DRIVER DROWSINESS DETECTION SYSTEM

Team 11

Nihaas Reddy R – AM.EN.U4CSE20157

Dheeraj Reddy B – AM.EN.U4CSE20115

Karthik P M – AM.EN.U4CSE20138

Vamsi Narayanan – AM.EN.U4CSE20146

Problem Statement

Driver drowsiness and fatigue are significant causes of road accidents.

Every year, they increase the number of deaths and fatalities worldwide.

A module for an advanced driver assistance system is presented in this system to reduce the number of accidents caused by driver fatigue and thus increase transportation safety.

This system deals with automatic driver drowsiness detection based on visual information and Artificial Intelligence.

The proposed OpenCV algorithms effectively find and help to normalize human faces helping in detecting whether the person is feeling drowsy.

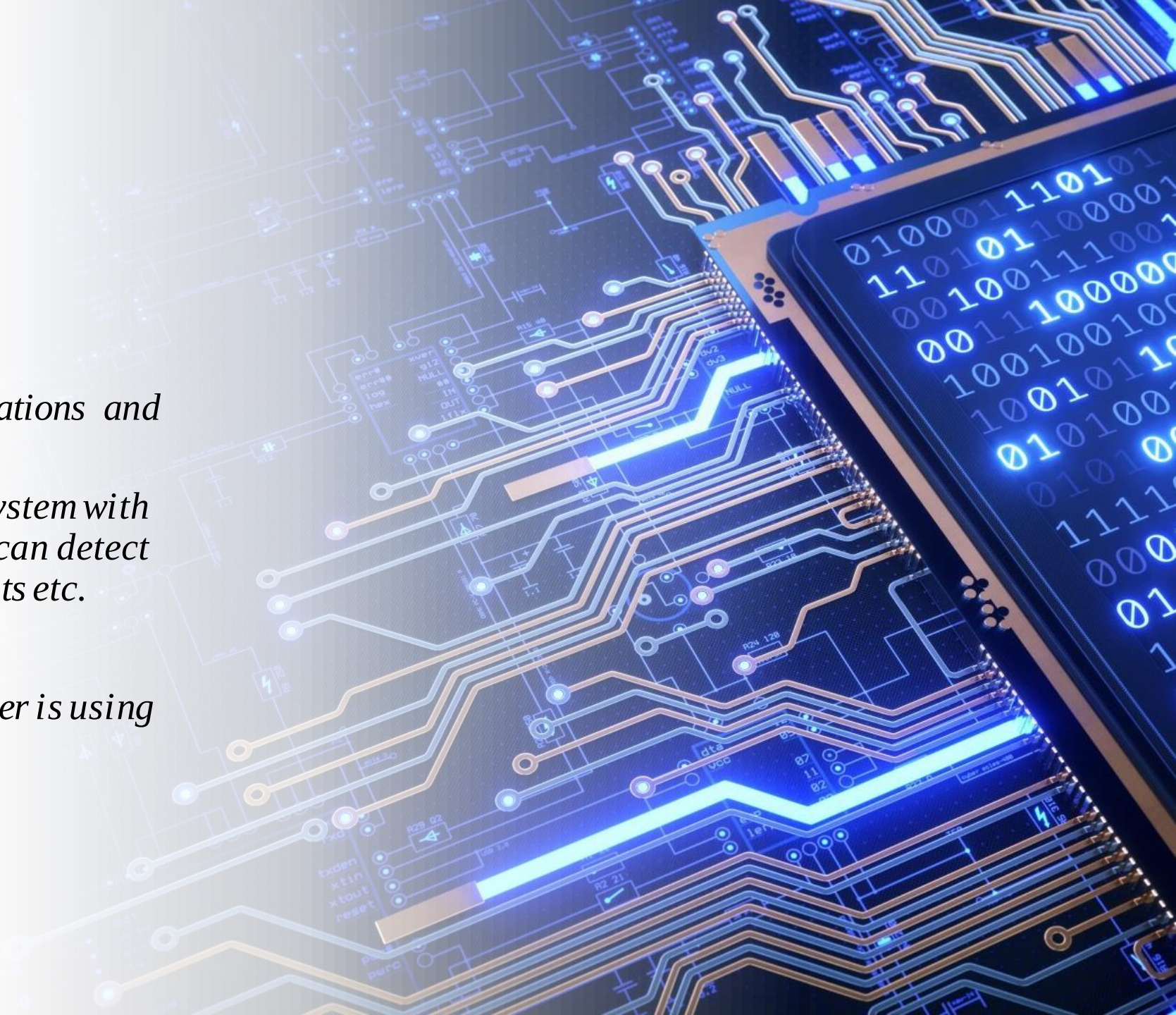
Several faces and body gestures, including tiredness in the eyes and yawning, are regarded as signs of drowsiness and fatigue in drivers. These characteristics indicate that the driver's condition is poor.

