NC STATE UNIVERSITY

CONNECTED

A NEWSLETTER FROM THE
DEPARTMENT OF COMPUTER SCIENCE
MARCH 2005

Students' Wolfgrid tests strengths of grid computing software

What if you had a bunch of computers all over the world, hooked together? That's a question that Sammie Carter, computer science senior, and Jon Harris, graduate student in the College of Design, had in mind when they began to build the Wolfgrid across the NC State community.

Sammie Carter, computer science student, discusses the Wolfgrid with Everette Allen, computing consultant. NC State's Information Technology Division, center, and Jon Harris, student in the College of Textiles.

Using Apple's new Xgrid software, the two have been hooking up personal computers across campus, creating a virtual community grid that works like a super computer, performing tasks when the individual computers are not being used by their owners.

The student-initiated Wolfgrid project was launched in February 2004, with guidance from Everette Allen, computing consultant with NC State's Information Tech-

Continued on page 5

As member of Defense Science Study Group,
Antón explores national security issues

Summer 2004 was anything but typical for Dr. Annie Antón, associate professor at NC State's Department of Computer Science.

She spent several weeks touring military bases and government agencies, learning about the technical dimensions of national security issues as well as the people and operations involved. She also earned an 'Honorary Paratrooper' award in recognition of her successful jump from the 34-foot tower at Fort Bragg, NC.

Antón had been selected for the 2004-2005 Defense Science Study Group (DSSG), designed to develop strong links between the national security community and emerging leaders of science and engineering. This is a very selective program; Anton was one of 14 chosen from a group of 137 nominees, according to Dr. Phillip Gould, DSSG director.

Managed by the Institute for Defense Analyses (IDA) and sponsored by the Defense Advanced Research Projects Agency (DARPA), the central research and development organization for the Department of

Continued on page 8

Kudos

Matthew Vail and Qingfent (Frank) He received CISCO scholarships. Also, Jack Frink received an award for developing a new software tool, and Lucas Layman received a second place award in ACM Competition. [See page 4.]

Nader Moussa, a triple-major senior, was an IBM Extreme Blue intern last fall.

Bensong Chen, doctoral student, was named an Outstanding Teaching Assistant by NC State's Graduate Student Association.

Neha Jain, Tyler Johnson and Matthew Vail, all seniors, received CRA's 2005 Outstanding Undergraduate Award honorable mentions.

Senior Rich Killian is serving as the Microsoft Ambassador at NC State for the 2004-05 academic year.

Carol Allen, administrative assistant in the undergraduate advising office, was recognized for 25 years of service at the university's staff recognition program last August. She has been with the computer science department for her entire NC State career.

Dr. Peng Ning, assistant professor, received an NSF CAREER Award. [See p. 10.]

Pride of the Wolfpack Award recipients in the last quarter were Kelly Potter, Senior Design Center; Carol Allen, administrative assistant, undergraduate advising, and Linda Honeycutt, departmental executive assistant and director for personnel actions.

Nearly 170 computer science degrees were conferred in December 2004. Donald Haile, president of Fidelity Investments Systems, was guest speaker.

Inside this issue

From the Desk of the Department Head

Another academic year is well on its way, and it has been wonderful so far. The computer science department spent the early autumn months preparing for two major milestones - the CAC/ABET[1] accreditation review, and an external peer review in preparation for the formal search for a new department head.

The CAC/ABET review took place in late October, and the external review in mid-November. As a department, we have gained a lot from both. The process of reviewing carefully and constructively both our undergraduate and graduate programs, as well as our research program, yielded an honest and very useful assessment of our core strengths, challenges and potential. We have accomplished much and have much to look forward to.

One highlight is recognition that our educational programs equip our students to be competitive, to succeed in their profession, and to contribute to society. For example, for the fourth year running, NC State was the largest supplier of new hires to IBM – and computer science students represent a large fraction of those hires. Also, we are among the *top* in the nation in the number of awarded bachelor's and master's degrees in computer science and in the top 40 in the number of awarded Ph.D.'s in Computer Science.

Currently, we have 41 tenured and tenure-track faculty, over 850 undergraduate majors, and over 380 graduate students. We are in the process of looking for new faculty members to help make our department even more competitive.

In the last six months our students, staff and faculty have received a number of awards and recognition, and have participated in a number of professional events. This includes best paper awards, student and faculty scholarship and research awards, a prestigious NSF CAREER award, several Pride of Wolfpack awards, and appointments on prestigious national bodies such as the National Lambda Rail (http://www.nlr.org) Network Research Council.

The Fall 2004 commencement ceremony recognized the academic achievements of 166 Computer Science graduates and brought the ranks of our alumni to over 4500. This was an exciting and auspicious event that culminated years of hard work and dedication for all concerned.

In the fall of 2005, we will be moving into a new building on the NC State Centennial Campus. This move will enable our department to consolidate, and our students to take the majority of their courses and conduct research with our faculty in new state-of-the-art classrooms and laboratories. We have several exciting months ahead as we prepare for this move.

