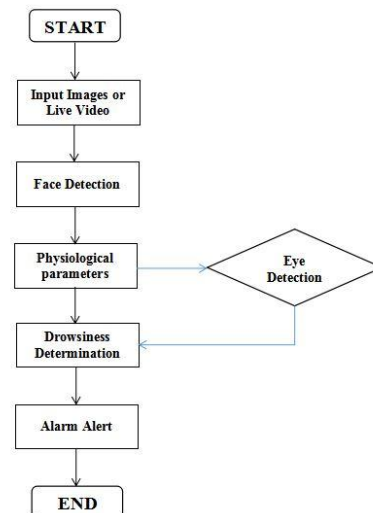
4 Test Cases
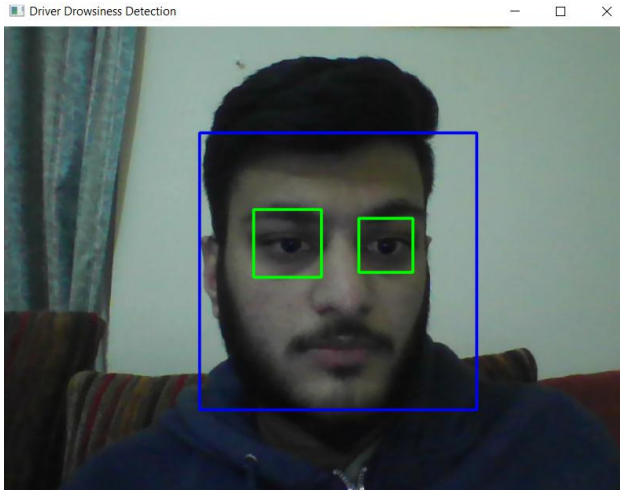
1. This image shows Face detection and Eye detection using camera.

2.This image shows face detection with eye glasses.

3.Below image shows drowsiness detection and give alert.

5 Conclusion

In this project I'd demonstrated Driver Drowsiness System using OpenCV, Python And open source Libraries by Face Detection,Image Processing and measuring EAR (Eye Aspect Ratio).For authentic results the camera position have to be focused on driver's face and Night time I have suggested to use IR camera.

5.1 References

1: AWS Developers Club,Amazon,Leicester.