

## REAL-TIME DRIVER FATIGUE DETECTION USING EYE DETECTION

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### ABSTRACT

Drowsiness of drivers are among the huge reasons of road accidents. Consistently, they increment the measures of deaths and fatalities wounds internationally. This framework assists with decreasing the quantity of mishaps because of driver's weariness and henceforth increment the transportation wellbeing. This system manages programmed driver drowsiness direction dependent on visual data. We propose to find, track, and examine both the driver's face and eyes to gauge EAR.

**KEYWORDS:** Driver Drowsiness Detection, visual, EAR

### I. INTRODUCTION

Drowsiness is a procedure wherein one degree of mindfulness is diminished because of lacking of rest or sleep and it might cause the driver fall into sleep discreetly. At the point when the driver is experiencing sluggishness driver loses the control of the vehicle, so driver may be out of nowhere veered off from the road and hit an obstruction or a vehicle to topple.

As indicated by accessible measurable information, over 1.3 million individuals kick the bucket every year out and about 20 to 50 million individuals endure non-lethal wounds because of road mishaps. Driver sleepiness has been one of the significant reasons for road mishaps and can prompt extreme physical wounds, deaths and noteworthy financial misfortunes. So there is a need of a solid driver sluggishness directionsystem which could alarm the driver before an accident occurs.

### II. METHODOLOGY

To conquer the difficulty we thought of solving the problem as image processing. For image processing, OpenCV and Dlib open source libraries are utilized. Python is utilized as a language to actualize the thought.

There's a camera mounted to ceaselessly track the facial landmarks and motion of the driver's eyes. This project mostly focuses on driver's eyes landmarks. Images are passed to the module which performs landmark detection to identify interruption and driver's fatigue. On the off chance that the driver is seen as diverted, at that point a voice (sound) alert is given and a message is shown on the screen.

### III. REQUIRMENTS AND PROPOSED SOLUTION

#### 3.1 Hardware

- 32-bit, x86 Processing system
- Windows 10
- High processing computer system without GPU or with GPU (high performance)
- Web Camera or any other camera: To capture the driver's face for face detection.

#### 3.2 Software

• **Python** and its supported libraries: Python is a simple and minimalistic language. The Python Standard Library is an assortment of content modules open to a python program to rearrange the programming procedure and expelling the need to rework normally utilized orders. They can be utilized by 'calling/bringing in' them toward the start of a content. The Python Library is immense indeed.

#### 3.3 Tools Used

##### OpenCV

OpenCV (Open Source Computer Vision Library) is a library fundamentally which focuses on real-time computer vision. Originally developed by Intel, OpenCV was intended for computational effectiveness and with a solid spotlight real-time applications.

**SciPy (Scientific Python)**

SciPy is a open-source library which performs scientific and technical computation.It's benefits are that it can be used for manipulating data, powerful and interactive sessions with Python. It's easy to use and understand as well as fast computational power, classes, and web and database routines for parallel programming.

**3.4 Proposed Solution**

The proposal is to deploy a system in car which can detect the eyes of driver to analyze eyelid movement continuously in order to avoid accidents due to drowsiness.The System can,

- Be able to process the video continuously while driving.
- State the driver's drowsiness.

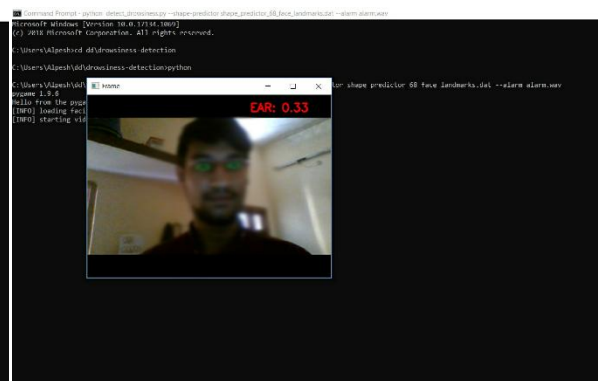
**IV. RESULTS AND TEST CASE ANALYSIS**

**4.1 Test Case-1**

Test Case ID	TC001
Test Case Summary	It will check whether the system detects and warns in the different lighting condition.
Test Procedure	Place and start the camera in different light conditions.
Expected Result	Person should be detected in different conditions.
Actual Result	Person in different light conditions is detected.
Status	Pass



**Fig-01**



**Fig-02**

**4.2 Test Case-2**

Test Case ID	TC002
Test Case Summary	It will check whether the person with spectacles is detected or not.
Test Procedure	Place and start the camera in front of person with spectacles.
Expected Result	Person must be detected wearing spectacles.
Actual Result	Person with spectacles is very much detected
Status	Pass

