Autonomous Aircraft Defense System Using Deep Learning for Real-Time Threat Detection and Response

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Abstract

Aircraft are increasingly vulnerable to missiles, drones, and enemy aircraft, necessitating advanced autonomous defense systems. Manual observation and response-based detection systems are inadequate in high-threat environments. This project proposes an autonomous defense system using deep learning through Convolutional Neural Networks (CNNs) for real-time threat detection and response. Processing visual and sensor data, the system detects threats with high accuracy and autonomously executes defensive maneuvers. The CNN-based approach ensures adaptability through ongoing learning, optimizing performance against evolving threats. The system is easy to integrate with aircraft avionics, enhancing operational efficiency, survivability, and mission success rates. The innovation lies in automating defense systems, reducing human dependence, and enabling rapid countermeasures. This new method revolutionizes aircraft defense, ensuring enhanced security and robustness in dynamic combat scenarios.

Keywords

Autonomous Defense, Threat Detection, Deep Learning, Aircraft Security, Real-Time Response, Adaptive System, CNN-Based Classification.