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DETECTION SYSTEM FOR DRIVER SAFETY

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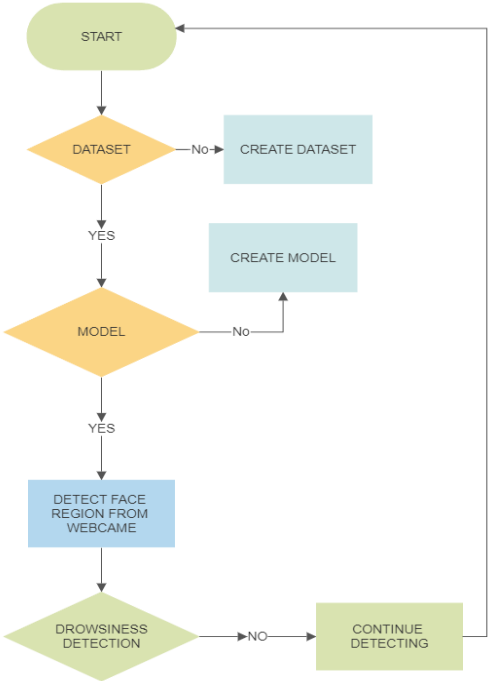
Abstract----

Detection system for driver safety is an enhanced technology that can help in prevention of accidents that are caused by motorists who fell asleep while driving the vehicle. The holy grail of this Python project is to build a drowsiness detection system that will detect that if a person's eyes are closed for a few seconds or not. In this project we use OpenCV for gathering images from webcam. The approach we will be using for this python project is as follows: 1. Take image from camera as an input. 2.Detecttheface and create Region of Interest (ROI). 3.Detects the eyes from ROI and passit to classifier. 4.Classifier will categorize whether the eyes are closed or not. 5.Calculate score whether person is drowsy or not. Properties required for this project are: OpenCV, TensorFlow, Keras , Pygame. Output of our project will be that which we have built a drowsy driver alert system that you can implement in numerous ways. We have used OpenCV to detect face using a haar - cascade classifier a CNN (Convolutional Neural Network) model to predict the status. This project is used to address the real world problems such as drowsy driving by alerting drivers when they are sleepy, we can prevent accidents and make safer roads for everyone.

Keywords : Python , Open CV , Kera's Tensor Flow etc…

I. INTRODUCTION

The purpose of the detection system for drivers safety we build is to the prevention of accidents of passenger and vehicles. This system will detect the early symptoms of drowsiness before the motorist has fully lost all presence and warn the driver that they are no longer forfeit to operate the vehicle safely. This device will not, assure that the driver will be fully awakened and that an accident can be avoided.



It is a simple tool for improving motorist safety and make sure not to feel drowsy; It is natural for the drivers who take long drives to little drowsy off behind the steering wheel. In this, we will develop a detection system that will alert the motorist as soon as the person fell asleep.

II. LITERATURE REVIEW

The literature review identifies the strengths and limitations of existing information about detection systems of driver safety. That the accidents always cause great vehicle and human losses. One of the most important causes of these accidents is the human factor, which is usually caused by fatigue or yawning. To address this problem, several approaches were proposed the predict the driver's state. several solutions focus on measuring driver behavior to detect drowsiness, including factors such as head movements and blink duration. These solutions analyze the driver's head movements and track the duration of eye blinks. By monitoring these behavioral patterns, it becomes possible to infer the level of drowsiness and assess the driver's attentiveness on the road. These measurements serve as important indicators of driver fatigue and can be used to trigger timely alerts or warnings to prevent accidents. The analysis of head movements and blink duration provides valuable insights into the driver's state and helps enhance overall road safety

I. Electrocardiogram (ECG)
II. Electromyography (EMG)
III. Electroencephalography (EEG)
IV. Electrooculogram (EOG)
V. Pulse

III. PROBLEM STATEMENT

The problem statement for this detection system for driver safety. The goal of the project is to detect

drowsiness while the motorist is driving and inform the driver to avoid the accidents. The project interprets a CNN model to determine whether a person is drowsy based on their face weather the eyes are closed or open. The idea is to introduce application in the vehicle sector, making driving safer and reducing the number of car accidents caused by drowsy driving

