XERXEZ SOLUTIONS
DEVELOPMENT – TRAINING – RESEARCH

Project Name: Drone Autonomous Defense System (DADS)

ABSTRACT: In recent years, drones have undergone tremendous development. Due to the low price and ease of use, drones have been widely utilized in many application scenarios, which potentially pose great threats to public security and personal privacy. To mitigate these threats, it is necessary to deploy anti-drone systems in sensitive areas to detect, localize, and defend against intruding drones. In this article, we provide a comprehensive overview of the technologies utilized for drone surveillance and the existing anti-drone systems.

Then we developed an anti-drone system at Zhejiang University, named ADS-ZJU, which combines multiple passive surveillance technologies to realize drone detection, localization, and radio frequency jamming. Furthermore, we discuss the challenges and open research issues in such a system.

INTRODUCTION: Drones, that is, small unmanned aerial vehicles (UAVs), are experiencing explosive growth nowadays, and they have been widely used in many areas (aerial photography, traffic monitoring, disaster monitoring, etc.). They have attracted much research interest about path planning, secure communication, attack detection, and so on.

Nevertheless, the increasing use of drones poses great threats to public security and personal privacy. For example, an attacker might strap explosives or other dangerous materials to a drone to carry out an attack; criminals can use drones to smuggle illicit materials across borders; an operator can control a drone carrying a high-fidelity camera to fly over walls and spy on inhabitants' private information. The increasing frequency of incidents caused by drones makes it necessary to regulate drone air traffic. A few drone manufacturers (e.g., DJI) have embedded geofencing software into their drones to prevent them from flying over security-sensitive areas (government buildings, airports, etc.). However, it is unrealistic for geofencing to cover every place and every drone. Therefore, it is of great significance to deploy an anti-drone system in a geofencing-free but security-sensitive area. Such an anti-drone system can detect a drone at the time it flies into a sensitive area and estimate its location for drone defense (e.g., jamming, hunting, or control of the detected drone).

EXISTING PROBLEM: Due to the drones' small size and low flying speed at low altitude, drone surveillance is a challenging task, and many technologies, such as radar surveillance, audio surveillance, video surveillance, and RF surveillance, have potential for drone detection and localization. Each technology has its strengths and weaknesses. A few anti drone systems have been developed based on one or several of these technologies. The performance of these systems relies on the utilized technologies, while their application scenarios also vary with the utilized technologies. Moreover, not all the existing systems can simultaneously realize drone detection, localization, and defense.

TECHNOLOGY WE COVER:

1. Python Programming
2. Machine Learning/Deep Learning
3. Django – Front End
4. PostgreSQL – Database
5. MLOps using MLFLow – Model Orchestration
6. Github Action - CI/CD Pipeline
7. DVC for Data Tracking
8. DagsHub
9. Docker and Kubernetes

OUR OFFERING:

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2. Training and Project Deployment on local system
3. Project Completion Certificate
4. Paper Publication in IJera International
5. Project Report
6. Xerxez T-Shirts

DISCLOSURE:

1. Students must prepare the PPT for demonstration.
2. 50% Advance and 50% during project submission.
3. Once Payment is done, cannot be refundable.

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