DROWSINESS-DETECTION SYSTE

Submitted in the partial fulfillment for the award of

the degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE ENGINEERING IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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DISCOVER . LEARN . EMP

Outline

- Introduction to Project
- Problem Formulation
- Objectives of the work
- Methodology used
- Results and Outputs
- Conclusion
- Future Scope
- References

Introduction

- According to the National Highway Traffic Safety Administration, every year about 100,000 police-reported crashes involve drowsy driving. These crashes result in more than 1,550 fatalities and 71,000 injuries.
- In this project, we focus on the challenge of road safety and introduce a new system for driver sleepiness. In this system, to detect the driver's sleeping position as a sign of drowsiness.
- If a person falls asleep then a buzzer will be automatically turned on and it will alert the driver not to fall asleep.

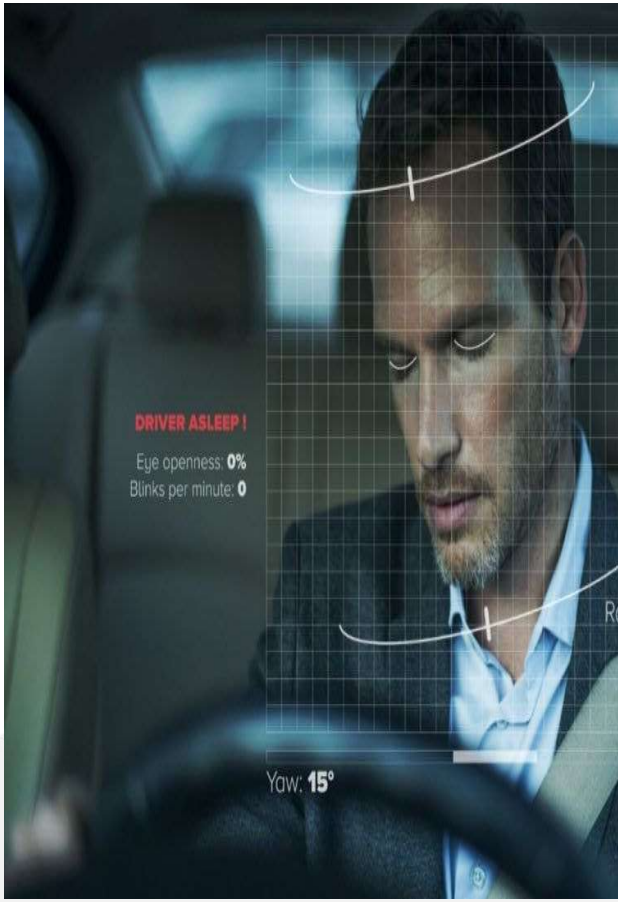
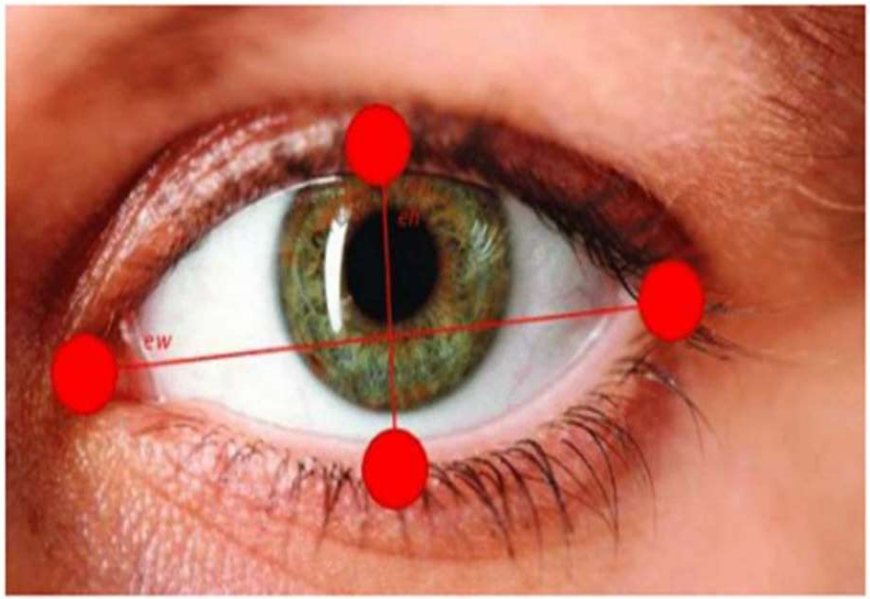


