The humanities and the social sciences are critical players in the development of cyberinfrastructure because they deal with the intractability, the rich ambiguity, and the magnificent complexity that is the human experience.

American Council of Learned Societies: “Our Cultural Commonwealth: The Report of the ACLS Commission on Cyberinfrastructure for the Humanities and Social Sciences”

Illinois has been in the forefront of information technology since IT came into being, and remains a leader in IT innovation.

Breakthroughs that have revolutionized people’s daily lives, from LEDs to the first computer-mediated social network, took place at Illinois. This website provides a reminder of those world-changing "firsts," along with a virtual tour of vibrant IT-related research, education, outreach, and facilities at Illinois today.

News Headlines

National Institute of Food and Agriculture honors MarketMaker
WED, 06 OCT 2010
MarketMaker, a tool created at Illinois with assistance from NCSA, was honored by the National Institute of Food and Agriculture for outstanding contribution in support of the...

Preserving Virtual Worlds II Awarded More Than $750,000 by IMLS
MON, 27 SEP 2010
The second phase of the Preserving Virtual Worlds project, which explored methods for preserving digital games and interactive fiction, has...

Ember ready for friendly users
THU, 07 OCT 2010

New technology for old text
WED, 22 SEP 2010

Noble Joins Prestigious Group to Discuss Broadband
WED, 22 SEP 2010

Virtual School summer courses draw record number of participants
WED, 22 SEP 2010

Small Sciences Could Benefit from Better Data-sharing Practices
TUE, 21 SEP 2010

Preserving Virtual Worlds Shortlisted for UK Prize
TUE, 21 SEP 2010
News & Events

The top IT news headlines and upcoming events from the University of Illinois at Urbana-Champaign.

IT News Stories

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MON, 27 SEP 2010

The second phase of the Preserving Virtual Worlds project, which explored methods for preserving digital games and interactive fiction, has...

Imaging Without Boundaries

WED, 29 SEP 2010

The faculty members who originated the Strategic Initiative on Imaging at the University of Illinois set their goals...

Upcoming IT Events

Ember ready for friendly users

THU, 07 OCT 2010

Ember, NCSA's new 16-teraflop SGI supercomputer, has been installed at the National Petascale Computing Facility and is ready for "friendly users" as of...

New technology for old text

WED, 22 SEP 2010

Computing time from I-CHASS and NCSA helps scholars improve digitization of 18th century...

Noble Joins Prestigious Group to Discuss Broadband

WED, 22 SEP 2010

Doctoral student Safiya Noble was an invited guest scholar at the twenty-fifth annual Aspen Institute Conference on Communications...

Virtual School summer courses draw record number of participants

WED, 22 SEP 2010

This summer, over 1,000 graduate students and researchers registered for courses offered by the Virtual School...

Small Sciences Could Benefit from Better Data-sharing Practices

TUE, 21 SEP 2010

The proliferation of scientific research data is creating an urgent situation for organizations and professionals charged with data...

Preserving Virtual Worlds Shortlisted for UK Prize

TUE, 21 SEP 2010

The "Preserving Virtual Worlds" project, led by GSLIS Assistant Professor Jerome McDonough, has been shortlisted for the 2010 Digital...
Illinois academic programs at the heart of IT education are consistently ranked in the top five in the country:

- Computer Science
- Electrical and Computer Engineering
- Library and Information Science

In addition, the innovative Informatics minor provides an avenue for any student in any major to study IT and its intersection with other fields.

The interdisciplinary Computational Science and Engineering program for graduate students is widely considered to be one of the top programs of its kind in the country, and has served as the model for many other institutions.

"Studying computers and computing is no longer a free elective; it's a prerequisite for professional success in the 21st century."

Max Levchin, 1997 Illinois graduate
Founder, PayPal; Founder and CEO, Slide

Explore the full range of IT-related academic programs to get a feel for the breadth, depth, and innovation of Illinois IT education.

Student Involvement

Students that come to Illinois have the opportunity not only to study with top people in their field, but also to actively shape their learning environment and their future. For example:

- E-waste class and competition

Illinois has the largest student chapter of ACM in the world, and over a thousand student organizations overall.

