

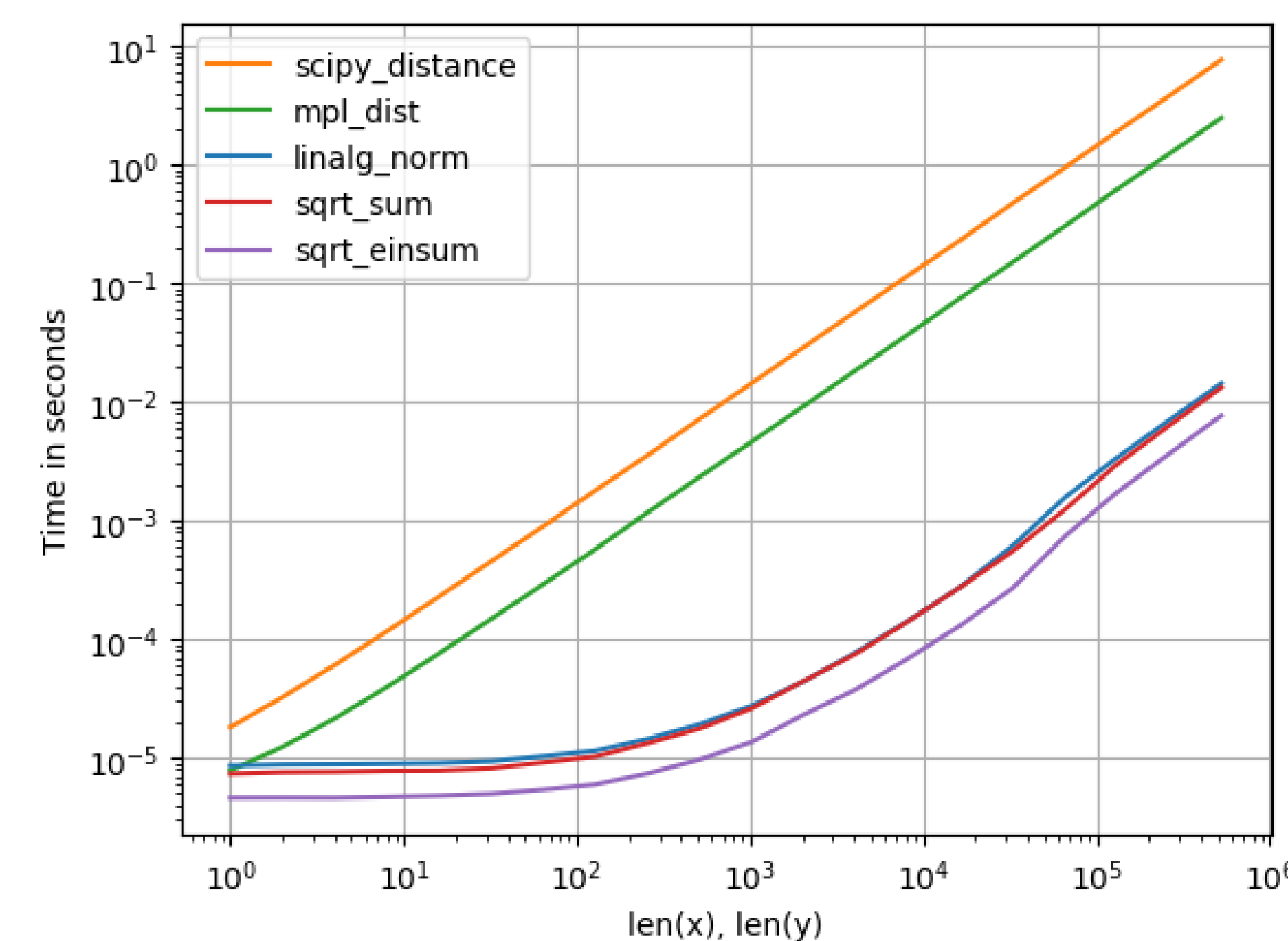
# DROWSINESS DETECTION SYSTEM

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## ABSTRACT

Traffic accidents due to human errors cause many deaths and injuries around the world one of those human error is the driver being drowsy. As a solution to this problem, we design a software which tracks and analyze the face and the eyes to compute a drowsiness average, working under varying light conditions and in real time.

## METHOD



We use Euclidean Distance formula to compute the distance between facial landmark points in the eye aspect ratio calculation.

