ThreatNet: Real-Time Object-Aware Surveillance Using Contextual Deep Vision Models

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Abstract: *The increasing demand for intelligent surveillance systems in high-risk and public environments has led to the need for more context-aware and real-time threat detection solutions. ThreatNet is a novel AI-powered surveillance framework designed to detect, analyze, and respond to potential threats with exceptional precision. Leveraging advanced deep vision models and contextual object awareness, ThreatNet goes beyond traditional object detection by interpreting the scene's semantics—recognizing not only the presence of suspicious items (e.g., weapons) but also understanding behavioral cues and environmental context.*

The system employs a hybrid architecture combining convolutional neural networks (CNNs) with attention-based mechanisms to ensure rapid, accurate threat localization across dynamic video streams. By integrating real-time analytics with threat prioritization algorithms, ThreatNet minimizes false positives and enhances situational awareness, enabling swift and appropriate responses. This paper presents the system's architecture, implementation workflow, and real-world performance evaluation, demonstrating its potential to redefine proactive surveillance strategies in both public safety and critical infrastructure domains.

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