



The IT Commons:

Preparing Students for the Information World

What is the best way to assure that UAlbany students have the IT knowledge and skills they need to succeed?

The question is one that Peter Bloniarz, dean of UAlbany's School of Information Science and Policy and associate provost for informatics, thinks about a lot as he leads a University-wide effort dubbed the "IT Commons." Its goal is to infuse more IT-based courses into the University's curriculum.

“Information is power. I think that has never been more true than today.”
— Peter Bloniarz

“If you look at which companies have competitive advantage, if you look at which government organizations are really doing innovative things in terms of services to citizens, if you look at what's happening in education today, you'll see effective use of information technology,” says Bloniarz.

UAlbany already has IT-related areas of excellence in its academic and research programs.

The Nelson A. Rockefeller College of Public Affairs and Policy, for example, was ranked fourth in the nation this year in information and technology management by *U.S. News & World Report*. The management information systems program in the School of Business is nationally recognized. The

Photo: Tara Engberg



Peter Bloniarz, dean of UAlbany's School of Information Science and Policy and associate provost for informatics

Center for Technology in Government, an applied research center and recipient of a Ford Foundation Innovations in American Government award, works with government to develop information strategies that foster innovation and enhance the quality and coordination of public services. In addition, the University curriculum includes courses in information literacy, web design, geographic information systems and more.

The challenge, however, “is to incor-

“Our IT Commons initiative will assure that our graduates are well prepared — and we also expect it will help us recruit more of the best and brightest students.”

porate information technology across the campus and in every discipline, whether someone is studying to be a biologist, or a lawyer or an accountant or a sociologist. Virtually whatever they are doing, information technology is incredibly important,” says Bloniarz.

Incorporating informatics curricula into traditional disciplines is essential to preparing UAlbany graduates for life and work in the 21st century, Bloniarz says, and the IT Commons effort aims to make this a reality.

“What we are doing is identifying the kinds of IT courses our students need, and then working together to recruit faculty who will teach courses and conduct

research in the areas we have identified, such as information policy and management, information security, database applications, data analysis, modeling and simulation, web development, information technology and learning, and computer programming.

“We'd all love to hire many more faculty in our own respective disciplines — sociology, history, geography, English, wherever. We realize we cannot afford to build it up everywhere.

But if we work together and share needs and share positions and hire faculty whose job is not only to support their own department, but also to support needs across the campus, we will be able to provide the IT courses we need for our students,” Bloniarz explains.

Joining the University this fall are the first faculty members hired through the IT Commons initiative.

Peter Shea, formerly the director of the State University of New York Learning Network, an award-winning online education program, is an expert in teaching with technology in higher education. Yvette Mattern brings artistic sensibility and technical know-how to

video art. Senem Guney works with organizations on identity, information flow, collaboration and leadership.

The University recently asked all faculty members to suggest other areas where there might be an opportunity to create a world-class interdisciplinary research cluster by recruiting additional faculty in that area. By looking for the best researchers applying information technology in their disciplines, the University will be in a good position to

develop new courses and degree programs that ensure that students have the IT skills they need when they graduate. Plans for a new IT minor are getting underway this fall, with new and improved majors to follow.

“It's clear that students with a combination of IT and disciplinary skills are highly sought in today's workforce,” says Bloniarz. “Our IT Commons initiative will assure that our graduates are well prepared — and we also expect it will help us recruit more of the best and brightest students.”

The IT Backbone: Trillions of Bytes and Growing

When 17,000 students and 3,500 employees count on their computers and the campus network around the clock, you need a robust, dependable system. By most any measure, UAlbany's ever-expanding information infrastructure is exactly that.

It includes powerful computers to support cutting-edge research, e-mail servers that route 200,000 outgoing and 270,000 incoming messages a day, 17,000 ports (high-speed connection points to the network for students, faculty and staff), several hundred miles of copper cable and approximately 225 miles of fiber optic cable, over 550 public-access computers, and more.

UAlbany's information infrastructure, Chief Information Officer Christine Haile likes to point out, is a little like electricity.

"Online services are absolutely fundamental to all campus operations, and we have grown to expect them to be 'always on'—like a utility. It's only when the power is out or a service is down that we realize how dependent we are on the systems," she notes. "But we're barely 15 years into the Internet as a widely used tool; the electrical grid has 100 years of experience behind it."