IV. REQUIRED TOOLS

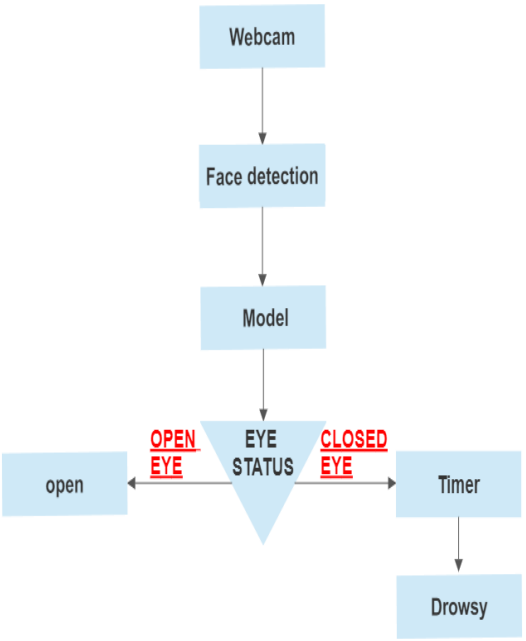
I. Python
II. OpenCV: OpenCV is a powerful tool widely used for image processing and various computer vision tasks. It serves as an invaluable open-source library, offering a comprehensive range of functionalities. With OpenCV, developers can accomplish tasks such as face detection, object tracking, and numerous other driver-related operations TensorFlow is an open-source library created by the Google Brain team, specifically designed for machine learning and artificial intelligence applications. It provides extensive support for training and inference of deep neural networks, making it a powerful tool for developing and deploying AI models

III. Keras is a user-friendly open-source software library that offers a convenient Python interface for developing artificial neural networks. As an integrated Python library, Keras simplifies the process of working

with neural networks. It provides a user-friendly interface that allows developers to build and train neural networks efficiently. With its intuitive design and extensive documentation, Keras enables users to focus more on the implementation of neural network architectures and less on the intricate details of the underlying framework. This user- centric approach makes Keras a popular choice among developers seeking a straightforward and accessible tool for their deep learning projects.

V. METHODOLOGY

The approach employed in this project involves utilizing a webcam to capture a video feed. The video is then processed using the Har cascade algorithm to detect the presence of a face, followed by the identification of the eyes. Subsequently, a deep learning model constructed through transfer learning is employed to assess the condition of the driver's eyes. If the eyes are open, the system indicates an "Active" mode, but if they are closed, it examines the duration of closure before concluding that the driver is drowsy, subsequently activating an alarm to alert the driver. This solution is aimed at mitigating road accidents by promoting driver attentiveness.



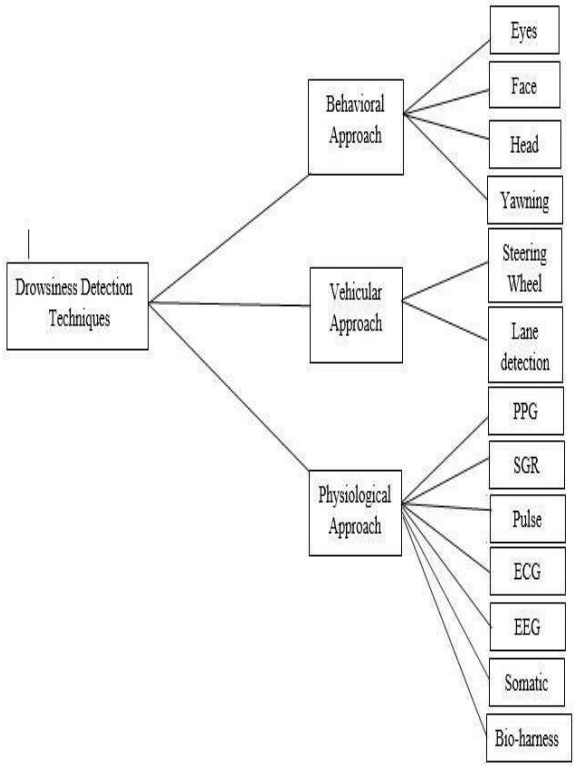
In this project, we will leverage Python along with the powerful libraries of OpenCV, TensorFlow, and Keras to develop a system specifically designed to detect closed eyes in drivers and promptly alert them

if they exhibit signs of drowsiness while operating a vehicle. By utilizing OpenCV, we can effectively monitor and capture images of the driver through a connected webcam. These images are then fed into a deep learning model, constructed using TensorFlow and Keras, which accurately classifies the status of the driver's eyes as either "open" or "closed." In cases

where closed eyes are detected, the system will swiftly notify the driver, ensuring their immediate attention is refocused on the road. This intelligent solution aims to enhance road safety and mitigate the risks associated with driver drowsiness.

