Cal Poly students collaborate on unmanned systems project

By DIANE HENSLEY

REDONDO BEACH—An interdisciplinary team of Cal Poly engineering students and faculty from two campuses are collaborating on a project that will develop a system (including an unmanned air vehicle and an unmanned ground vehicle) capable of autonomously locating and commanding ground vehicles to simulated targets of interest.

This project aims to fulfill a Northrop Grumman goal of providing the students from San Luis Obispo and Pomona campuses with a large, system-level, multidisciplinary, geographically-diverse design experience.

The Northrop Grumman-sponsored UAV-UGV project is being led by the Pomona university’s associate professor of Aerospace Engineering, Subodh Bhandari.

University Relations’ Kerri Bennett, Aerospace Engineering Vice President of Unmanned Systems Frank Flores, and Eliza Velardez of Engineering Services and Process Strategy are supporting the teams which expect to demonstrate success of the project within four months.

The collaboration follows Northrop Grumman’s donation of three Yamaha RMAX Remote Control helicopters in early 2009 to Cal Poly Pomona, Cal Poly San Luis Obispo and New Mexico State universities to encourage interest in unmanned air systems. The RMAX is controlled by commands sent from a personal computer at the ground base that control the helicopter’s position, flight direction and speed. Its flight range is about two kilometers and 90-minute continuous autonomous-flight time capability.

“I know that this donation will go a long way in inspiring interest in UAV technology,” Flores told university officials and students when they presented the RMAX gifts in 2009. “As you know, research and experimentation are excellent ways to advance the education of our future engineers.”

Back then, Flores had only imagined the possibilities for the students—which will now be realized with this collaborative effort by Aerospace Systems, Electronic Systems and Information Systems.

“Northrop Grumman is thrilled to be able to support this exciting project,” Flores told airspace.

“We have told the students that the world is changing. Virtual design teams collaborating on projects with teams that are geographically dispersed is the way of the future. We are excited to see the students from both campuses organize their work shares, establish communication links between the campuses, and start to design in a virtual environment.”
The project presents students with a serious challenge. While the system is typical of the Intelligence, Surveillance, and Reconnaissance (ISR) systems Northrop Grumman develops for our warfighters, the students are also seeing application to solve a variety of civilian applications, Flores said.

“We are seeing great leadership and innovation from the students,” he added.

Students at San Luis Obispo will develop the air vehicle part of the project, while students at the Pomona campus will develop the ground vehicle, according to Bhandari.

“A UAV, such as the Yamaha RMAX helicopter, will determine the target location using vision systems and other geo-location techniques. The relevant information pertaining to the expected location of the target will then be used by the ground vehicles to independently identify the location of simulated targets. The ground vehicles will then navigate to the target autonomously and supply an emergency package, or other payload.”

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UAV-UGV Coordination

Cal Poly’s plan for the mission. Courtesy Cal Polytechnic State Univ.