I wish you a year of happiness and success.

Mladen A. Vouk
Interim Department Head

Footnotes

[1] Computing Accreditation Commission of the Accreditation Board for Engineering and Technology (http://www.abet.org/cac1.html)

Staff Appointments & Changes

Barbara Adams, PhD, is assistant director of undergraduate advising, working with Joyce Hatch, lecturer and coordinator of advising.

Ginny Adams transfered to the Centennial Campus faculty secretary position.

Jason Corley was named information technology coordinator for the department.

Jennifer Craddock left for a position with Fidelity Mutual.

Dana Lasher was named director of student services.

Anna Rzewnicki left for a position with the College of Management. *Irene Rindos*, CSC freshman, is assisting with department communications.

Don Martin, former CSC department head, dies

Donald Martin, Ph.D., professor and former head of the computer science department, died Feb. 11 following a battle with MDS and leukemia.

Martin received bachelor of science and master's degrees at the University of South Carolina and a Ph.D. in chemical engineering at NC State. He helped to develop and headed the computer science department at NC State during a time that has come to be known as the "Martin Era."

Although he received numerous accolades, his family notes that his most important was being voted teacher of the year for several years by his students. He loved teaching and was known as a tough professor from whom students learned well.

Martin had served in the U.S. Navy and Reserves for over 20 years and retired as Commander.

He is survived by his wife Doris, children and grandchildren. In lieu of flowers, the family requested that donations be made to St. Jude Hospital, 501 St. Jude Pl., Memphis, TN 38105. Tributes may be sent to www.bronwynne.com.

Technical papers

To keep up with faculty research, view Computer science faculty members' technical papers online at http://www.csc.ncsu.edu/research/tech/reports.php.

Mayr joins the CSC faculty

The newest member of the computer science faculty is bringing additional expertise in software verification to the department.

Dr. Richard Mayr joined the faculty as assistant professor this fall, coming from the computer science faculty at the Albert-Ludwigs-University in Freiburg, Germany.

His main research areas are formal verification, logic, automata theory, term rewriting, asynchronous systems and computer networks.

Although he began his research in semi-automatic verification methods, using computer assisted proving systems, he shifted to fully automatic methods when he changed research groups while working on his doctorate, and continued that approach in his post-doctoral research.

"The semi-automatic methods are powerful but require a lot of knowledge of the user and can be cumbersome," he says. "The automatic methods, based on algorithms, are powerful and have the advantage of being easier to push into applications. Both are important and are used in different roles, depending on the application," he says.

Richard Mayr

While much of the work in verification has been about systems which have finite state spaces, Mayr has focused on the more general case of infinite state spaces. His research has applications in safety-critical systems, primarily in telecommunications and data flow analysis, as well as performance analysis. He also works with scalable verification methods and their application to industrial specification languages such as UML RT.

Mayr, who has studied and worked abroad for much of his academic career, seeks out opportunities for international collaboration. Over the years, he has conducted research with colleagues in the United Kingdom (particularly Scotland), France, Sweden and the Czech Republic. His doctoral supervisor in Munich was Spanish and had also worked in Scotland, "so this was a contributing factor" to Mayr's international interests, he says.

It stands to reason that he includes travel, foreign cultures and languages on his list of hobbies, along with hiking, cycling and skiing. He speaks four languages fluently: German, English, French and Swedish, plus a little Spanish and Greek.

Mayr also enjoys working with students. "Teaching is a very rewarding experience, especially when something difficult gets across (to the students) successfully," he says. He is teaching CSC 333, Automata, and CSC591C, Software Model-Checking.

He received his Ph.D. in computer science from TU-Muenchen, Germany. The title of his dissertation: `Decidability and Complexity of Model Checking Problems for Infinite-State Systems.'

Engineering Building II On Track for Fall 05

Engineering Building II is on track for completion and use by Fall 2005. The computer science department will be located in the left side of the building; computer and electrical engineering will be housed in the right side of the facility. The new building is located on NC State's Centennial Campus, near the Red Hat building.

Privacy research experience yields student recognition

Frink receives award for new software tool

Jack Frink, senior in computer science, recently received an entrepreneurship award in recognition of his work in developing Flesh, a cross-platform, freeware Java application. He also received a $1,000 scholarship from the local company n software in recognition of his achievement.

Neha Jain, also a computer science senior, assisted with extensive testing and feedback on the project.

Jack Fink at Wither's Hall computer lab.

Frink developed the software tool to help with a research project that he, Jain and other students were engaged in through ThePrivacyPlace.org, a research group founded by Dr. Annie Antón, associate professor of computer science.

The tool was used to evaluate online healthcare privacy policies that evolved in response to the Health Insurance Portability and Accountability Act (HIPAA). Flesh quickly analyzes a document (such as plain text files) and displays the difficulty associated with comprehending it.

