ABSTRACT

The utilization of machine learning and computer vision techniques for aircraft detection during air wars through satellite imagery presents an innovative solution with significant potential to enhance security and surveillance systems. This thesis introduces the AI-based Aircraft Detection System, a cutting-edge solution specifically designed for military applications. The system leverages machine learning and computer vision techniques to accurately identify aircraft from high-resolution satellite images, thereby enhancing airspace security. The core of the system lies in its employment of a Convolutional Neural Network (CNN) model, trained on an extensive dataset of aircraft images. By utilizing multiple layers of convolution and pooling operations, the CNN model effectively extracts essential features from the input images. Consequently, the model achieves high precision in classifying satellite images as either containing an aircraft or not. The system's capability to process highresolution satellite imagery enables aircraft identification across diverse global locations. By feeding the satellite images into the trained CNN model, the system accurately distinguishes the presence or absence of aircraft in each image. The model's proficiency in learning and adapting to new data ensures improved accuracy over time, thereby providing reliable real-time intelligence. The AI-based Aircraft Detection System not only facilitates prompt and informed decision-making for military leaders in high-stakes situations but also serves as an invaluable tool for defense organizations worldwide. Its advanced image recognition capabilities significantly enhance airspace security and operational effectiveness. By accurately detecting and tracking aircraft, the system enables defense organizations to proactively respond to potential threats.