News Release

Defense Advanced Research Projects Agency

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DARPA SELECTS CONTRACTORS FOR SELF-REGENERATIVE SYSTEMS PROGRAM

The Defense Advanced Research Projects Agency (DARPA) has selected 11 research projects for funding under the Self-Regenerative Systems (SRS) program. Researchers will develop technologies for building military computing systems that provide critical functionality at all times, in spite of damage caused by unintentional errors or attacks. Pending final negotiations, individual contracts are expected to range between $815,000 and $1,350,000.

The SRS program will develop cognitive technologies enabling military systems to learn, regenerate themselves, and automatically improve their ability to deliver critical services. Self-regenerative systems will show a positive trend in reliability, actually exceeding initial operating capability and approaching a theoretical optimal performance level over long time intervals. SRS technology will make possible advanced military systems that remain potent for extended deployment periods even in the face of sophisticated and sustained attack. The program is envisioned to last 18 months.

To achieve the SRS program goals, the program will address four key technology areas:

- *Biologically Inspired Diversity.* In this technical area, the program will reduce the leverage available to adversaries by generating many variants of a system component that perform the same desired functions but are sufficiently different in their vulnerabilities so that a single attack can only damage a small part of an entire system. Two projects were selected in this area: University of Virginia, Charlottesville, Va.; and Global Infotek Inc., Reston, Va.

- *Cognitive Immunity and Regeneration.* The goal in this technical area is to develop cognitive techniques that introspect about a system's operation, that recognize damage resulting from successful attack, and that reason about appropriate countermeasures. Through such techniques, the program will build systems that automatically recover and regenerate their operational capability, even in the face of continuing attack. Four projects were selected in this area: Massachusetts Institute of Technology Computer Science and Artificial Intelligence Laboratory, Cambridge, Mass. (three projects selected); and Honeywell Labs, Minneapolis, Minn.

- *Granular, Scalable Redundancy.* Self-regenerative systems must operate even when damaged. The keystone technique for doing this is to maintain multiple copies of selected system components and, if an attack damages some, to dynamically switch to using other, undamaged components. This technique imposes stringent coordination requirements on system components, but these requirements currently degrade performance to unacceptable levels. In this technical area, the program will develop new techniques that allow the necessary coordination to occur but with levels of performance that are needed by high-performance military systems. Three projects were selected in this area: Carnegie Mellon University, Pittsburgh, Penn.; Johns Hopkins University, Baltimore, Md.; and Cornell University, Ithaca, N.Y.

- *Reasoning About Insider Threats.* In this technical area, the program will develop technology allowing a system to estimate the likelihood that a military system operator will become malicious. Progress in this area is critical to safeguarding deployed military systems, and can also serve as a deterrent to military system operators that might consider an inside attack. Two projects were selected in this area: Massachusetts Institute of Technology Computer Science and Artificial Intelligence Laboratory, Cambridge, Mass.; and Telcordia Technologies, Morristown, N.J.

Additional information on the SRS program is available on the Web at http://www.darpa.mil/ipto/solicitations/open/03-44_PIP.htm.

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