Cyber Defense Laboratory Opens on Centennial Campus

Since the terrorist attacks of September 11, the people and government of the United States have intensified their efforts to protect our critical infrastructure. Faculty and students in the Department of Computer Science at North Carolina State University have contributed to that effort with their research in cyber defense. To better support this effort, the department officially opened the Cyber Defense Laboratory on NC State's Centennial Campus on April 24.

The new laboratory will eventually house all faculty and students performing cyber defense research, as well as all necessary equipment. Three computer science faculty members, Professor **Douglas S. Reeves**, Associate Professor **S. Purushothama Iyer** and Assistant Professor **Peng Ning**, and their graduate students recently moved to the new facility. Reeves and Iyer have several projects related to cyber defense, and Ning is a security specialist. Their job is to find ways of keeping computer systems safe from hackers.

Aside from the simple need for more space for students and equipment, there were several reasons for starting up the laboratory. Reeves explained, "Security is a huge priority right now, and there is a great deal of student interest in this type of research." According to Ning, who led the laboratory initiative, housing students and faculty together in one space will promote collaboration and will provide centralized support for faculty who have technical questions regarding security issues.

Ph.D. candidates Kun Sun and Yeon Noh discuss their research projects during the Cyber Defense Lab Opening Ceremony.

The long-term goal of these researchers is to develop techniques to secure computer systems; their short-term goals are related to recent projects on intrusion alert and wireless security. Reeves and Ning currently are working on a series of projects to improve intrusion detection systems for computer networks.

Ning's research in wireless security has special challenges because the technology is relatively new. "We have a fairly good understanding about security issues in a wired network, but the technology of the wireless network creates new challenges," he said. For example, Ning and his graduate student, Kun Sun, are studying possible attacks against mobile ad-hoc routing protocols. Mobile ad-hoc networks have no infrastructure at all. They are completely wireless networks that have possible applications for battlefields and disaster relief. Ning and Sun have identified vulnerabilities, including the manipulation of routing messages, and have simulated attacks to examine their impact.

Iyer, a self-professed "mathematician at heart," approaches cyber defense by analyzing software for computer "bugs." "Any computer system has software, and software has bugs. Hackers can take advantage of that," he said. Typically, these loopholes are unintentional. The programmers did not foresee certain kinds of interactions between users or with other programs. Iyer models various kinds of software to find out what interactions can be

1

THE DEPARTMENTAL CONNECTION

Developing the Technology Paratroopers of the Future

**A Message from Department Head,
Dr. Alan L. Tharp**

An executive member of our Strategic Advisory Board commented recently, "Your graduates are like paratroopers. No matter what situation we drop them into, they perform well." What a tremendous compliment to our department!

This "paratroopers" concept really does speak to the essence of our efforts to develop well-rounded talent. We strive to ensure that our graduates are properly equipped with the skills they need to be successful in today's business climate, not just from a technical perspective, but also from a collaborative and leadership perspective.

This is all well and good, but we must recognize that the same skill set that made yesterday's paratroopers successful will not necessarily meet the challenges of the future business environment. More and more companies are turning to overseas resources for their core software coding and programming needs. While this is not good news for our economy, it does create new opportunities for our graduates as we expect a surge in the demand for highly skilled technical program and project managers.

The paratroopers of the future will be highly skilled in the areas of emerging technologies like Pervasive Computing, Knowledge Management, and Security. They will have exposure to cross and multidisciplinary learning opportunities like our e-commerce initiatives with the College of Management. And they will have opportunities to develop strong teaming, communication, and leadership skills. As an example, with the help of many of our accomplished alumni and business partners, we are initiating a Leadership in Technology course this Fall. We are also exploring ways that we can leverage the success of the Senior Design Center project learning experiences earlier in the curriculum to develop stronger collaboration skills and an appreciation for the end-to-end software development process.

We are very proud to hear that our graduates are thought of in such high regard, and we pledge our commitment to ensuring that our *technology paratroopers* are well prepared to meet the challenges of the future.

As always, this issue of *Connected* is filled with news and information that we trust will make our alumni proud. Your support is greatly appreciated.

Sincerely,

Dr. Alan L. Tharp

LAB, continued from Page 1

anticipated, so he can seal off any possible openings for hackers.

These researchers recognize the difficulty of protecting computer systems from hackers. As Reeves put it, "Unlike most areas of computer science where it's us versus the machine — this is person versus person. It's a very challenging area of research."

Grad Student Presents Security Research to Federal Government Agencies

Jim Yuill, a computer science Ph.D. candidate, is pursuing research focused on computer security investigation and has determined how to apply principles of military battlefield intelligence to the problem of investigating network attacks. In January, Jim had the opportunity to visit the Pentagon and present his research to Dr. Litton Wells, the Deputy Assistant Secretary for Military Intelligence. During his visit to Washington, D.C., Jim also had the honor of sharing his research with the Department of Defense's Computer Forensics Lab.

Jim is also actively researching the use of deception in computer security in conjunction with Dr. Bowyer Bell, a political science professor at Columbia University.

Jim would like to thank Marine Corps Colonel G. I. Wilson and his advisor, Dr. Annie Anton, for the support of his research.

NC State Students' Business Reaches Sales & Service Agreement

Liquid Communication Systems, LLC, a company founded and run by NC State students, recently announced that they have reached a sales and services agreement with GlobalChat covering Liquid Communication Systems' Effusia Business Messenger software.

