The Institute for Cyber Security (ICS) conducts basic and applied research in partnership with academia, government and industry. The Institute's Executive Director Prof. Ravi Sandhu reports to the Dean, College of Science and to the Vice-President of Research.

Research

Our researchers bring exceptional expertise in cyber security models, architectures, protocols and technologies, and world-class laboratories, to basic and applied research. Their past innovations are widely practiced and their foundational results have had sustained influence.

Philosophy

ICS research is motivated by the two big questions in cyber security:

What does it mean to be secure?

Modern cyber systems involve numerous stakeholders with different, and typically conflicting, security and privacy priorities. Reconciliation of these multiple priorities and allocation of costs, liability and recourse responsibilities is at best an art today. ICS seeks to develop the knowledge, insights and tools necessary to make this process more of a science.

How do we achieve the desired security?

Of equal priority is study of how to achieve the desired security by use of existing security technology where applicable and invention of new security technologies where needed. Progress on these two questions requires collaboration with researchers and practitioners in various application and technology domains. Collaboration is crucial to the ICS research agenda.

Research Excellence

Cyber security research at ICS encompasses four major thrust areas with mutual synergy.

• **Foundations**: Core principles, models and theories for cyber security and their translation to practice. ICS researchers have a distinguished record of contributions to cyber security foundations and continued activity in this fundamental arena.

• **Application-Centric**: Theory and practice of security for new and emerging application domains. Current projects include:
  - Secure Information Sharing
  - Social Computing Security
  - Infrastructure Assurance
  - Assured Data Provenance
  - Privacy Policies and Enforcement

• **Technology-Centric**: Theory and practice of security in context of specific technologies which present novel challenges due to the intrinsic nature of the technology. Current projects include:
As of Jan. 31 2012

• Trustworthy Cloud Computing

• **Attack-Centric:** Theory and practice of malware analysis and detection. Current projects include:
  
  • Botnet Analysis and Defense

ICS research leaders bring a deep knowledge of cyber security models, architectures, mechanisms and protocols, as well as a deep knowledge of cyber technologies to their research. Past innovations by ICS researchers are widely recognized and practiced in industry. Additionally, ICS researchers have produced significant foundational results with sustained influence in the cyber security research community. ICS can mobilize world-caliber multi-disciplinary teams to address specific research problems utilizing researchers within UTSA and external to UTSA amongst our network of national and international R&D partners, collaborators and friends.

**Research Labs**

ICS has built and operates two world-class academic research laboratories dedicated to studying current and emerging cyber security issues. Both environments are managed by full-time dedicated technical staff who possess cyber security experience in industry, government, and academia. The laboratories were funded by a $1 million grant from the UT System as part of Professor Ravi Sandhu’s initial recruitment package to UTSA and have received additional support from Dell Computers and the United States Airforce.

**ICS FlexCloud**

The ICS FlexCloud is one of the first dedicated academic Cloud Computing research environments focused on studying security challenges surrounding Cloud Computing. It offers significant compute capacity and similar design features adopted by Cloud Computing providers.

**ICS FlexFarm**

The ICS FlexFarm is an Internet connected environment providing researchers with a dedicated platform to conduct academic research on malware programs and methods for improving malware detection, faster response times to malware infections and effective malware removal techniques, with a special focus on botnets.

**Research Sponsors**

• National Science Foundation (NSF)
• Air Force Office of Scientific Research (AFOSR)
• Air Force Research Laboratory (AFRL)
• Office of Naval Research (ONR)
• Department of Homeland Security (DHS)
• Texas Emerging Technology Fund (ETF)
• The University of Texas System

**External Corporate Partners**

• BAE Systems
• Dell
• Denim Group
• Rackpace
• Silicon Informatics
• Southwest Research Institute • Symantec
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**External Partners**

- Arizona State University
- Georgia Institute of Technology
- University of Illinois at Urbana Champaign
- University of Maryland at Baltimore County
- University of Massachusetts Boston
- University of Michigan
- University of North Carolina at Charlotte
- Pennsylvania State University
- Purdue University
- Texas A&M University
- University of Texas at Dallas
- University of Wisconsin–Madison

**UTSA Partners**

- College of Sciences
- Department of Computer Science
- Center for Infrastructure Assurance and Security
- College of Engineering
- Department of Electrical and Computer Engineering
- College of Business
- Department of Information Systems and Technology Management
- Center for Education and Research in Information and Infrastructure Security
- Center for Innovation and Technology Entrepreneurship
- Office of the Vice-President for Research
- South Texas Technology Management

**Publications**

Publications by ICS researchers are available at their individual home pages at their discretion.