The annual Computing Habitat Programming Competition challenges student teams to create software applications that enlarge and enhance student life.

A U of I Industrial Design student shared the Grand Prize in the Collegiate Inventor's Competition, and became the only undergraduate ever to win the top award.

The contributions of engineering students to the design of the National Petascale Computing Facility have helped to push the boundaries of what is possible in scientific computing.
IT-related research at Illinois is characterized by its depth, breadth, and impact, as shown in the research areas highlighted on this page.

Other ground-breaking research is conducted in centers, institutes, and laboratories, as well as in faculty research groups. Increasingly, the research spans traditional disciplinary boundaries, building on Illinois’ strength in marshaling scholarship from multiple disciplines to address complex problems.

One reason that Illinois was the most cited institution in the engineering field during the past 10 years is the ongoing excellence of Illinois research in the following pivotal areas.

Simulation

Excellence in simulation requires fundamental knowledge of the mathematical models that describe the natural world, together with the computational expertise to implement them and the computing capacity to run large-scale simulations. Illinois has all three elements in abundance, and an environment that naturally brings them together. Simulations such as those shown on this page enable a deeper understanding of the natural world, optimization of engineering designs, decision support, and predictive capability to anticipate and adapt to change.

High Performance Parallel Computing

Illinois began paving the way for parallel computing research and innovation over four decades ago, and today Illinois is a globally recognized leader in parallelism. Life-changing applications of the future will rely on efficient parallel computers (from handhelds to supercomputers) that provide scalable performance and are easy to program. So collaborative research at Illinois covers the computing stack from applications to hardware. The research endeavors highlighted on this page involve the design of new parallel application frameworks and patterns, new programming and metaprogramming languages, software engineering techniques, computers and autotuners for parallelism discovery and optimization, runtime systems for resource management and virtualization, new hardware designs, and formal methods to reason about the correctness of future parallel systems.

Trustworthy Systems

Designated a National Center of Excellence in Information Assurance Education and Research, Illinois provides national leadership through education and research in Trustworthy Systems. Society’s increasing reliance on computer systems that affect daily lives, health, and security heightens the importance of trustworthiness, with impact on medical care, travel, the global financial system, the national electric power grid, and much more. The Illinois research endeavors shown on this page address the capability of computer systems, software, networks, and hardware to be secure, safe, dependable, correct, private, and validated.

Data Sciences

As home to unrivaled national assets in data intensive computing, Illinois has a long and distinguished history in data-intensive computing. Illinois combines excellence and leadership in data systems, artificial intelligence, systems and networking, architecture and parallel computing, statistics, and information systems. The research endeavors listed here reflect the increasing reliance of tomorrow’s data-driven world on methods and tools that can access, retrieve, and
As a land-grant university, Illinois has a strong sense of public engagement and a vision of turning new knowledge into a better quality of life for its community.

**Urbana-Champaign Big Broadband**

Urbana-Champaign Big Broadband (UC2B) is an inter-governmental consortium of the University of Illinois and the cities of Urbana and Champaign, which will be linking schools, healthcare facilities, libraries, homes in underserved areas, and much more with 187 miles of fiber-optic broadband networking. The Department of Commerce evaluated more than a thousand broadband infrastructure proposals from across the country and to date has awarded funding to fewer than 100. The $29.4 million UC2B proposal was the only urban project in the country to be funded that included a fiber-to-the-home component.

**University of Illinois Extension**

Extension uses IT in innovative ways to reach residents of all of the state’s 102 counties and beyond, providing educational programs and learning partnerships. More than 2.5 million Illinoisans take part in Extension programs each year. For example:

- **MarketMaker**, an interactive GIS-based mapping system that locates businesses and markets of agricultural products in Illinois, providing an important link between producers and consumers. Originated by U of I Extension specialists, MarketMaker is supported by partnerships with Farm Direct, the Illinois Specialty Growers Association, the Illinois Initiative for the Development of Entrepreneurs in Agriculture, the Illinois Department of Agriculture, and the Council for Food and Agriculture. MarketMaker is now being used beyond Illinois, in nine other Midwestern and Eastern states.