Fig. 1.1

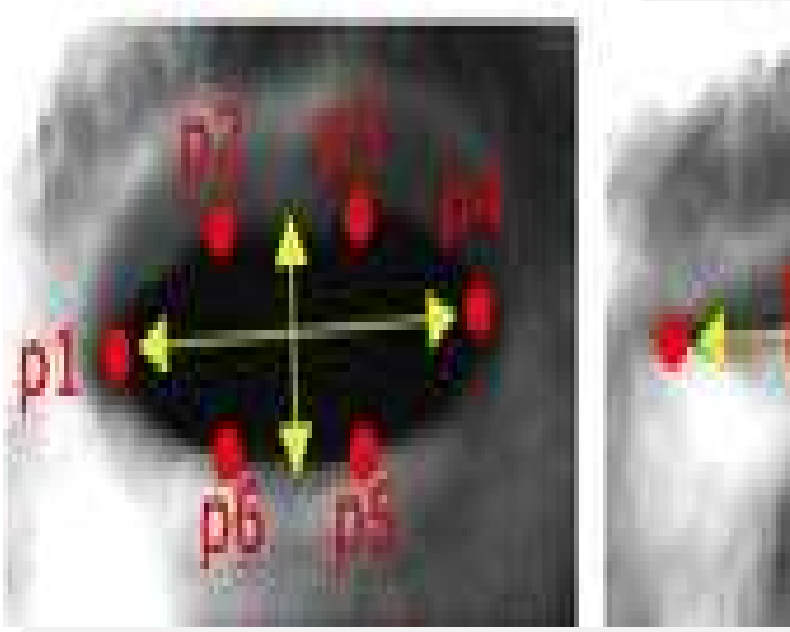
Introduction

- The system is capable of detecting facial landmarks and computes Eye As (EAR) and Mouth Aspect Ratio(MAR) to detect driver's drowsiness adaptive thresholding.



Eyes with horizontal and vertical distance marked for Eye Aspect Ratio calculation.

Fig. 1.2

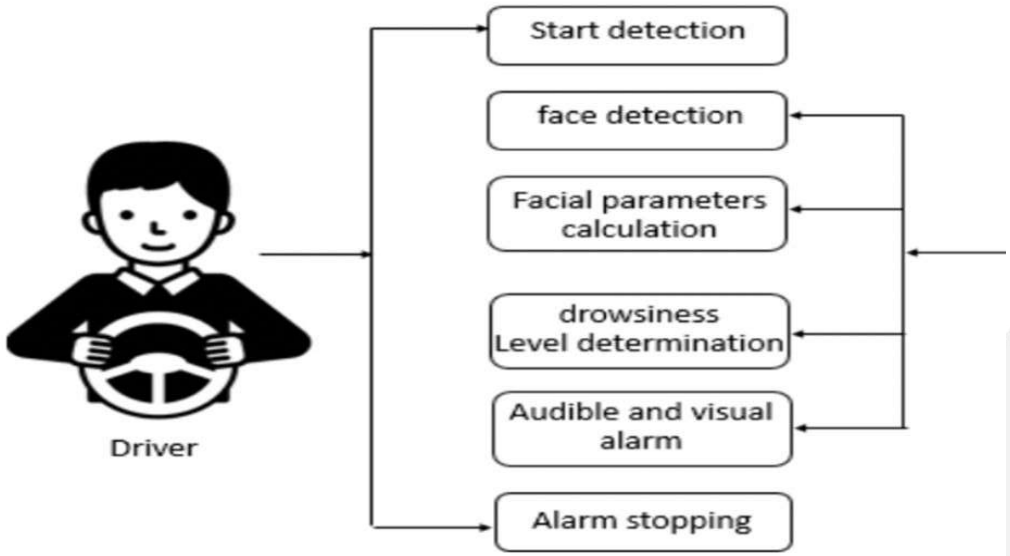


Mouth Aspect Ratio

Fig. 1.3

Introduction

- We will be using a machine-learning algorithm to predict the drowsin person.
- We are using the OpenCV library to detect the live facial expression, so detection, we will be analyzing facial landmarks.



Flow Representation

Fig. 1.4

Objectives

The project focuses on these objectives, which are:

- To suggest ways to detect fatigue and drowsiness while driving.
- To Determine the drowsiness from these parameters - Eyeblink - Area of th detected at eyes - Yawning (mouth open or close based on some threshold
- To investigate the physical changes of fatigue and drowsiness.
- To develop a system that uses eyes closure and yawning as a way to detect and drowsiness.
- Data collection and measurement.
- Integration of the methods chosen.
- Coding development and testing.

Problem Formulation

- Currently existing driver drowsiness detection systems are divided into two categories: extremely expensive systems that are limited to specific high-end automobile models, and less expensive but less reliable options.

- Our work focuses on developing a drowsiness detection system that attempts to bridge the gap by balancing price and availability with usefulness.

