e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:06/Issue:03/March-2024 Impact Factor- 7.868 www.irjmets.com

SAFE DRIVE GUARDIAN: DROWSINESS DETECTION AND WHITE LINE FEVER PREVENTION SYSTEM

Aman[*1], Ashwinkumar[*2], Amit[*3], Sarthak[*4], Ms. S.S. Gadkari[*5]

[*1,2,3,4]Information Technology, Sharad Institute Of Technology Polytechnic, Ichalkaranji, Maharashtra, India.

[*5]Ex- Professor, Sharad Institute Of Technology Polytechnic, Ichalkaranji, Maharashtra, India.

ABSTRACT

Drunk driving is a widespread problem that causes thousands of fatal collisions every year. Over the past ten years, there have been continuous advancements in computer technology and artificial intelligence, which have enhanced driver monitoring systems. A number of experimental studies have collected real-world driver fatigue data, applied various artificial intelligence algorithms, and integrated features in an attempt to significantly enhance the efficiency of these systems. The proposed system aims to improve transportation safety by lowering the number of accidents brought on by tired and drowsy drivers. As a result, accidents have become more common in the recent past. Several facial expressions and physical gestures, like yawning and sleepy eyes, are thought to be signs of fatigue and drowsiness in drivers. We can also provide one alert message set at a particular time interval for the white-line fever prevention system. The study also examines the reliability and practicability of each of the four system types, highlights current issues in the field of driver drowsiness detection, and outlines some potential future directions.

Keywords: Driver Drowsiness Detection, E-Speak Module, Yawn Detection, Driver Drowsiness Detection, Image-Based Measures, Vehicle-Based Measures.

I. INTRODUCTION

The National Highway Traffic Safety Administration (NHTSA) concluded that sleepy drivers were at fault for 91,000 auto accidents in 2017, based on police and hospital data. A little over fifty thousand people suffered severe injuries in these incidents. 2019 saw 697 fatalities, including sleep-deprived drivers. The NHTSA is aware that the numbers it has released are estimates and that it is difficult to determine the precise number of incidents, injuries, or fatalities related to sleep-related driving. The goal of this paper is to design an inexpensive, effective drowsiness detection system. The method needed in this case determines tiredness by utilizing the geometric characteristics of the mouth and eyes. The purpose of this work is to achieve the same by developing a system for identifying sleepiness in order to monitor and prevent a detrimental outcome from fatigue. One major contributing factor to the increasing number of accidents on the roads is driver fatigue. these days, and this is widely acknowledged. This emphasizes the need for more study in this field to reduce the number of accidents caused by fatigue and spur the development of a system for monitoring driver drowsiness.

II. METHODOLOGY

The face in the image is first located using facial milestone detection. Shape-prediction techniques are then used to identify important facial features. OpenCV uses for face and eye. OpenCV for face and eye detection and Keras for eye state classification (open or closed). It continuously captures frames from a webcam, detects faces, and then analyzes the state of the eyes within those faces. If the eyes are closed for an extended period (score > 15 frames), it triggers an alarm sound to alert the user. The alarm sound is played using Pygame. The model used for eye state classification is loaded from a saved Keras model file. The script stops when the user presses the 'q' key. The EAR is determined by dividing the distances between the horizontal and vertical eye landmarks for drowsiness detection by their ratio. To detect yawns, a YAWN (score 15 frames) value will be computed based on the separation of the upper and lower lips. This value will then be compared to a threshold.

III. MODELING AND ANALYSIS

When a driver operates a vehicle, a camera records their face, which is subsequently converted into a video stream. After that, the app analyzes the video to spot signs of exhaustion and drowsiness and gauge how drowsy the user is. At this point, the driver's face tracking, the driver's level of fatigue, and the identification of significant facial regions based on yawning and eye closure are the main elements that require analysis. Finally, if the drowsiness is detected, a warning voice alert is played. The way the system is built guarantees that the driver's face, eyes, and, by extension, mouth, are continuously observed. An alarm is triggered, and necessary action is taken to prevent any fatalities if the predefined levels of alertness are observed to be compromised or to have defaulted. The Driver Drowsiness and Yawn Detection System Architecture. It is clear that the driver's face and eyes are constantly being watched by the camera. The dashboard system will sound an alert to the driver if it senses fatigue or drowsiness; otherwise, it will monitor.

IV. RESULTS AND DISCUSSION

Our project uses OpenCV, Keras, and Pygame. OpenCV is used to detect faces and eyes, while Keras is used to classify the state of the eyes (open or closed). It continuously records webcam frames, recognizes faces, and then examines the condition of each eye within those faces. An alert sound is activated to notify the user if the eyes are closed for a prolonged duration (a score greater than 15 frames). Pygame is used to play the alarm sound. A Keras model file that has been saved is used to load the model for eye-state classification. When the user hits the 'q' key, the script ends. The image was annotated using 68-point markup, which covered all of the significant facial landmarks, including the eyes, nose, mouth, and so forth. 19] But for the sake of this project, only the lips and eyes—which can be extracted using Python slicing techniques—fall within our region of interest (ROI). The According to the system's methodology, if a driver yawns or closes their eyes for more than the preset number of frames, they are likely tired. From now on, the right thing happens when one of these high-profile cases happens. The accuracy as established by the performance analysis phase is almost 100% when the face is positioned correctly and there are no wearable obstacles present. Ambient illumination conditions are critical for optimal results. The system reacts erratically and acts out of sync when a user yawns and closes their eyes at the same moment. Therefore, in order to prevent inconsistent results, it is best to avoid such a situation.

V. CONCLUSION

The model can detect indications of drowsiness by monitoring their mouth and eyes. Shape prediction techniques are used to identify key features on the face. These methods use facial landmarks, which come from facial point detection, as inputs. This module covers the EAR function, which determines the ratio of distances between the vertical and horizontal eye signs. Additionally, when drivers show signs of fatigue or yawning, a text-to-speech synthesizer module called e-Speak is used to alert them with appropriate voice cues. The main goal of the work is to lower the number of accidents and advancements that have happened in order to reduce the death toll from traffic accidents. Future research on this paper can focus on utilizing external factors to measure drowsiness and weariness. We believe that the development of DDD systems will greatly benefit from 5G networks. Future 5G-enabled DDD systems will be based on real-world driving scenarios. The data, which will account for variables like light outside, road noise, and variations between drivers, will come from a variety of drivers in real cars. One of the most important preventive steps needed to address this issue is keeping an eye on the driver's level of fatigue and giving them the information they need to take the necessary action.

ACKNOWLEDGEMENT

We thank the professors at the Sharad Institute of Technology Polytechnic for their advice and suggestions. We also thank our HOD, Principle, for supporting us.

VI. REFERENCES

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8914892/
[2] https://www.researchgate.net/publication/353109539_Driver_Drowsiness_Detection_and_Alert_System
[3] https://iopscience.iop.org/article/10.1088/1757-899X/767/1/012066