Group No.: 24

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A Drone-Based System for Detecting and Neutralizing Unmanned Aerial Vehicles

Introduction

The Drone Detection and Classification System (DDCS) project responds to the pressing demand for an innovative solution to accurately identify and classify drones.

Integrating a camera, ultrasonic sensor, YOLO v7 and OpenCV, the project aims to enhance adaptability and overcome limitations inherent in traditional radar-based drone detection systems. A versatile approach to drone detection, contributing to improved security and safety measures.

Methodology

Utilizing YOLO v7 for real-time object detection, the system processes visual of drone classification and signatures to classify drones. The project also incorporates machine learning algorithms for comprehensive data analysis and categorization and training the system.

Results

Extensive real-world testing is conducted to assess the system's performance, measuring key metrics such as detection accuracy, classification precision, and responsiveness in diverse environmental scenarios.
Result focus on system's adaptability to various environments and its success in reducing false positives and negatives.
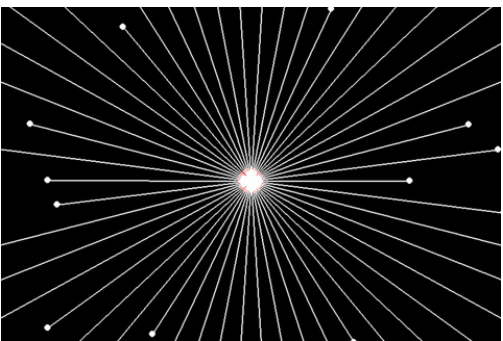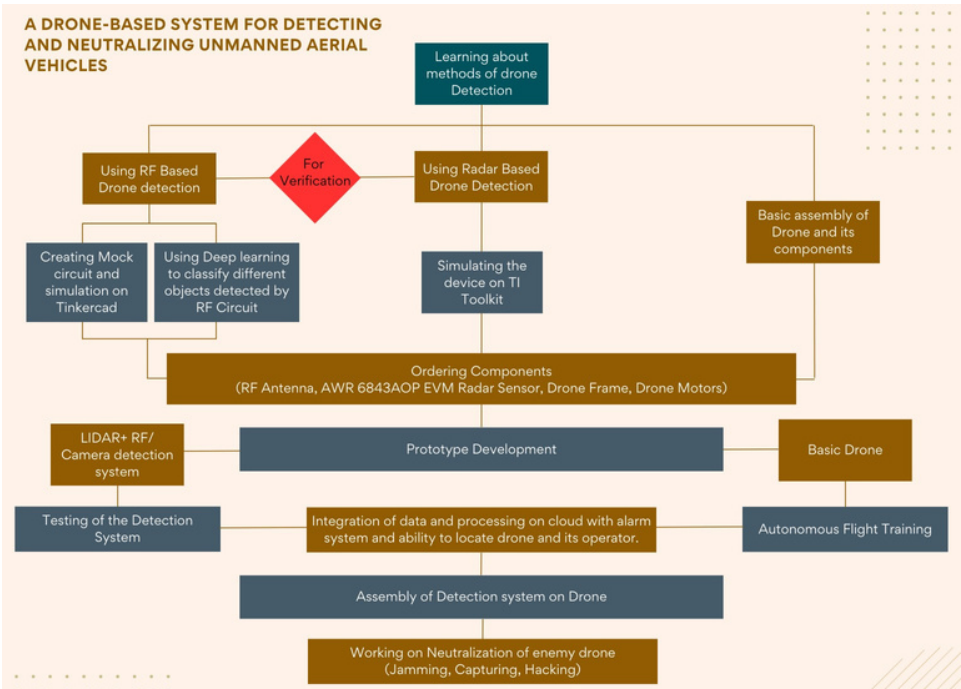
Abstract

Problem Statement:

Addressing the rising security threats posed by drones, existing detection systems lacks adaptability and accuracy, especially in diverse environmental conditions.

Proposed Solution:

Introducing a Drone Detection and Classification System (DDCS) integrating a camera, ultrasonic sensor, YOLO v7, and OpenCV for real-time, accurate identification and classification of drones, overcoming current system limitations.

Conclusions

The project successfully achieves its objectives, showcasing advancements in drone detection technology through the integration of YOLO v7, OpenCV, and a camera with an ultrasonic sensor.

Future work should focus on continuous algorithmic improvement, scalability for larger deployments, integration with drone response systems, and collaboration with regulatory bodies to ensure the responsible and secure use of drone detection system.