Hayes Davis, **George Peterson**, and **Jared Hodak**, all computer science majors, created their instant messaging idea along with **Forrest Samuels**, an electrical and computer engineering major. They developed their product during their sophomore year when they shared a dorm suite in Sullivan Hall on NC State's historic campus. **Jen Deering**, a graduate student in communication, serves as the company's marketing director.

Their company, based in Raleigh, launched its first product, the Effusia Business Messenger, in 2002 and released version 1.2 in January 2003. Effusia is a secure internal messaging system enabling small to medium enterprises to manage presence-enhanced communication.

GlobalChat will begin offering Effusia as part of its online collaboration solutions to small and mid-sized businesses. GlobalChat, a privately held company based near Research Triangle Park, NC, provides online collaboration solutions to clients including Nike, Globo.com, WB Network, Accenture, H&R Block, MCI Worldcom, Northrop Grumman, Rodale, E.W. Scripps, and NASA.

"In today's security conscious, competitive world, business executives and network administrators are right to prohibit their employees from discussing business on unsecured, public IM systems. But instant messages increasingly serve a critical role for internal communication," said Hayes Davis, president and CEO of Liquid Communication Systems.

Effusia Business Messenger 1.2 is available immediately from GlobalChat. Effusia is supported on Windows 9x, NT 4, 2000, and XP, and on most Linux platforms. More information is available at www.liquidcs.com

Did You Know?

NC State Computer Science will have a new home in 2005, a $41 million, 100,000 square foot, state-of-the-art teaching and research facility on Centennial Campus.

Department Hosts High School Programming Competition

The department hosted its first annual Triangle High School Programming Competition (THSPC) on March 1, 2003. THSPC was designed to recognize excellence in programming at the high school level and encourage interest in computer science as a major at the university level. Approximately 25 area high school students competed in programming teams of up to three people to solve a series of programming problems.

In the advanced category of 11th and 12th graders, Leesville High School from Raleigh, NC won both first and second place. Thomas Mason, Kenny Wyman and Andy Chen placed first and Jeremy Roszko and Sasha Sobran earned second place.

Many thanks to **Apple Computer** for providing equipment loans and funding for this competition.

Did You Know?

The most recent incoming freshman class for the NC State Department of Computer Science was our best ever with an average weighted GPA of 4.13 and an average SAT score of 1250.

"Women In Computer Science" Program To Support Summer Outreach

The Women in Computer Science (WICS) program is reflecting upon a successful first year that has seen the rise of new leadership as well as several opportunities for networking and professional development. Most recently, the WICS organization has volunteered to assist with the development of a camp curriculum for the College of Engineering's Summer Outreach Program in Computer Science. These summer workshops are designed for high school students interested in pursuing education and careers in computing.

To date, the WICS program has received approximately $7,000 in sponsorship funding from Super ePartners: **Cisco**, **EMC**, **Foundry Networks**, **John Deere**, **Intel**, **Sas, Network Appliance**, and **Progress Energy**, and from Corporate Friends: **Apple, Lucent Technologies and Hewlett Packard**. Sponsor funding assists

Susan Irlbeck, WICS Publicity Chair, designs a flyer for an upcoming event.

the students in hosting development workshops, providing course materials for the summer programs, and promoting the mission of the WICS organization through outreach. For more information, about this program or to become a sponsor, please contact Jill Koethcke, Director of Public Relations & Program Development for NC State Computer Science at (919) 513-2985 or koethcke@csc.ncsu.edu

NC State ACM/AITP Chapter Hosts Annual Pig Pickin'

NC State's chapter of ACM/AITP hosted their annual Pig Pickin' on May 2. Faculty, staff and students enjoyed an opportunity to relax, socialize and share barbeque at Raleigh's Pullen Park. The highlight of the event was a pie-in-the-face activity where students had the opportunity to throw pies at three of their favorite undergraduate lecturers, including Martin Dulburg, Carol Miller and Dana Lasher.

Many thanks to **Cisco Systems** and **Hewlett Packard** for sponsoring this popular event for our department.

Dana Lasher, Director of Student Services, recovers from a pie in the face during the Pig Pickin'.

THE STUDENT CONNECTION

Computer Science Undergrad Receives Cisco Scholarship

Congratulations to CSC undergraduate, **Neha Jain**, for being selected as one of four nationwide recipients of a Systems Information Assurance Scholarship. These highly competitive awards are valued at $2,500 and provided to students who are making a significant contribution in the field of Information Security. The awards are provided by **Cisco's Critical Infrastructure Assurance Group**.

Students Attend Apple Conference

Four students at NC State University won scholarships to attend Apple's World Wide Developer's Conference: **Joel Williams**, a junior in computer science; **Zane Purvis**, a graduate student in computer engineering; **Doug Steigerwald**, a junior in computer engineering; and **Hua Ying Ling**, a computer engineering graduate and current student in the Post-Baccalaureate Studies Program. The conference will be held in San Francisco in June. Each award was valued at $1,300.

Ph.D. Students Rank #10 in Forensics Challenge

Jim Yuill recently teamed with fellow computer science Ph.D. candidate, **Joe Sremack**, to earn a #10 ranking in the Forensics Challenge, sponsored by the Digital Forensic Research Workshop at honeynet.org. This competition received over 90 submissions.

