Near Earth to develop technologies to enable accurate, fast, and low cost 3D scene modeling

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PITTSBURGH—The National Science Foundation (NSF) has awarded a development contract to Near Earth Autonomy Inc. (Near Earth) to produce technology capable of constructing three-dimensional (3D) models of scenes accurately, rapidly, and at low cost. The work will enable the widespread use of 3D modeling for scene documentation, since systems currently available for this application are expensive, slow, bulky, and their use require special training.

The technology leverages recent developments in laser- and vision-based sensing and perception and enhances them for operation under varying ambient conditions while increasing the speed of model construction, thereby making their use suitable for practical applications such as law enforcement, emergency response, insurance, urban planning, architectural design, engineering, and transportation. The work addresses the development of methods and algorithms to enhance the reconstruction of scenes containing surfaces that are featureless or have poor optical texture. The work also includes the development of algorithms to guide the data collection process, ensuring that a complete model reconstruction is achieved. The research plan investigates human-machine interface issues and evaluates the usability of such a system by studying how users interact with it while reconstructing scenes in the real world.

The technology will enable the production and commercialization of systems that are faster, more affordable, and easier to use by non-experts, thereby simplifying their adoption by a larger number of law enforcers, prosecutors, insurers, government agencies, and private companies.

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.