IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 4, May 2022
Impact Factor: 6.252

Drowsiness Alert Using Machine Learning Algorithms and Deep Learning Algorithms

Prof. Malan Sale[1], Sahil Tamboli[2], Prajakta Mankar[3], Om Chirde[4], Siddharth Matale[5]
Faculty, Department of Computer Engineering[1]
Students, Department of Computer Engineering[2,3,4,5]
Sinhgad College of Engineering, Vadgaon Bk. Pune, Maharashtra, India
Savitribai Phule Pune University, Pune, Maharashtra, India

Abstract: *We proposed to use this approach to reduce the number of accidents caused by driver weariness, thereby improving road safety. This device uses visual data and artificial intelligence to identify driver drowsiness automatically. For the neural transfer function, we use SoftMax to find, monitor, and examine both the driver's face and eyes in order to measure PERCLOS (% of eye closure). It will also employ alcohol pulse detection to evaluate whether or not the user is normal. Due to long driving periods and boredom in overcrowded conditions, driver fatigue is one of the primary causes of traffic accidents, particularly for drivers of large vehicles (such as buses and heavy trucks).*

Keywords: Drowsiness in Drivers, Machine Learning, Image Processing, and Deep Learning

I. INTRODUCTION

There are two types of methodologies for detecting driver drowsiness: behavior-based approaches and eye and neck angle-based approaches. Recent studies show that algorithms that calculate the distance between the driver's open and closed eyes have more reliability and accuracy than other methods for detecting driver drowsiness
The proposed system makes use of parameter conduct:

- Eye blinking, yawning, eye openness, jaw angle, as well as other behavior parameters are included in the personality parameter.
- A camera mounted on the bus captures the live video.
- The video is separated into frames, after which the photos are selected from the frames.
- Image noise is reduced by taking individual images.

1.1 Motivation

Monitoring the driver's actions while driving by examining the vehicle's maneuverability may be a very essential task in terms of improving driving safety. The most crucial factor to be identified will be the ability to distinguish between unintended and deliberate automobile steering wheel inputs, such as a sudden significant steering input could indicate the driver's level of alertness.

II. LITERATURE REVIEW

Paper Name: Towards Detection of Bus Driver Fatigue Based on Robust Visual Analysis of Eye State
Author: Bappaditya Mandal, Liyuan Li, Gang Sam Wang, and Jie Lin
Abstract: Because of extended driving times and boredom in the workplace, driver weariness is one of the leading causes of traffic accidents, especially among big vehicle drivers (such as buses and heavy trucks). We present a vision-based tiredness detection system for bus driver monitoring in this study, which is simple and adaptable enough to be used in buses and big vehicles. Head-shoulder detection, face detection, eye detection, eye openness estimation, fusion, sleepiness measure percentage of eyelid closure (PERCLOS) estimation, and tiredness level classification are among the modules included in the system. The following are the most important innovative techniques: 1) a method based on spectral regression for estimating the continuous amount of eye opening.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 4, May 2022
Impact Factor: 6.252

Paper Name: Safe driving by detecting lane discipline and driver drowsiness
Author: Yashika Katyal; Suhas Alur; Shipra Dwivedi
Abstract: In today's modern world, road accidents have become all too prevalent. They inflict property damage as well as putting people's lives at danger while travelling. Road safety is a national concern because of its scope and the consequent negative impacts on the economy, global health, safety, and the general welfare of the people.

Paper Name: Portable Prevention and Monitoring of Driver's Drowsiness Focuses to Eyelid Movement Using Internet of Things
Author: Menchie Miranda,Alonic a Villanue va; Mar k Jomar Buo; Re ynald
Abstract: Since the number of vehicular accidents in the Philippines has lately increased, this article offers a sleepiness prevention device. To raise driver awareness, current safety measures are used, such as the usage of standard rumble strips on roadways, GPS installation, and speed limiters.

