Orbit Logic Awarded Phase II Navy Autonomy Contract

GREENBELT, Md. – Orbit Logic has been awarded a Phase II Small Business Technology Transfer (STTR) contract sponsored by the Office of Naval Research (ONR) to develop the MinAu System, an advanced multivehicle mission planning, scheduling and response system for the maritime environment, the company announced July 9.

MinAu addresses current and future mission needs by employing teams of autonomous, cooperative, agent-based vehicles of differing types. Through collaboration strategies, these teams can be highly effective in maximizing mission effectiveness in dynamic environments (where conditions may not be known until the team is deployed). MinAu accomplishes this flexibility through a combination of upfront mission planning and onboard autonomous response capabilities. The solution has been adapted from Orbit Logic's high-heritage COTS space mission planning software.

The STTR team includes the University of Colorado, Boulder's Research and Engineering Center for Unmanned Vehicles (RECUV) and the University of California San Diego's MUlti-Agent RObotics (MURO) lab.

Phase I efforts resulted in an initial prototype of the MinAu solution that demonstrated its effectiveness through several relevant multivehicle collaborative mission scenarios played out in simulation.

During Phase II of the STTR, the team will collaborate with the Naval Information Warfare Center (NIWC) Pacific Command to integrate MinAu with vehicles in NIWC's Heterogeneous Autonomous Mobile Maritime Expeditionary Robots (HAMMER) system and validate its capabilities in a maritime test environment.

HAMMER system is made up of NIWC's SeaRover UUVs (an autonomy enhanced and untethered BlueROV) for collaborative ocean floor bottom mapping, a USV surface craft to act as a mothership for UUV deployment and recovery, and a rotorcraft UAV used as a data ferry to transport mission data from the UUVs and mothership to a shore station for processing and visualization.

For the HAMMER mission, MinAu will optimize an initial plan for all assets that maximizes the satisfaction of mission objectives (for example, getting the bottom mapping data collected by each asset to the shore station as quickly as possible) while minimizing the use of expendable resources, notably the energy stored in an asset's batteries. Once the HAMMER vehicles are

programmed and
deployed, the autonomous software onboard each asset will adapt its actions
when unanticipated events or conditions are encountered.

The University of Colorado’s
Event-Triggered Decentralized Data Fusion algorithm facilitates the exchange of
state and situational information between assets with minimal use of acoustic
communications equipment, which allows all collaborating assets to work
together to best meet the original mission needs by responding appropriately to
the unexpected. One example is UCSD’s Conflict Avoidance algorithm, which
enables each asset to meet its mission objectives as efficiently and
effectively as possible while preventing collisions with other assets or
obstacles in its operating environment.