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(57) Abstract :
ABSTRACT The present invention relates to a real-time gun and weapon detection system designed to enhance security and public safety by accurately identifying firearms and other dangerous objects in diverse environments. The system employs an advanced object detection model, trained on a custom dataset of approximately 9,000 images, optimized for high accuracy and precision using one or more optimizers, including AdamW, SGD, and Adamax. It demonstrates an average precision of 90.5% for firearm detection and is capable of processing live video feeds to generate alerts in time-sensitive scenarios. The system is highly adaptable, robust to occlusion and motion, and scalable for deployment across various security infrastructures, such as surveillance networks, public venues, and emergency response systems. It integrates cutting-edge detection techniques to ensure reliable performance and lays the groundwork for future advancements through continuous learning and expansion.

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