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# Woozy Driving Detection

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***Abstract: Abstract-wooziness has been identified as one of the primary causes of injury or death in car accidents. As a result, it is proposed in this research work to develop an adaptive heavy vehicle driver fatigue and alertness model based on spectral bands by combining signal processing algorithms with soft computing techniques such as the neuro-fuzzy algorithm to estimate the driver cognitive state while driving a vehicle in a virtual reality (vr)-based dynamic simulator under monotonous driving conditions. As a result, it is proposed in this study to use soft computing approaches to reduce the amount of features and non-linear supervised classification algorithms to classify them. The suggested adaptive model distinguishes between the driver's level of exhaustion by analysing brain responses to determine whether the driver is fatigued owing to task- induced variables or attitude/behaviour, and then the amount of fatigue is associated to sleepiness (i.e. Level of alertness towards driving). The adaptive model can also be used to warn drivers and regulators about impending catastrophes by optimizing the features of interface systems. The suggested system notifies the driver when he or she is fatigued or drowsy based on the identification of cognitive state and calculates the fatigue index and alertness level. The proposed method also assists the driverin being more alert and intuitive in order to avoid deadly road accidents.***
***Keywords: wooziness, driver, driving, face, image, recognition, processing, image processing. Eeg,deep learning, sleepiness.***

## I. INTRODUCTION

Wooziness is a condition of gradually reduced consciousness linked with a desire or propensity to sleep that exists between waking and sleep. We are developing a sleepiness detecting system. A large number of people use the roadway at all hours of the day and night. Taxi drivers, bus drivers, truck drivers, and those commuting great distances are all sleep deprived. As a result, driving when drowsy is extremely risky.

Wooziness has been classified using data from a wide range of sources. Physiological parameters such as electroencephalography, heart rate variability, andrespiration are examples of driver-based measures. Furthermore, eye, gaze, and head measurements have been utilized to categorize driver state. Drowsiness has also been classified via steering wheel manipulation. Distinct techniques have different advantages and disadvantages.

In vehicle- based detection systems, for example, may categorize chronic tiredness based onIndications such as unpredictable steering and lane incursions. This article describes current woozy research that was carried out using an automotive grade production-ready driver monitoring system. It starts with a description of data gathering methods as well as the methodology to developing and evaluating a wooziness algorithm.

## II. RELATED WORK

Many ways have been proposed to improve the accuracy of the driver drowsiness system detection. They suggested an electroencephalography (eeg)-based approach for detecting drowsiness. For discriminating drowsiness and alertness, chaotic characteristics and the logarithm of signal energy are extracted. The classification was done using an artificial neural network, which had an accuracy of 83.3 percent. Suggested a model based on the combination of driving quality signals, eeg, and electrooculography to detect tiredness. A class separability feature selection method was utilised to find the optimal subset of characteristics.

## III. OBJECTIVES

The main goal is to build a sleepiness detection system based on eye tracking, it is thought that the signs of driverweariness can be recognized this way. Early enough to prevent being involved in an automobile accident detection of exhaustion involves observing blink patterns and eye movements. The study of facial pictures is a majorfield of study. Face recognition and person identification are examples of uses. Systems of security the focus of thisresearch is on the localization of the eyes, which entails inspecting the full image of the eye and a self-developed system for detecting the position of the eyes algorithm forimage processing.

This proposed research intends to design a real- time, easy-to-implement, nonintrusive, and accurate drowsiness detection system to overcome the limitations of present wooziness detection approaches. The term "wooziness" refers to a condition of decreased alertness that is often accompanied by performance and psychophysiological changes and can lead to loss of awareness or falling asleepat the wheel.

## IV. METHODOLOGY

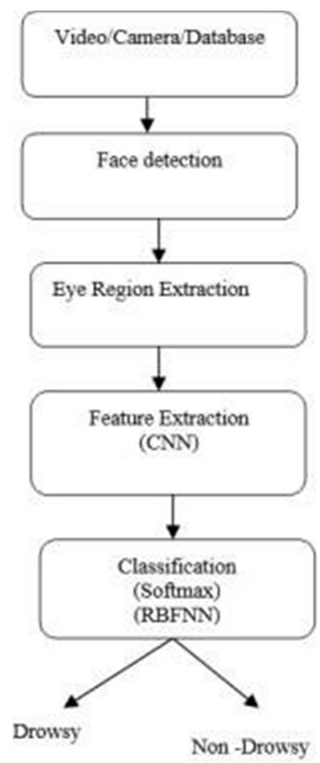
A face detection method is used to recognise faces in images, which is then passed on to an eye detection algorithm as input.

Once the face has been identified, an eye identification method is utilised to extract the eye region from the facial images, which is then fed into cnn.

Deep features are extracted using a cnn with four convolutional layers, which are then sent to a fully connected layer in cnn, the soft max layer classifies the pictures as sleepyor non-sleepy.

Cnn soft maximum layer sort the photos into sleepy andnon-sleepy categories.

The drowsiness detection system architecture proposed using deep cnn the proposed paradigm is divided into three Stages. Preprocessing, feature extraction,and the deep cnnclassifier are the three stages of the procedure.