Flesh is available for both Mac OS X and Windows. Within days of publishing it, Flesh was downloaded by several hundred users, Frink says. He continues to take feedback and is working to extend its functionality and overall utility. More information about the tool is available online at http://jack.gravco.com/flesh.html.

Vail, He receive CISCO scholarships

Two computer science students received Cisco Information Assurance Scholarships this year. Eight Cisco scholarships are awarded each fall and each spring.

Matthew Vail, senior, was awarded a Cisco Scholarship for fall 2004, and Qingfeng (Frank) He (Ph.D. candidate) received a Cisco Scholarship for spring 2005. He is the third NCSU computer science student (and third member of theprivacyplace.org) to be so honored.

The scholarships recognize students who are making a significant contribution in the field of information security information assurance.

Scholarship requirements include prior intern or work experience and research in the field of information assurance or information security.

He's application was selected based on the originality of the ideas posed in his essay along with his breadth of knowledge in the IA field.

During the 2003-04 academic year, Vail led a multidisciplinary team of undergraduate researchers in the evaluation of online healthcare privacy policies that evolved in response to the Health Insurance Portability and Accountability Act (HIPAA). Other students on his team were Neha Jain and Jack Frink in computer science, and Carrie Gheen in the College of Management at NC State.

Their research was performed under the direction of Dr. Annie Antón, assistant professor of computer science and a leader in privacy and security research. The team's objectives were to examine privacy policies to evaluate the compliance of specific healthcare organizations with HIPAA, investigate the evolution of the organizations' privacy practices before and after HIPAA went into effect, and to quantify each policy's level of readability and clarity.

Vail is working full time as a distributed computing services engineer in the Administrative Offices of the Courts for the State of North Carolina and carries a full academic load at NC State.

Neha Jain (B.S. 2004), currently in the Accelerated Bachelors/Masters computer science program, received a CISCO scholarship in fall 2003.

The results of this project are summarized in Technical Report 2004-21, "An Analysis of Web Site Privacy Policy Evolution in the Presence of HIPAA," posted on the computer science department's website [http://www.csc.ncsu.edu/research/tech/reports.php]. The article is also currently under review for publication in IEEE Security and Privacy.

Department Mourns the Loss of Freshman

CSC freshman, Michael Lloyd Ireland, Jr. of Aurora, NC, was killed in an auto accident on Sunday, November 14, 2004. He is survived by his parents Mr. and Mrs. Michael L. Ireland of Aurora, NC. Our deepest sympathies and prayers go out to the parents, family and friends of Michael.

Students take learning beyond the classroom

For NC State's computer science students, learning is not limited to formal coursework. A growing number of student organizations, they offer workshops and other opportunities to stretch their knowledge and gain experience in this dynamic field.

The Wolfgrid project featured in this issue of *Connected* is one example of such student initiative. About 300 graduate and undergraduate students attended an information night early last fall, sponsored in part by a contribution from CISCO, to learn what other opportunities are available to them.

Following is an overview of current student organizations. All feature guest speakers, workshops, educational and social events. Alumni and corporate leaders interested in discussing speaking opportunities may contact Ken Tate, director of development and external relations for the department, at 919-513-4292.

• ACM/AITP - NC State's combined student chapter of these two leading national organizations are continuing in a tradition of leadership and service. For the second year in a row, they are rebuilding donated computers, preparing them for a new service in an area school.

• Computer Science Graduate Student Organization, which is developing an interactive website for its members.

• Game Developers' Club -- for those interested in game development.

• Java Users Group -- promoting applications using Java.

• Linux Users Group – LUG -- promoting and supporting the use of Linux and related free and open source programs within the NC State campus community.

• Microsoft.net Users Group – DNUG – extending the programming knowledge of NC State students, faculty and staff with teaching sessions on .NET, ASP and much more.

• PacMUG – possibly the largest campus-based MUG in North Carolina.

• Women in Computer Science – WIC – supporting, promoting and helping to retain women in computer science.

• The department also has members in the Association for the Concerns of African American Graduate Students.

Check out all the organizations online at http://www.csc.ncsu.edu/academics/students_orgs.php

Student officers meet as a student board and provide a channel of communications to the department administration. Two board members also serve as student representatives to the department's technology committee. represents undergraduate students.

A number of the student organizations are supported in part from contributions through the computer science department's ePartners Program and the College of Engineering's E-Council.

Wolfgrid tests grid computing software

Continued from page 1

nology Division and staff advisor for the project. The Wolfgrid currently allows collaborative computations on networked Macs; soon, Linux boxes will be added to the grid.

The Wolfgrid now includes about 25 computers, and the number grows daily, Carter says. He and Harris have done a bit of troubleshooting and creative problem solving while building the grid.

