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Drowsiness Detection Using Deep Learning

The Driver Drowsiness Detection Project, the goal is to develop a system that can identify whether a driver is alert or drowsy. Detection of driver drowsiness helps prevent potential accidents, save lives, and reduce the economic impact of road incidents. This system assists drivers in recognising their fatigue state, allowing them to take necessary precautions before a dangerous situation arises. The project involves the creation of a diverse dataset encompassing alert and drowsy driving instances. The dataset undergoes preprocessing to standardize images, and examines facial features to detect drowsiness patterns, eye closure duration and yawning frequency. To analyze and classify driver states, the technique used here is Convolutional Neural Network (CNN). CNNs are powerful for image-related tasks, as they can automatically learn patterns and features from facial expressions and eye movements. The model incorporates two key metrics: the Eye Aspect Ratio (EAR) and Mouth Aspect Ratio (MAR), which quantifies eye closure and yawning, respectively. When signs of drowsiness are detected, the system generates a voice alert to warn the driver. This real-time processing capability ensures timely interventions, crucial for preventing accidents.

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