The general flow for the system is as follows:

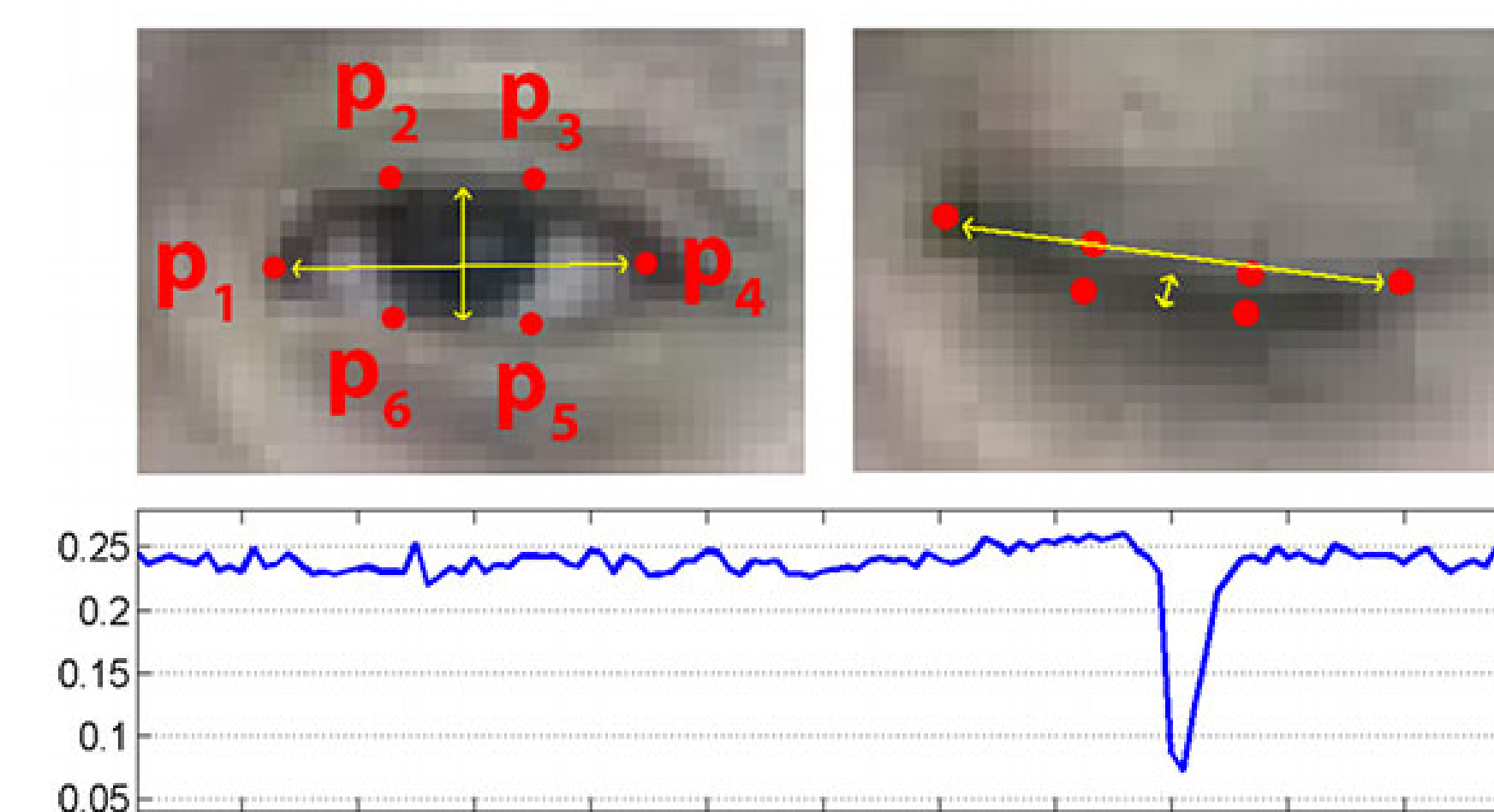
1. Setting up a camera that monitors a stream for faces.
2. If face is found we applied facial landmark detection and extract eye region.
3. We compute the aspect ratio to determine if the eyes are closed.
4. If the eye aspect ratio indicates that the eyes have been closed for a sufficiently long enough amount of time, we'll sound an alarm to wake up the driver.

## TESTING/VALIDATION

We use Euclidean Distance formula to compute the distance between facial landmark points in the eye aspect ratio calculation. Based on the eye aspect ratio we check if eye lid is open or closed.

