Near Earth to develop system to enable small unmanned aerial vehicles to fly safely beyond line-of-sight

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PITTSBURGH—The Defense Advanced Research Projects Agency (DARPA) has awarded a development contract to Near Earth Autonomy Inc. (Near Earth) to create a system that will enable small unmanned aerial vehicles (UAVs) to fly safely beyond line-of-sight. For safety reasons, the FAA currently requires UAV operators to keep their aircraft within sight of the pilot-in-command. The Near Earth system will detect and avoid obstacles en route and find suitable landing sites for the aircraft even in the absence of GPS signals. It will provide a quantum leap in UAV guidance and navigation, and unlock the true potential of UAVs for corridor and infrastructure inspection, mapping and surveying of large regions, surveillance and reconnaissance, disaster response, and other important civilian and military applications. The project, named “Miniature Optical Guidance and Navigation,” will be led by Near Earth’s Principal Systems Scientist, Mr. Lyle Chamberlain.

The work funded by DARPA will address five key challenges associated with operation of small UAVs beyond line-of-sight: (1) enable effective obstacle detection and landing zone evaluation, which require high-bandwidth sensing over wide field-of-regard; (2) maintain stable aircraft control and consistent mapping in environments with intermittent GPS; (3) plan trajectories that provide safety guarantees with respect to obstacle avoidance while accounting for the aircraft’s dynamic properties; (4) package the system in a form factor with the appropriate size, weight, and power for a small UAV, and that is cost effective for operators; and (5) enable system evolution through the use of new sensors and algorithms as they become available in the market.

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 safety, efficiency, and performance 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.