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Aerial Swarm Behavior Development in Support of USMC Training

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Aerial Swarm Behavior Development in Support of USMC Training

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Swarm Concept to Capability

- **Incorporation of adversarial (air-to-ground) behaviors into the ARSENL multi-UAV system with focus on the following:**
  - **Heterogeneous swarms**: subtask assignment that accounts for vehicle capabilities in mixed-swarm (e.g., quadrotor vs fixed wing)
  - **Robust swarm behaviors**: deliberative behaviors that utilize reactive capabilities to realize increasingly complex composite behavior
  - **Supporting algorithms**: application of consensus and market-based approaches to distributed decision-making within the swarm
  - **Human-swarm interaction**: process and system improvements supporting safe and effective control of large multi-vehicle systems

- **Training-appropriate behavior implementations and support systems**
  - All on-UAV and ground software to be maintained on the NPS Git server
  - Publicly available (no password) as appropriate
  - When required, restricted access software will be made available to sponsors and collaborators
- **Vehicle system (fixed wing and quad rotor) design**
  - Design documentation will be made publicly available (via Git or tech rpt)
  - Hardware will remain in the custody of NPS (ARSENL)
- **Field experiment after action reports**
  - Per mission/sortie objectives and results
  - Lessons learned and results analysis

- Low cost UAVs increasingly available to and utilized by adversaries

FY18 Call for Proposals

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