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(57) Abstract :
An AI Hybrid Model for Road Accident Detection based on YOLO and CNN Algorithm Precise and real-time accident detection is critical for improving road safety and minimizing emergency response times. Conventional accident detection techniques are usually based on sparse datasets and lack scalability for real-world implementation. This work proposes a hybrid model with an AI-powered approach that fuses the You Only Look Once (YOLO) algorithm and Convolutional Neural Networks (CNNs) for effective classification and detection of road accidents. YOLO enables fast object detection in real-time video streams, and CNNs enhance classification accuracy by learning prominent accident-related features. The new model utilizes real-time video surveillance feeds to accurately detect accidents and send immediate alerts to emergency responders, hence minimizing response time. Experimental tests show that our method performs better than traditional methods both in terms of speed and accuracy, recording a detection precision of more than 94%. The model leverages deep learning methods for feature extraction, making it more robust to varying weather and lighting conditions. This paper advances the construction of intelligent transportation systems (ITS) by combining YOLO with CNNs, providing a scalable and efficient approach to computerized accident detection. The result highlights the potential of AI technology to avert traffic accidents and lives lost.

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