Currently used driver fatigue detection systems

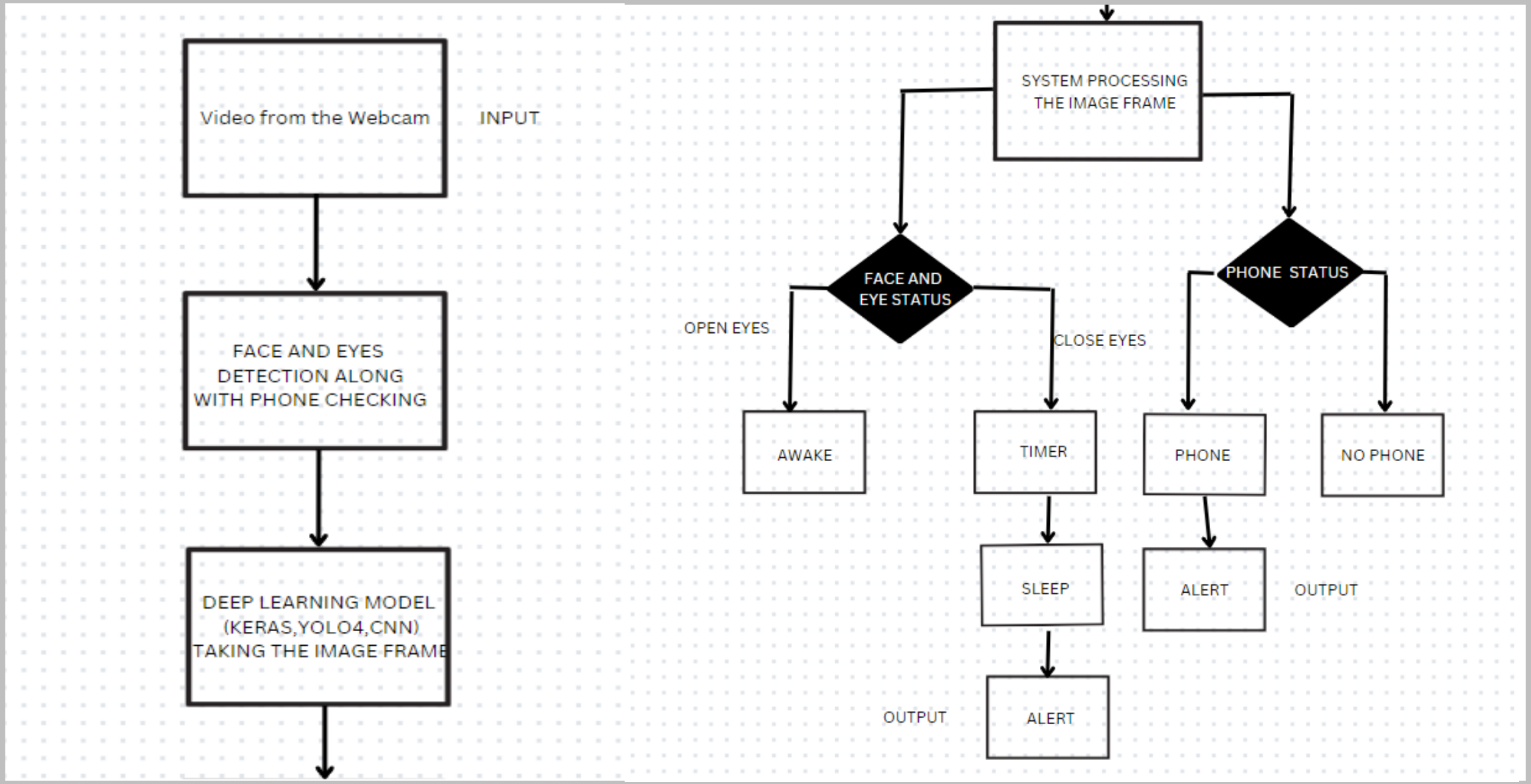
- One of the examples of a system detecting a driver's fatigue is the system
- implemented into the Driver Assistant in Ford cars. It analyses rapid steering movements, driving onto lines separating lanes, irregular and rapid braking or acceleration.
- Skoda cars use a similar system. It analyses the steering
- movements and compares them to the movements in normal driving.
- Volkswagen uses the Bosch Driver Drowsiness Detection
- It also analyses how a car behaves on the road. Based on the information
- from the power assisted steering sensor and the steering angle sensor, the system detects sudden changes in the trajectory of the vehicle, which translates into driver's fatigue.
- Such a solution allows detecting a fatigue at the operator of the vehicle.

