Pothole and Accident Detection

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Abstract: *Potholes and road accidents are among the leading causes of vehicle damage and road-related fatalities. Inadequate road maintenance and delayed detection of these hazards contribute to dangerous driving conditions and increased repair costs. To overcome these challenges, a real-time detection system has been developed that leverages modern computer vision techniques. This system uses YOLO (You Only Look Once), a fast and accurate object detection algorithm, to identify potholes and accidents in real-time from images or video streams. YOLO's ability to quickly analyze frames allows the system to promptly detect road defects and raise alarm alerts, ensuring faster responses from authorities and reducing the risk of further damage or injury. In addition to detection, the system assesses road conditions and keeps track of the frequency and locations of pothole occurrences. This information is essential for generating road maintenance recommendations, enabling better planning and efficient allocation of repair resources. To make this data accessible, the system uses a Flask-based web platform to display detection results and alerts in a clear and user-friendly manner. This interface is designed to be intuitive and suitable for both technical and non-technical users, such as traffic inspectors or municipal staff. By automating the process of detecting and reporting potholes and accidents, this system contributes significantly to improving road infrastructure and enhancing vehicular safety. It serves as a smart, scalable solution for creating safer roads through the power of real-time monitoring and AI*

Keywords*: Machine learning, Deep learning, YOLOV8, PyTorch.*