Abstract

This project develops an advanced weapon detection system using image processing and AI to enhance security in public and sensitive areas. By leveraging Convolutional Neural Networks (CNNs), the system analyzes video feeds from surveillance cameras to identify and classify weapons in real time. The process begins with preprocessing the video data to improve image quality, followed by feature extraction using edge detection and morphological techniques. These features are then analyzed by the CNN, trained on a diverse dataset of weapons and non-weapons. Performance is evaluated using metrics like accuracy and precision, demonstrating high reliability in detecting weapons and minimizing false positives. The system integrates with existing surveillance infrastructure, providing timely alerts to security personnel and significantly advancing weapon detection capabilities.