**Research Park**

The Research Park is home to over 70 companies, employing almost 1,400 people in high-technology careers. At any given time, over 400 University of Illinois student interns with leading-edge technical skills are working in these companies, gaining valuable work experience while making real contributions to internal corporate R&D and product development programs.

Research Park video gallery
On campus, Illinois has approximately 200 teraflops of computational capacity and over 6 petabytes of storage. These numbers will take a quantum leap when the Blue Waters Petascale Computing System comes to life in 2011.

National Center for Supercomputing Applications Facilities

The University of Illinois' National Center for Supercomputing Applications provides powerful computers and expert support that help thousands of scientists, engineers, and educators across the country better understand our world. The facilities are leading edge, by virtue of their innovative architectures or the sheer magnitude of the problems they can tackle.

Next year, the unprecedented computing power provided by the Blue Waters sustained petascale system will allow U.S. scientists to make extraordinary leaps in knowledge and discovery. At NCSA, work is already underway to help teams around the country prepare their codes to run on Blue Waters so that they can take full advantage of the system’s hundreds of thousands of processor cores and its high-performance interconnect and I/O subsystems.

- Key Partner in the TeraGrid
  The world’s largest, most comprehensive distributed cyberinfrastructure for open scientific research
- Graphics Processor Unit (GPU) Clusters
  Enabling researchers and students to explore the potential of new architectures to accelerate scientific computing and discovery.

Other Noteworthy Campus Facilities

- Turing Cluster
  Used for research and class projects in parallel algorithms and computational science.
- Cloud Computing Testbed
  The world’s first cloud testbed aimed at supporting both systems innovation and applications research within a single microcosm.
- Trusted ILLIAC
  A configurable, application-aware, high-performance platform for trustworthy computing
- Illinois Research Network
  High-speed, low-latency connection to other research networks
- IDEALS (Illinois Digital Environment for Access to Learning and Scholarship)
  Recently named as a top 10 institutional repository in the Webometrics Ranking of World Universities; the ranking is based on a combination of size, number of rich files, and visibility on search engines and Google Scholar.

Another key resource for educators and researchers is the University of Illinois Library’s collection of digital materials, including:

- Illinois Harvest
  A free public gateway combining search, aggregation, and discovery services
- Digitization Projects
  Ranging from digitization of library collections and archives to research in information retrieval technologies
Increasingly, scholarly inquiry at Illinois focuses on problems that refuse to be contained within disciplinary, institutional, or national boundaries. The following examples illustrate the innovative ways in which Illinois researchers and educators are crossing those boundaries.

**Crossing disciplinary boundaries...**

- **eDream** - the Illinois Emerging Digital Research and Education in Arts Media Institute - is dedicated to promoting arts that are conceived, created, and conveyed through digital technologies.

- The Institute for Computing in Humanities, Arts, and Social Science creates environments for digital discovery, as illustrated by their partnership with NCSA to provide 1 million hours of supercomputing time to projects that are pushing the boundaries of humanities, arts, and social science discovery.

- **Computational Science and Engineering (CSE)** hosts a number of major research projects in which computer scientists collaborate with structural engineers, fluid dynamics, material scientists, and others to develop the air frames, space vehicles, and advanced materials of the future.

- **The Coordinated Science Laboratory** brings together researchers from business, engineering, law, neuroscience, and speech and hearing science, among other areas, to innovate new IT solutions to real-world problems in defense, robotics, aeronautics, life enhancements for people with disabilities, computer vision, imaging, and much more.

**Explore more interdisciplinary collaborations**

**Connecting scholarship and real-world challenges...**

- **The Sustainable Electronics Initiative** is dedicated to the development and implementation of a more sustainable system for designing, producing, remanufacturing and recycling electronic devices. Members include academia, non-profits, government agencies, manufacturers, designers, refurbishers, and recyclers.

- **Neuroengineering IGER at Illinois** is an NSF-funded initiative in which Illinois researchers are training tomorrow's scientists in the emerging field of neuroengineering. Their work in audition, neuroimaging, and brain-machine interfaces may lead to improved cochlear implants, better understanding of learning processes, and novel brain-machine interfaces enabling people with physical disabilities to direct wheelchair movement through thought.

