FORMATION CONTROL AND ATTACK ALIGNMENT IN UAV SWARM MISSIONS

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This paper explores the tactical procedures involved in ensuring proper formation control and attack alignment during swarm-based UAV military missions. One of the key aspects of swarm coordination is the transition from a route-following mode to a combat formation as the UAVs approach the target zone. Based on preloaded information about the estimated number, location, and spatial distribution of targets, the UAVs initiate a collective maneuver approximately 300 meters before reaching the target.

Initially flying in a column formation along a pre-planned route, the UAVs autonomously shift into a line (chain) formation to enable simultaneous target acquisition and synchronized engagement. During this phase, the UAVs conduct real-time video surveillance to detect and identify targets, with the possibility of operator intervention for additional accuracy. This formation ensures optimal use of firepower while minimizing the risk of mid-air collisions and maintaining secure distances from terrain obstacles.

The study highlights the importance of intelligent coordination algorithms and flexible flight control systems to manage swarm behavior under dynamically changing battlefield conditions. These findings contribute to the development of more effective swarm UAV mission planning and real-time operational control in modern warfare scenarios.

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