One problem dealt with the unpredictable speed of the individual computers, which varied depending on the computers' features and how they were being used. They resolved that by hooking up all the fast computers in one grid and all the slow ones on another. Those first two grids are dynamic – people and their computers can come and go. As a result, computer processing on the grid can be fast or slow, depending on how many and the power of the computers that are connected to it.

"We're building a third grid that will be static, with a fixed number of computers," Carter says, using computers in the university's computer labs.

"The software being used for the grid is preview technology," he says. "Apple is beta testing it to see what people can do with it."

Carter and Harris presented their progress via videoconference to participants at the University of North Carolina CAUSE 2004 conference held in Boone, NC, last fall.

"The long term IT goal (of this project) is to see if we can scale up this technology and see if we can use the computing cycles that are not being used in the labs and even the office machines," Allen says.

But the greater value of the project, he says, "is to provide an outlet for creative students to do a project on their own, to get the extra experience, and also to create awareness that this technology is on the forefront for the groups that are interested."

Exploring the potential for such technology is a great fit for computer science students, he says.

For design students such as Harris, it offers a chance to see how the new technology can be implemented to speed up their production processes. For example, when creating a movie with multiple components, "They can see if they can ship it out to a bunch of computers that are asleep and have them do the work, achieving a faster turnaround," Allen says.

Senior Design students aim to keep Insight Racing's vehicle on track

Seniors in NC State's computer science software design projects course are facing a unique challenge this year: designing the software that will keep an experimental autonomous vehicle on track.

The off-road vehicle is being designed and built by Insight Racing, a Raleigh-area based company comprised of a number of College of Engineering students and three of their mentors. Their goal: to compete in the DARPA 2005 Grand Challenge [http://www.darpa.mil/grandchallenge/] scheduled for Oct. 8, 2005.

Insight Racing came to the Computer Science Senior Design Center, which assigns teams of students to real-world projects, for software design support. A special summer session of the senior projects course was offered, with four teams of students working on various aspects of Insight Racing's software needs. Additional teams are continuing to work on the project this year.

Created in response to a Congressional and Department of Defense mandate, the Defense Advanced Research Projects Agency (DARPA) launched the Grand Challenge as a field test intended to accelerate research and development in autonomous ground vehicles that will help save American lives on the battlefield.

The Grand Challenge brings together individuals and organizations from industry, the R&D community, government, the armed services, academia, students, backyard inventors, and automotive enthusiasts in the pursuit of a technological challenge.

In the 2004 Grand Challenge, autonomous ground vehicles ran from Barstow, Calif., to Primm, Nev., competing for a $1 million prize. The Insight Racing Team was one of only 25 teams to fully qualify for the 2004 event, but was unable to compete due to a lack of funding. While 15 of the 25 finalists attempted the field trial, the prize went unclaimed as no vehicles were able to complete the difficult desert route.

The 2005 DARPA Grand Challenge will be held in the Mojave Desert. The team that develops an autonomous ground vehicle that finishes the designated route most quickly within 10 hours will receive $2 million. The route will be about 142 miles over desert terrain featuring natural and man-made obstacles. The exact route will not be revealed until two hours before the event begins.

Insight Racing has completed a two-mile test run and is continuing this fall to enhance its object avoidance, routing, and control systems, with the assistance of the two senior design teams.

CISCO and Foundry Networks, both computer science ePartners companies, have provided sponsorship support for fall senior design teams working on this project.

The Insight Racing [http://www.insightracing.org/] team includes Kate Caldwell, senior, mechanical engineering; Mike Randall, senior, computer science and vice president of Ascot Technologies; Matt Rhinehart, junior, aerospace engineering; Brendan Shanley, senior, electrical engineering; and mentors Grayson Randall (B.S., aerospace engineering), Brian Dean (B.S., physics; M.S., computer science), and Walt Sliva (B.S., electrical engineering). Sliva also is Insight Racing's business manager.

College of Engineering Dean Nino Masnari provided funding for an attitude and heading reference system (AHRS) to assist the senior design students with their efforts working with Insight Racing. The AHRS device uses micro-electro-mechanical systems (MEMS) sensors to measure acceleration and magnetic heading. The computer science senior design teams working on this project use these sensors as input to a computational process to create an inertial navigation system that provides precise location information.

Those interested in being an additional sponsor of this project may contact Walt Sliva at (919) 468-8558 or walt@insightracing.org.

Layman places second in ACM Competition

Lucas Layman, a computer science Ph.D. student, received second place in the graduate category of the ACM Student Research Competition held last fall in Vancouver, B.C., in conjunction with the OOPSLA (Object Oriented Programming, Systems and Applications) 2004 conference.

Layman is a research assistant working with Dr. Laurie Williams, assistant professor, investigating the effects of Agile Software Development practices, such as Extreme Programming, in industry.

He is currently working with groups at IBM, Sabre Airline Solutions, and Tekelec to study the effects of Agile practices on requirements engineering, production quality, and customer satisfaction. Their work is funded by the Center for Advanced Computing and Communication under its core research program for Analyzing Emerging Software Development Methodologies and Practices.

