Expertise in Wireless Techniques, Internet Helps ITTC Nab $362,000 NASA Project

Joe Evans and Gary Minden

The National Aeronautics and Space Administration (NASA) awarded ITTC investigators Gary Minden and Joe Evans $362,000 for their project Architecture for Space Based Internets (SBI). The two-year project grew out of ITTC's longstanding work in the area of Rapidly Deployable Radio Networks (RDRN). The techniques and data gleaned from this wireless high-speed communications system for military units in the field will now be applied to satellites orbiting in space.

NASA intends to equip future satellites with SBI capability to improve communication links. Communicating with satellites now requires time-consuming scheduling. Transmissions must be timed to when a satellite will pass over a particular area, and satellite downtime disrupts the schedules and may interrupt communications for long periods of time.

In comparison, the Internet on land flexes with disruptions and breakdowns by rerouting data along other pathways. With IP in space, satellites could originate or terminate traffic and—most importantly—could reroute traffic traveling between other satellites and the ground.

The research team will study the design, development, and initial prototype implementation of an SBI architecture and evaluate it on an emulation testbed. The team's work builds on the Center's increasing expertise in Internet protocols (IP) and high-speed wireless communications. ■

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NASA Honors ITTC's Glenn Prescott

Glenn Prescott, director of ITTC's Wireless Communications & Digital Signal Processing Lab, received the Special Service Award from the National Aeronautics and Space Administration (NASA). At an award ceremony held Oct. 18 at NASA headquarters in Washington, D.C., Prescott was recognized for his work in helping to define, formulate, and establish the NASA Earth Science Enterprise Advanced Information System Technology (AIST) program.

AIST is a three-year research initiative that awards up to $15 million annually to researchers whose work helps NASA's Earth Science Enterprise (ESE) to better understand changes to global environment from natural and human activities. The ESE collects a large volume of data from long-term space, airborne and in situ observations and modeling of the complex earth system including the land surface, liquid and frozen ocean, ice sheets and atmosphere.

"His leadership was an essential element for the

Glenn Prescott

The fall semester has ended. Here at ITTC, a great deal has been accomplished during these past few months. A top priority was the completion of the staff reorganization, which began this summer. Under the new plan, Tim Johnson—the Center's Executive Director for Operations and Applied Technology—now has more time to focus on technology and economic development activities—areas critical to the Center's future.
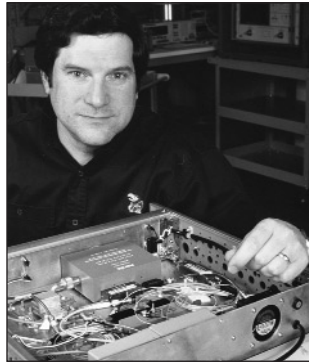
Director Victor Frost

ITTC's achievements have grown from our researchers' awareness that sharing knowledge and expertise fosters success. – Victor S. Frost, ITTC Strategic Plan 2000-2005

Our strategic plan for 2000-2005 is well under way and should be completed during the first quarter of 2001. During the plan's development stage, our researchers had opportunities to provide us with important feedback, suggestions, and direction. The plan will help clarify the roles of the research labs and enhance the Center's ability to do large, multi-discipline research efforts.

I'm pleased that ITTC offers its researchers several benefits—both tangible and intangible. A common infrastructure and a solid support staff certainly are important to the research effort. But the intangibles also are crucial. As a melting pot of ideas, the Center helps researchers find stimulation, focus, and success. This mix of tangibles and intangibles is what makes it possible for our researchers to execute large collaborative research efforts. It is this atmosphere of success and partnership that continues to stimulate and support our growing research efforts.

Also important to our efforts is that many of our faculty are highly regarded within federal agencies, like NASA and DARPA, which fund so many of our projects. This year the National Aeronautics and Space Administration honored Professor Glenn Prescott with two distinguished awards that recognized his contributions to NASA during his sabbatical year in Washington, D.C.

Glenn's work at NASA follows in the tradition of Prasad Gogineni, who also worked at NASA, and of Gary Minden, who spent a sabbatical year with the Defense Advanced Research Projects Agency. Their leadership activity contributes greatly to the Center's success.

This fall we were pleased to welcome several groups of visitors. Four IT representatives from Shanghai visited Oct. 16. The group was led by Gu Ziaoxhong, a senior engineer with the Information Office of Shanghai Municipal People's Government and network administrator for Shanghai. Two representatives accompanied him from Shanghai Information Network Co. Ltd. and another from Shanghai Information Investment, Inc. The four had visited other IT facilities in Los Angeles, San Francisco, and Washington, D.C.

