Lockheed Martin To Develop Learning Software To Assist And Train U.S. Air Force Planners

The Defense Advanced Research Projects Agency (DARPA) awarded Lockheed Martina $22 million, 48-month contract to develop the Generalized Integrated Learning Architecture (GILA). GILA will help U.S. Air Force planners leverage the skills of expert operators to better control air space over the battlefield and to transfer expert knowledge to inexperienced personnel.

Lockheed Martin Advanced Technology Laboratories (ATL) will use advanced machine learning and planning research from top university teammates on U.S. Air Force systems and processes provided by Lockheed Martin Integrated Systems and Solutions (IS&S), Colorado Springs, CO. It will then integrate the results into tools for military planners, starting with WEBAD -- a web-based tool for airspace deconfliction.

Planners in air operations centers use an Airspace Control Order (ACO) to define and control four-dimensional, time-space volumes in which an increasing number of manned and unmanned aerial vehicles (UAVs) and weapons remain separated, or "deconflicted." The dynamics of warfare make deconfliction difficult, which endangers pilots and reduces the effectiveness of aerial assets, particularly large numbers of UAVs. Adding to that difficulty are frequent rotations of personnel and a desire to reduce staff.

GILA will help create the ACO by automatically learning the planner's tasks from an expert -- often by using only one example. Eventually it will outperform the novice human planner by 125 percent while giving the inexperienced user an embedded, accelerated training capability.

"GILA will revolutionize the way expert skill and knowledge are captured and transferred," said Ken Whitebread, GILA principal investigator at Lockheed Martin ATL. "Using planning, learning and reasoning technologies, GILA will know what to learn, why it's important to learn it, and how to focus resources to quickly achieve that learning."

Teammate James Hendler, professor and director of the Joint Institute for Knowledge Discovery at University of Maryland, said GILA will be a notable challenge. "We have a team with some of the top researchers in the country coupled with Lockheed Martin's research and integration expertise. To get a system that can learn at the level this one must in four years is one of the hardest problems DARPA has tackled in modern times. "

GILA technology could extend to other planning processes, significantly improving the U.S. Air Force's capability to rapidly and safely use large numbers of manned and unmanned aircraft and weapons.

Lockheed Martin ATL leads the team that includes Lockheed Martin IS&S, Lockheed Martin Advanced Technology Center, University of Maryland, Georgia Institute of Technology, Georgia Tech Research Institute, University of Illinois, Arizona State University, Stanford University, University of Massachusetts, University of Wyoming, Oregon State University, and Fujitsu Laboratories of America.

Headquartered in Bethesda, Md., Lockheed Martin employs about 135,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services.

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