CSC Student Receives Honorable Mention from CRA

Congratulations to **Phillipe Loher** who received honorable mention from the Computing Research Association (CRA) during their Outstanding Undergraduate Awards competition for 2003. Phillipe created a system that can run from start to finish to create high quality lip-synchronization. He developed three-dimentional facial animation that was able to mimic audio recordings. This technology can assist with voice-recognition and speaker identification and can be used in helping the hearing impaired or for use in the production of movies or animation.

Phillipe graduated in December 2002 and has moved to Massachusetts where he works as a software developer for IBM. He hopes to pursue his master's degree in the near future.

Posters & Pies Event Largest Ever

The Department of Computer Science Senior Design Center held its bi-annual Posters & Pies event on May 1 in Withers Hall. This event, which showcased 19 student team projects, attracted over 275 attendees. At the conclusion of the presentations, visitors enjoyed pizza and dessert pies as they viewed more in-depth demonstrations from the students.

The next Posters & Pies event is scheduled for Wednesday, December 3, 2003. For more information about sponsoring a Senior Design Center project, please contact **Dr. Robert Fornaro**, Director of the Senior Design Center, at (919) 515-7848 or **Ken Tate**, Director of the ePartners Program, at (919) 513-4292.

Did You Know?

The NC State Department of Computer Science was founded in 1967 in the College of Physical and Mathematical Sciences (PAMS). In 1988, the Department was realigned under the College of Engineering.

THE FACULTY CONNECTION

Our Award-Winning Faculty & Staff

Carol Holloman receives the College of Engineering Award for Excellence from Dean Nino Masnari.

Carol Holloman, our Departmental Bookkeeper, was recently chosen as one of two recipients of the 2003 Award for Excellence through the NC State College of Engineering. Carol and our own **Gary Stelling**, Manager of Technical Support, were among the eight individuals nominated for this prestigious award. College of Engineering winners will be nominated for the university-level Award for Excellence.

Gary Stelling, Manager of Technical Support, **Carol Holloman**, Departmental Bookkeeper, and **Dr. Annie Antón**, Assistant Professor of Computer Science, have all received the College of Engineering's Pride of the Wolfpack Award. Sponsored by university retirement program TIAA-CREF, the award is given to NC State employees to recognize their contributions of leadership, university community service and exceptional service to the college or unit.

Christopher Healey, Assistant Professor of Computer Science, was recently named to the North Carolina State University Academy of Outstanding Teachers.

George Rouskas, Professor of Computer Science, received the Alumni Association Outstanding Research Award for 2002-2003. This is one of the highest honors that a faculty member can receive at NC State.

Injong Rhee, Associate Professor of Computer Science, was awarded US Patent # 6,421,387 B1 for Methods and Systems for Forward Error Correction Based Loss Recovery for Interactive Video Transmission. He was recognized at the NC State Inventors Lunch on April 30th for his accomplishment.

Mueller Receives Prestigious NSF CAREER Award

Dr. Frank Mueller, Assistant Professor of Computer Science, recently received an NSF CAREER Award. This prestigious award is one of the highest honors given by NSF to university faculty in science and engineering. Each grant is for $400,000 and runs for five years. Mueller will use the award to support his research project entitled, "Exploiting Binary Rewriting to Analyze and Alleviate Memory Bottlenecks for Scientific Applications." With the addition of Dr. Mueller, the department now has an unprecedented 10 award recipients on faculty.

Computer Science Welcomes New Professor

Dr. Freeh and his youngest daughter, Bridget.

Dr. Vincent W. Freeh recently joined our department as an Assistant Professor in the area of operating systems. Freeh is the recipient of an NSF Career Award and an IBM Faculty Development Award.

His general research interests include operating systems, compilers, and programming languages. He is especially interested in how these topics relate to distributed and parallel computing. Freeh co-developed parasitic computing and has most recently become involved in power-aware computing. His office is located on NC State's Centennial Campus.

Freeh earned his undergraduate degree in engineering mathematics, his M.S. in computer science and his doctorate in computer science, all from the University of Arizona. Freeh was an assistant professor of computer science and engineering at the University of Notre Dame for seven years prior to joining NC State Computer Science. He lives in Holly Springs, NC with his wife, Jennifer, and their three children: Danielle, Nicholas, and Bridget.

THE FACULTY CONNECTION

Chou Retires After 27 Years With NC State Computer Science

After providing 27 years of excellent service to NC State, **Dr. Wushow (Bill) Chou**, will retire in May 2003. When Dr. Chou joined our department in 1976, he was the youngest full professor and program director in our department.

His well-published research includes a focus on software development, computer networking, web-based learning, network optimization, and computer communications, particularly in the evaluation of protocol procedures, analyzing response time and throughput in computer communications systems.

In addition to his teaching and research, Dr. Chou has made several significant contributions to NC State. He founded the Computer Studies Program, an interdisciplinary graduate program concentrating on computing. He also developed graduate programs for both computer science and computer engineering, initiated computer networking research and curriculum, and facilitated collaboration between computer science and computer engineering faculty. Dr. Robert Funderlic, professor of Computer Science and former Department Head,

said "Wushow Chou has been a true leader in our department and we owe him considerably for the development and growth of computer science and computer engineering at NC State."

