LBP-CNN Fusion for Driver Fatigue Detection

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Abstract: *Nowadays, individuals tend to rely on their own means of transportation. As the number of vehicles on the road continues to rise, the occurrence of accidents has also increased. Specifically, road accidents are becoming more prevalent, with driver drowsiness being a significant contributing factor. Approximately 2.3 lakh out of the 23 lakh road mishaps that transpire in the country each year are attributed to drowsiness. Recent data indicates that an estimated 2.3 lakh to 3.5 lakh road accidents are a direct consequence of sleepiness[9]. To mitigate the occurrence of such accidents, we propose the implementation of a drowsy detection system for drivers. This system ensures that both the passengers and the driver can embark on their journey with the assurance of safety. The system utilizes a camera to monitor the driver's facial expressions and issues alerts accordingly. It analyzes various facial features such as eye closure, yawning, and signs of fatigue, subsequently notifying the driver to remain attentive. This approach involves the utilization of the local binary pattern texture analysis method in conjunction with convolutional neural networks (CNNs). By doing so, it effectively highlights the textural variations in the driver's face, thereby clearly identifying the relevant facial features. The camera detects the driver's face, captures the image, and subsequently converts it into LBP images. This process enables the system to detect subtle indicators of drowsiness, ultimately aiding in the prevention of accidents. Consequently, this system significantly reduces the occurrence of drowsiness-related accidents, thereby saving numerous lives*

Keywords: Local Binary Pattern (LBP) texture analysis, Convolutional Neural Networks (CNNs), Driver Fatigue Detection, Facial Features, Prevention of Accidents

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