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PercepTek Team Demonstrates Autonomy and Collaborative Behaviors in UAVs

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A team led by PercepTek, Inc. with Carnegie Mellon University has successfully demonstrated a new level of autonomy and collaboration among multiple unmanned air vehicles (UAVs). In this engineering flight test, a team of two RMAX unmanned helicopters was given multiple, simultaneous objectives, such as reconnoitering tree lines and areas for specific vehicle types and humans, and tracking multiple moving vehicles in complex terrain where line of sight may be occluded. The two UAVs successfully collaborated to achieve the objectives, all the while mapping and avoiding the terrain and obstacles and performing communications relay for one another when needed. In addition to planning, allocating, and executing the tasks required to achieve the objectives, the team of UAVs also reacted autonomously to real-time events such as simulated equipment failure and line of sight blockage by reallocating tasks between them.

The key to this capability is a powerful and flexible software architecture that enables autonomous and collaborative behaviors. The “autonomy architecture works almost flawlessly,” said Dr. Jay Moorthy, the Army’s project manager, and is not limited to airborne vehicles. This engineering flight test culminates the PercepTek Team’s work on Part 1 of the Army’s Unmanned Autonomous Collaborative Operations (UACO) program. In Part 2, General Dynamics Robotics Systems and John H. Northrop Associates join the UACO team and will transfer the complete set of behaviors into soldier’s hands for a thorough testing in an operational environment at an urban combat training/test site at Fort Benning, Georgia, early next year. The U.S. Army’s Aviation Applied Technology Directorate located at Ft. Eustis, VA initiated the UACO effort to develop and demonstrate an autonomy architecture and a set of collaborative behaviors for teams of Unmanned Systems. The goal is to enable groups of Unmanned Systems to collaboratively accomplish tactical missions with little human intervention.

PercepTek, Inc. is a small business in Littleton, CO that specializes in development and fielding of autonomous solutions for military and commercial applications. PercepTek develops “intelligent” systems for unmanned vehicles and surveillance systems to meet the needs of the US future forces, “smart” safety systems for the commercial automotive industry, commercial mining and farming equipment, and surveillance systems for both military and commercial customers.

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