Layman received the award for his research report, "Empirical Investigation of the Impact of Extreme Programming Practices on Software Projects."

Daniels Hall now home to CSC teaching labs

The old computer science teaching labs in Leazar Hall closed in January. A new 24/7 lab is now open in Daniels Hall. This is Phase I of the Daniels Hall renovation project.

Faculty, students join in IBM's University Day

… *more IT jobs expected*

NC State's computer science faculty and students were among the more than 100 participants and presenters at the IBM University Day held at the company's main campus in the Research Triangle Park in October.

The ongoing event brings together IBMers and academics to share information and to collaborate on technology projects and trends, industry requirements and future employment opportunities.

IBM's comments about employment prospects in the industry drew local media attention this fall. In its news release about the event, IBM cited U.S. Department of Labor in reporting and enormous opportunity in all technological fields. By 2006, it predicts this country will need 1.5 million more information technology professionals, and that one out of every four jobs in this decade will be in IT.

Colleges and universities will have to quadruple their number of graduates by 2008 in order to meet this demand. This situation exists at a time when schools in North Carolina and nationwide are witnessing dwindling enrollments in computer science and related engineering courses.

NC State's undergraduate enrollment in computer science declined from 900 in fall 2003 to 826 for fall 2004. However, enrollment in the graduate computer science programs rose, from 362 in fall 2003 to 384 in fall 2004 for the masters programs and from 91 in 2003 to 127 in 2004 for the doctoral programs.

Margaret Ashida, IBM's director of University Relations, told University Day participants that "One of the greatest concerns of leaders from industry and academia alike is the challenge of preparing talent capable of driving innovation -- and thus economic growth. We intend this Academic Initiative (discussed at the event) to help lead to the bright, optimistic future we see on the horizon," he added.

Launched earlier this year, IBM's initiative offers a wide range of technology education benefits for participating schools. Its gifts to the computer science department, for example, totalled more than $325,000 last year.

NC State produces more IBM new hires than any other single school in the nation, it was reported at the event. Worldwide, the company has increased new-hire projections for this year by 88 percent – to nearly 19,000 total hires. Most of the positions will be for people with technical skills.

IBM expects to hire between 300 and 400 graduates of North Carolina schools, with the lion's share coming from NC State, Duke, The University of North Carolina and North Carolina A&T, all of which participated in the University Day event and joined IBM's initiative to better prepare students for information technology jobs of tomorrow.

NC State presenters included Dr. Laurie Williams, assistant professor of computer science, and Dr. Michael Rappa, Alan T. Dickson Distinguished University Professor of Technology Management in the College of Management.

Rappa and Williams collaborate on open source software research. More about their work is available online at http://openseminar.org/. About five computer science students also presented posters at the event.

Also participating were universities in Virginia, Maryland, South Carolina and Florida plus IBM technologists. The event was sponsored by the IBM RTP Center for Advanced Studies.

Corporate involvement brings real-world perspective

Corporate-academic interaction helps advance knowledge through sponsored research. It also strengthens the learning experience for computer science students through informal presentations as well as hands-on learning opportunities, including sponsored projects, internships and co-ops.

Numerous opportunities exist for companies to interact with students, including sponsoring Senior Design Center projects or presenting in classrooms and at student organization meetings.

On-campus presentations typically last from 30 to 45 minutes, covering technical and other topics relevant to computer science students, followed by a question and answer session.

Corporate leaders interested in discussing project sponsorship or speaking opportunities are invited to contact Ken Tate, director of development and external relations for the computer science department, by email at tate@csc.ncsu.edu or phone at 919-513-4292.

New online job board puts students-employers in touch

The computer science department has recently enhanced its online job board, providing a convenient place for employers to post full and part time opportunities targeted to computer science students.

Employers are welcome to post positions using the new easy-to-use interface at the department's online Career Services Center: http://www.csc.ncsu.edu/corporate_relations/career_center.php.

Antón in DSSG

Continued from page 1

Defense, the program acknowledges the fundamental role that technological advantage has in assuring U.S. national security, according to the department's website. It is part of the sponsoring agencies' efforts to keep pace with the nation's rapidly evolving technology and defense needs.

The DSSG selects young professors from many of the nation's top universities as well as non-university affiliated men and women – all nominated by senior academic officials – and other officials from various government agencies to take part in DSSG. Over the course of the two-year program, participants focus on defense policy, related research and development, and the systems, missions, and operations of the armed forces.

During the course of eight sessions – a total of 22 days per year over a two-year period – the DSSG members take to the road as they immerse themselves in the issues and policies related to national security. They interact with top-level officials from the Defense Department, as well as senior officials of other government organizations such as the Department of Energy, various intelligence agencies, and Congress.

