Improving U.S. missile defense

October 25 2010, By Emil Venere

Researchers at Purdue University are working with the U.S. Department of Defense's Missile Defense Agency to develop software that would improve the ability to manage the large volume of incoming data during an enemy attack.

The work aims to enable more efficient and effective battle management and command and control of the missile defense system.

"New software algorithms are needed to determine if it's a missile and what type, then engage our [missile defense system](#) to bring it down," said Saurabh Bagchi, an associate professor in Purdue's School of Electrical and Computer Engineering.

Daniel DeLaurentis, an associate professor in Purdue's School of Aeronautics and Astronautics, is leading the project and working with Bagchi.

The Purdue researchers will work to create computer software for "enhanced command and control" that takes input from various sensors - information from radar, satellites, reconnaissance aircraft and ships. Software algorithms will include aerospace modeling of the flight characteristics of enemy missiles and interceptors.

One significant challenge is early intercept.

"Intercept shortly after enemy missiles are launched is key," DeLaurentis said. "Otherwise they fan out more and have greater opportunity to

further complicate the engagement. Additionally, the closer they get to our friendly positions, the more you have to worry about additional factors like potentially dangerous debris."

The research is funded with a 15-month, $1.2 million contract from the U.S. Missile Defense Agency and is anticipated to continue for three years, totaling $4.8 million.

"The key aspect we're reaching out to universities on is how to handle larger ballistic missile attacks, which we refer to as raid events," said LTC Reid Vander Schaaf, program manager.

The area of research is known as "system of systems," or dealing with many facets that must mesh together in complex systems.

The researchers also will work toward making the system resistant to enemy cyberattacks on the command and control computers. The system will run on computers in forward combatant command regions and the command center back in the United States, with some algorithms originating at either point, Bagchi said.

The work will involve about 10 graduate students and two research scientists dedicated to the project.

The research group at Purdue also will develop and implement simulations for potential architectures. The simulations will enable the Missile Defense Agency to make informed decisions on future hardware and software experimentation and development efforts.

Provided by Purdue University

Citation: Improving U.S. missile defense (2010, October 25) retrieved 26 April 2024 from