making IT all-pervasive, high-performance, reliable & secure to support a wide range of applications.

www.csl.uiuc.edu

• Fifty years as a premier national research facility
• World leader in IT infrastructure: the confluence of communication, control, and computing technologies.

- High-speed wireless and wireline communication.
- Management and control of complex networks & systems.
- High-performance, robust computing systems: hardware & software.
- Reliable and Secure systems and software.
- Applications to critical infrastructure systems:

  - Aerospace, Emergency/disaster response, Telecommunications, Embedded systems, and e-commerce. Medical imaging
CSL Profile

- CSL profile: 550 researchers and staff
  - 90 Professors
    - Outreach to 13 academic departments
    - 8 National Academy of Engineering members
    - 1 National Academy of Science member
    - 22 Chaired professors
  - 75 Academic professionals, post-docs, and visitors
  - 350 Graduate Research Assistants
  - 90 Undergraduates
  - Basic Research combined with significant industry interaction
• Design & Validation of Trustworthy Systems
  – Trust – a holistic combination of security, correctness, dependability, privacy, and survivability
  – Assessment-Driven Design for Trust
  – Building Trustworthy Systems, Software, and Networks from the ground up
• Combining University, Industry, & Government Expertise
  – Campus-Wide Effort in Information Trust & Security
  – Taking Application-centric approach; close industry-academic partnerships
  – Including Research, Education, and Workforce Development
Assessment-Driven Design for Trust: Specification, Design, Implementation, and Validation

Trust (e.g., Correctness, Dependability, Security)

Resources (Computing and Networking)

Information (Flow, Protection, Quality)

Functional Requirements

Trust Knowledge Specification Tools (capture trust requirements and attributes)

Trust Policy Management Tools (provide abstractions of, and specify allowable operations on trust policies)

Trust Synthesis and Configuration Tools (create trustworthy systems from architectural constructs)

Requirement Specification

Design

Assessment/Validation

Architecture/Testbed

Requirement-Driven (based on specification)

Construct-Based (based on decomposition of functionality)

Composable (while preserving trust properties)

Configurable (to provide different trust properties)

Self-Adaptive and Cognitive (Enable learning and reasoning to understand and deal with impediments to trust and changing requirements)

Metrics (specification of requirements in a quantifiable manner)

Measurement Techniques (how, where, what)

Modeling Techniques (stochastic (analytic & simulation), formal)

Technique Integration (to build trust cases)

Design for Validation (to support efficient validation)