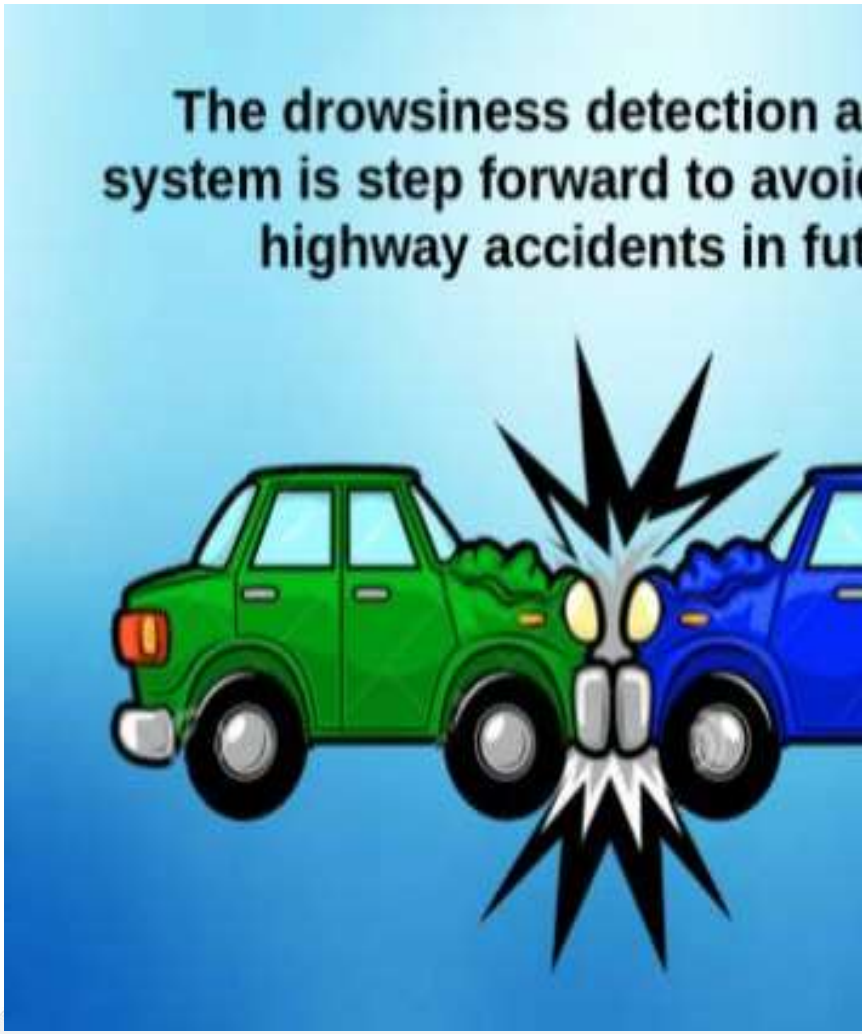


Fig. 2.1

Problem Formulation Continue..

- A drowsiness detection system that uses a camera in front of the driver is preferable, but the physical indications that indicate tiredness must first be identified. Trying coming up with a dependable and accurate drowsiness technique.

- As a result, the goal of this project is to review all past research and appro order to provide a way for detecting tiredness via video or webcam.

- With the help of eye Aspect Ratio Calculation, it analyses video images a a system that can examine each frame of the film.

- The former is difficult and costly to do, while the latter somewhat fixes th problem because driving for lengthy periods of time is exhausting.

Methodology

The entire architecture is divided into 7 phases.

