



Driver Drowsiness Detection

Abstract

- ▶ Driver drowsiness has become one of the main reasons for large number of road accidents.
- ▶ The main aim of this project is to overcome the problem of road accidents which are related to drivers experiencing fatigue leads to a need arises to design a system that keeps the driver focused on the road.
- ▶ With the evolution and improvement in Computer Vision technologies, smart/intelligent cameras are developed to predict drowsiness in drivers, thereby alerting drivers which in turn reduce accidents when they are feeling drowsy.
- ▶ In this work, a new approach is taken using deep learning to detect driver drowsiness based on Eye state while driving the vehicle.
- ▶ To detect the face and extract the eye region from the face images, OpenCV algorithms and haar cascade classifier are used

Problem statement (Motivation)

- ▶ Sleep disorders increase the risk of road accidents by 300%, finds a World Bank study. Many of these truck drivers or bus drivers who drive vehicles on highways suffer from Obstructive Sleep Apnea (OSA), a disorder that majorly goes undetected because of lack of testing.

Introduction

- ▶ The drowsiness detection based on eye state has been done accurately based on the varying features and factors, and also with the help of experts knowledge.
- ▶ Predicting the facial landmarks and detecting the eye-state and displaying the driver status on the screen and producing alert sound if the driver is drowsy for drowsiness detection.
- ▶ Generally, the driving person feels drowsy due to continues driving for long hours or Physical illness or might be drunken and this leads to major road accidents.
- ▶ Our aim is to detect the drowsiness, make them alert to prevent accidents and generate an alarm sound.

Beneficiaries of the proposed solution(Societal Impact)

- ▶ with this Python project, we will be making a drowsiness detection system. A countless number of people drive on the highway day and night. Taxi drivers, bus drivers, truck drivers, and people traveling long-distance suffer from lack of sleep. Due to this, it becomes very dangerous to drive when feeling sleepy.
- ▶ The majority of accidents happen due to the drowsiness of the driver. So, to prevent these accidents we will build a system using Python, OpenCV, and Keras which will alert the driver when he feels sleepy.