The entire face region may not be required to identify drowsiness, but merely the eyes region is sufficient. Face detection is done in the first phase using a face detection algorithm. The eye detection

Algorithm is used to extract the eye region from the facial images once the face has been detected. The first algorithm for face detection was the object detection algorithm [20, 21]. Haar-like features, and cascade classifier are three techniques used in the face detection algorithm. The objectdetection technique with haar cascade classifier was utilised in this study, and it was implemented in python using open cv. Haar characteristics are used by the haar cascade classifier to recognise the face in photos.

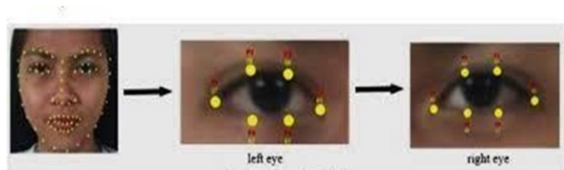
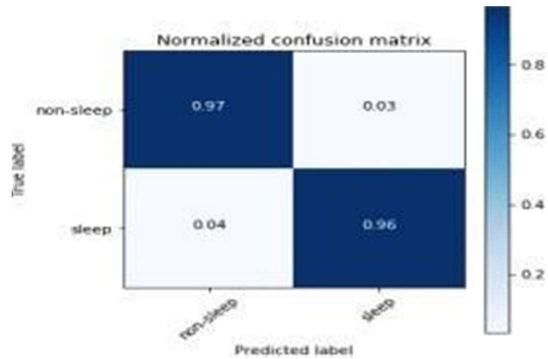


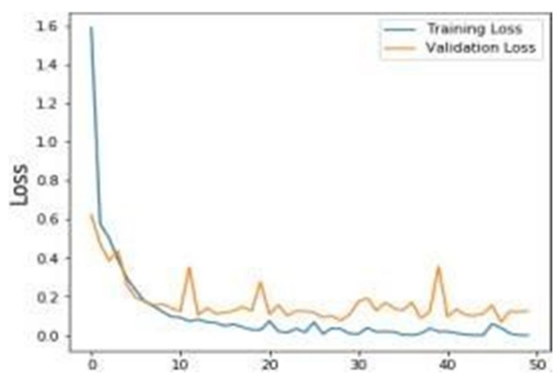

Figure 10. Eye Landmark Points

## V. RESULT AND ANALYSIS

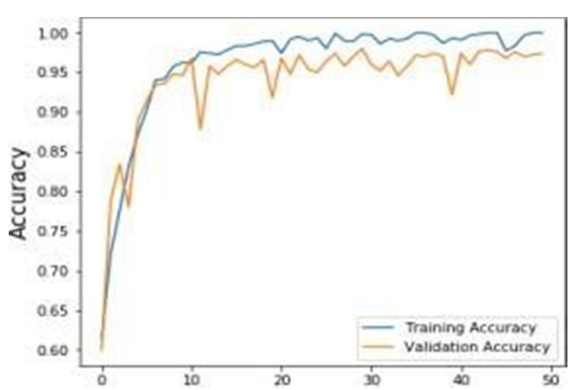
The following is an example of a two-type experiment. The experiment of the first type is carried out on a dataset that has been collected. The experiment is done on video in the second type. We created a dataset containing 2850 photos to conduct the first sort of experiment, and we tooka few samples from it. There are 1450 drowsy photos and the rest are non-drowsy images out of 2850 total. A total of 1200 photos are utilized for training in this experiment, 600 of which are drowsy images and 600 of which are non-drowsy images. A total of 500 photographs are used for validation, with 250 of them being drowsy and the remaining 250 being non-drowsy. A total of 1150 photos were employed in the testing, with 550 being drowsy and 600 being non-drowsy, and the proposed model attained an accuracy of 96.42 percent on the test dataset. In the second type of experiment, the model was trained with 1200 samples first. During the testing phase, we capture video frames with a Webcam and sound an alarm if the model predicts drowsy output state on a regular basis.




During the training phase, static images are employed, but during the testing phase, crucial frames from continuous video are retrieved and compared to the taught staticimages.




Here in the above picture there are the training and validation losses vs the number of epochs




Here in the above picture there are the training and validation accuracy vs the number of epochs

The accuracy table

| Training Samples | Testing Samples | Validation Samples | Training Accuracy (%) | Validation Accuracy (%) | Testing Accuracy (%) |
|---|---|---|---|---|---|
| 1200 | 1150 | 500 | 98 | 97 | 96.42 |

## VI. RESEARCH GAP

In terms of accuracy and underpinnings, current research is promising; nevertheless, more study is needed to validate techniques for on-road application. Model adaptation should also be addressed, with the goal of detecting driver drowsiness early or before the driver is putat risk

## VII. FUTURE WORK

In the future, we will apply transfer learning to increase the system's performance and it will be critical for studies of sleepiness detection to include participants with sleep disorders, so that they can be monitored properly on the road as well. Once these issues are resolved, accurate sleepiness tracking and, presumably, broader commercial adoption will be possible.

## VIII. CONCLUSION

We conclude that a new strategy for detecting driver tiredness based on eye condition is proposed in this proposed work. This determines if the eye is drowsy or not, and alerts the user with an alarm if the eye is drowsy. The viola-jones detection algorithm is used to detect the face and eye region. To extract features, a stacked deep convolutional neural network is created and employed in the learning phase. The driver is classified as sleep or non-sleep using a softmax layer in a cnn classifier. The proposed system had a precision of 96.42 percent. When the model forecasts drowsy output condition continually, the proposed system 465 successfully identifies the status of the driver and alerts with an alarm.

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