1. Face Detection

2. Eye Detection

3. Face Tracking

4. Eye Tracking

5. Drowsiness Detection

6. Alert generation.

7.Building the frontend

Flowchart of Methodology

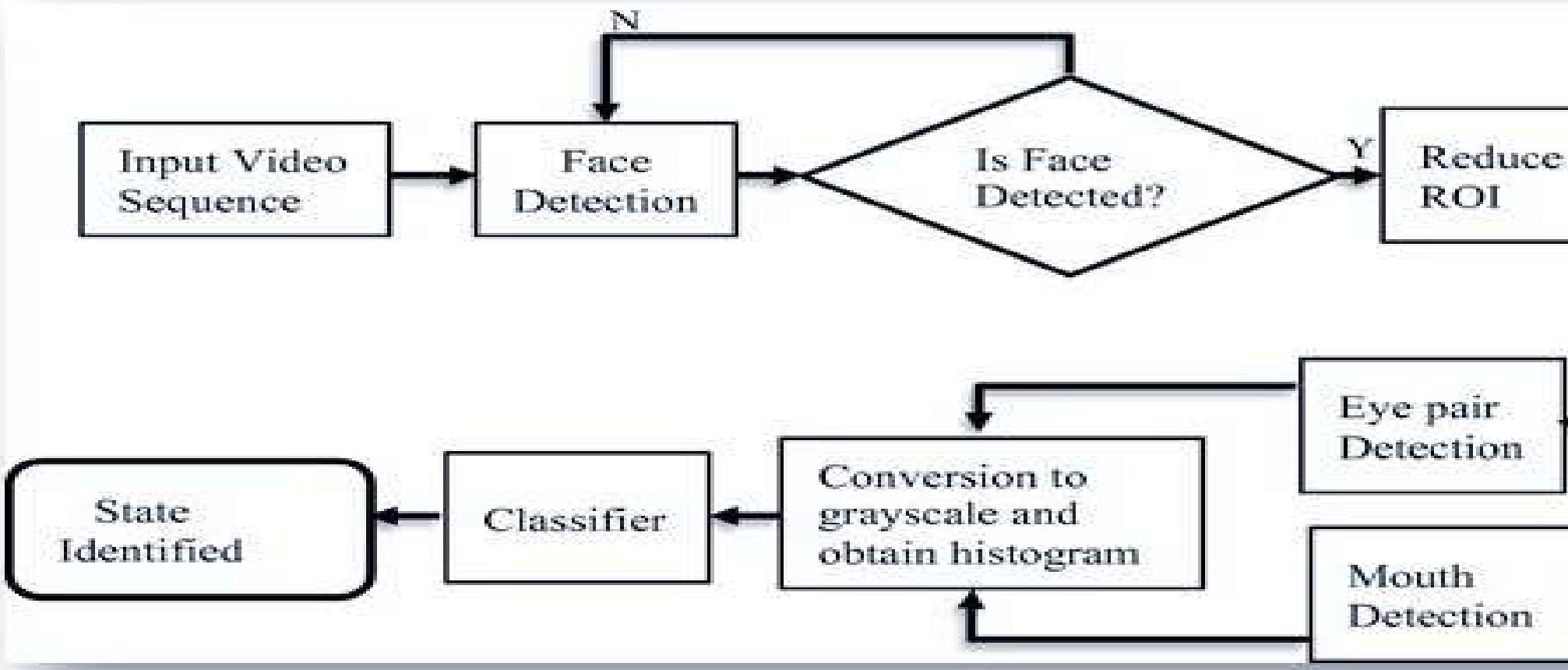


Fig. 3.1

Results and Output

- Whether a driver is drowsy or not, it depends on their facial expression main eyes and mouth.
- Accuracy for different classifiers:

S.no	Classifiers	Accuracy	Precision	Recall	F-Measure	TPR
1.	Naive Bayes	80	80.7	80	79.8	80
2.	SVM	80	80.1	80	79.9	80
3.	Random Forest	84	84	84	84	84