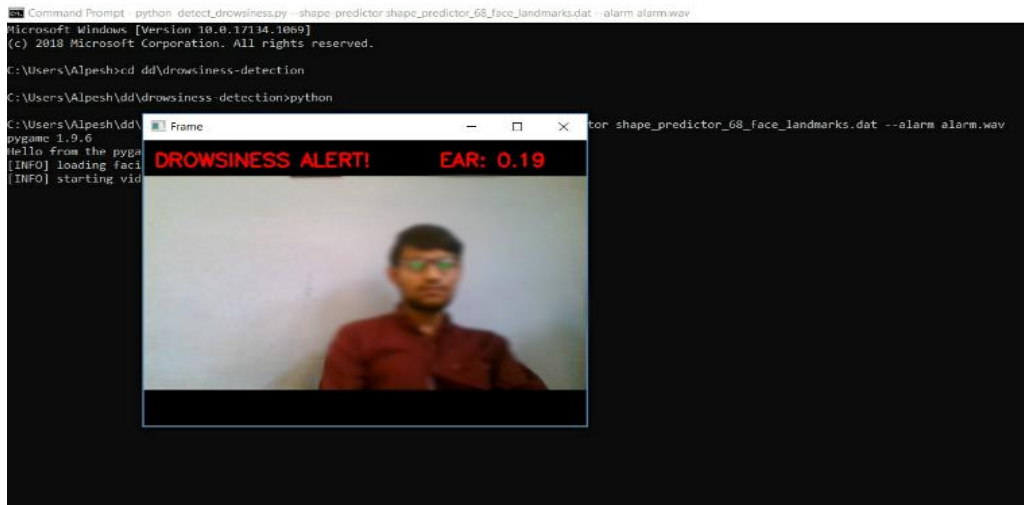


Fig-03

### 4.3 Results

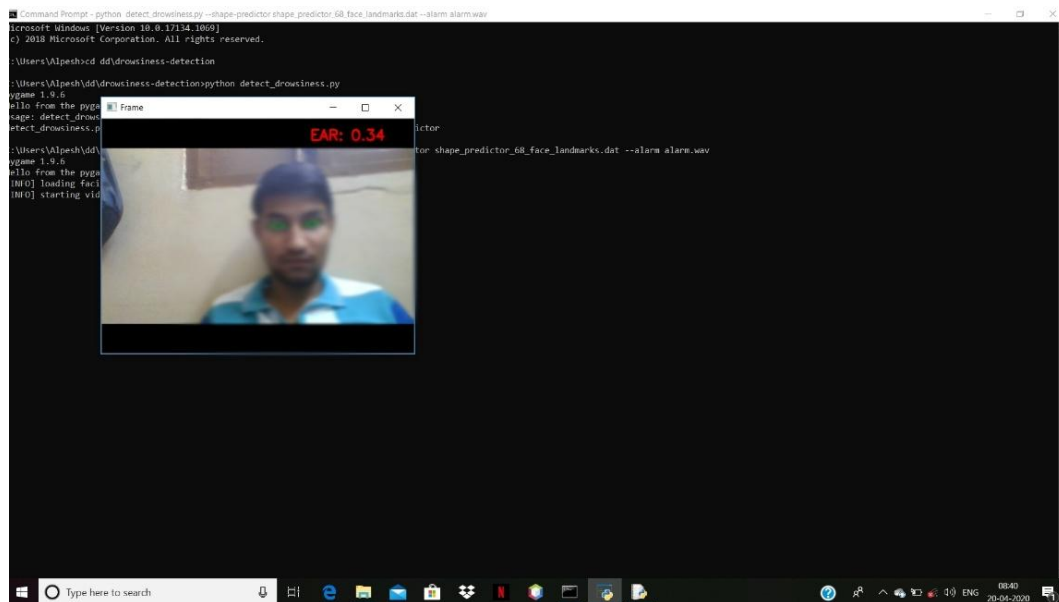


Fig-04

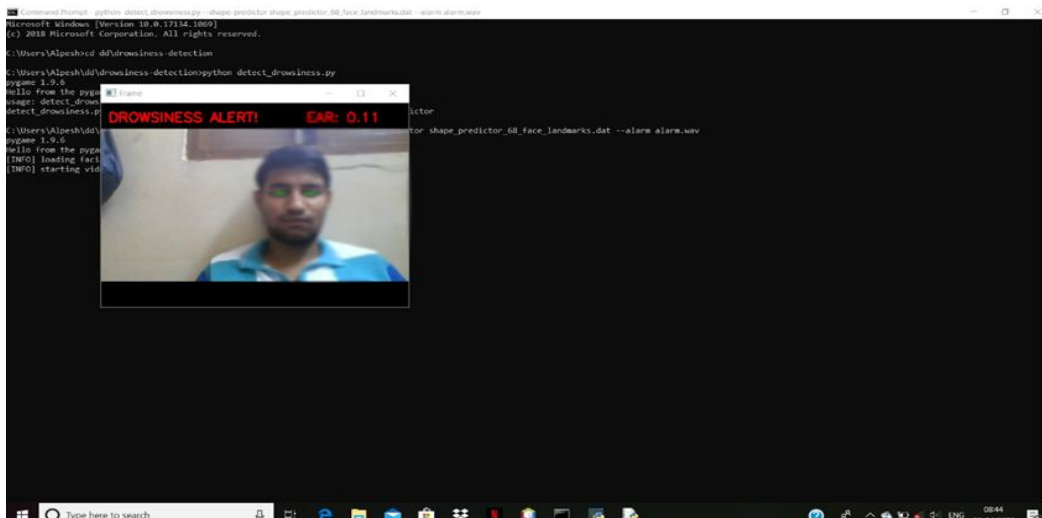


Fig-05

## V. CONCLUSION

The main aim of the project is to make a system that supervises and identifies the distraction of driver. The driver's face is detected by capturing facial points and cautioning is given to the driver to stay away from constant accidents. Non-intrusive methods have been preferred over intrusive methods. The presented proposal uses EAR and Eye Closure Ratio with adaptive thresholding to detect driver's drowsiness in real-time. This is valuable in circumstances when the drivers have burden and drive ceaselessly for extended distances. The proposed system works with the collected data sets under different conditions. The facial landmarks captured by the system are stored and machine learning algorithms have been employed for classification.

The developed system prevents the driver from going in these luggishness state while driving. The system can easily choose whether the eyes are open or shut. The numerous mishaps will be diminished and give safe life to the driver and vehicle security by performing this.

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