III. Design And Analysis

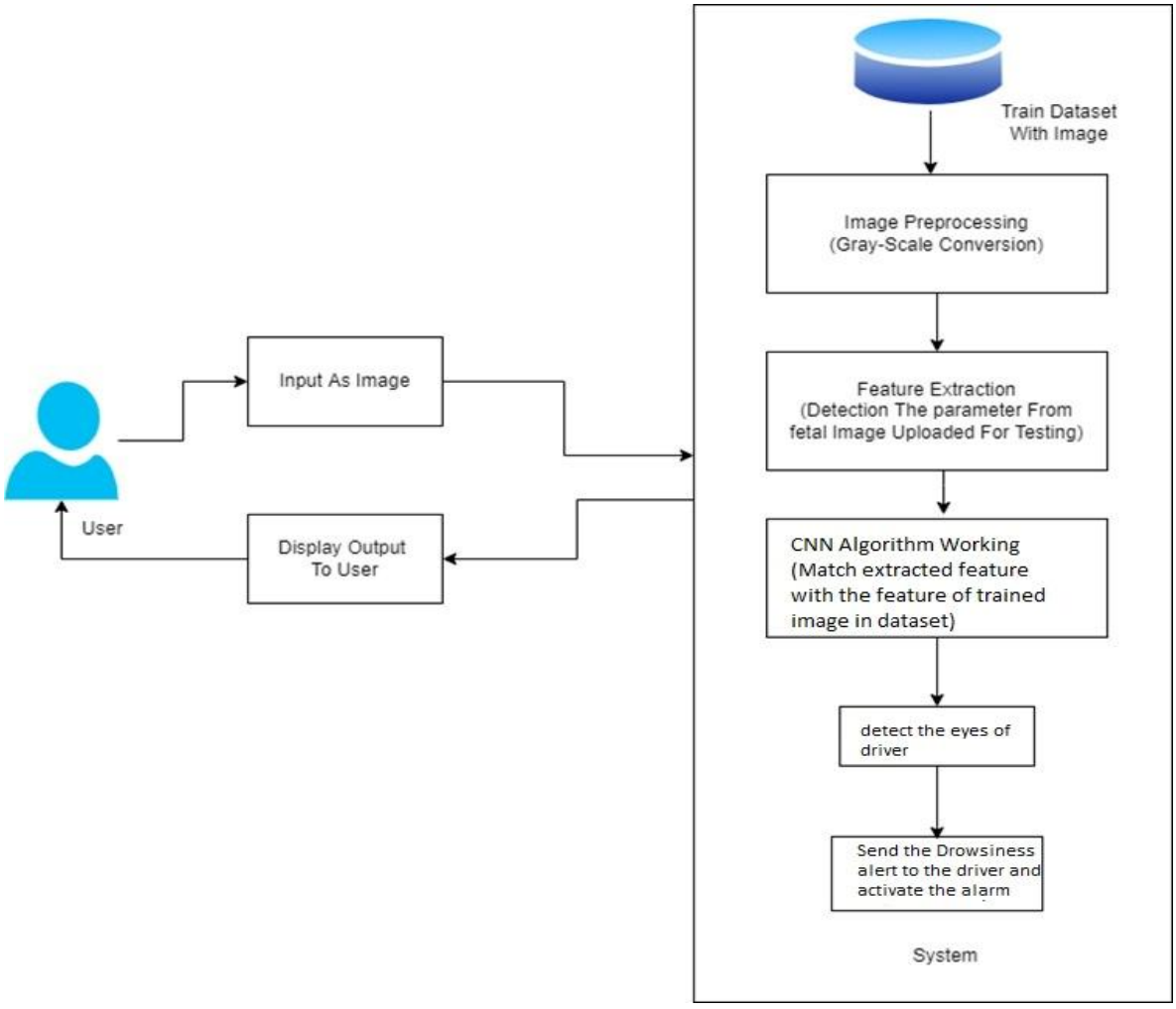

Figure 1: System Architecture

The system which detects driver sleepiness starts monitoring the driver's steering behaviour as soon as the trip starts. It then detects changes over the duration of long excursions, as well as the driver's tiredness state.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 4, May 2022
Impact Factor: 6.252

IV. Proposed Algorithms

4.1 Convolutional Neural Network (CNN)

CNN is a Deep Learning algorithm that can take an input image, assign priority to various aspects/objects in the image, and distinguish between them. A CNN, or convolutional neural network, is a deep learning neural network designed to analyse organised arrays of data like representations.

