Project Title: SMART DRIVER DROWSINESS DETECTION SYSTEM USING DEEP LEARNING

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ABSTRACT

Driver drowsiness is one of the major causes of road accidents, leading to severe injuries and fatalities every year. To address this problem, this project presents a Driver Drowsiness Detection System using a hybrid deep learning model that combines Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM) networks for accurate and real-time detection of driver fatigue. The system continuously monitors the driver’s eyes through a live camera feed using OpenCV, and the model analyzes spatial and temporal features to determine whether the eyes are open or closed. If the eyes remain closed beyond a specific duration, the system triggers an immediate audio alert (“Drowsiness Detected”) to warn the driver. The model is trained on datasets such as YawDD, CEW, and NTHU-DDD, along with custom images, ensuring reliable performance under various lighting conditions and facial orientations. Implemented using Python, TensorFlow, and Keras, the system achieved an accuracy of 92% and can be deployed on lightweight devices like Raspberry Pi, making it a practical, non-intrusive solution to reduce fatigue-related accidents and improve road safety.