Annie Antón after completing her paragrapoper exercise

Visits to military bases throughout the United States provide members with a unique perspective of operating forces and allow program members to meet with senior commanders as well as enlisted men and women. Tours of defense laboratories and industrial facilities provide further insight into research, development and manufacturing technologies.

"This year, we each are working on a project that in some way helps the Department of Defense, for example, by applying our research to a challenging engineering or science problem," Antón says. The participants will also each write "a think piece" summarizing their project.

"Papers written by the participants as a result of their research are distributed widely within the Department of Defense," Gould says. "A few have even been briefed to the staff of the President's National Security Council."

Faculty, students present research at broadband, security conferences

Computer science faculty and students participated in the first Annual International Conference on Broadband Networks held in San Jose, Calif., in October. (See details at http://www.broadnets.org.)

This new conference included a Broadband Optical Networking Symposium and a Broadband Wireless Networking Symposium.

Dr. George Rouskas, professor, was a member of the networking symposium's technical program committee, co-chair of its Workshop in Traffic Grooming of WDM Networks, and chair of the Burst and Packet Switching syession. Dr. Rudra Dutta, assistant professor, was chair of the Dynamic Traffic Grooming session.

Doctoral student Bensong Chen received an NSF travel grant that enabled him to present a paper at the Optical Networking symposium's Workshop on Traffic Grooming. The paper was co-authored with Dutta nd Rouskas.

Several other doctoral students also participated in the conference.

The department was also well represented at the International Symposium on Software Reliability Engineering, held in November in France (See details online at http://www.issre.org/2004/.)

Faculty presenters were Dr. Laurie Williams, assistant professor, and Dr. Mladen Vouk, professor.

Several graduate students and one undergraduate student also attended and presented papers at the conference.

These two conferences are just a sampling of faculty members' professional activities. As a group, they published nearly 100 papers and conference presentations, books and book chapters in the past academic year.

For more information about current faculty research, review the department's online summary of funded research at http://www.csc.ncsu.edu/research/faculty_projs/2004.php.

Perros appointed to NLR Network Research Council

New book on networks coming in 2005

Dr. Harry Perros, professor of computer science and program coordinator for the Master of Science in Computer Networks at NC State, has been appointed to the National Lambda Rail (www.nlr.org) Network Research Council (NRL NRC). He also recently completed a new book on networks, to be published in early 2005.

NRL, a major initiative of U.S. research universities and private sector technology companies, provides national scale infrastructure for research and experimentation in networking technologies and applications. NC State is part of the NRL network through a coalition of North Carolina universities represented by Duke University.

In addition to supporting cutting-edge uses of optical networking capabilities in research and education, one of its primary goals is to bring together networking research communities to solve complex challenges of network architecture, end-to-end performance, and scaling. The NLR infrastructure will initially provide four separate 10 gigabit per second wavelengths with provisions to add another 28 to 36 wavelengths as needed to support members' research collaborations.

In his new book, Connection-Oriented Networks: SONET/SDH, ATM, MPLS, Optical Networks, Perros explores connection-oriented packet-switched and circuit-switched networks. Written as a textbook for a second upper level course on computer networks, Perros says it would also be useful for networking engineers in the field.

The first connection-oriented network is probably the familiar and ubiquitous telephone network, he says. This circuit-switched network establishes a connection between the two parties by allocating a channel on each transmission link along the path. The concept of connection, as used in the telephone system, has been emulated for a long time in computer packet-switched networks.

"In this book, we explore two connection-oriented packet-switched networks, ATM networks and Multi-Protocol Label Switched (MPLS) networks. The book also discusses two circuit-switched networks, SONET/SDH and Optical Wavelength-Routing networks.

"We also present a new optical networking scheme, which has not as yet been standardized, known as Optical Burst Switching, which can be seen as lying between packet switching and circuit switching," he says. The book also contains a chapter on access networks, such as ADSL-based networks, cable modems, and ATM passive optical networks, and a chapter on voice over ATM and voice over MPLS.

Speech identification research draws international scholar

What's in a voice? Increasingly, it is being used to help narrow down the list of suspects in forensics cases, says Dr. Robert Rodman, professor of computer science whose research focuses on computer speaker identification and automatic lip synchronization of spontaneously spoken speech.

Rodman compares the use of voice identification to the use of the refractory index of glass in determining the likelihood that glass shards found on a suspect came from a particular crime scene.

"We use likelihood ratios, or what people commonly call 'odds,' to determine the possibility that two different recordings of a voice were made by the same person."

More recently, his research has focused on developing methods for distinguishing mimics from real voices. That research drew the attention of a group of doctoral students working on the same topic in Sweden.

"I got an email from a Swedish woman working on her Ph.D who was studying what was involved in mimicking another voice," Rodman says.

In discussions with the student and her advisor, he learned of another student, Erik Eriksson, who had received an award to study abroad for five months. Eriksson joined Rodman as a visiting scholar earlier this year.