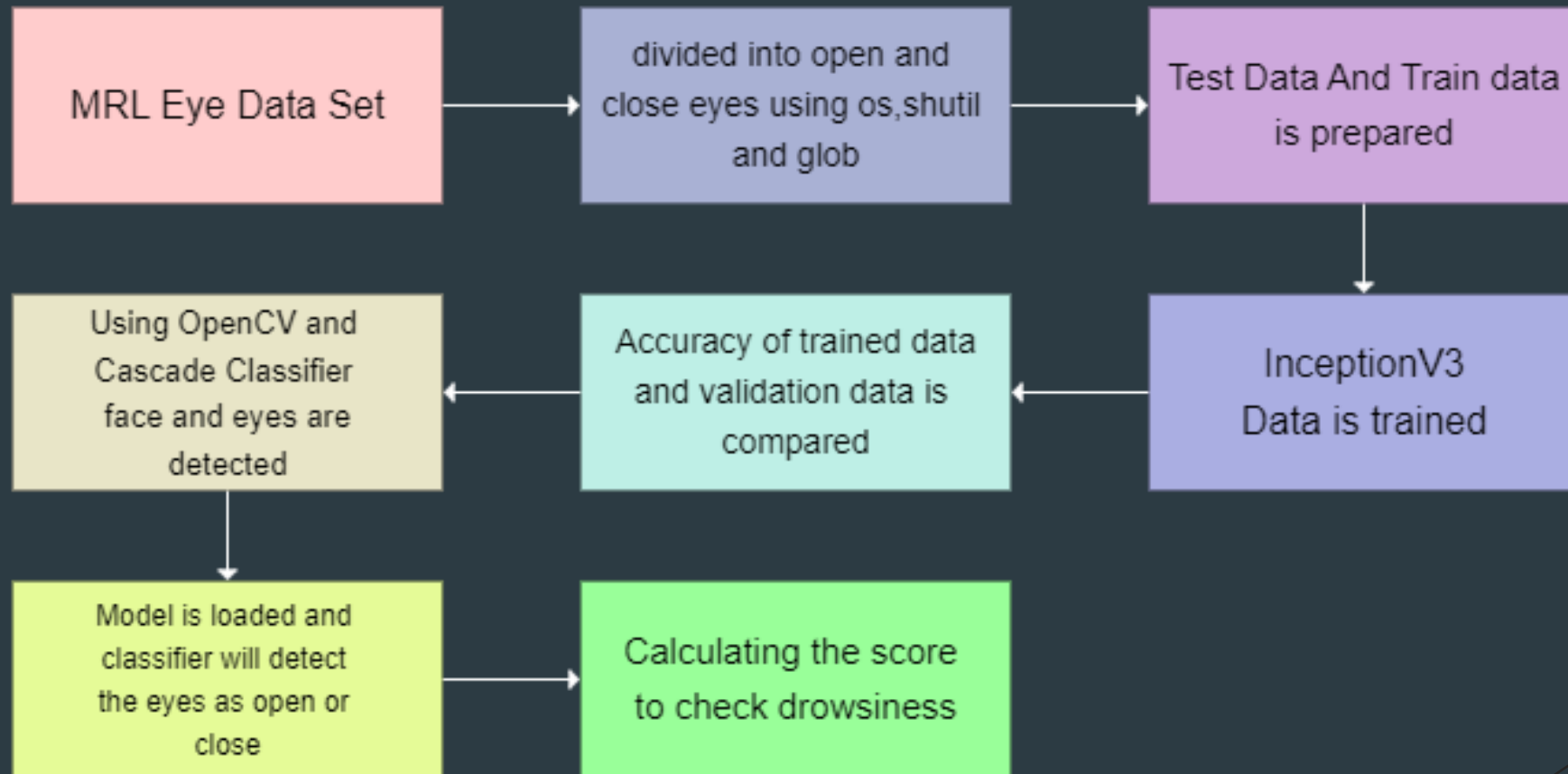
Literature Survey

Sl.no	Paper Title	Methodology	Outcome	Year of Publication
1	Facial Features for Drowsiness Detection	Productive strategy includes face discovery, eye following and yawning discovery	Faces are Marked and eyes are recognized using Chi square test	2016
2	Driver Drowsiness Detection System	Advanced Driver Assistance System(ADAS)	Programmed Driver Sleepiness Identification using AI	2018
3	Real Time Drowsiness Detection with Individual Consideration	Constant Driving Laziness Recognition Calculation	Eyes Aspect Ratio is acquainted with assess the tiredness of driver	2019
4	Design of Control and Monitoring System to reduce traffic accidents	Drowsiness Level Recognition Framework	Recognizes the Number of Blinks per sec and directs the Alert System	2019

Software Requirement Specification

- ▶ a webcam through which we will capture images
- ▶ opencv-python (face and eye detection)
- ▶ tensorflow (keras uses TensorFlow as backend).
- ▶ keras (to build our classification model).
- ▶ Pygame (to play alarm sound).
- ▶ Data Set To build and train our model