Innovation

- *However, these sensors had limitations and were not always accurate.*
- *We are trying to do a vision-based system with machine learning algorithms which can detect the drooping eyelids, head movements etc.*
- *With an alert sound upon detection.*
- *System also detects whether the driver is using phone while driving.*

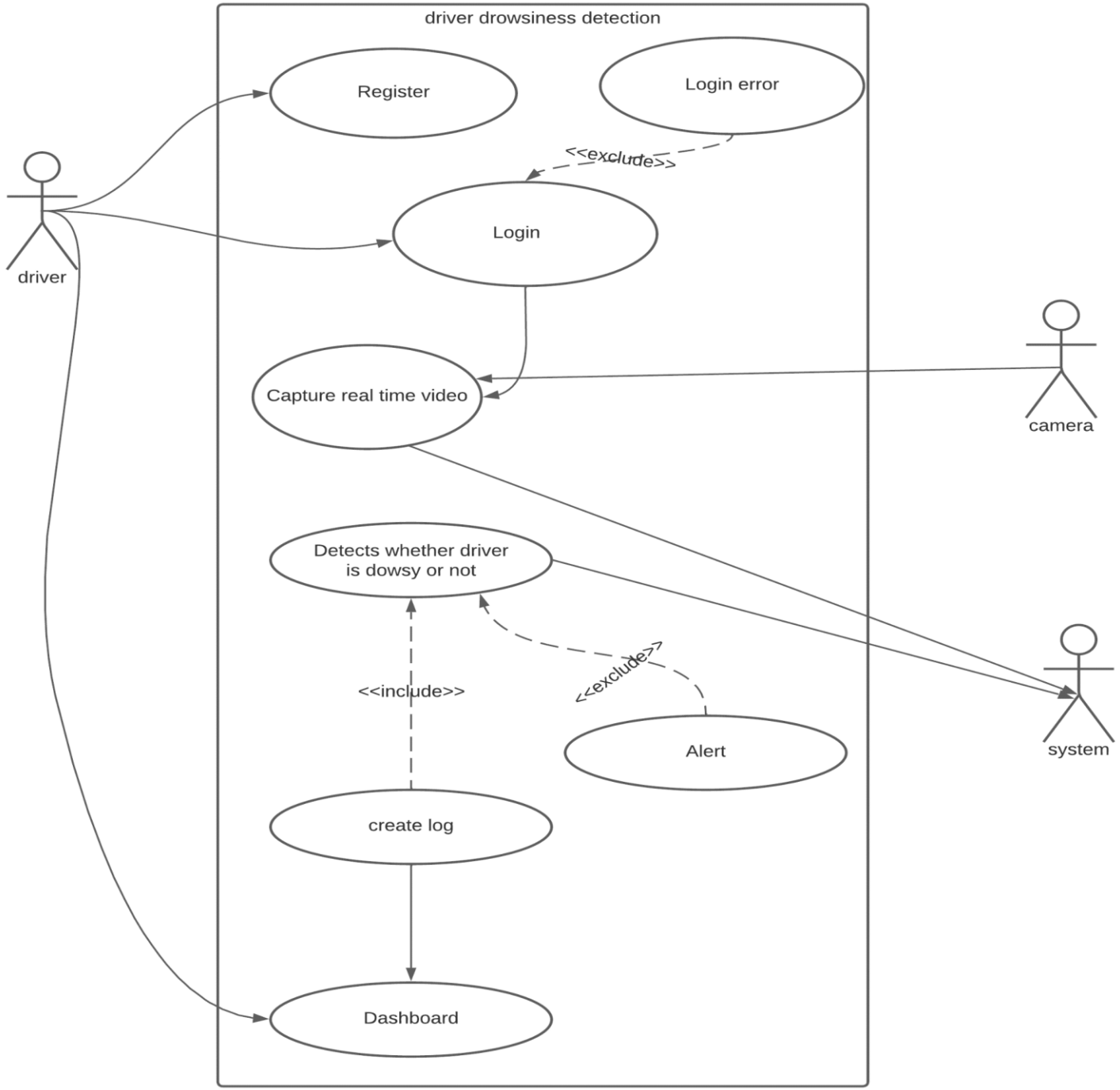