One of their joint projects involved applying the speech identification technology that Rodman and colleagues at NC State have been developing over the past decade to the Swedish language.

Speech identification can be used to identify a person – such as in a criminal trial – or to verify a person's identity, to activate a voice-based command to open a door, for example. Rodman wanted to learn if their method, which uses spectral features to discriminate between speakers, was language-independent.

Results of Eriksson's work on the project, presented at the 17th Swedish Phonetics Conference at Stockholm University last May, show that language is not a factor that affects their method's accuracy. Co-authors on the paper were Luis Cepeda, an NC State computer science doctoral candidate, as well as David McAllister and Donald Bitzer, both NC State computer science professors.

Eriksson also assisted Rodman with a literature search regarding emotion detection, which would be useful in determining changes in the emotional state of an individual participating in computer-based training.

For Derek Meyer,

Computing, piloting skills combine for high-flying career

"It's way cosmic, and very, very complicated." That's how Derek Meyer (B.S. computer science, '79) describes his current consulting project, the F/A-22 Air Combat Simulation being developed by Lockheed Martin in Marietta, GA.

His understanding of computer science gained as an undergraduate student at NC State while on an Air Force ROTC scholarship, coupled with several decades of flying experience that included stints as a fighter pilot and an instructor pilot, prepared him well for his current role.

Meyer credits Dr. Alan Tharp, professor of computer science and one of his undergraduate instructors, for getting him on the right track. "The way he ran his classroom and how he organized things, his methodology – it just clicked with me," Meyer says.

"It helped me do my work (then), and it helped me later on in how to deal with problems, even after leaving graduate school and going into a completely different field. (And) all those things helped me get my job at Lockheed when I left the military service."

Meyer had planned to enter the Air Force after receiving his bachelor's degree in computer science, but a backlog in pilot training at the time postponed the start of his military career. He opted for delaying active duty for a year and headed off to graduate school at the University of Texas at Austin, where he studied electrical engineering.

After completing his master's degree, he started pilot training in the Air Force and launched a military career that included piloting an F-15 Eagle, serving as an instructor pilot and squadron weapons officer, attending the U.S. Air Force Fighter Weapons School, and eventually returning as an instructor. The school combines academics and flying with the latest fighter tactics – a Ph.D. program for fighter pilots, he says.

Meyer's last assignment involved duties at the F-15 test and evaluation squadron and as a core pilot for the F/A-22 Raptor being developed by Lockheed in Marietta, GA.

"I provided advice and really enjoyed the design side," he says.

Meyer in the F/A-22 air combat simulator

This led to Meyer's employment as a staff engineer with Lockheed. He has worked on cockpit design, pilot-vehicle-interface, and assisted the chief pilot in preparation for the Raptor's first flight. During the same period, he was flying F-15s on weekends as a member of Georgia's Air National Guard.

Meyer left the National Guard in the mid-1990s, but has continued flying, now as a pilot for FedEx Express, where he has been working since 1995.

"But in 1997, some of the guys I worked with at Lockheed wanted help with an aircraft design project, so I started there again as a part-time engineering contractor."

Currently, Meyer is a part-time consulting employee for Science Applications International Corporation (SAIC), involved in the operational testing and evaluation of the F/A-22.

He works with the Air Force Operational Test and Evaluation Center (AFOTEC) and Lockheed Martin's F/A-22 Air Combat Simulation (ACS). The ACS features 12 advanced cockpits with 360-degree out-the-window visuals that Meyer describes as "incredible." The ACS allows today's Raptor pilots to fly in dense, advanced threat environments that current airspace and budgets don't allow.

"We have some outstanding software engineers that have helped to make this happen," Meyer says.

Ning Receives NSF Career Award for Sensor Network Security Research

Peng Ning, assistant professor of computer science, recently received a Faculty Early Career Development (Career) Award from the National Science Foundation (NSF), effective July 1, 2005, through June 30, 2010. The NSF will provide $400,000 in funding over the next five years to support Ning's research project entitled, "Career: Towards Trustworthy and Resilient Sensor Networks." NSF Career Awards are one of the highest honors given to young university faculty in science and engineering. The department is now home to 13 NSF Early Career Award winners.

Alumni newlyweds pay tribute to former professor

Jenn Taranto (CEM '00) and Tom Vitolo (CSC '99, AMA '00) got married last June, and they shared their story with all NC State engineering alumni.

They did so because they wanted to spread the word about their matchmaker and catalyst of their present careers.

Although both were students at the same time, they didn't meet until both attended a memorial service for the late Dr. Richard L. (Ric) Porter, who had been assistant dean for academic affairs in the College of Engineering. He was both mentor and friend to both.

Their relationship began as they shared memories after meeting at his memorial service.

Porter passed away unexpectedly in 1999. Taranto and Vitolo, who after nearly four years in the College of Engineering had yet to cross paths, met at Porter's memorial service.

