



Center for Cyber-Security, Information Privacy, and Trust

<http://cybersecurity.ist.psu.edu>



The center was established in 2003 to serve three main purposes: (a) conduct research to detect and remove threats of information misuse to the human society: mitigate risk, reduce uncertainty, and enhance predictability and trust; (b) produce leading scholars in interdisciplinary cyber-security research; and (c) become a national leader in information assurance education.

The Lions Center aims to be the best at performing inter-disciplinary research in cyber- security and privacy. The lab plays a leading role in helping Penn State pursue cyber-security research opportunities that revolve around the National Science Foundation (NSF), U.S. Department of Defense (DoD), National Security Agency (NSA), and Department of Homeland Security (DHS).

The Lions Center includes four different labs/facilities, including the Cyber-Security Lab, RFID Lab, Privacy Assurance Laboratory, and PIKE (Penn State Information, Knowledge, and Web) group. The Cyber-Security Lab performs original researches on a variety of important topics including self-healing systems, trusted recovery, malware, intrusion detection and prevention systems, privacy protection in healthcare, network security, adversary models and game theory, and cyber defense situation awareness.

OVERVIEW

The Center for Cyber-Security, Information Privacy, and Trust, aka Lions Center, is a university-level research center at Penn State with a vision of being synonymous with seminal works in interdisciplinary cyber-security research.

Dr. Peng Liu, Director

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Currently, the Lions Center has 15 faculty members and about 40 post-docs and doctorate research assistants. Dr. Peng Liu, a professor at the College of Information Sciences and Technology, is the director of the Lions Center. Chao-Hsien Chu, a professor at the College of IST, is education co-director; and Heng Xu, an associate professor at the College of IST, is associate director for outreach. The center's active grants are around \$8 million in total. Since 2002, the center has produced over 250 publications. Since 2004, over 15 professor positions have been taken (elsewhere) by former graduate students and post-docs of the center.

Current research in the Lions Center focuses on four thrusts: (a) cyber situational awareness; (b) self-protecting (cloud) data centers; (c) system-wide security protection of mobile devices; and (d) online privacy. The researchers develop situation knowledge reference models; human-in-loop tools to track and analyze security analysts' reasoning processes; and self-monitoring, self-intrusion-detecting, self-diagnosing and self-recovering data centers. They do whole system vulnerability analysis and backdoor removal of mobile devices and apply social sciences to do privacy-by-design.

The key initiatives that the Lions Center has undertaken include "Computer-aided Human Centric Cyber Situation Awareness," which is funded by the Army Research Office's Multidisciplinary University Research Initiative (MURI)—a tri-service DoD program that supports research teams whose research efforts intersect more than one traditional science and engineering discipline. The problem that the project addresses is that physical situational awareness (SA) tools alone cannot solve cyber problems, and a large gap between human cognition and SA algorithms often exists.

Another project in the lab, which deals with information sharing and privacy, is "Privacy Assurance in Location-based Services," which is funded by the NSF. The project addresses the problem that privacy "is in disarray and nobody can articulate what it means" and a lack of trust deters information sharing.

The Lions Center's goals for the next several years are (a) elevate the center's reputation from a national leader to a prestigious world-famous research center in the cyber-security field; (b) continue winning prestigious 10-15 percent selection ratio NSF grants in the cyber-security field; and (c) produce Ph.D. graduates who can earn tenure-track faculty job offers from top twenty programs in the cyber-security

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