Drone Swarm Inspection of Large Naval Ships

An ARM Institute Project | Department of Defense Manufacturing Innovation Institutes

Technology: Autonomous Swarm Inspection and Interactive 3D Modelling with Orchestrated Visualization (ASIIMOV)

Project Participants: Siemens Technology (Principal Investigator), Allem Business Ventures (ABV), U.S. Navy (supported by the Deputy Assistant Secretary of the Navy for Sustainment)

Institutes' Role: The ARM Institute's strategic collaboration with the Joint Robotics Organization for Building Organic Technologies (JROBOT) Working Group resulted in the identification, funding and execution of several projects addressing pervasive Department of Defense (DoD) sustainment needs, such as those addressed by this drone inspection project. We brought these needs to our member consortium and identified a team who could leverage their technology and expertise to help solve this sustainment challenge.

Technology Description: The Autonomous Swarm Inspection and Interactive 3D Modelling with Orchestrated Visualization (ASIIMOV) project developed autonomous swarm capabilities to significantly enhance the inspection quality and visualization of critical Navy assets. It takes significant time to inspect and monitor maintenance activities of large naval ships, inhibiting the availability of assets critical to sustaining the security of the Unites States and its allies. Current methods were time consuming, unwieldy, or unsafe for humans. Leveraging existing design from a Siemens' DARPA project, a prototype was developed that navigates unmanned aerial vehicles (UAVs) to obtain the desired viewpoint and decompose high-level tasks into UAV commands on swarms using a mixed reality (AR/VR) module for management.

Impact: The advancements from this project resulted in reduced costs for sustainment operations, reduced time to execute inspection processes in complex environments with little infrastructure support and increased safety by eliminating manual processes in complex or difficult environments.

Check out the video here: https://vimeo.com/759900781