TPR: True Positive Rate

FPR: False Positive Rate

SVM: Support Vector Machine

Fig. 4.1 < 1st USER INTERFACE >

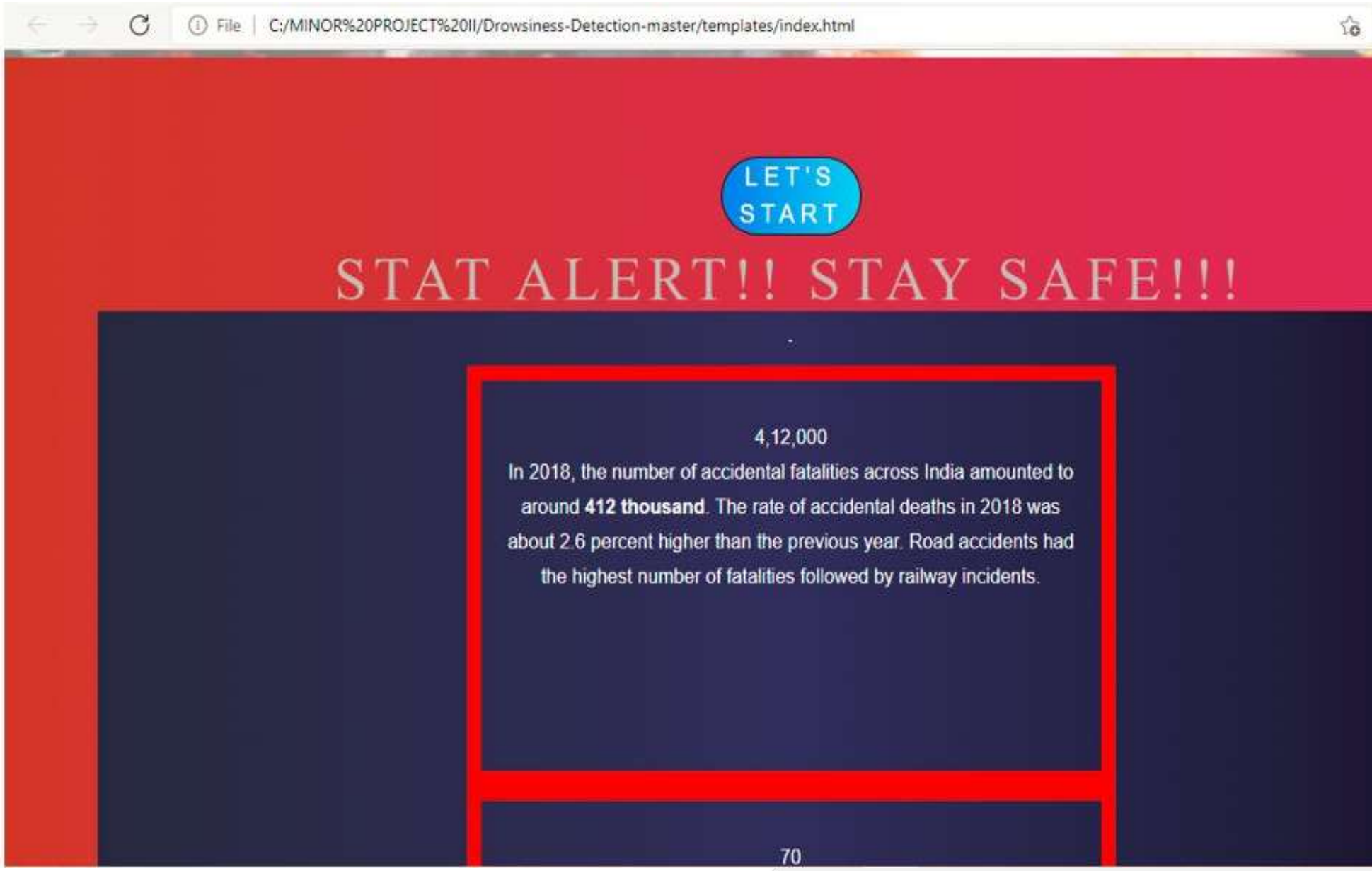


Fig. 4.2 < 2nd USER INTERFACE >

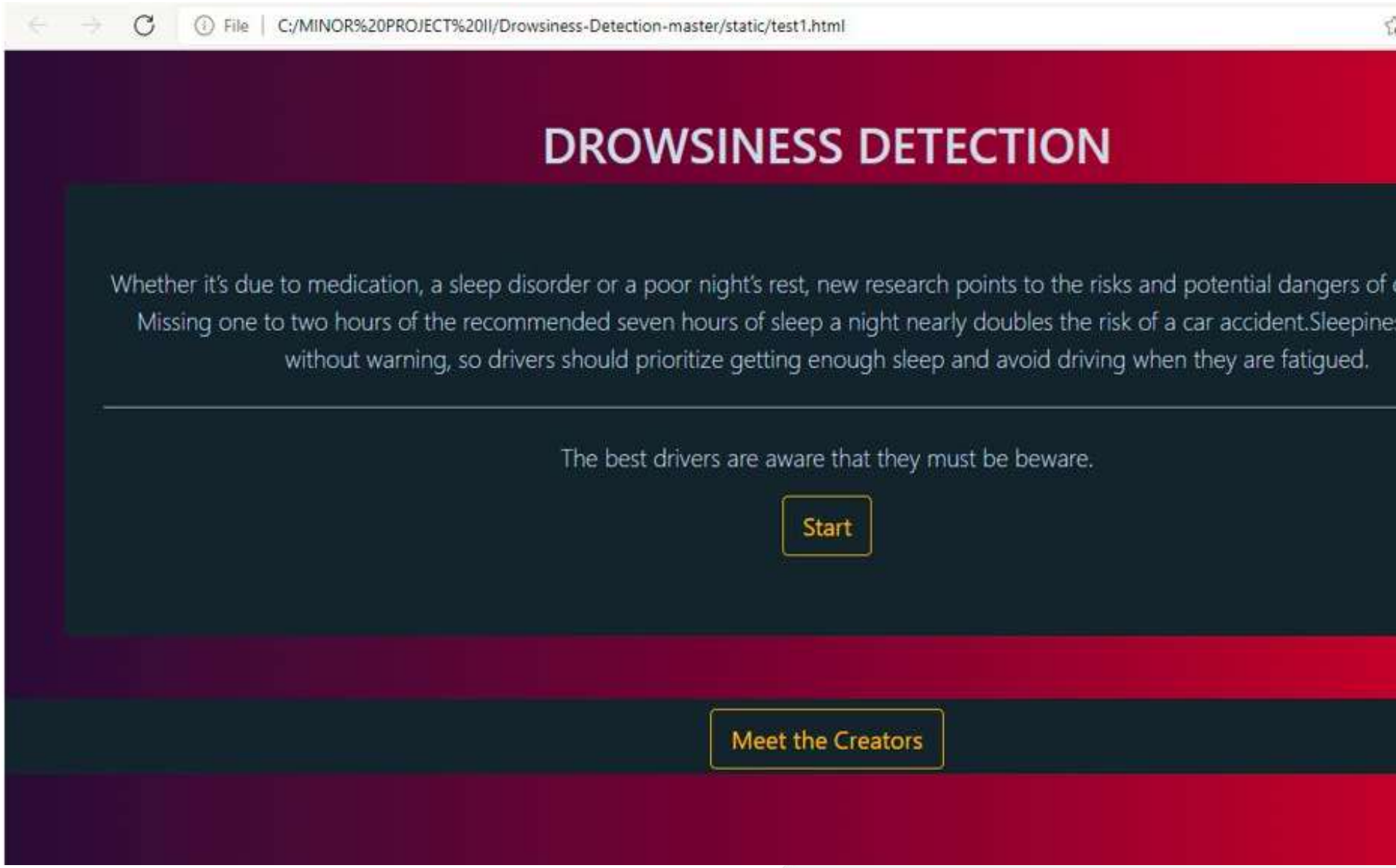


Fig. 4.3 < START BUTTON >

Fig. 4.4 < 1st Dialogue Box >

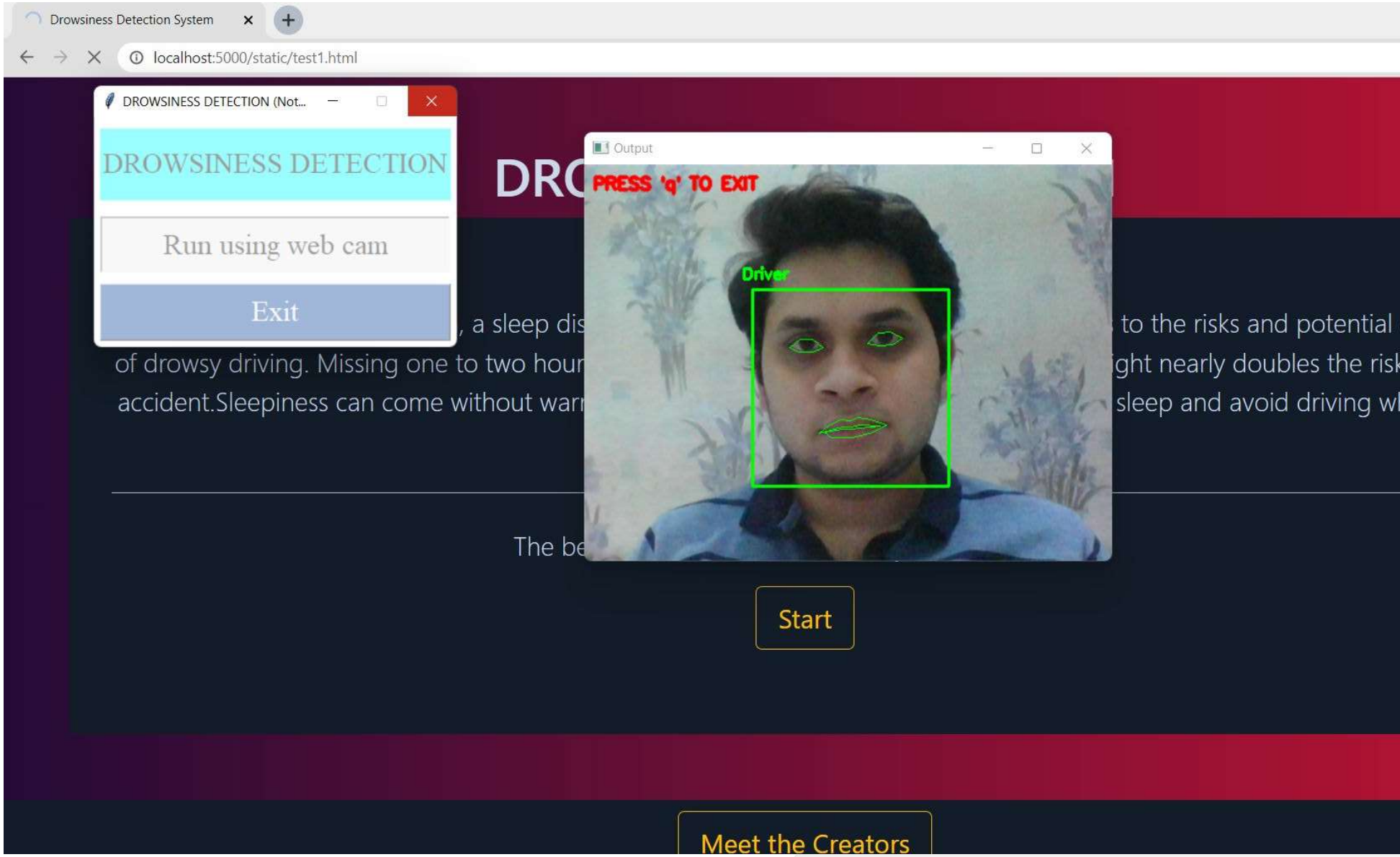


Fig. 4.5 < Driver is not Drowsy >

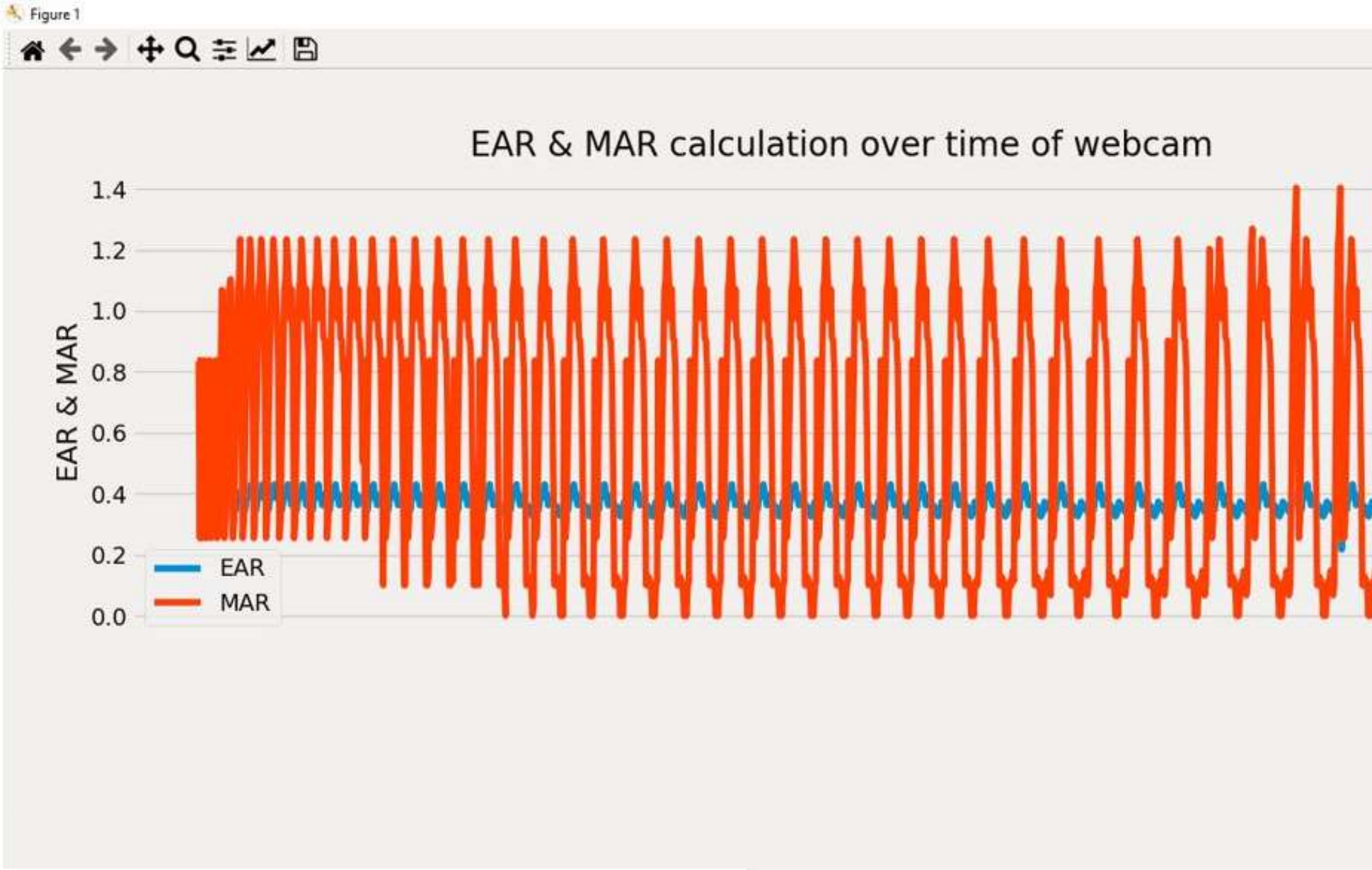


Fig. 4.6 < "EAR & MAR" Driver is not Drowsy >