System Design



Data Flow Diagram

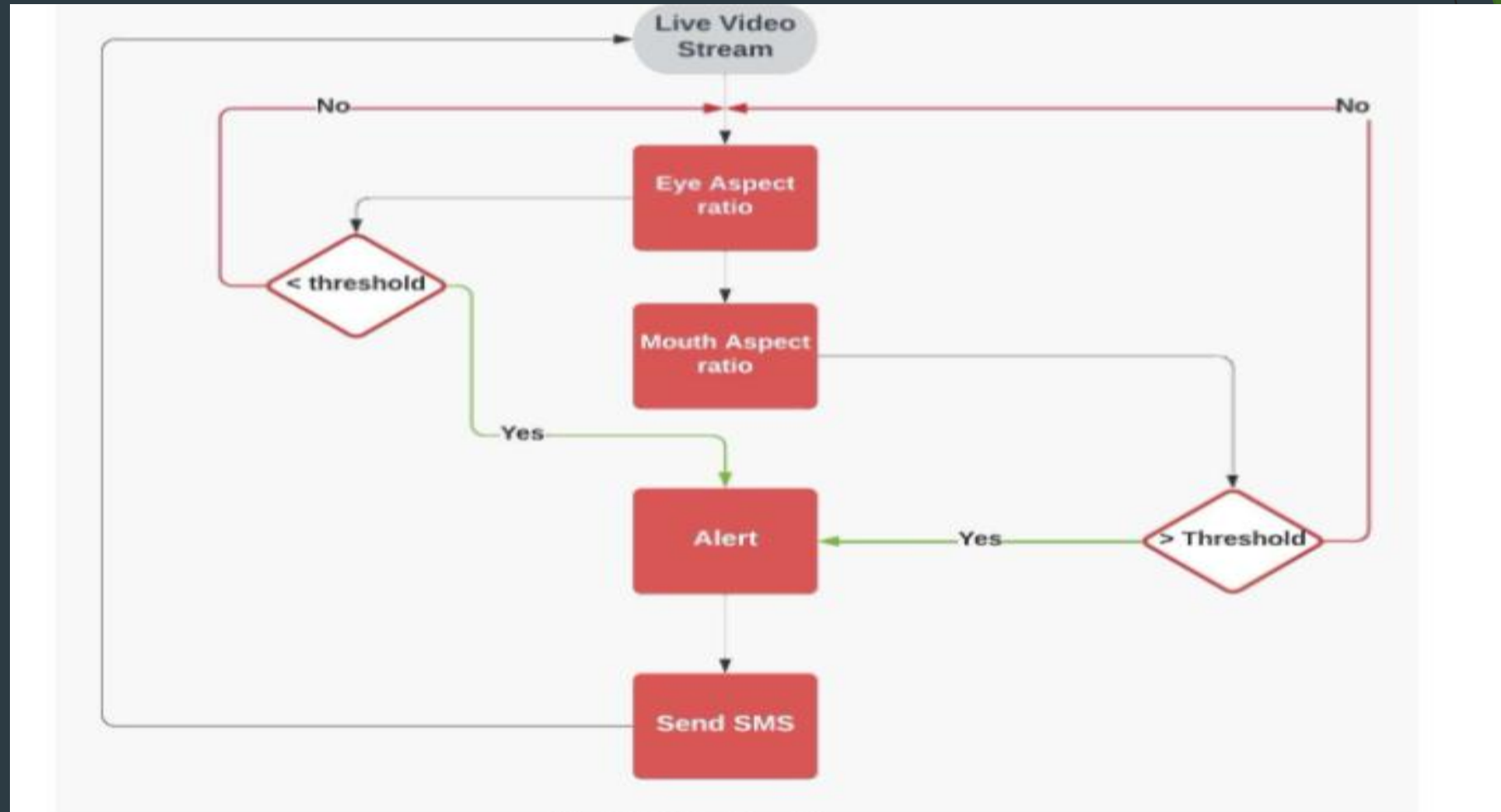


Fig 4.1 Dataflow Diagram

System Development

Step 1: Take Picture as Input from a Camera.

Step 2: Image Face Detection and creation of a Region of Interest(ROI)

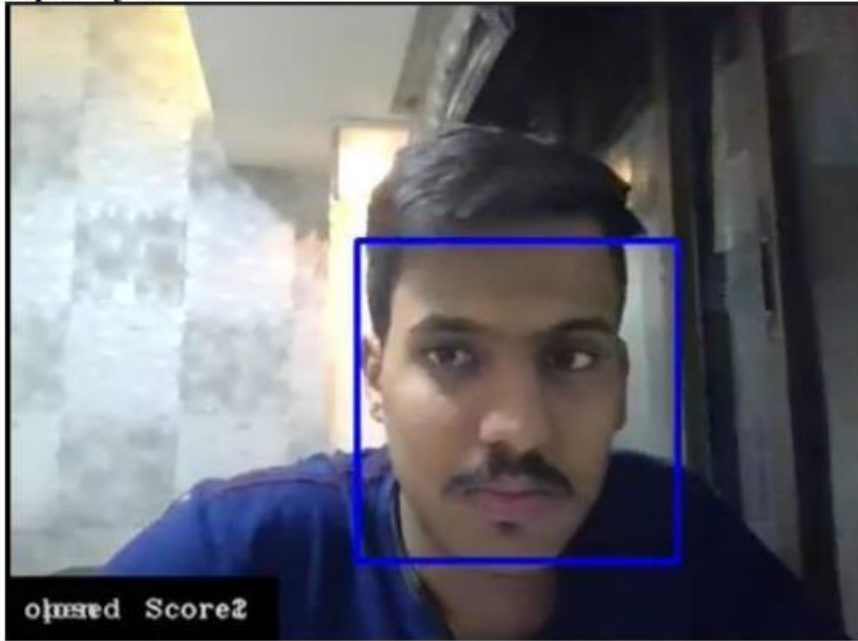
Step 3: ROI Detects the Eyes and Feeds them to the Classifier

Step 4: Categorizes that Eyes are Open or Closed

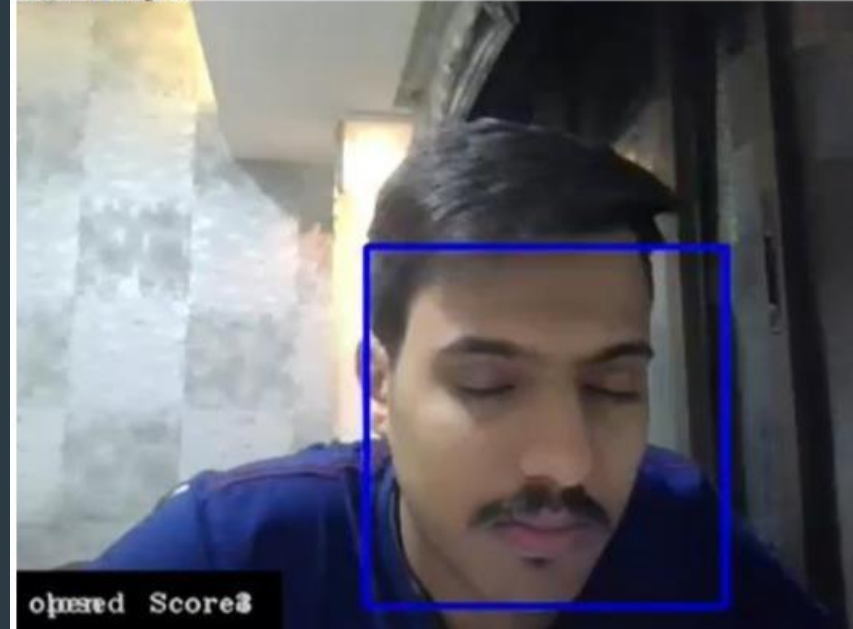
Step 5: Check Whether Person is Drowsy or Not.

Results

Open eyes



Closed eyes



References

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