

Computer scientist aims for a better-networked military

August 7 2008

Patrick Crowley, Ph.D., assistant professor of computer science and engineering at Washington University in St. Louis, has received a one-year, \$499,765 grant from the Defense Advanced Research Projects Agency (DARPA) for research titled "Revolutionizing Defense Communications with a Diversified Internet Infrastructure."

This award is the second phase of his participation in the DARPA Computer Science Study Group (CSSG). Each year, an elite group of 12 pre-tenure academics in computer science and related areas are chosen to participate. The purpose of the first phase of the CSSG is to introduce members to the current and future challenges facing the U.S. Department of Defense (DoD). In 2007, as part of the CSSG, Crowley traveled a total of 20 days visiting DoD sites and officials to get a comprehensive understanding of the organization and see where his expertise can benefit DoD.

The year-long program features four, one-week trips to various DoD sites, including military bases, intelligence agencies, combatant commands, military contractors, and civil agency headquarters.

In 2007, Crowley did everything from pulling the trigger on a torpedo and visiting the basement of the Pentagon to touring defense industry plants and actually donning a jump suit rigged in a harness and jumping out of a 35-foot tower that airborne Army Rangers use to simulate parachuting.

All to find out "the right stuff."

The second phase of the CSSG consists of a research program selected and funded through an additional round of competitive reviews. Crowley, a computer architect, intends to design a new a kind of network for DoD to facilitate real-time information in the field so that everyone from a foot soldier to commanders and everything from tanks to transport vehicles, are networked.

"Imagine tactical combat-type situations where commanders of part of a region want to understand the location and states of all the platforms, equipment and personnel in real-time,' Crowley said. "At WUSTL we have a programmable network platform that can scale real-time information sharing over several orders of magnitude, from a handful of interconnected platforms to thousands and tens of thousands. The core idea is information sharing. What had been lacking was knowledge of platform components. Now we have that and can try it out."

Crowley said that DoD is best at combat challenges, but all around the world the source of their problems is information management, processing and managing it. It's not a question of military might in Iraq or Afghanistan but learning who the influential people are, working with them and finding who the dangerous people are.

"This type of tactical operations doesn't have much to do with flying F22s or operating tanks," Crowley said. "It has more to do with understanding people and their relationships. The underpinnings of knowing that rely upon networking and information management."

Crowley said that DoD has "extraordinary" technologies, such as autonomous aircraft predator drones that can monitor people with cameras from seven to eight miles away. But because of the way the computer is architected, it's limited to only a few visual feeds that only a

few people can observe simultaneously.

"That's the kind of thing that I hope our network can do," Crowley said.
"In a short amount of time you should be able to have not only video feeds from the predator, but feeds from individual soldiers in the field."

Source: Washington University in St. Louis

Citation: Computer scientist aims for a better-networked military (2008, August 7) retrieved 19 April 2024 from <https://phys.org/news/2008-08-scientist-aims-better-networked-military.html>

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