As the first Chief Information Officer for the U.S. Department of the Treasury from 1994 to 1997, Dr. Chou oversaw all information systems, managed a $1.5 billion annual budget, and supervised 130 government staff and 400 contracting staff. He has additionally held executive consulting positions for over 30 organizations and has served as Chairperson for several Federal Government committees on information technology. During his tenure at NC State, Dr. Chou has chaired numerous conferences and seminars. He has also served as Editor-In-Chief for *IT Professional Magazine* and the *Journal of Telecommunications Networks*. He was selected as an IEEE Fellow in 1986, and has been listed in *Who's Who in America* and *Who's Who in the World*.

Dr. Chou earned his Ph.D. in electrical engineering and computer science from the University of California at Berkeley in 1968. He earned his M.S. from the University of New Mexico in 1965 and his B.S. from National Cheng Kung University in Taiwan in 1961. He lives with his wife, Lena, and has two sons, Wesley and Warren, both of whom work in the computer industry. His hobbies include traveling, photography and ballroom dancing.

The department would like to thank Dr. Chou for the numerous contributions he has made to NC State and we wish him the best for his upcoming retirement.

Dr. KC Tai Memorial Fund
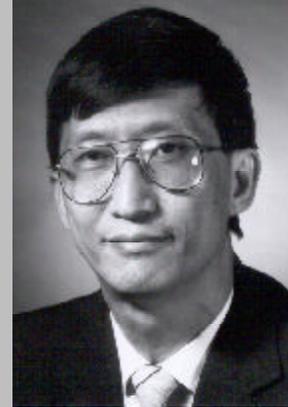
Through the generous contributions of relatives, friends, colleagues, and former students, the "**Dr. KC Tai** Memorial Fund" has now grown to approximately $11,000. A minimum of $15,000 is required to establish a permanent "named" scholarship endowment.

If you would like to contribute to this effort, please make your check payable to the "NC State Engineering Foundation Inc." and send it to Ken Tate, NC State Department of Computer Science, Campus Box 8206, Raleigh, NC 27695

Did You Know?

The National Science Foundation has honored ten current NC State Computer Science faculty with the prestigious CAREER Award.

Computer Gaming More Than Child's Play

From heroic epics of old to this winter's blockbuster movies, everyone loves a story. How we experience and enjoy stories, or narratives, has a lot to do with our own cognitive processes and how we understand the physical and social rules at work in the world around us. According to **Dr. R. Michael Young**, Assistant Professor of Computer Science at NC State University, computers can contribute to the process of helping people understand narratives and social context.

Young directs the Liquid Narrative research group, a collection of collaborating professors, graduate students and undergraduates working to apply artificial intelligence (AI) computer programs to the construction of interactive narratives. "My research has to do with putting AI behind the scenes of a computer game or a virtual world, so that the interaction inside that world is different, more engaging, more compelling than it would be without the behind-the-scenes tools," he said. This increased level of engagement, in turn, yields a higher level of comprehension of the narrative by people playing a computer game or experiencing a virtual world in an educational setting. By creating types of interactions that are more readily understandable, Young and his research team hope to use AI to study cognitive models of comprehension traditionally examined in disciplines such as linguistics, narrative theory and psychology.

For example, online subscription games services such as Everquest or Asheron's Call, known as Massively Multiplayer Online Games (MMOGs), provide tens of thousands of people with an opportunity to interact with other computer game players around the world. Because players can log in and out of the action, they may miss important events; Young is developing programs that can spin a story-like summary of the action that occurred while the player was absent based on the program's ability to understand story structure. Typically computers can provide a transcript but not a summary. "Our computer models of storytelling employ abstraction — selecting what elements to leave in or take out to summarize the story," said Young. Just as cinematographers choose appropriate scenes for a movie to convey the plot to the viewer, Young's computer models translate cognitive theory into programs that can automatically select elements of the action to summarize.

Arnav Jhala, a Computer Science Masters Student, suits up for his research on 3D camera control in virtual worlds with help from undergraduate student, Spencer Reynolds.

Although the overall goal of Young's research is to create computational theories describing how people and computers interact, the practical applications of the research are many. Teaching students about social dynamics is one of the educational applications. For example, Young has created a virtual world set in the great hall of a thirteenth century castle. Young's computer programs can create a story in this world tailored to a student's interests in and knowledge of history, and students can observe and understand the social rules that operated in that world as they work through the narrative. The story can be complete or it can contain gaps that the student can fill in by controlling one of the story's characters. According to Young, "Rather than just being a passive observer, players use their cognitive processes to recognize opportunities for their own action. They see how the world around them works, formulate theories about it, then test those theories out by actually stepping into the story, trying actions and seeing if their theories are right or wrong."

Another educational program under development in the Liquid Narrative group is a virtual tour of the Monterey Bay Aquarium, a large, public marine science education center located in California. In this system, the AI program controlling the simulation can tailor the actions of each character in the environment so that the visitor will experience or observe events based on his or her interests. In the virtual tour, the system will make certain that a visitor interested in sea otters, for instance, will view a mother otter feeding her children in one of the large habitats, whereas a visitor to the actual aquarium might not see this event in many visits.