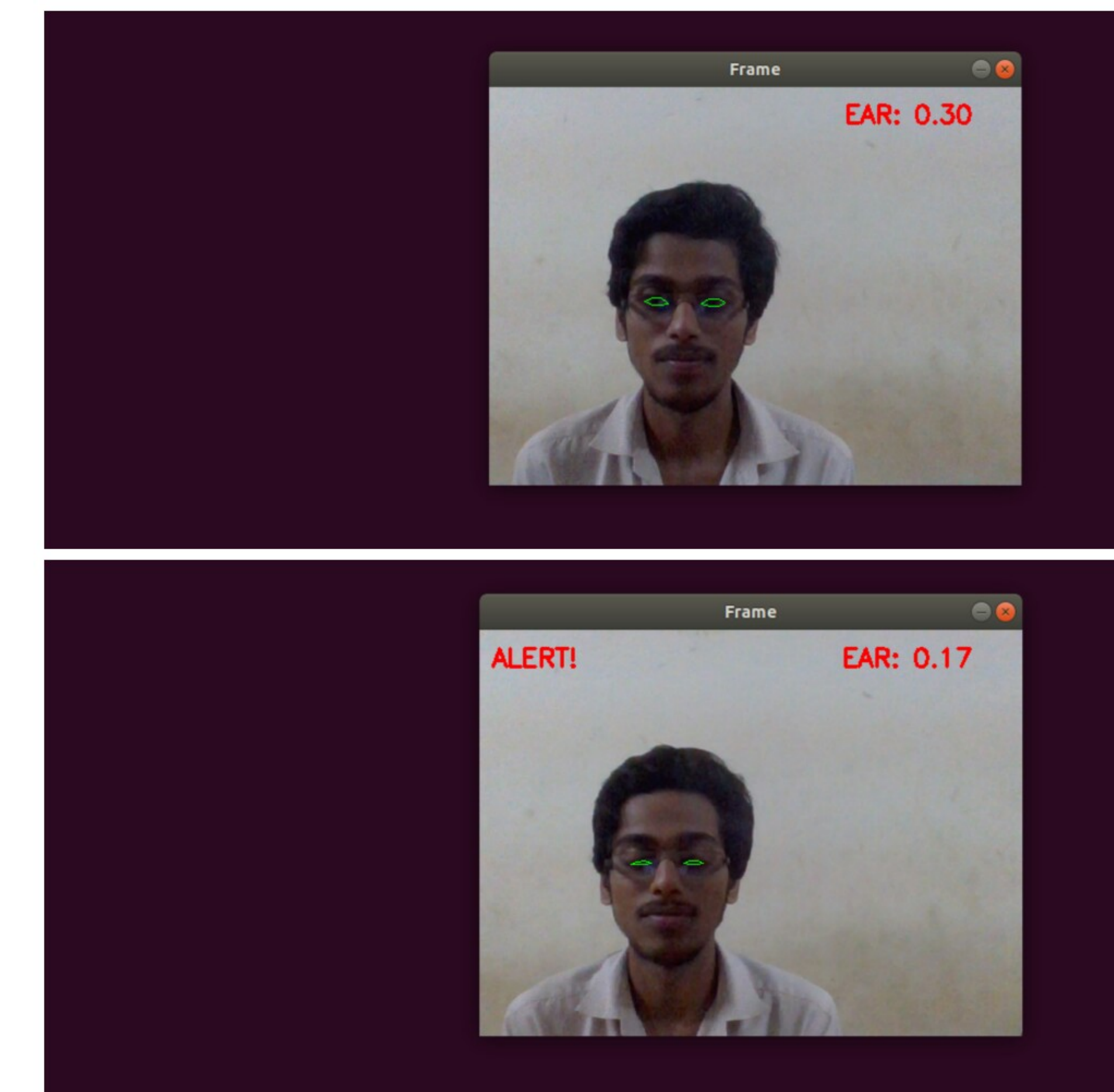
## BACKGROUND MODEL

Aspect ratio using Euclidean Formula



1. Using imutils and dlib packages, we applied facial landmark detection algorithm and extract the eye region.
2. Calculate the distance between the eyes using euclidean distance formula and the aspect ratio.
3. We define two constants, one for the eye aspect ratio to indicate blink and then a second constant for the number of consecutive frames.
4. When continuously for 48 frames the eye threshold is below the defined threshold the alarm is set off.

## RESULTS WITH SPECS



## RESULTS WITHOUT SPECS



RESULT:

We are able to detect, if the person is drowsy or not.

## REFERENCES

1. <https://en.wikipedia.org/wiki/Driverdrowsinessdetection/Drivereye/facemonitoring>
2. <https://www.pyimagesearch.com/2017/05/08/drowsiness-detection-opencv/>
3. <https://ieeexplore.ieee.org/document/6602353>

## SOURCE CODE

The source code is available at following git-repository

[https://github.com/dhruv007patel/Drowsiness\\_Detection\\_System](https://github.com/dhruv007patel/Drowsiness_Detection_System)