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Real Time Vehicle Counting and Classification at Traffic Signals

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Abstract: *This project presents a deep learning-based system designed to analyze traffic videos by detecting, classifying, and counting different types of vehicles. The system works in two steps. First, a Convolutional Neural Network (CNN) is trained on a custom car image dataset to recognize specific vehicle models like Swift, Scorpio, and Innova. The dataset used for training was downloaded from Kaggle, a popular open-source data platform. In the second step, the YOLOv8 object detection model is used to find and mark vehicles in each frame of a traffic video. Each detected vehicle is cropped from the frame and passed to the CNN model to identify its exact type. For testing and demonstration, a sample traffic video was obtained from Pexels, a free stock video website. This combined approach offers reliable vehicle detection and classification, and helps collect valuable information from traffic footage that can support further analysis and monitoring. The system achieved an overall accuracy of 85%, showing that it performs well for traffic video analysis and vehicle classification tasks*

Keywords: CNN, YOLOv8, Vehicle Detection, Deep Classification, Traffic Surveillance, Object Recognition.

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