As it expands, UAlbany's campus technology infrastructure plays a growing role in supporting every aspect of campus life, and that, in turn, drives demand for further expansion of the system. "Meeting the growth in user expectations is probably our greatest

challenge," says Haile. "We need to maintain an infrastructure that is robust, integrated, secure and easy to use. That infrastructure gets more complex with each technological advance."



Photo: Mark Schmidt

Chief Information Officer Christine Haile oversees the University's technology infrastructure.

The main computers that support institution-wide applications boast storage capacity of 13.75 terabytes or 13.75 trillion bytes. By contrast, the personal computers students bring to campus have between 30 and 60 gigabytes or 30 to 60 billion bytes.

Those 13.75 terabytes are used to support administrative management; electronic communication (mail, calendaring, and web); management of the University network; distance learning; computer-intensive tasks; public-access user rooms; and network connectivity. The main computers also house important electronic data for students, faculty and staff, and much of their capacity is available online anytime and backed up daily.

When students registered for classes

via UAlbany's web site for the first time last year, that marked a major milestone in tapping information technology to streamline and improve student services. As alumni who graduated before

1993 remember, students then waited on lines, sometimes long ones, to register for classes. Phone registration, begun in 1993, eliminated long lines, but could not offer the searching capabilities and interactivity that today's web-savvy students are accustomed to, and that is offered by the new web-based service known as MyUAlbany.

UAlbany's webserver at www.albany.edu is

an example of the dramatic growth in both the sheer quantity of information and the range of services available online. It now features well over a thousand different web pages, offering instant access to library catalogues, course web pages, and events calendars. Online visitors can order tickets for Great Danes events or buy gear, and they can give a gift to support the Campaign for the University at Albany.

Spread across the University's schools and colleges is the human backbone of the system: IT staff who manage and protect the servers and networks, develop applications, and train and assist users. A specialized group, with three staff members, was formed earlier this year to better support the IT

needs of researchers. IT staff who work for CIO Haile number about 130, and another 30 to 50 staff members provide IT support in University units. Tech-savvy students also help.

Another reflection of the growth and importance of campus information technology was the appointment of Haile in 2001 as UAlbany's first chief information officer, with responsibility for information technology policies, programs and services. Haile's work was recognized in June when she received the "Best of New York" Award for Demonstrated Leadership in Management of Information Technology from the Center for Digital Government, a national research and advisory institute.

Analyzing Genome Evolution

A very recent addition to UAlbany's information infrastructure is one of the largest university-based Apple XServe clusters in the nation. The 75-node system is being used for computational biology and bioinformatics, and supports research in several areas, including protein structure and statistical analysis of genomes. The server cluster, which provides vector processing capacity and enhanced multitasking ability, produces calculations roughly 150 times faster than UAlbany researchers' current systems allow.

"New technologies and investigations, like the Human Genome Project, are uncovering vast amounts of new data about the information in our genes and how they define who we are and how our bodies work," notes George Berg, a faculty member in the Department of Computer Science. "To analyze these data and to truly understand them, researchers need correspondingly large amounts of computing and storage power. The new Apple XServe cluster provides just these tools and abilities to UAlbany researchers." Berg uses the cluster to support his work in protein folding.

The cluster is also supporting the work of, among others, biologists Caro-Beth Stewart and Ph.D. candidate Jason de Koning, who are working on a project to statistically compare

the genomes of chimpanzees and humans. When compared to the human genome sequence, it will give geneticists and other scientists information about genes that might have contributed to biological selection and human evolution. "The cluster is vastly speeding up what we're doing," said de Koning. "Studying genome evolution is computationally intensive, and statistical analyses that used to take us more than a month can now be done in hours with the Apple cluster."

Computational power: From left, faculty member George Berg of the Department of Computer Science; master's student Sara Seepo, B.S.'01, of Albany; faculty member Caro-Beth Stewart of the Department of Biological Sciences; and doctoral student Jason de Koning of Chatham, Ont., all use a powerful new Apple XServe cluster tool (background) to speed the computations needed in their research. Berg relies on the cluster to support his work in protein folding, while Seepo and de Koning are doing comparative genomics research with Stewart.