Methodology Diagram

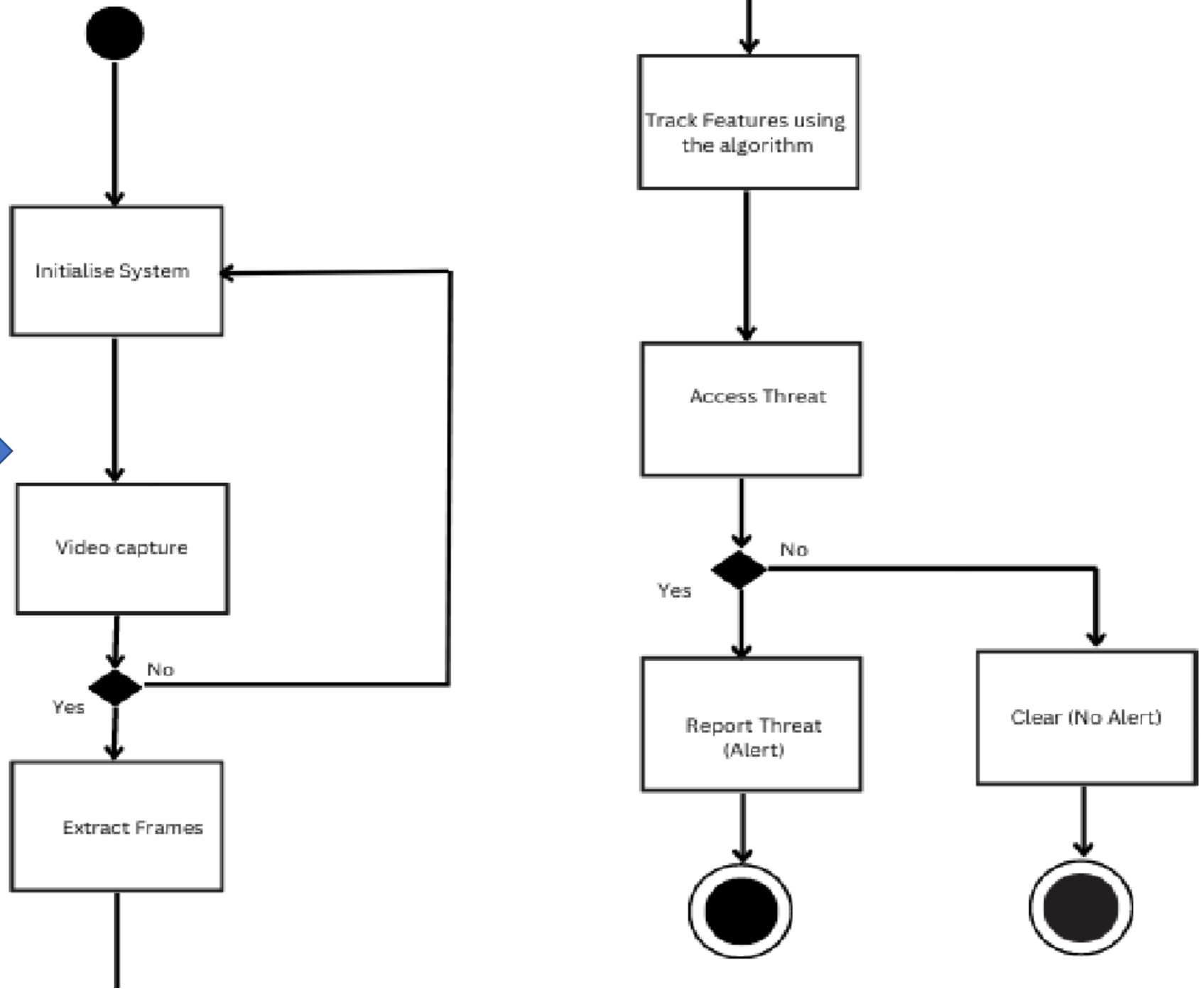

Video from the Webcam
INPUT
FACE AND EYES DETECTION ALONG WITH PHONE CHECKING
DEEP LEARNING MODEL (KERAS,YOLO4,CNN) TAKING THE IMAGE FRAME
SYSTEM PROCESSING THE IMAGE FRAME
FACE AND EYE STATUS
PHONE STATUS
OPEN EYES
CLOSE EYES
AWAKE
TIMER
PHONE
NO PHONE
SLEEP
ALERT
OUTPUT
OUTPUT
ALERT

