OBJECTIVE: Design and prototype counter swarm algorithms. This is a three part objective – (1) the prototype should be able to pick up on adversary swarm behavior based on sensor data; (2) The prototype should have algorithms that are able to translate the data associated from the adversary’s swarm behavior into logical input into its own swarm; (3) create a swarm of autonomous agents that constantly ingest data from (2) and dynamically decide its action and try to counter the adversary swarm.

DESCRIPTION: Swarm technology—the ability of autonomous agents to autonomously make decisions based on shared information—has the potential to revolutionize the dynamics of conflict. And we’re inching ever closer to seeing this potential unleashed. In fact, swarms will have significant applications to almost every area of national and homeland security. There is a gap for detection, tracking and effective defeat of incoming threat swarm with the use of friendly swarm. The focus of the prototype should be the development of the algorithms that can decipher the swarm behavior of the adversary swarm, develop its own expert and effective Counter swarm algorithm and then implement its own swarm that targets the adversary swarm.

PHASE I: Investigate innovative methodologies and design concepts that can achieve the criteria for the system listed above. Develop design documents for the potential implementation of the system. Demonstrate a proof of principle of the design using simulated environment for a simple swarm pattern.

PHASE II: Further design, develop and demonstrate a prototype capability that meets the following three sub-objectives – (1) decipher simple and complex incoming swarm behavior based on simulated track data; (2) develop counter swarm algorithm in the same simulated environment that demonstrates the friendly swarm to effectively defeat the incoming threat swarm; (3) implementation of a small swarm that can ingest the counter swarm algorithms as input. Government will provide the threat swarm scenarios for (1).

PHASE III DUAL-USE APPLICATIONS: Demonstration of full up swarm on swarm (n to n) field exercise – simple and complex. Government will provide the threat swarm scenarios.

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