Photo: Tara Engberg

Information Age Challenges

On the Trail of Terrorists

As many a Google search proves, it's easy to find a treasure trove of information about a universe of topics via the Internet. Making sense of it all is what's sometimes difficult.

For intelligence analysts charged with tracking terrorists and other threats to national security, the challenges of extracting relevant clues and accurate intelligence from mountains of information are even more daunting and critical.

To help address these challenges, UAlbany computer scientist Tomek Strzalkowski and teams of researchers across the U.S. are working to develop new tools for intelligence analysts.

"Analysts spend many hours, often most of their time, reading through

things that are actually not relevant. That leaves little time for answering the important question: 'Now I have this — what does it mean?'" he says. "We are building an application for the intelligence community to more quickly provide relevant information so analysts have more time to figure out what it means."

While human analysts can read reports and make decisions as to the relevance of a bit of information, people are likely to have trouble remembering seemingly unrelated bits of information gleaned from hundreds of reports. Yet connecting these small pieces may be essential to building a case, whether it pertains to tracking terrorist activity or, if you are a police investigator, organized crime.

"The challenge here is to digest this

much more quickly than any human being can," says Strzalkowski, who directs the University's Institute for Informatics, Logics and Security Studies. "Essentially it means being a detective, a Sherlock Holmes, and remembering a piece that you read a week ago."

"This is where the computer can help: Computers can remember things forever and make the connections."

Strzalkowski is building an automated question-answering system that would help analysts flesh out seemingly unrelated information around the edges of a problem; when added together, these facts may yield hypotheses not considered before. The system is called High-Quality Interactive Question Answering, and is funded by the Advanced Research and Development

“Essentially it means being a detective, a Sherlock Holmes, and remembering a piece that you read a week ago. This is where the computer can help.”



Tomek Strzalkowski, director of the University's Institute for Informatics, Logics and Security Studies

Activity (ARDA) of the U.S. Department of Defense under the AQUAINT program, which develops advanced tools for intelligence analysts.

Strzalkowski's work is one of many ways UAlbany researchers are addressing information-age challenges and driving advances in the information field. The important issue of information security, for example, is the focus

of a new center that is part of the Institute for Informatics, Logics and Security Studies.

Outwitting Cybercriminals and Viruses

Damaging computer viruses used to strike once every few months. Today, however, new viruses are being released daily and outwitting cybercriminals is a major challenge.

In 2004, UAlbany, with key governmental partners, established the Center for Information Forensics and Assurance (CIFA) to address the information security challenge through both research and specialized courses. CIFA is part of the institute headed by Strzalkowski.

"The idea is to develop a kind of teaching hospital for information assurance in which we have real-life cases

continued on page 10

IT-Savvy Alumni

Frances Allen, B.A.'54,
IBM Fellow emerita, T.J. Watson Center,
Yorktown Heights, N.Y.

Nicholas Aprigliano, M.B.A.'85,
director, Quality Assurance Information
Technology, Mount Sinai NYU Health
System, New York City

Daniel M. Austin, M.B.A.'88,
vice president and IT leader for infrastruc-
ture, General Electric, Pittsburgh

Kristen R. Baker, M.B.A.'02,
consultant, Citrix, New York City

William A. Battino, B.S.'81,
partner, Business Consulting Services,
IBM, New York City

Barbara Chen, M.L.S.'75,
director of Bibliographic Information
Services and editor, MLA International
Bibliography, Modern Language
Association, New York City

James J. Corbett, M.L.S.'78,
vice president for business development,
VersusLaw, Inc., Redmond, Wash. ("Mr.
Golf Etiquette")

Ellen Costello, B.S.'96,
Senior manager, Cap Gemini,
New York City

Susan Cronizer, M.L.S.'87,
director, Research Network, Computer
Sciences Corp., Rochester Heights, Mich.