After the service they had coffee together and shared their memories of Porter. They've been sharing coffee, and making their own memories, ever since.

Jackson receives award

Dr. Laura Jackson (Ph.D., '03) received the 2004 Nancy G. Pollock PhD Dissertation Award for the College of Engineering.

The title of her dissertation is: "The Directional p-Median Problem with Applications to Traffic Quantization and Multiprocessor Scheduling." Her advisors were Drs. G. Rouskas and M. Stallmann. She is currently a senior research statistician at the SAS Institute.

Johnson wins award, thanks profs

William Johnson reports that he recently received Booz Allen Hamilton's "Team's Appreciation Award."

In a letter to Carol Miller, computer science instructor, he says:

"I would like to say that I received the award because of the quality of education and guidance that I received from NC State university, which allowed me to provide innovative ideas and solutions to solve complex technological problems .

"You, along with Mr. Lasher, helped shape and mold my intellect. So I have all of you to thank, along with whole computer science department, for this wonderful accomplishment."

Alumni, others join Strategic Advisory Board

Six new members recently joined the computer science department's Strategic Advisory Board (SAB).

The SAB is a cornerstone of the department's strategic planning efforts, providing input and guidance critical to helping shape our future. SAB members meet annually on campus and work as a virtual working team during the year, serving on subcommittees and executive panels.

Starting three-year terms on the board this fall are:

- Richard Conn, university liaison, Microsoft Corporation
- Chris Evans, entrepreneur with The Deepwood Group
- Vivien Joklik, vice president, marketing, John Deere
- Kathy Markham (B.S. '80), vice president, Information Systems, Kindred Healthcare, Inc.
- Rudy Puryear (B.S. '74), director, IT practice, Bain & Co.
- Kristopher Tyra (B.S. '86), co-founder and previous CTO, HiddenMind Technologies.

What are CSC alumni doing now?

About 20 percent of Spring 2004 bachelor's degree recipients went on to graduate school. One of those, Andrea Costellow, is working on her MBA at NC State. A growing number are pursuing graduate studies through computer science's combined Bachelor's/Master's degree program.

Scott Vu (B.S. '04) took a slightly different approach. He was the department's first alumnus to enroll in the university's new biomedical doctoral program.

The department also has tracked nearly 20 of its doctoral graduates.

Two are in postdoctoral fellowships, at SUNY Stony Brook and Carnegie Mellon University.

Seven are in faculty positions at the University of North Carolina-Charlotte, NC State, Bogazici University in Turkey, University of California-Irvine, University of Texas-Arlington, University of Nebraska-Lincoln, and Istanbul University in Turkey.

Others are in research or senior programming positions with SAS Institue, IBM, Livewire Logic, and Avaya Research Laboratories.

Elwood Becton (BS '73) and his wife, Diane, have been active, loyal NC State alumni for three decades. After graduataing, he worked for several years for Southern Bell (now BellSouth), then went on to law school and earned a Master's in public policy sciences from Duke University. He now has a private law practice. Read more online at http://www.csc.ncsu.edu/enews/.

Alumni are encouraged to submit updated information to the department's online alumni directory at http://www.csc.ncsu.edu/alumni/directory.php.

Providing email addresses will ensure receipt of the college's monthly e-newsletter.

Coming Events

April 1

Engineering Open House for prospective students. Stop by Withers Hall for computer science information, 9:00 a.m to 1:00 p.m. For more information call (919) 515-9669.

Nov 6-10

2005 IECON [IEEE Industrial Electronics Society Annual Conference), to be hosted by NC State. IECON'05 is an international conference on industrial applications of electronics, control, robotics, signal processing, computational and artificial intelligence, sensors and actuators, instrumentation electronics, computer networks, internet and multimedia technologies. Details online at Details online at http://www.adac.ncsu.edu/IECON05/index.html.

Anna Rzewnicki, editor
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5,000 copies of this public document were printed at a cost of 4 cents each.

The newsletter was printed with the financial support of Foundry Networks, a Department of Computer Science Super ePartners company.

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Alumni encouraged to stay in touch

Computer Science's online Jobs Board has caught the attention of employers, with more posting their employment opportunities each month. This is just one of the opportunities offered to students and alumni of the department.

"We are always looking for new ways to add value to our students, alumni and friends of the department," says Ken Tate, director of development and external relations.

"We encourage our alumni to stay in touch, so that they can continue to stay informed about the news of the department. We also encourage our alumni to consider opportunities to return to campus and share from their experiences, either through student organization meetings or classroom presentaitons. Such exchanges are extremely valuable for our students."

The department recently launched the electronic CSC eNewsletter, which features research stories, awards, alumni and donor relations news and other news from the department. It is now being distributed to approximately 3,000 alumni, students, faculty, staff, and corporate partners.

Alumni are encouraged to provide their email address at http://www.csc.ncsu.edu/alumni/alumni_update.php, to assure that they are on the distribution list.