In addition to educational applications, Young's work shows promise for the computer gaming industry, which generates more than $6 billion in sales per year. Using computer models of narrative comprehension, Young hopes to merge storytelling techniques developed for the film industry with computer gaming. Traditionally, film industry designers have understood how to tell a story but have had little experience incorporating

8

THE FACULTY CONNECTION

Bitzer Receives 2003 Outstanding Alumnus Award from the University of Illinois

Dr. Don Bitzer, professor of computer science, was recently chosen as the 2003 College of Engineering Outstanding Alumnus at the University of Illinois at Urbana-Champaign by Tau Beta Pi, a national engineering honor society. This award recognizes Dr. Bitzer's acheivements as a co-inventor of the flat plasma display panel and the other numerous contributions he has made to the engineering profession.

Other recipients of this award include Nobel Prize winner Jack Kilby, Japan Prize recipient Nick Holonyak, Jr., and molecular beam epitaxy developer Alfred Cho.

Dr. Don Bitzer, Professor of Computer Science

Faculty Promotion & Tenure Announcements

Tenure and/or promotion decisions have been approved at the university level and forwarded to the Board of Trustees for approval for the following faculty: **Dr. Annie I. Antón** and **Dr. Christopher Healey**, promoted to Associate Professor with Permanent Tenure; **Dr. Purush Iyer** and **Dr. Munindar Singh**, promoted to Full Professor; and **Dr. David Thuente**, granted permanent tenure as Associate Professor.

If approved by the board of trustees, these new appointments will take effect August 16, 2003. Congratulations to all these faculty members for their outstanding achievements!

New Director of Graduate Programs

Effective May 16, 2003, **Dr. Ed Davis** will be stepping down as Director of Graduate Programs for the department. We would like to commend Dr. Davis for the outstanding job he has done in this role during a period of phenomenal growth and change. During his 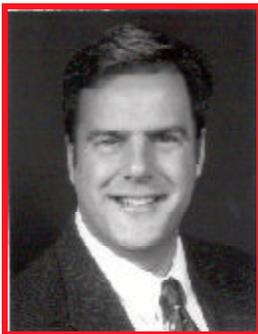tenure as Director of Graduate Programs, the Graduate Program has grown considerably. The number of graduate students has increased from 175 to 339, and a new distance MCS program has been implemented. **Dr. David Thuente**, who is currently serving as Associate Department Head, will assume the role of Director of Graduate Programs at the end of this academic year.

GAMING, continued from Page 8

Dr. R. Michael Young, Assistant Professor of Computer Science

interactive elements. For computer gaming designers, the reverse is true. "We hope to merge these two approaches to create games more like films but that retain the very interactive flow typical of today's computer games," said Young. "Action-oriented experiences make a game entertaining, but we hope to improve both the action and the story line using AI."

Future computer game players may be able to have their computers create alternative endings to the stories that they play through, much like the create-your-own-story books for children that currently exist. Seeing how the different endings play out makes the game more entertaining, increases interactivity and improves cognitive development for the player. Increased understanding of social context is a traditional benefit of storytelling that has found application in the computer age through Young's work.

9

THE RESEARCH CONNECTION

Williams, Vouk Receive IBM Eclipse Innovation Award

Dr. Laurie A. Williams, assistant professor of computer science, and **Dr. Mladen A. Vouk**, professor of computer science, associate vice provost for Information Technology, and technical director of the Center for Advanced Computing and Communications (CACC) at NC State, have received an IBM Eclipse Innovation Award for their project "Good Enough Reliability Tool." The project, which is an extension of the work of computer science graduate student **Lili Wang**, will be continued in her memory. The award is for $28,000.

Williams and Vouk will use Eclipse, IBM's open source development environment, to create a reliability test for Extreme Programming, a software development process.

Phase 3 of Jumpstart Project Receives $1.3M in Funding

Congratulations to **Dr. George Rouskas** and **Dr. Harry Perros** for having their joint proposal with the MCNC funded for $1.3M from the Intelligence Technology Innovation Center for the third phase of the Jumpstart project. The new award will run from January 2003 to December 2004, and brings the total funding to date to $3.3M.

The first two phases of the Jumpstart project involved the definition, specification, performance evaluation, implementation (in the ATDNet optical network test bed in Washington, DC), and testing of a Just-In-Time signaling protocol for optical burst switched networks.

The third phase extends the scope of the project to include the specification of a novel architecture for routing and multicast in optical burst switched networks, as well as the development, evaluation, and implementation of new routing algorithms that take into account physical constraints imposed by the optical layer.

Antón Named To Microsoft University Relations Board

Congratulations to **Dr. Annie Antón**, Assistant Professor of Software Engineering, for being named to the Microsoft Research University Relations Faculty Advisory Board. Other schools with representation on the board include the University of California, Berkeley, University of Utah, University of Maryland, Indiana University, Arizona State, Yale, Columbia, and Carnegie Mellon.

Rodman's Published Term Enters Oxford English Dictionary

The Oxford English Dictionary recently honored **Dr. Robert D. Rodman**, professor of computer science at NC State University, by giving him the first citation in the definition of a new entry called "Montague grammar."

According to the dictionary entry, Montague grammar is "a linguistic theory which maintains that a grammar is built up from individual syntactic units, each of which has a corresponding semantic unit." The dictionary adds that the term also is "a description of the grammar of a language in terms of this theory." Rodman published the first occurrence of the term in "Papers in Montague Grammar" in 1972. Rodman joined the College of Engineering in 1978. Author of books on linguistics, voice recognition and computer speech technology, his research interests include computer speaker identification and automatic lip synchronization of spontaneously spoken speech. He earned his bachelor's degree in mathematics in 1961, his masters in mathematics in 1965, his masters in linguistics in 1971 and his doctorate in linguistics in 1973, all from the University of California at Los Angeles.