**Projects**

Assured Information Sharing LifeCycle
Provsec

**People**

**Management**

- Ravi Sandhu
As of Jan. 31 2012

Executive Director Lutcher Brown Endowed Professor of Cyber Security

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  Vice-President for Research

• George Perry
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  Postgraduate School

• Joe Sanchez
  Department of Defense

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- Keying Ye
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**Research Scholars**

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- Jared Bennatt
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- Khalid Zaman Bijon
  Computer Science

- Prosonjit Biswas
  Computer Science

- Yuan Cheng
  Computer Science

- Omar Haider Chowdhury
  Computer Science
As of Jan. 31 2012

• Andreas Gampe
  Computer Science

• Ruting Jia
  Electrical and Computer Engineering

• Ying Ji
  Management Science and Statistics

• Xin Jin
  Computer Science

• Weiliang Luo
  Computer Science

• Dang Nguyen
  Computer Science

• Hui "Catherine" Shen
  Computer Science

• Bo Tang
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• Li Xu
  Computer Science

• Zhenxin Zhan
  Computer Science

• Wanying Zhao
  Computer Science

• Yun "Amy" Zhang
  Computer Science

• Qingji Zheng
  Computer Science

Research and Professional Staff

• Carlos Cardenas
  Associate Director

Administrative Staff
About

ICS Vision

Cyber space is becoming ever more pervasive and entangled with physical space and our daily work and social lives. We need new methodologies and endless innovation to keep cyber space safe for our nation and its individual citizens, so we can fully realize the productivity and quality-of-life potential offered by cyber technologies. UTSA and its Institute for Cyber Security put Texas in a prominent position for this effort.

ICS Mission

The Institute for Cyber Security pursues world-leading research with real-world impact, including development of commercializable technologies and services.

ICS Goals

- Be a world leader in cyber security research, and thereby put UTSA, San Antonio and Texas on the cyber security research map.
- Advance the cyber security profession towards a sound scientific and engineering discipline from its current immature state.
- Improve the cyber security posture of the United States of America so its citizens can fully benefit from the ongoing cyber revolution.

ICS History

The Institute for Cyber Security was created at UTSA in June 2007 through a competitive $3.5 million grant from the Texas Emerging Technology Fund. Prof. Ravi Sandhu, a world-renowned cyber-security researcher, scholar, educator and entrepreneur, was invited to join UTSA as the Founding Executive Director as a condition of the funding. UTSA awarded a $1.0 million Lutcher Brown Endowed Chair to Prof. Sandhu. The STARS program of the University of Texas System subsequently awarded a $1.0 million grant to Prof. Sandhu for furthering the Institute's mission.

Cyber security was identified as an area of strategic importance for UTSA and for San Antonio in 2000. The Center for Infrastructure Assurance and Security was established at UTSA in 2001. Cyber-security research and education activities were pursued in the Colleges of Science, Engineering and Business. Exercises, training and competition activities were pursued in the Center. A vision for the Institute for Cyber Security was articulated in 2005 with the goal of strengthening and synergizing the already substantial cyber security activities and expertise across UTSA, and particularly to develop a world-leading research reputation in cyber security. A winning proposal to establish the Institute was submitted to the Texas Emerging Technology Fund, leading to founding of the Institute and invitation of Prof. Sandhu to lead it as a condition of the funding. San Antonio business, government and academic leaders were crucial to this process with special acknowledgement of the leadership of David Spencer. The Institute reports to the Dean of the College of Science and to the Vice-President for Research.
Join Us

Staff positions are posted at the UTSA jobs site at [http://www.utsajobs.com](http://www.utsajobs.com) as they become available. Tenure-track faculty positions are advertised directly by the respective Departments. Current tenure-track faculty and graduate students can become members of the Institute through research collaboration. Recruitment of research faculty and post-doctoral researchers is opportunistic. If you are interested in contributing to the ICS research agenda please reach out directly to Prof. Sandhu or other Institute members. Incoming graduate students need to apply to the individual departments for admission. ICS plays no role in the admission process but once students are at UTSA they can reach out to Prof. Sandhu or other Institute members.

Contact ICS

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