

UC Berkeley to lead \$19 million NSF center on cybersecurity research

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The National Science Foundation (NSF) announced today that the University of California, Berkeley, will lead an ambitious multi-institution center to protect the nation's computer infrastructure from cyberattacks while improving its reliability.

Collaborators from eight universities around the country will form the new Team for Research in Ubiquitous Secure Technology (TRUST), one of two NSF Science and Technology Centers to be funded this year. The TRUST center is expected to receive nearly \$19 million over five years, with the possibility of a 5-year, \$20 million extension at the end of the initial term.

The announcement comes amidst mounting concerns over the security of the nation's information and data systems. A report released last month by the President's Information Technology Advisory Committee said the "information infrastructure of the United States is highly vulnerable to disruptive domestic and international attacks," and recommended increased support for fundamental research in cybersecurity.

The TRUST researchers say that through the prevalence of information technologies, modern society has become increasingly dependent upon properly functioning computer systems that control such critical infrastructures as finance, energy distribution, telecommunications and transportation.

"The cybersecurity community has long feared that it would take an electronic Pearl Harbor for people to realize the scale of disruptions

possible from a concerted attack by terrorists," said S. Shankar Sastry, UC Berkeley professor of electrical engineering and computer sciences, and the principal investigator and director of the TRUST center.

The academic partners joining UC Berkeley in this effort are Carnegie Mellon University, Cornell University, Mills College, San Jose State University, Smith College, Stanford University and Vanderbilt University. The initiative also brings together industrial and other affiliates, including Bellsouth, Cisco Systems, ESCHER (a research consortium that includes Boeing, General Motors and Raytheon), Hewlett Packard, IBM, Intel, Microsoft, Oak Ridge National Laboratory, Qualcomm, Sun Microsystems and Symantec.

"It's an extremely strong group, and it's going to be very exciting working with them," said Fred Schneider, professor of computer science at Cornell University and chief scientist at TRUST. "I expect to see some great work resulting from this collaboration. I expect to learn a lot, too."

TRUST researchers have set their sights on developing new technologies that will radically transform the ability of organizations - from private software vendors to local and federal agencies - to design, build and operate trustworthy information systems that control critical infrastructure. They will go beyond research into how to protect networks from attacks and develop ways to keep systems running properly even when intrusions occur - a concept known as "degrading gracefully under attack."

The center will look at systems problems through modeling and analysis, development of secure embedded systems, and integration of trusted components and secure information management software tools.

The researchers emphasize that the mantra for the center is TRUST,

going far beyond cybersecurity research alone. They pointed out that the center relies upon close, interdisciplinary collaboration with experts in economics, public policy, social science and, significantly, human-computer interface.

Sastry pointed out that system design to date has not sufficiently accommodated human users and the usability of systems, which can often be the weakest link in information assurance.

Last week, Sastry was also appointed the new director of the UC Berkeley-based Center for Information Technology Research in the Interest of Society (CITRIS). The center is one of four California Institutes for Science and Innovation established in 2001 to develop the next generation of technologies that will be critical to sustaining the state's economic growth and global competitiveness. Many CITRIS researchers will also be working with the TRUST center.

TRUST also involves an education and outreach component, which will be headed by Ruzena Bajcsy, UC Berkeley professor of electrical engineering and computer sciences and former director of CITRIS. These education programs, geared to K-12 schools, undergraduate students and institutions serving underrepresented populations, will lay the groundwork for training new scientists and engineers who, center leaders say, will develop the next generation of trustworthy systems. The program includes a focus on outreach to women-only institutions, exemplified by the partnerships with Mills and Smith colleges.

Congressman Sherwood Boehlert (R, N.Y.), chairman of the House Science Committee and author of the Cybersecurity Research and Development Act of 2002, has played a particularly active role in supporting the type of cybersecurity research that will be conducted at TRUST.

"I congratulate Dr. Fred Schneider, Dr. Shankar Sastry and the all the members of the TRUST consortium for winning this award," said Boehlert. "They represent the 'dream team' of information assurance and complex systems research."

NSF established the Science and Technology Centers program in 1987, responding to a Presidential commitment to fund important fundamental research activities that also create educational opportunities. The program was also designed to encourage technology transfer and provide innovative approaches to interdisciplinary research challenges.

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