- **The Illinois Foundry for Innovation in Engineering Education (iFoundry)** is transforming engineering education to equip students for 21st century challenges, emphasizing philosophical underpinnings and conceptual clarity, pervasive
The "IT Excellence at Illinois" web site has been designed to be accessible to everyone, including those with disabilities.

The site is one example of the Illinois commitment to accessibility, reflected in the campus legacy of physical and online accessibility innovations.

Current Activities Related to IT Accessibility

- Involvement in development of best practices at the local, state, and national level
- Development of tools, such as the Functional Web Accessibility Evaluator and Firefox Accessibility Extension
- Research in human-computer interfaces, automated reasoning, natural language processing, machine learning, image processing, and other IT-related fields that have significant potential impact for people with disabilities. A few examples:
  - A Coding Guideline for HCl+Autism Research using Video Annotation
  - Transfer Learning in Sign Language
  - Building an Automated Writing Assistant
  - Image Formation and Processing

The University of Illinois at Urbana-Champaign was the first university in the nation to enroll and support students with disabilities requiring assistance in the performance of basic activities of daily living such as transferring in and out of a wheelchair, dressing, and grooming. That legacy of leadership continues today with the redeployment of the University’s transitional residential and educational support services for students with severe physical disabilities within the new, technologically sophisticated confines of Timothy J. Nugent Hall. The facility includes an accessible computing lab with assistive technology.
The legacy of IT Excellence at Illinois is one of game-changing breakthroughs in hardware, software, algorithms, and networking; but it's also the story of re-imaging how humans interact with computers and with one another, and the power of having immediate access to millions of sources of information.

In short, the IT Excellence timeline shows Illinois students, faculty, and alumni who have changed the world through vision and determination.

1959

**First computer-assisted instruction system**

PLATO was conceived by Professor Chalmers Sherwin and developed by faculty member Don Bitzer. Its many pioneering concepts were described in papers such as *The Uses of PLATO: A Computer Controlled Teaching System*.

PLATO subsequently became the first on-line community, with notes (email), gnotes (newsgroups), term-talk (IM), multimedia (microfiche & audio device), and a plasma touch panel.
The Present and Future: To get a sense of current IT-related activities, see IT News & Events. To explore the environment in which those activities take place, check out...

For Undergrads

Majors
- Computer Science
- Computer Engineering
- Information Systems & Information Technology

Minors
- Informatics Minor
- Hoeft Technology & Management Program
- Computer Science Minor

For Grad Students
- Computer Science
- Computer Engineering
- Graduate School of Library and Information Science
- Computational Science & Engineering
- Bioinformatics
- Informatics
- Civil & Environmental Engineering Information Technology MS-PhD
- MD/PhD in Computer Science
- MCS/Master of Architecture Program
- M.S/MBA Program

Course Tracks
- Technology Entrepreneur Center
- Introduction to Advanced Computing in Humanities, Arts, and Social Science
- Writing with Video

Certificate Programs
- Software Engineering Certificate
- Certificate of Advanced Study in Digital Libraries
- Technology Commercialization
- Strategic Technology Management
- Networks & Distributed Systems
- Computer Security
- Information Systems
- System Software

IT & Arts
- New Media Program
- MCS/Master of Architecture Program

IT & Business/Management
- Hoeft Technology & Management program
- Information Systems & Information Technology
- MCS/MBA Program
- MCS/BA in Accountancy Program
- Master of Computer Science
- Technology Commercialization Certificate
- Strategic Technology Management Certificate
The Present and Future: To get a sense of current IT-related activities, see IT News & Events. To explore the environment in which those activities take place, check out...