VI ARCHITECTURE

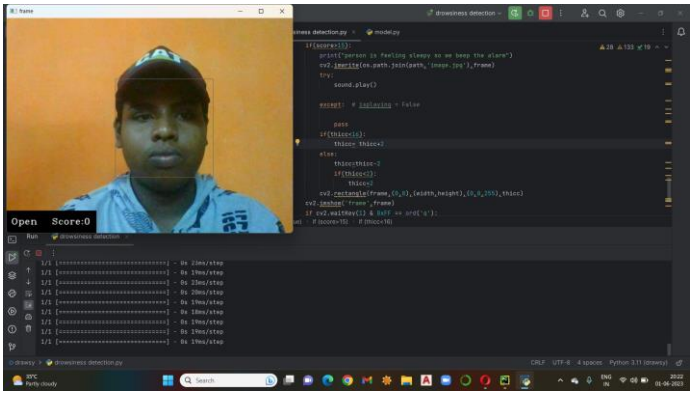
Drowsiness and fatigue contribute significantly to road accidents, posing a substantial risk to road safety. Timely warnings to drowsy drivers can prevent numerous fatal accidents. Various methods exist for detecting driver drowsiness by monitoring their level of concentration while driving and alerting them accordingly.

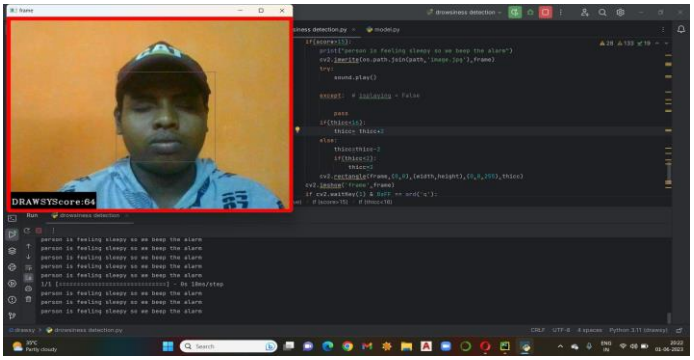


These methods rely on extracting relevant features from facial expressions such as yawning, eye closures, and head movements to infer the level of drowsiness. Additionally, the biological state of the driver's body and vehicle behavior are analyzed to detect drowsiness.This paper offers a comprehensive analysis of existing techniques for driver drowsiness detection, focusing on three categories: behavioral, vehicular, and physiological parameter-based techniques. The study also reviews the top supervised learning techniques employed in drowsiness detection and provides a comparative analysis of their advantages and disadvantages. Detailed diagrams are included to illustrate the research frameworks, enhancing comprehension. Finally, the paper concludes with overall research findings derived from an extensive survey, serving as a valuable resource for young researchers seeking potential avenues for future work in this field.

VII. EXPERIMENTAL RESULTS

The experimental phase depends on various factors such as diver closing or yawning driver fatigue. These are capture by the camera . If the diver are closing eyes or yawning the system can give an Alaram to alert the driver. The experimental results demonstrate the positive impact for reduce the road accidents.





VIII. CONCLUSION

Detection systems have proven to be the effective in preventing accidents caused by drowsy driving. They are now being implemented in many vehicles. And they are becoming popular in the automotive industry.

In conclusion, the detection systems is an important technology that can be the significant improve of road safety. These systems are continuously evolving, and the further advancements in machine learning and artificial intelligence, they are likely to reduce the road accidents

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X. REFERENCES

I. Ralph Oyini Mbouna, Seong G. Kong, Senior Member,IEEE,(2013),Visual Analysis of the Eye State and the Head Pose of the Driver
Alertnes Monitoring the driver , (IEEE),,vol.14,USA

II. J Ambient HumanComputing ,“A real-time non-intrusive FPGA-based Drowsiness detection system” Springer, pp.251-262, Italy2011

III. Road safety for driver , “driver fatigue and the road accidents”,www.rospa.com, 2011

IV. Arun Sahayadhas, Kenneth Sundaraj, Drowsiness detection system Based on the Review”, ISSN 1424-8220, Malaysa2012 http://djhurij4nde4r.cloudfront.net/images/images/000/005/917/fullsi