THE INDUSTRY CONNECTION

Apple's Steve Wozniak Visits NC State

Steve Wozniak, co-founder of Apple Computer, the inventor of the Apple I and Apple II computers, and a pioneer of the personal computer industry, spoke to NC State students, faculty and staff when he visited campus at the end of April. PackMUG, the North Carolina State University Macintosh Users Group, hosted the event where NC State Chancellor **Dr. Marye Anne Fox** delivered welcoming remarks.

Wozniak preceded the event with a campus tour and emerging technology roundtable discussions which included students from the Center for Robotics and Intelligence Machines, Engineering Entrepreneurs, Embedded Systems, Accelerated Undergraduate Research in Computer Science, and Centaur Labs. Apple Computers sponsored the event admission for over 600 students, faculty, and staff representing eight universities in North Carolina.

Julie Starr (M.S. 2000) hosted an after-party at her home for Steve Wozniak and several Computer Science faculty, staff and students.

(pictured from left to right) Mladen Vouk, John Streck, Steve Wozniak, Radhika Bhandarkar, Chintan Desai, Lee Graham, and Andy Barnes (kneeling) during a tour of the Centaur Lab on NC State's Centennial Campus.

Senior Design Benefits Both Students & Industry

The faculty and staff of the Senior Design Center help prepare students for professional life by creating an on-campus environment in which students can develop the writing, speaking, interpersonal and project management skills necessary for a successful future.

Each semester, teams of students in Senior Design (CSC 492) apply their technical skills to real-world projects sponsored by local organizations. These software development projects benefit both students and industry.

The **John Deere Corporation**, a longtime supporter of Senior Design, sponsored two projects this Spring semester. One of these projects allowed students to develop John Deere's Web Auction, which permits employees to bid on surplus equipment or company sponsored giveaways. Proceeds from these auctions are donated to various charities.

Four Computer Science seniors, **Susan Irlbeck**, **Leigh Barr**, **Joe Bergmark** and **Chris Spohr**, worked together to create a new version of the web auction in Java. This new application will give John Deere the ability to modify and further improve upon their application. Team member Susan Irlbeck said, "Our sponsors gave us great support, provided us with example code, and made their expectations clear from the beginning. As a result, our team really came together and we were able to deliver a great product to John Deere."

For more information about sponsoring a Senior Design Center project, please contact **Dr. Robert Fornaro,** Director of the Senior Design Center, at (919) 515-7848 or **Ken Tate**, Director of the ePartners Program, at (919) 513-4292.

Strategic Advisory Board Update

For many years, the department has received valuable direction and guidance from executives comprising our Industrial Advisory Council. In a bold effort to recognize the strategic nature of their work and to provide the flexibility for new membership options, the group recently approved the change of its name to the **Strategic Advisory Board**.

When the group met in Raleigh in October 2002, members expressed a strong desire to work with the department throughout the year. Subsequently, committees have been created to work on membership, corporate & alumni development, and departmental branding & positioning recommendations. **Keith Collins** (B.S. 1982), Chief Technology Officer for SAS Institute, has been appointed the chairperson for the board. Their next group meeting is planned for October 16, 2003 in Raleigh.

THE ePARTNERS CONNECTION

e PARTNERS

Our ePartners Program continues to experience strong growth. We welcome **Foundry Networks** as a new Super ePartner and **Epic Games** and **Shark Technology** as new ePartners. We are also pleased to announce that long-time supporter, **SAS Institute**, recently upgraded its membership to the Super ePartner level.

The unrestricted funding provided by our ePartners allows our department to continue to grow in emerging areas of computer science technology while providing the highest quality education for our students. This has especially been true during the state's prolonged budget crisis. The availability of unrestricted funds provided from our ePartners has played an instrumental role in the recruitment and relocation of several key faculty additions and the launch of several strategic programs such as our Women in Computer Science (WICS) initiative.

To all of our corporate partners, thank you so much for your continued support.

What Is "ePartners?"

Launched in the fall of 2000, the ePartners Program provides a formal and structured framework for fostering collaboration between the business community and NC State's Department of Computer Science. The program provides its growing list of corporate partners an extensive portfolio of benefits including:

• Exclusive recruiting events and online tools
• Access to news from NC State, the College of Engineering, and the Department of Computer Science
• Recognition & exposure through targeted communications to students, faculty, alumni, and leaders in the business community

• Invitations to special events, seminars, lectures & forums
• Opportunity to interact with and engage our dynamic faculty on industry/technology trends and leading-edge research
• Priority naming rights for new Computer Science Facilities
• Sponsorship of high-profile departmental activities & events
• Sponsorship of Senior Design Center projects
• Charitable tax benefits

For more information about NC State's ePartners Program, visit the program web site at www.epartners.ncsu.edu or call **Ken Tate**, Director of the ePartners Program, at (919) 513-4292.