- **Beckman Institute**
  An interdisciplinary research institute devoted to basic research in the physical sciences, computation, engineering, biology, behavior, and cognition

- **Blue Waters Sustained Petascale Computing**
  A massive project, sponsored by the National Science Foundation, to build and deploy a sustained-petascale compute system, dubbed Blue Waters, which will be available to the national research community in 2011

- **Center for Biophysics and Computational Biology**
  An interdisciplinary center that serves physical and computer science students who are interested in applying their knowledge to biology, as well as students with a biological background interested in instrumentation, computation, and physical aspects of biology

- **Center for Informatics Research in Science and Scholarship (CIRRSS)**
  A research center that focuses on information problems that impact scientific and scholarly inquiry

- **Center for IT and e-Business Management**
  An interdisciplinary center developing world-class research and educational programs on electronic commerce, information technology strategy, technology management, and the commercialization of technology

- **Center for Process Simulation and Design**
  An interdisciplinary center bringing engineers, mathematicians, and computer scientists together to improve the quality and performance of products and materials through simulation and optimization of manufacturing processes

- **Center for Reliable and High Performance Computing**
  A research center developing high-performance systems and networks for the future

- **Center for Simulation of Advanced Rockets**
  An interdisciplinary research center creating computational simulations of solid propellant rockets in order to enable accurate prediction of the performance, reliability, and safety of complex physical systems

- **Community Informatics Initiative**
  An interdisciplinary initiative that fosters collaborations across campus, local, national, and international communities, building innovative community networks, community technology centers, software, and library services

- **Coordinated Science Laboratory**
  An interdisciplinary research laboratory that focuses on information technology at the crossroads of computing, control, and communications

- **eDream - the Illinois Emerging Digital Research and Education in Arts Media Institute**
  An institute dedicated to promoting arts that are conceived, created, and...
Discussion Topics re: IT Excellence Website
Mona Heath
September 2009

Big Picture

The IT Excellence website presents several challenges unlike those of a unit- or center-specific site. It must take a campus-wide perspective; effectively present content from a variety of IT Excellence contributors; and convey to prospective students, faculty, sponsors, and collaborators how the parts add up to a remarkable “whole” – an environment of IT excellence unlike any other.

I believe that those special challenges suggest that this is not merely an exercise in creating an effective website, but also a task that calls for a collaborative community guiding the site and supporting one another. In that spirit, I suggest organizing our discussion around what each person brings to the table and mutually determined roles.

Topics for Discussion

1. What I can provide

   **The vehicle:** A website (design, hosting, maintenance, full accessibility) that accommodates news, events, features, and other contributed pieces that describe or demonstrate IT excellence

   *By the time of the meeting, I expect to have a prototype site whose elements attempt to address various points from our 5/08 meeting and from subsequent informal discussions with a range of students and faculty members. I eagerly solicit your feedback on how well the design serves these identified needs.*

   **Facilitation:** A reason for people to connect on a somewhat regular basis to talk about ways to improve the IT Excellence site, or about any other items of mutual interest

2. What you as individuals can provide

   **Content:** News, events, features, pictures, videos – whatever you’re creating for your own site(s) that you think would be effective on the IT Excellence site

3. What you as a group can provide

   **Determine a low-overhead approach** for
   - Content submission
   - Content selection
   - Content accessibility

   **Contribute ideas for ongoing improvement**
   - Possibly an informal, voluntary get-together

   **Consider content consistency** concerning titles, tone, intended audience, etc.
   - To what extent is consistency important?

   **Determine how to promote the visibility and usefulness of the IT Excellence site**
Additional Background

In case you find it interesting, here's a list of considerations that have had significant impact on how this project has taken shape.

• Sustainability
  o Maximize shelf life of design and content
  o Make it easy to plug in content from a variety of sources
  o Minimize resources needed to create and maintain the site

• A home for the general and the specific
  o Convey the big picture of IT excellence at Illinois (after figuring out what that big picture really looks like!)
  o Accommodate focused content (e.g., features on a wide variety of activities) without looking disjoint or scattershot
  o Impress both a window shopper and a motivated buyer

• The medium is part of the message; the site must be cutting edge in terms of accessibility and type of content

• A "different" kind of site
  o Not comprehensive; instead, a sampling of what Illinois has to offer
  o Conveying a sense of activity, diversity, and modernity without appearing chaotic
  o Not associated with any particular unit, center, institute, laboratory, or office
  o No known model to follow