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IoT based Speed Control and Accident Avoidance using AI Road Sign Detection System

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Abstract: *The project aims to enhance vehicle safety on Indian roads through a traffic sign detection system powered by the YOLO deep learning architecture. The system is trained and validated using the Indian Traffic Sign Recognition dataset, ensuring high accuracy and relevance to local traffic conditions. YOLO's powerful feature extraction and classification capabilities enable the real-time detection and recognition of various traffic signs, facilitating immediate responses to dynamic road environments.*

Real-time video processing allows the system to instantly identify and classify traffic signs as vehicles navigate through different areas. Upon detecting a traffic sign, integrated vehicle controls automatically adjust speed, promoting safer driving and minimizing the risk of accidents for both drivers and pedestrians. The system is engineered to withstand challenging conditions such as low lighting, adverse weather, and partially obscured or damaged signs, ensuring consistent and reliable performance. Extensive real-world testing across diverse Indian traffic scenarios optimizes system robustness and practical applicability.

These tests help fine-tune the model for performance under complex conditions, improving its ability to handle the unique characteristics of Indian roads. The proposed system bridges the gap between advanced traffic management and local road safety needs, contributing to reduced accidents and enhanced driving experiences.

Keywords: traffic sign detection

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