

Near Earth to develop technologies to enable robust and precise ship-relative navigation in degraded conditions

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PITTSBURGH—Unmanned aerial vehicles will soon become an integral part of the US Navy's operations, requiring these vehicles to be capable of taking off from and landing on ships at sea. Precision ship-relative navigation (PS-RN) in degraded visual environment conditions, possibly in the absence of GPS, is a key enabling technology to realize this capability. To bring it a step closer to reality, the Office of Naval Research has awarded Near Earth Autonomy a contract to conduct sensor modeling for the Sensor Evaluation & Modeling for Robust Ship-Relative Navigation In Degraded Conditions (SALRS) program. The 18-month program of sensor performance characterization and modeling will provide a comprehensive foundation for the development of robust PS-RN capabilities applicable to autonomous landing and recovery operations in demanding naval environments. The products of the project will be pertinent to fixed-wing aircraft operating from aircraft carriers and rotary-wing aircraft operating from surface combatants including destroyers and frigates under challenging weather, sea-state, and operational conditions, and includes the need for robust navigation in cases where GPS availability is denied and emissions must be managed.

Multi-sensor fusion will maximize the synergy among multiple sensors to achieve high-performance ship detection and tracking, deck motion estimation, hazard detection and avoidance, and precision landing. The program will evaluate candidate sensors individually and simultaneously to produce the models and database necessary to effectively enable future fusion and system architectures to meet PS-RN requirements. The final output will be sensor simulation models, field collected sensor data, PS-RN performance data, and a list of promising sensor modalities for fixed-wing and rotary-wing aircraft. It will also include modalities that can provide higher precision, improved safety and higher approach speeds in nominal conditions.

Near Earth (<http://nearearth.aero>) is a privately held, spin-off from Carnegie Mellon University. The company develops comprehensive solutions for manufacturers and users of low-flying aircraft that need to operate in all weather conditions, and in hostile unprepared environments. Near Earth bridges the gap between aerospace and robotics with complete systems that improve efficiency performance and safety and expands the types of missions where aircraft are used, enabling manned and unmanned operations. Currently, the company leads key efforts in perception, motion planning, and human-machine interfaces as applied to cutting edge programs developing next generation capabilities for aviation.