Also in October, U.S. Representative Thomas M. Davis of Virginia's 11th district toured the center; and in November, we hosted members of the Partnership for Peace in Eastern Europe.

Our doors are open to guests. So please give us a call if you or your colleagues would like to tour the Center.

From all of us at ITTC, here's wishing you a Happy New Year. ∎

Center Welcomes New Faculty, Staff

ITTC welcomes two new faculty and one new staff member, but it also bids goodbye to three long-time staff people.

David Andrews comes from the University of Arkansas, where he chaired the combined departments of computer science and computer engineering. He has a Ph.D. from Syracuse University and a master's from the University of Missouri. He worked for eight years as a senior systems engineer and research engineer for General Electric.
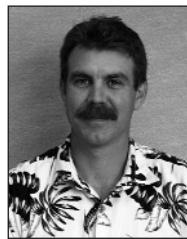
Hossien Saidien was most recently at the University of Nebraska-Omaha, where he headed the University Committee on Research. In 2000, he received the UNO Excellence in Teaching Award and the Excellence in Research Award. In 1998, the *Journal of Systems and Software* included him on its list of the top 10 software engineer scholars. He has a Ph.D. in computer science from Kansas State University and a master's in mathematics from Emporia State University.
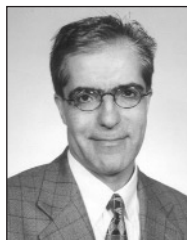
Paula Szuwalski joined ITTC as program assistant to the director. She will assist in budgeting, special events planning, and preparation of presentations. Before coming to ITTC, she worked as a bonding executive for Kansas Bankers Surety Company in Topeka. She has a B.S. in Computer Information Systems from Friends University and an A.A. in Office Administration from Washburn University. During the summer of 2000, Szuwalski played professional tennis.

Roel Jonkman , ITTC's senior network engineer, left to join Silicon Defense in California.

Enlian Chong, the Center's senior software engineer, became a senior consultant in software development with one of the largest IT consulting firms.

Wendy Prescott started as a student office assistant in 1993 while earning her B.S. in Geography. Prescott accepted a position with the KU Endowment Association. ∎

Prescott *continued from Page 1*

success of this first-of-a-kind ESE proposal solicitation," said Gordon Johnston, associate director for technology strategy at NASA Headquarters in the Office of Earth Science, Program Planning and Development. "Glenn's work directly supported NASA's future ability to acquire, process, and deliver large volumes of Earth remote sensing and related data to public and governmental entities in a timely manner."

A specialist in information systems and a professor in KU's Department of Electrical Engineering and Computer Science, Prescott worked at NASA Earth

Science Enterprise from May 1999 through mid-August 2000. He served as an associate director for technology (Information Systems) in the Office of Earth Science while on sabbatical from KU.

The NASA award was the second Prescott has received this year. On July 12, 2000, he received the Terra Award—one of the highest honors given by NASA's Earth Science Enterprise group—for his contributions to the planning of future Earth observing satellite information systems. ∎

ITTC Trio Finds Success with Local Web Firm

Scott Woodward, MS'94, former ITTC systems engineer, remembers the day in 1995 when he and two other ITTC staffers decided to start a Web development company. Woodward, Galen Blakeman, BS'94, and Juan Cuadra-Sola, MS'94, were in Topeka at a trade show on behalf of ITTC. People stopped by their booth to ask about "the Web." They wanted to know how it worked and especially how they could get a Web site. "People kept asking, 'Would you build a Web site for us?'" On that day, the trio saw an opportunity for success.

"We saw other people starting companies, so we knew we weren't crazy. If they could do it, we could too." Woodward says. They each paid $100 to file the paperwork needed to create a Web development company in Lawrence that they called Fastlink. For the next five years, the men kept their full-time jobs at ITTC and worked part-time on evenings and weekends for their new company.

At the end of five years, a Canadian company approached the Fastlink owners, wanting to buy the name. The three owners agreed and adopted a new name: Athenix.

The sale of the original name helped the team gain capital that would help continue the business. Soon after that, the company won its first contract with an advertising agency in Wichita.

Today Athenix provides a variety of Web-based Internet applications mostly for

Scott Woodward and Juan Cuadra-Sola

local and regional clients. It breaks its services into three main categories. New Media Services includes all the tools used to design interactive Web sites. Programming Services includes database integration and e-commerce tools. And finally, the hosting services include databases, processing, and other related services.