Dataset (images):
DRIVER_DROWSINESS_DETECTION_DATASET

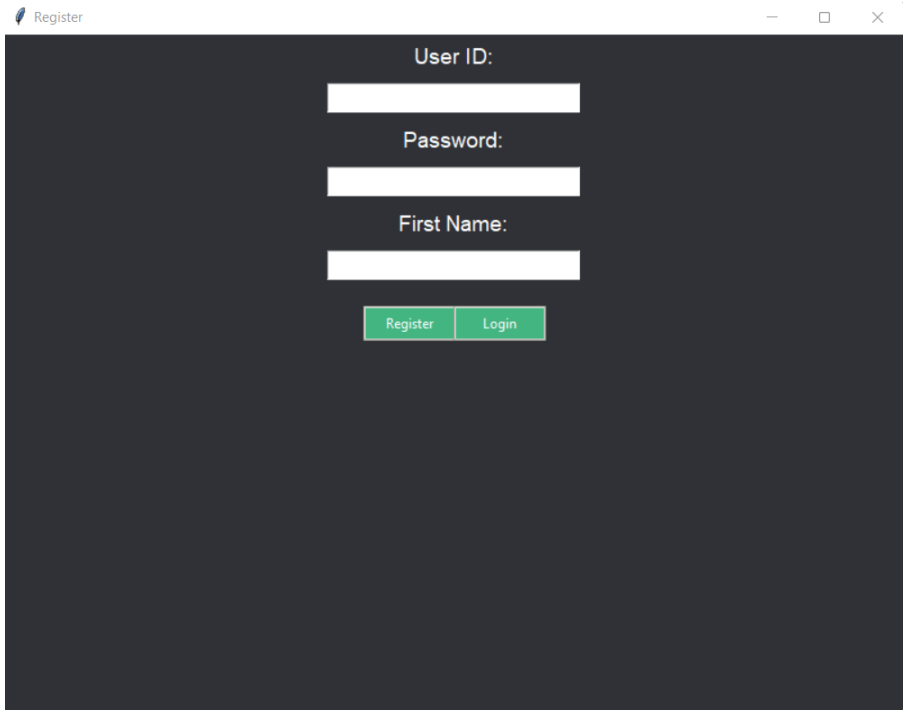
Use case Diagram

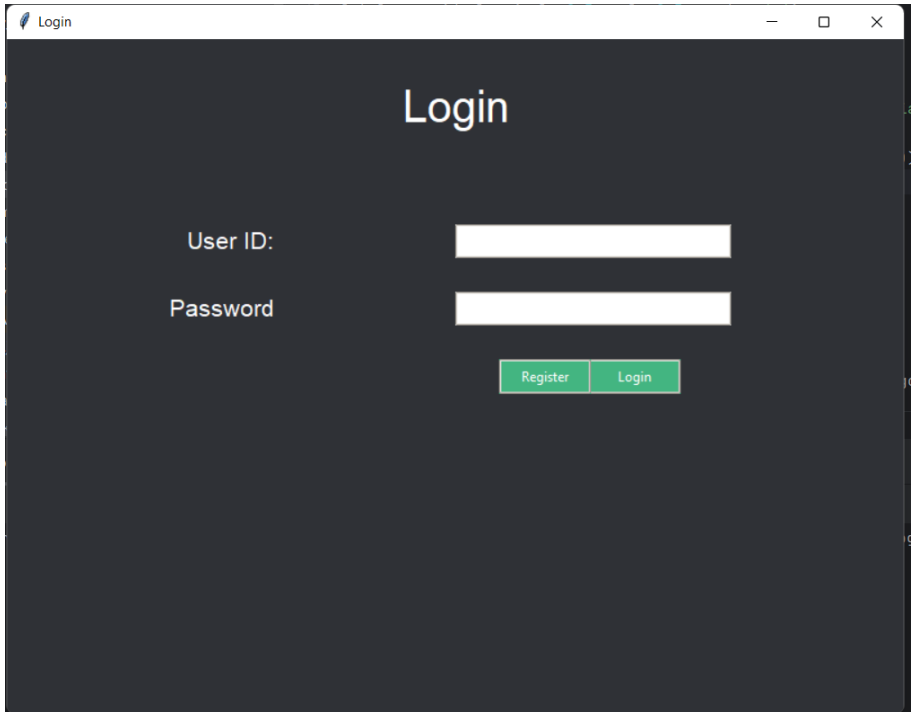


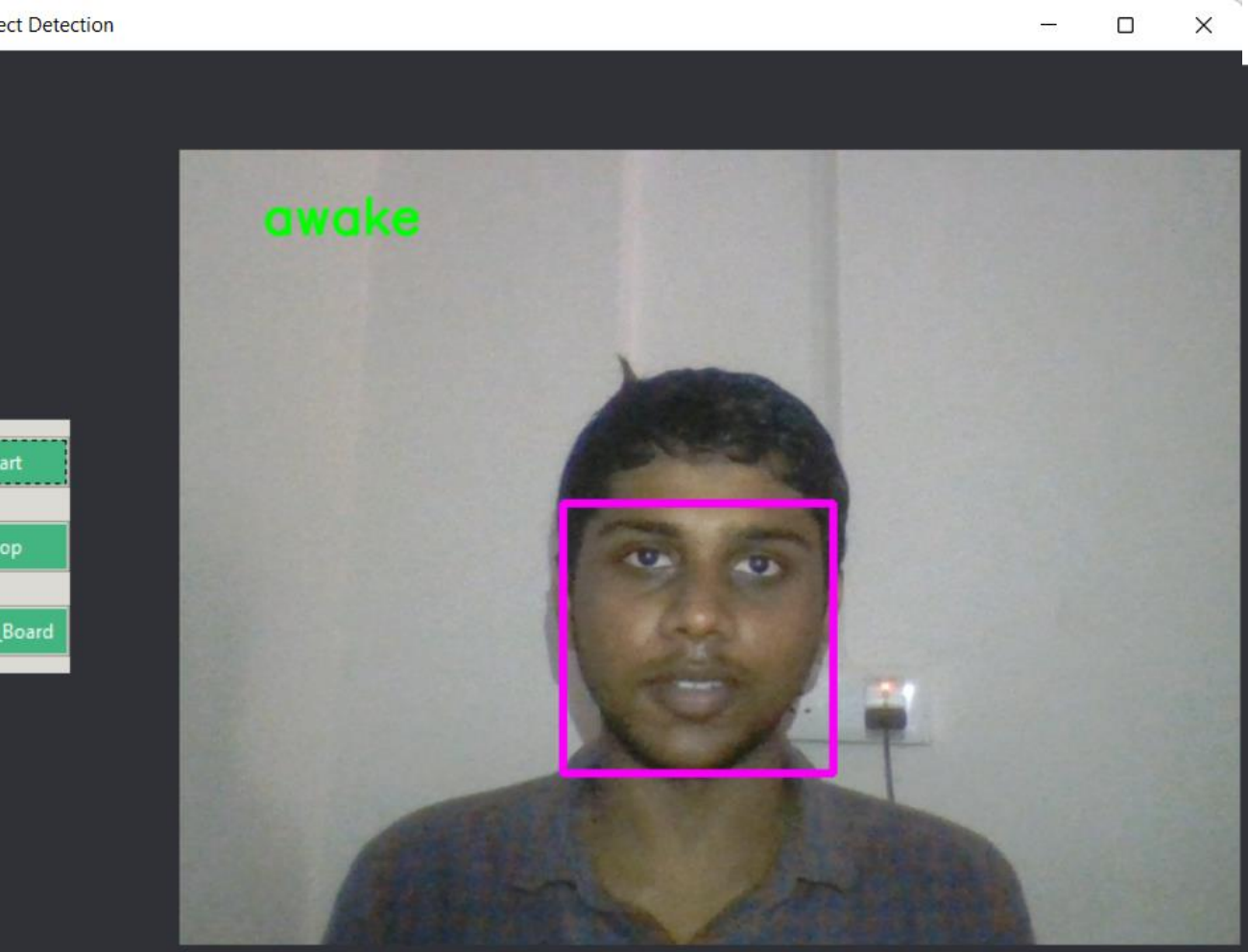
Activity Diagram

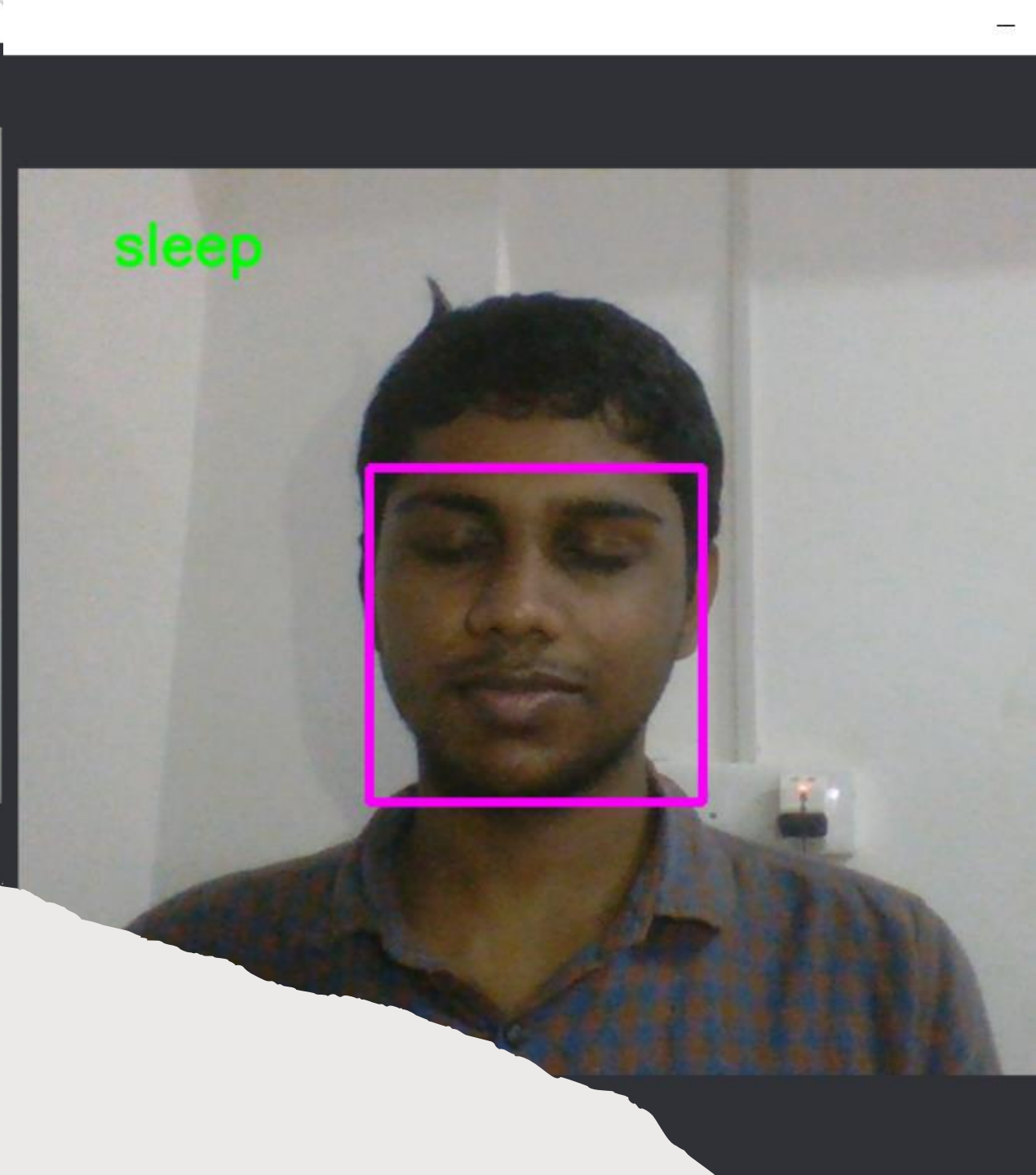


RESULTS

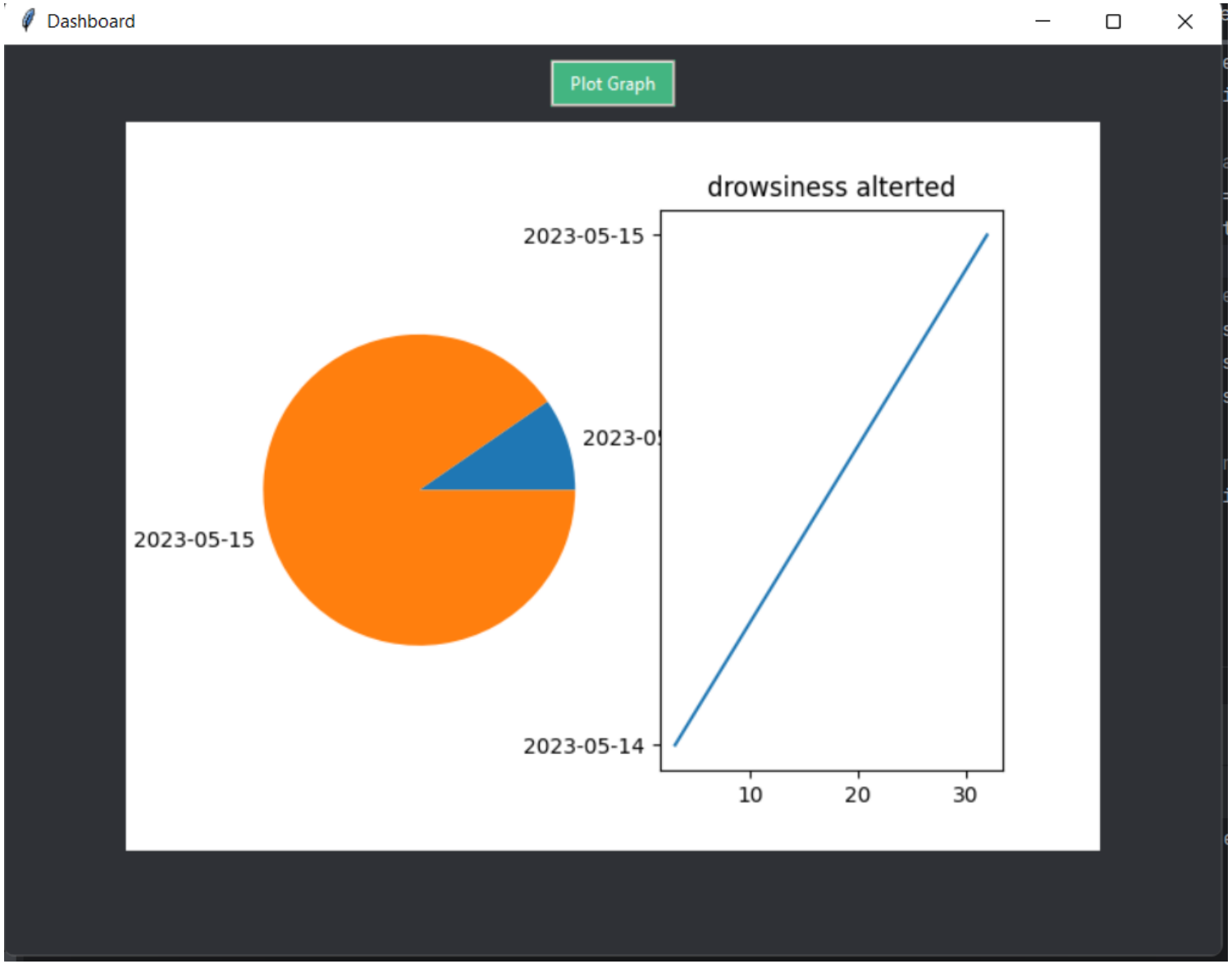

Register
User ID:
Password:
First Name:
Register
Login

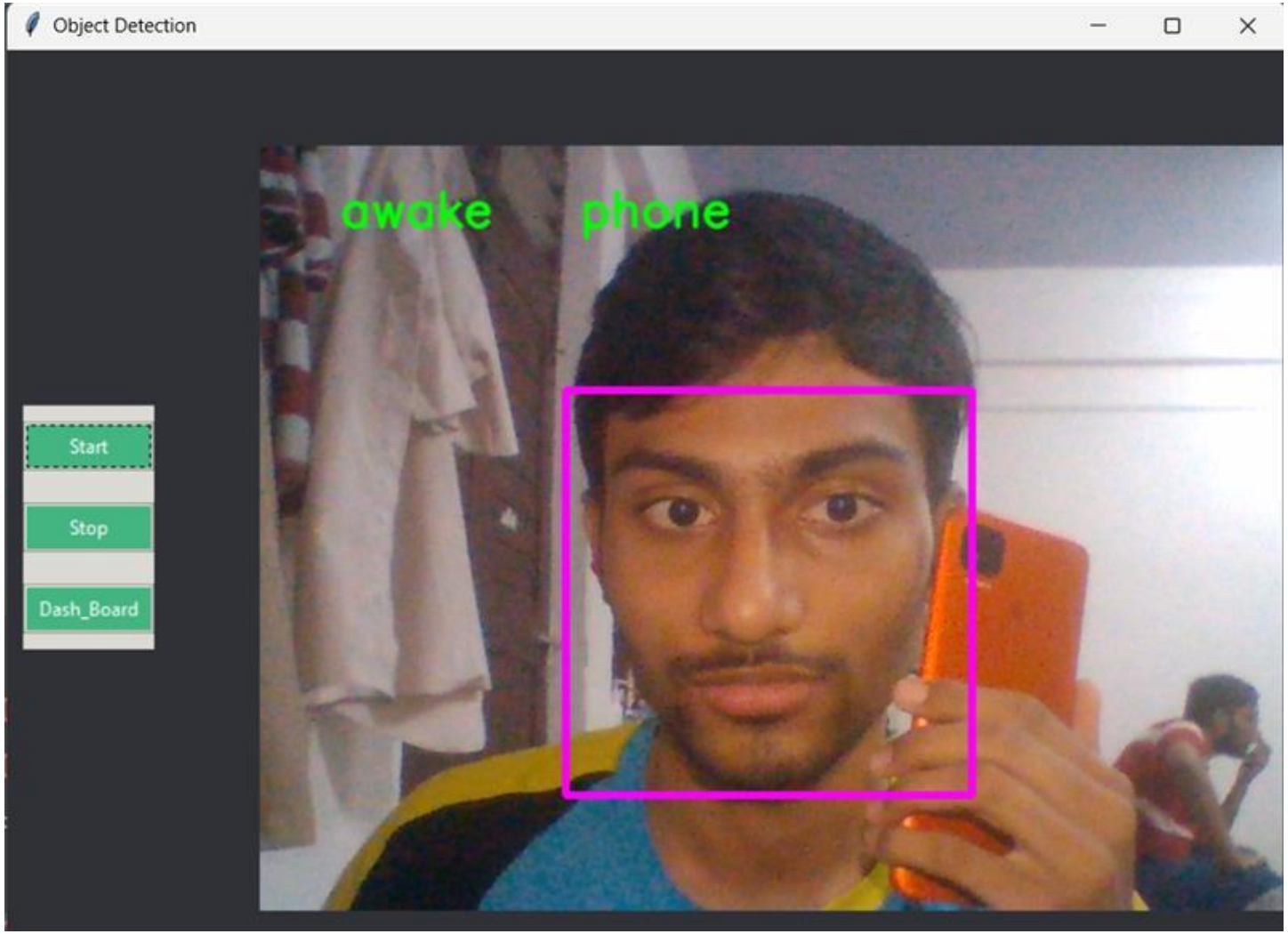

Login
Login
User ID:
Password
Register
Login





RESULTS


Dashboard
Plot Graph
drowsiness alterted
2023-05-15