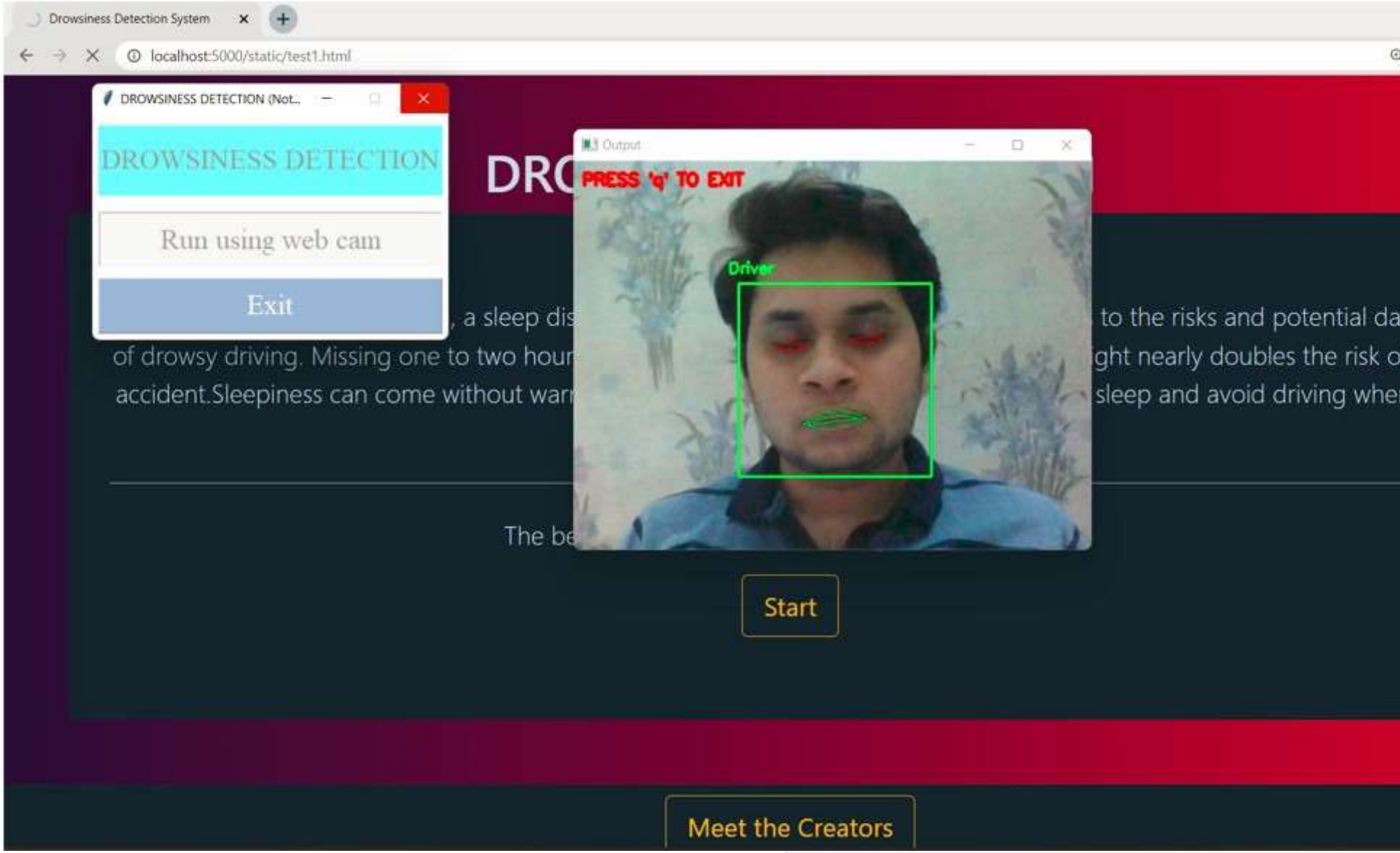


Fig. 4.7 < Driver is Drowsy >

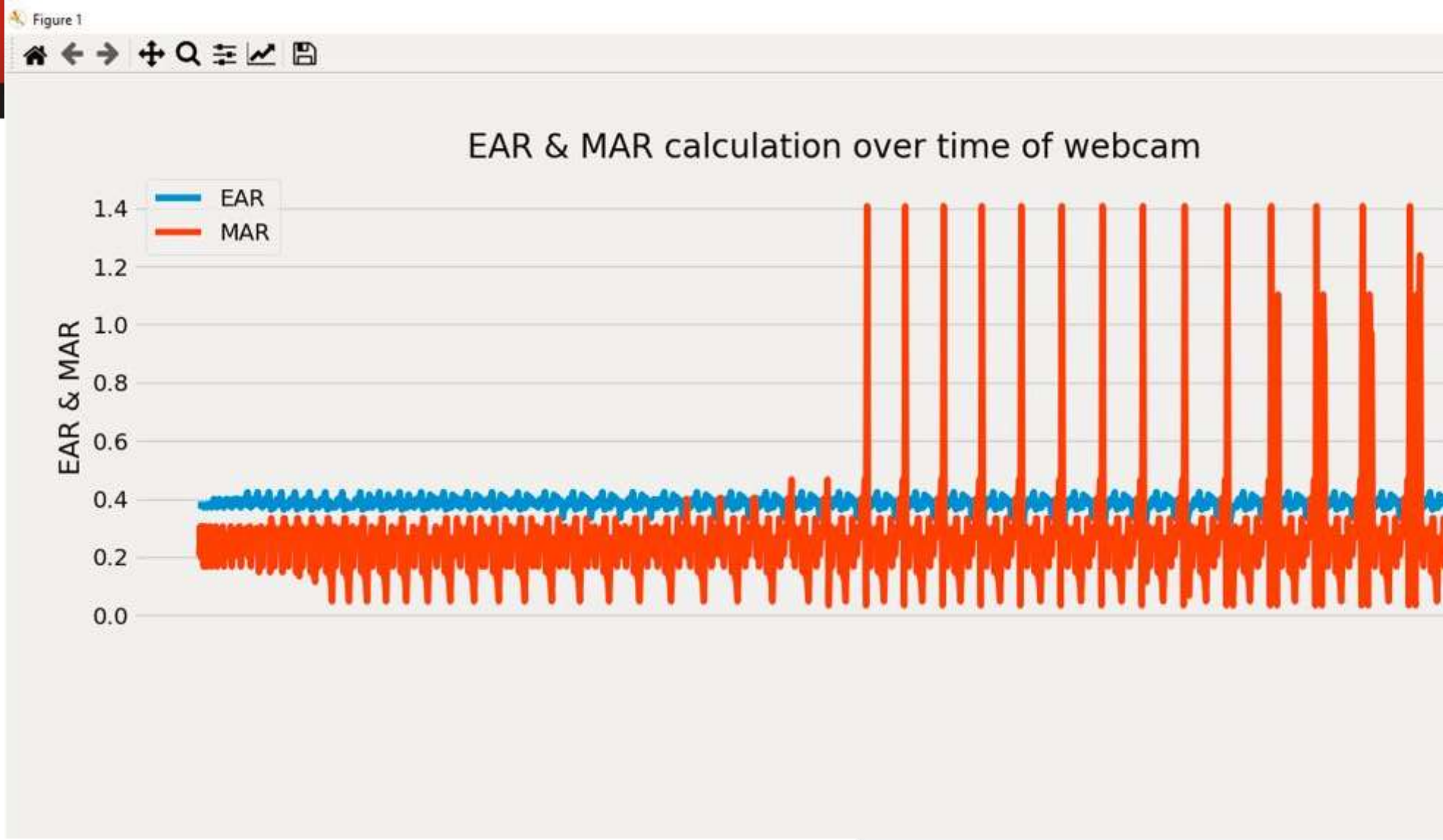


Fig. 4.8 < "EAR & MAR" Driver is Drowsy >

Conclusion

- In this work, a real-time system has been created that monitors and detec attention of drivers due to fatigue and drowsiness is proposed.
- The face of the driver is detected by capturing facial landmarks and a war to the driver to avoid real-time crashes.
- Drowsiness detection plays a vital role in safe driving, and this project pro system to prevent accidents arising from drowsiness.
- We would like to conclude our work that all the main objectives have be and this could be useful in solving real world problem.

Future Scope

- The future scope for this project includes increasing the speed of operatio system and hence increasing the accuracy rate.
- It can include the integration of the proposed system with globally used applications
- The difficulties faced due to bad lighting that may occur while driving du nighttime is a potent problem that needs to be taken care of. Bearded men people wearing spectacles too should be able to use this system accurately
- In the real-time drowsiness detection system, it is required to slow down a automatically when the drowsiness level crosses a certain limit. Instead o threshold drowsiness level, it is suggested to design a continuous scale dr fatigue detection system.

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