Additional articles and information are available on the ePartners web site at:

http://epartners.ncsu.edu

SUPER ePARTNERS

Cisco Systems

EMC

Foundry Networks

Intel

John Deere

Network Appliance

Progress Energy

SAS

ePARTNERS

Computer Service Partners

Connectix

Duke Energy

Epic Games

HiddenMind

Integrated Industrial Information

Lulu Press

Red Hat

Shark Technology

Recent Corporate Contributions

Also providing significant tangible support to the department are our "Corporate Friends," or any business entity providing the department targeted support of any kind (scholarships, gifts-in-kind such as equipment or software, sponsorship of a Senior Design Center project, faculty endowment support, research grants, etc.) with a value of $1,000 or more. Corporations providing targeted gifts recently include:

Apple Computer provided financial and equipment support in sponsorship of both the Women in Computer Science (WICS) program and the Triangle High School Programming Competition (THSPC) valued at $1,000.

Super ePartner, **Cisco Systems** has donated two intrusion detection appliances valued at over $17,500 to Dr. Peng Ning to support his security research.

ABB Inc. provided an unrestricted gift of $12,500 toward a total pledge of $25,000 to support the research of Drs. Laurie Williams and Annie Antón.

Super ePartner, **Intel Corporation**, provided financial sponsorship of the Women in Computer Science initiative, three PC systems to support classroom technology needs valued at approximately $6,750, and $1,800 to sponsor WICS' efforts to support the College of Engineering's Summer Outreach Program.

Microsoft and **Cisco Systems** each provided $2,000 sponsorships for the Symposium on Requirements Engineering for Information Security (SREIS 2002) co-hosted by our department here in Raleigh.

Dell USA provided a $5,000 unrestricted gift to support the CS Enhancement Fund.

Lucent Technologies provided unrestricted funding and a sponsorship of the WICS program valued at $2,500.

GlaxoSmithKline provided $44,044 in graduate assistance funding.

Southpoint Partners donated two Bluetooth Network Nodes valued at $1,300. The equipment is targeted for integration in Senior Design Center applications.

Borland Software donated approximately 350 Java related textbooks co-written by TogetherSoft founder Peter Coad, valued at over $20,000. Most of the books were distributed to unemployed high-tech workers at the recent TechEngage Conference.

**MATRIX Resources** donated $500 for scholarship funding.

OnWired donated web development and graphics support to the ePartners Program valued at over $1,000.

Mitsubishi Electric Research Laboratories (MERL) donated DiamondTouch (a simultaneous multi-user touch input device) hardware and software to the department valued at approximately $5,000.

Microsoft recently donated equipment (several new Tablet PCs & PDAs) and financial support valued at over $43,000.

Bally Refrigerated Boxes became a new Senior Design Center project sponsor. In total, 19 project teams were sponsored this spring by many of our ePartners and repeat sponsors including **Network Appliance**, **EMC**, **John Deere**, **Intel**, **I-Cubed**, **Fujitsu**, **Duke Energy**, and **Red Hat**. Each project sponsorship is valued at $5,000.
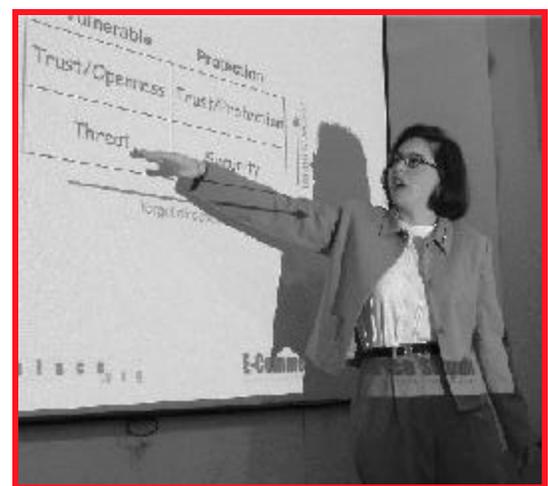
Dr. Annie Antón delivers an overview on "Privacy Policies" to the staff at I-Cubed during a recent lunch-time learning session. Such interactive presentations have proven to be valuable sources of information exchange between ePartners and faculty."

13

Alumni Acheiver: David Porter, B.S. 1974

Recent military engagements by the US in Iraq and Afghanistan have demonstrated first-hand the time and logistics required to move the massive quantities of troops and equipment around the globe, just to be in a position to strike a "target of opportunity". With today's advances in technology, is this really necessary? Is it possible that such targets could be struck with weapons launched here in the mainland US? Could this be done with precision on a relatively small moving target half-way around the world?

These are the questions **David Porter** and his team strive to answer everyday. Porter, who graduated from NC State University with a BS in Computer Science in 1974, is the Manager of the Missiles & Space Battle Laboratory at Lockheed Martin Space Systems Company in Sunnyvale, CA. The work he does there is of vital importance to our nation's defense.

Located in a secure area, deep in one of Lockheed Martin's Silicon Valley facilities, the Missiles & Space Battle Laboratory can best be described as a high tech, simulation based acquisition laboratory, designed to provide US Defense Department and key government decision makers a realistic view of weapons and defensive systems. This virtual battlefield employs simulations using the DIS (distributed interactive simulation) and HLA (high level architecture) standards. As an example of the types of simulations Porter's team delivers, one of their most recent projects uses high-end, game-like virtual reality animation to demonstrate the feasibility of delivering precision guided attacks anywhere in the world in a matter of minutes. Is it possible? Yes, but Porter's simulation indicates many challenges would need to be addressed. For instance: How would you communicate with this swiftly moving attack to ensure that the desired target is struck if the target is also moving? How would you coordinate with other countries where the attack would pass through or pass over in this very short time span? How can the transient effects or debris that current technologies leave behind be safely managed in this time span? These are all things the decision makers must consider before they build such a system.