Gary Duncan, M.B.A.'84,
partner, Accenture, New York City

**Mary Joan Koonz Egan, B.S.'40, M.S.'61,
M.S.'72,**
director of libraries, Burnt Hills-Ballston
Lake (N.Y.) School District, 1961-1999

Michael B. Eisenberg, B.A.'71, M.L.S.'73,
dean of the Information School, University
of Washington, Seattle

Robert Hansen, B.S.'77,
principal, business process IT risk,
DeLoitte & Touche, New York City

Susan Jacobsen, M.L.S.'80,
chief of the Statistical Services Unit, State
Division of Criminal Justice Services,
Albany, N.Y.

Jennifer Lego, M.B.A.'93,
managing consultant, Towers Perrin,
New York City

Victor Nhaisi, B.S.'86,
partner, Accenture, New York City

Marilyn Otto, M.L.S.'76,
vice president for data development,
MapInfo Corp., Troy, N.Y.

Ronald Peoples, M.B.A.'93,
manager, Citrix, New York City

Paul Racioppo, B.S.'77, M.B.A.'78,
managing principal, Business Consulting
Services, IBM, New York City

Paul W. Reedy Jr., B.S.'95,
senior manager, Cap Gemini,
New York City

Georgia Scura, M.L.S.'72,
manager of Library and Information
Resources, Bayer Pharmaceuticals Corp.,
West Haven, Conn.

Larry Solomon, B.S.'86,
partner, Accenture, Philadelphia

Sharon Studley, B.S.'85,
senior manager, Cap Gemini,
New York City

Michelle Roe Wienczkowski, B.S.'95,
manager, Cap Gemini, New York City

Jane L. Winer, B.A.'69, M.L.S.'70,
dean, College of Arts and Sciences, Texas
Tech University, Lubbock, Tex.



continued from page 9

coming into our security labs,” says Sanjay Goel, director of research for CIFA and an assistant professor in the School of Business. “Our graduate students work on these cases and develop solutions. At the same time, we get live cases that enrich our curriculum.

“Information security is a fast-changing field and it’s important that we are dealing with the latest real-life problems.”

The “teaching hospital” model is one successfully used by UAlbany’s Center

for Technology in Government (CTG). CTG staff work hand-in-hand with state agency staff in tackling real problems the agencies face. In fact, one such real problem — how government agencies can best share and integrate information — is the focus of two nationally funded CTG research projects. These problems then turn into cases used in both public administration and information science courses. The effectiveness of this approach is reflected in the high ranking of Rockefeller College’s information and technology management program.

At CIFA, key to assuring that both the problems and the solutions reflect reality are the two state CIFA partners — the New York State Police Forensic Investigation Center (Computer Crime

Unit) and the state Office of Cyber Security and Critical Infrastructure Coordination — as well as a third partner, the Center for Education and Research in Information Assurance and Security at Purdue University.

This past spring, Goel offered the first two specialized courses developed, “Information Security Risk Analysis” and “Incident Handling,” both aimed at better preparing the staff in state agencies who are responsible for information security.

“A lot of the weakness we observe in systems is because people are not well trained. We need to create training for the work force we have today,” says Goel. In his information security research, Goel is developing new models to protect systems.

“I am working on ways to build a reactive security system, which can anticipate attacks, react to them and repulse them automatically. The network itself should be able to cooperate synergistically in providing a defense,” he says.

The University’s programs in information assurance (a term that includes information security) have been certified by the Committee on National Security Systems (CNSS) as meeting their training standard for information systems security professionals. In its review, the CNSS said that UAlbany “has a robust, impressive, IA curriculum that spans several academic disciplines.” Indeed, CIFA is truly interdisciplinary, with faculty from computer science, IT management, accounting and law, information science and policy, and educational theory and practice.

UAlbany’s New College of Nanoscale Science and Engineering

Nanotechnology innovations are driving dramatic growth in information technology as well as other industries, and the University’s nanotechnology and nanosciences programs are internationally recognized as leaders in both research and education.

UAlbany’s College of Nanoscale Science and Engineering, the first of its kind, was approved in April by the State University of New York Board of Trustees. The college is located in Albany Nanotech’s research complex, which features state-of-the-art clean rooms and facilities that support the research and development needs of the global nanotechnology community. The college offers master’s and doctoral programs in the emerging interdisciplinary fields of nanotechnology, including nanoscience, nanobiotechnology, nanoengineering, and nanoeconomics.



The Albany Nanotech research complex

Photo: Gary Gold