2023-05-15
2023-05-14
10
20
30



USING THE VISION-BASED APPROACH THE PROJECT IS ABLE TO:

DETECT THE PERSON'S DROWSINESS BY THE MOVEMENT OF HIS HEAD AND EYES.

DISTINGUISH BETWEEN NORMAL EYE BLINKS AND DROWSY EYE BLINKS.

DETECT WHETHER THE PERSON IS DISTRACTED USING PHONE.

Conclusion

- *In order to, reduce the number of road accidents resulting from a driver fatigue, it is of great importance to introduce to the automotive industry a system that would effectively detect the first signs of a fatigue and notify the driver.*
- *Along with the car safety system detecting drowsiness with the help of how the car is being driven like rapid steering , irregular and rapid braking or acceleration. This vision-based system with the right hardware can be more helpful in detecting the driver's drowsiness.*
- *A system based on real-time face analysis can be one of the most effective approaches for detecting fatigue symptoms.*
- *There are many problems associated with its design such as uneven illumination of a driver's face or the selection of effective real-time data processing algorithms. Current technological advances in video recording and processing help reduce and even eliminate such problems*

References

- https://www.researchgate.net/publication/319464008_Driver_Drowsiness_Detection_Systems
- https://www.ijert.org/drowsiness-detection-system
- https://ieeexplore.ieee.org/document/6602353
- http://www.iraj.in/journal/journal_file/journal_pdf/12-351-149622577110l-104.pdf
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3571819/

Thank You