CERTIFICATE

Certificate ID: 548485547 Time & Date Of Publication: 11/24/2026 09:05:40

Title:

AI-Based Real-Time Vehicle Detection, Classification, and Counting for Sustainable Transportation

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Description

This software provides real-time vehicle detection, classification, tracking, and counting using MATLAB, artificial intelligence, and a standard USB camera. It uses the Tiny YOLOv4 deep learning model to identify five vehicle categories: cars, motorcycles, buses, trucks, and bicycles. The software implements a tracking and counting algorithm based on position prediction, velocity estimation, detection matching, and class voting to minimize duplicate counting and improve classification reliability. It displays live video with color-coded bounding boxes and vehicle labels. At the end of each session, it automatically generates a CSV report containing the start time, end time, vehicle categories, and total counts. The software can support intelligent transportation systems, traffic monitoring, urban mobility analysis, smart cities, and sustainable transportation research.

Chairman

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