

An End-to-end Autonomous Driver Drowsiness Monitoring System

Srishti Vashishtha^{1*}, Suchika Sachdeva¹, Manisha Saini²

¹ Department of Computer Science and Engineering, Bharati Vidyapeeth's College of Engineering, Delhi, India

² School of Engineering and Technology, BML Munjal University, Gurugram, Haryana

*Corresponding author's e-mail: srishtidtu@gmail.com

ABSTRACT

Drowsiness and fatigue are critical root causes of the majority of road accidents. Deaths and fatalities are reported globally due to these causes. Timely detection and handling of drowsiness whilst a driver is on the move and effective feedback and alert can prevent such casualties. This paper proposes an end-to-end dedicated system specifically made for detection and extraction of any signs of drowsiness in a driver while he's on the move. The system then alerts him to stay cautious will be a highly useful and invigorating move. For this, the proposed autonomous driver monitoring system would take into account Eye Aspect Ratio (EAR), blinking rate, yawning using landmark detection of facial features while ensuring that the driver is wearing a mask properly with respect to the COVID-19 precautions. The model will provide complete driver monitoring by giving alerts for drowsiness, inattentiveness as well as incorrect use of masks by the driver. The proposed facial landmark detection model achieves a R2 score of 0.96 that is able to work in both bright and low light surroundings for real-time drowsiness detection. Further, model has attained F1 score of 0.90 and the mask detection model has obtained an accuracy of 98%, F1-score 0.98, recall of 0.99 with mask and 0.97 without mask.

Keywords: Image Processing; Blink Detection; Face Recognition

How to Cite

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