In just the past year, Athenix has experienced tremendous growth. Early in 2000, Athenix had four employees, including the three owners. At year's end, Athenix employed 15 people. And it recently opened a sales-consulting branch in Wichita. Woodward says that the company will continue to grow, if only to keep up with business. Athenix doesn't do much in the way of advertising, but new clients come through referrals from satisfied customers.

In the future, Athenix's owners want to continue growing and learning. Cuadra-Sola says working with the Internet has always been fun and exciting. What first drew all of them to the Web still holds true. The Internet, he says, is like unexplored territory. There's so much to explore and build and there's always innovation. The team would like the opportunity to influence or contribute to the new technology, changing the way people do business and interact. But for now the Athenix owners and their staff are kept busy filling client requests. ∎

"Our work at ITTC taught us the discipline to see a project through from start to finish. We use that same approach with our clients. We consider everything including operation, maintenance, and the user." – Scott Woodward, Athenix co-owner

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*The*Link

Achievements and Acclaim

Recent Graduates

ITTC hires more than 100 students, and most of them are working on their master's degree or doctoral programs while they are with us. The following ITTC students successfully completed their studies this fall. We have included the title of their project and their adviser. We wish them well.

Anand Sundaram, M.S., "A Software Simulator for Multi-Aperture Spaceborne Radar," Jim Stiles.

Makarand Patil, M.S., "Soccer-A Specification Matching Based Component Retrieval System," Perry Alexander.

Ming Chong, M.S., "Optimistic parallel simulation on ATM and TCP/IP networks," Victor Frost.

Scott M. Daugherty, M.S., "Video Temporal Segmentation by Analysis of Representative Images," John Gauch.

Sean B. House, M.S., "Proportional Time Emulation and Simulation of ATM Networks," Doug Niehaus. ■

Faculty Awards

Hossein Saiedian, professor of Electrical Engineering and Computer Science, (EECS) served as a guest editor for the Winter 2001 (Jan/Feb) issue of *Computer Science Education*. The special issue focuses on practical software engineering education.

Dave Petr, associate professor in EECS, won the John E. Sharp and Winifred E. Sharp Professorship Award. The honor comes with a $5,000 salary supplement and a $5,000 teaching enhancement pool, each for the next three years.

Arvin Agah, assistant professor in EECS, won the Henry E. Gould Teaching Award for Outstanding Instruction in the School of Engineering. Each spring, seniors in the entire school vote on the teacher whom they feel is most deserving. The honor comes with a $4,000 award. ■

NASA's IT Needs Mesh with Center's Strengths

Charged with learning evermore about the earth and space, the National Aeronautics and Space Administration (NASA) gathers, stores, interprets, and distributes data—constantly. NASA's four-part mission—space science, human exploration and development of space, aeronautics and space transportation, and earth science—drives the agency's data hunger.

NASA's need to capture and use this data meshes well with ITTC's capabilities in both instrumentation and information systems, says Glenn Prescott, who this semester returned to KU after a year-long sabbatical in NASA's Earth Science Enterprise.

While at Earth Science Enterprise, Prescott helped the division develop its technology research program in information systems, instruments, and platforms. ITTC, he notes, already does NASA research in the area of instruments through a hybrid RF/laser radar project led by Chris Allen and Prasad Gogineni. Gary Minden and Joe Evans' Space Based Internets project is a NASA-supported research effort in information systems. (See page 1.)

"The opportunity is there for those of us at ITTC to respond to NASA's request for proposals within the information technology areas such as data mining, storage, transmission and distribution, and all aspects of high speed communications," he says.

"NASA wants to collect all sorts of measurements of the Earth using satellites, and this need presents an opportunity for the Center's Radar Systems and Remote Sensing Lab (RSL). Researchers in information systems can act to help NASA handle all the data it collects." Prescott says. ■

You can contact Glenn Prescott at prescott@ittc.ukans.edu or at (785) 864-7760.

What's a network?

To most people, the network is synonymous to the Web and to e-mail. These users search for and gather information, shop and exchange e-mail messages.

To slightly more technical types, the network is how your computer connects to the Internet-modem and phone line, a cable modem at home, or an Ethernet connection in the office.

To those who operate the network, it is a collection of boxes, known as routers, and transmission lines, or fibers, between the routers. The lines carry packets of data from one router location to another, whether across the room or across the country.
Gary Minden, ITTC's chief technologist, shared this definition.