Real Time Vehicle Collision Detection using Bounding Box Methodology with Alert System

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Abstract*: Accident detection is an essential application in intelligent transportation systems for the safety of drivers and passengers. In recent years, deep learning-based object detection models have shown significant improvements in detecting objects in real-time. YOLO (You Only Look Once) is one such model that has gained popularity due to its real-time performance and high accuracy. In this paper, we propose an accident detection system using YOLOv3, a state-of-the-art version of YOLO. The proposed system is designed to detect three types of accidents, namely vehicle rollover, rear-end collision, and head-on collision. The system uses a pre-trained YOLOv3 model trained on the COCO dataset, which is fine-tuned on a custom dataset of accident images. The proposed system achieves an average precision of 0.94 for vehicle rollover detection, 0.93 for rear-end collision detection, and 0.92 for head-on collision detection. The system also shows promising results in terms of real-time performance, with an average processing time of 0.03 seconds per frame on an NVIDIA GeForce GTX 1080 Ti GPU. The proposed system can be integrated into intelligent transportation systems to provide real-time accident detection and alerting, improving the safety of drivers and passengers on the road*

Keywords: Accident detection, Intelligent transportation systems, Deep learning, Object detection, YOLOv3, Real-time performance