National Institute of Technology Rourkela

Defence Seminar

Seminar Title	: Robust and Efficient Strategies for Invader Drone Surveillance System Based on UAV Borne Radar Antenna Array
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Venue	: EC-303, SEMINAR HALL
Date and Time	: 14 Jun 2024 (12:00 PM)

Abstract : The Invader Drone Surveillance System (IDSS) is a modern framework that enhances security and monitoring capabilities. It uses radar-equipped Unmanned Aerial Vehicles (UAVs)/drones to offer situational awareness in real-time for intelligence gathering. UAV&rsquos swift and agile nature allows for comprehensive coverage of expansive areas and remote locations. The IDSS is a flexible and efficient system for protecting vital infrastructure, boosting border security, and assisting military and law enforcement activities. The research proposes the following techniques for a better solution by looking at these issues. The success of surveillance activities, however, depends on the UAV&rsquos ability to coordinate effectively with one another. In this regard, a bio-inspired technique is proposed to maintain the connectivity and coordination among a swarm of UAVs in the surveillance system. In order to determine the presence of an invader drone, it is essential to recognize and keep an eye on a variety of flying objects, such as drones, birds, and helicopters. In this regard, the Convolutional Neural Network-Memetic Algorithm (CNN-MA) technique is proposed. After identifying UAVs from other flying objects, the distinction between the surveillance and invader UAVs is crucial. In this work, the bandstop filter filters out the surveillance UAV data from the invader. Further localization of invader UAVs is done in a surveillance system utilizing an adaptable (reconfigurable) radar antenna array (ARAA).Towards the continuous monitoring of the invader UAV, tracking is very important. For this, the Hybrid Unscented Kalman-Continuous Ant Colony Filter (HUK-CACF) is used to investigate the tracking of invader UAVs. Finally, the last work focuses on sensitive data transfer in UAV surveillance activities, such as patrolling UAV locations, sensor readings, control orders, etc., requires strong security against unauthorized access and alteration.