4.2 Haar Cascade

This is an Object Detection Algorithm that is used to recognise faces in images or real-time videos. Edge or line are used in the algorithm. A Haar-like feature averages the pixel intensities in neighbouring rectangular sections at a specified place in a detection window and calculates the difference between these sums. This distinction is then utilised to categorise picture subsections.

V. Implementation

5.1 Yawn Detection

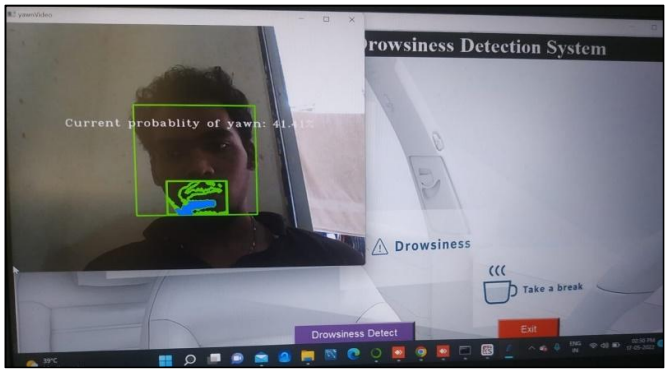

Figure 2: Current Probability of Yawn

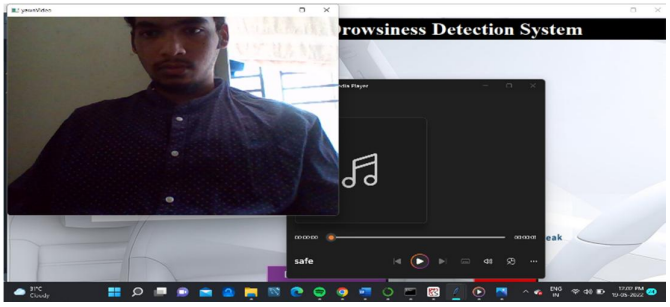

Figure 3: Yawn Detection

VI. Conclusion

On different resolutions images of faces and eyes taken from an oblique viewing angle, our proposed approach can discriminate between simulated drowsy and sleepy states and the typical condition of driving. As a result, our technology may be able to effectively monitor the attention level of bus drivers without the need for additional cameras. Existing vision-based strategies for detecting driver fatigue may be able to improve their capabilities and application using our approach.

References

[1]. J. May and C. Baldwin, "Driver fatigue: The importance of identifying causal factors of fatigue when considering detection and countermeasure technologies," Transp. Res. F, Traffic Psychol. Behav., vol. 12, no. 3, pp. 218–224, 2009.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 4, May 2022
Impact Factor: 6.252

[2]. S. Lal and A. Craig, "A critical review of the psychophysiology of driver fatigue," Biol. Psychol., vol. 55, no. 3, pp. 173–194, 2001.

[3]. E. Hitchcock and G. Matthews, "Multidimensional assessment of fatigue: A review and recommendations," in Proc. Int. Conf. Fatigue Manage. Transp. Oper., Seattle, WA, USA, Sep. 2005.

[4]. A. Williamson, A. Feyer, and R. Friswell, "The impact of work practices on fatigue in long distance truck drivers," Accident Anal. Prevent., vol. 28, no. 6, pp. 709–719, 1996.

[5]. W. Dement and M. Carskadon, "Current perspectives on daytime sleepiness: The issues," Sleep, vol. 5, no. S2, pp. S56–S66, 1982.s

.