The simulations take concepts and blend them with actual systems throughout the design process. This constantly helps decision makers determine if this component achieves the result they desire within the full system of systems. Only after a system has been proven successful in this simulation environment does it stand a chance of being fully funded and developed. It is a process that takes years, but it puts Porter on the front end of tomorrow's defense technology.

During his senior year, NC State won their first National Championship in basketball, but Porter says he paid no attention to sports at all. Porter recalls, "I vaguely remember that we were champions at basketball, only because I won a date with a young lady by betting on State to win a game in overtime. I do, however, have fond memories of being 1/2 hour late for my German final exam because I was having too much fun "testing" the space battle simulation for Dr. Skinner's class!" He remembers the focus on projects in our curriculum and says that is a real advantage over other more theoretical based schools. He claims he wasn't the best student and even negotiated a special project to gain his degree. Ironically, he has risen to one of the most important roles imaginable in terms of helping defend our country's freedom in the future.

David lives in Mountain View, CA, with his wife, Sue Lindner, and son, Cameron. His daughter, "K-", lives nearby. David and Sue enjoy playing, singing, and dancing to both Celtic and Balkan music. They also enjoy genealogy and outdoor activities.

A flight simulation taking place at Lockheed Martin's Missiles & Space Battle Laboratory in Sunnyvale, CA

THE ALUMNI CONNECTION

Marshall Brain Returns To Computer Science

The department would like to welcome **Marshall Brain** (M.S., 1989) back to the department as a part-time visiting lecturer and assistant to the Department Head. Marshall's primary responsibility will be to lead the Scheduling Committee which will replace David Thuente in optimizing the course scheduling for the department. In addition to scheduling, Marshall will also assist in enhancing the undergraduate program. Marshall is the founder of the How Stuff Works web site. He also has served as a teacher in the department and is a member of the North Carolina State University's Academy of Outstanding Teachers.

C. J. Saretto featured in Newsweek article

The February 24 edition of Newsweek featured a new Microsoft product created by a team of young developers including our own **C. J. Saretto** (B.S. 2000, M.S. 2001).

C. J. was recruited by Microsoft to serve on a software team comprised of recent graduates from Harvard, Princeton, and other schools. This team of young developers put their creativity to the test and eventually spawned Threedegrees, an application that allows users to communicate with one another in a virtual environment where they can chat, share music legally, and play games. The product targets the young tech saavy generation, the "NetGen" crowd, and appeals to their unique interests as lifelong internet users.

Threedegrees was first launched on Microsoft's internal website, much to the delight of many Redmond, WA employees. Threedegrees is currently available for free at threedegrees.com.

Suzanne Gordon Honored as One of 2003's Top 100 IT Leaders

Suzanne Gordon (B.S. 1975) vice president of information technology at SAS Institute, was recently recognized by Computerworld, IDG's weekly newspaper for IT leaders, as one of the business world's Premier 100 IT Leaders. The award honors individuals who have creatively applied technology to execute their organizations' business strategies.

In addition to her B.S. in Computer Science, Suzanne also holds a B.S. in Mathematics (1975) and an M.S. in Statistics (1980) from NC State. She has been extremely involved with the university over the years serving on the Alumni Association Board of Directors, College of Management Board of Directors, and Caldwell Scholarship Committee. In 1999, she was honored as the Distinguished Alumna of the College of Physical and Mathematical Science, and she is currently a member of the NC State Board of Trustees. Gordon has also been actively involved in the Department of Computer Science, where she has been a guest speaker at departmental functions and a strong supporter of women in technology initiatives. Congratulations Suzanne!

Will Bequests: An Easy Planned Gift

Have you ever considered a will bequest to benefit the Department of Computer Science? A will bequest is perhaps the easiest and most cost-efficient way to provide significant future financial support for the department and the students it serves.

A will bequest allows you to maintain control of the assets during your lifetime. You can fully designate how you would like the funds to be used - scholarships, fellowships, support for faculty or research. Perhaps you would like to fund a permanent "named" endowment for the department. Since the principal of such a gift is never spent, an endowment is a gift that will keep on giving forever. What a legacy to provide for future generations of students!

If you are considering a will bequest to the Department of Computer Science or if you have already planned for a future gift to the department in your estate plan, please let us know. We can help you target the gift to your interests and provide you the suggested bequest verbiage.

Making a deferred gift such as a will bequest also qualifies you for membership in the R. Stanhope Pullen Society.

For further information call **Ken Tate**, Director ePartners Program at (919) 513-4292 or **Joan DeBruin**, NC State's Director of Gift Planning at (919) 515-2846.

15

http://www.csc.ncsu.edu

Keep In Touch With Computer Science

The Department of Computer Science would like to have your updated contact information on file so we may **communicate with you electronically** and make sure your *Connected* newsletters are finding their way to your home or office. If you would like, we will share your new address, phone number and email address with the NC State Alumni Association. Also, please let us know what you are now doing!

Please send your updated information to **Jill Koethcke** (koethcke@csc.ncsu.edu) or via postal mail to the Department of Computer Science at the address listed to the right.

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