News & Notes from Sitterson Hall

Issue Twenty-One, Spring 1998

Department of Computer Science
The University of North Carolina at Chapel Hill

In this issue

Chairman's corner

It's a new year, and we have some new and exciting research taking place. **Henry Fuchs**, Federico Gil professor, and **Gregory F. Welch**, research assistant professor, are collaborating with researchers at other universities on a new project on tele-immersion that could change the office of the future. **Stephen M. Pizer**, Kenan professor, and **Elizabeth Bullitt, M.D.** , associate professor of neurosurgery in the Department of Surgery, have been collaborating on a new technique to give neurosurgeons better images of the brain. **Kevin Jeffay**, associate professor, **Don Smith**, research professor, and **Russell M. Taylor, II**, research assistant professor, are collaborating with colleagues in the Department of Physics and Astronomy and in the School of Education in taking the nanoManipulator to a local high school Advanced Placement Biology

class, where students will get first-hand experience manipulating viruses and molecules. For more on these and other projects, see **"Research Highlights"**.

We're also making changes to our facilities and infrastructure. Our new PC lab is now operational. The lab is stocked with 11 of the latest Intel Pentium®II 300s, which are being used by graduate students and advanced undergraduates. And we recently began a new project to upgrade our network in Sitterson Hall. See **"Computer Services news"** for more information.

We will welcome two additions to our faculty later this year. **Guido Gerig** of ETH in Zurich, a longtime collaborator of Stephen Pizer's, will join us as Taylor Grandy professor of computer science and psychiatry. **Bert Dempsey**, an assistant professor in the School of Information and Library Science, will join us as an adjunct assistant professor. He is already collaborating with Kevin Jeffay and Don Smith. More about Guido and Bert in our fall issue.

As always we are very grateful to you for your generous support which helps to fund our alumni fellowship. Spring is the best time to be in Chapel Hill; we hope you will pay us a visit.

Steve Weiss

Welcome

New students

These students began our program in the Spring 1998 semester:

Lin Cui
Yuqian Tu
Ruigang Yang

Visiting researchers

Joe Capowski (M.S. 1971), a visiting research associate professor in the Department of Surgery, is working on the MIDAG (Medical Image Display and Analysis Group) team, led by Stephen M. Pizer, Kenan professor. Joe is working with Elizabeth Bullitt, M.D., associate professor of neurosurgery, and Stephen R. Aylward, adjunct assistant professor of computer science and research assistant professor of radiology, to develop computer techniques that will help surgeons to visualize blood vessels in the brain in three dimensions. The process involves taking images from different types of vascular imaging machines, extracting the blood vessels, and presenting them using contemporary computer graphics techniques on an IBM PC. The resulting images are used to help a surgeon determine where defects in the blood vessels occur and where a catheter that is threaded through the vessels is located. Joe is also a research instructor in Ophthalmology and an adjunct lecturer in Physiology at UNC-Chapel Hill. He is a 1971 graduate of our department.

Martin Guthold, a postdoctoral scholar, joined us in December to work with the nanoManipulator project. He received his Ph.D. in physics and molecular biology in August 1997 from the University of Oregon. His dissertation work, under the direction of Carlos Bustamante, was the study of RNA transcription and DNA using the Atomic Force Microscope. Martin is involved in the nanoManipulator project's ongoing research in proteins and viruses, and is assisting visiting biochemists who wish to use the nanoManipulator system to examine or to modify biological samples. He will also use the system to pursue his own studies.

Martin Simons, a postdoctoral scholar, joined us in April from Germany. He is working with Jan F. Prins, associate professor, and Siddhartha Chatterjee, assistant professor, on high-performance irregular computation. Martin received his Ph.D. from the Technische Universitat in Berlin.

New staff

Murray F. Anderegg (M.S. 1991), systems programmer for Computer Services, joined us in December. His responsibilities include administration of the Hewlett-Packard systems and electronic mail. Murray earned a B.S. in Russian from the University of Massachusetts in 1987 and an M.S. in Computer Science from our Department in 1991. Most recently he worked as a systems administrator at the Office of Information Systems, the support group for the School of Medicine at UNC-Chapel Hill.

Bil Hays, network manager for Computer Services, joined us in December. In addition to managing our network, he manages departmental video and telephone operations, and provides Macintosh support, problem tracking, and interactions between different hardware and software platforms. Bil earned a B.S. in Biology and Comparative Literature from William and Mary in 1983, and an M.S. in Comparative Literature from UNC-Chapel Hill in 1991. He has worked in a variety of positions for the Department of Academic Technology and Networks (the campus computing support group) since 1985, including managing networks and being the campus Macintosh guru.

Jim Mahaney, administrative assistant for the Microelectronic Systems Lab (MSL), joined us in January. He earned a B.A. in Biology from UNC-Chapel Hill in December 1997. While an undergraduate, Jim also worked with the MSL.

Gayle H. Rice, accounting assistant, joined us in February. She most recently worked with the Department of Biochemistry at UNC-Chapel Hill and has many years of UNC accounting experience.

We say thanks and farewell to . . .

Bruce Farley, accounting assistant, who left in December to join N.C. State University as a contract manager in the Industrial Extension Services Department.

Keeping in touch

Ron Azuma (Ph.D. 1995) recently wrote his fourth Hitchhiker's on-line guide, "So Long, and Thanks for the Ph.D!", in which he describes what he wishes he had known about graduate school from the beginning but which he had to learn the hard way. The guide focuses on the mental toughness and socio-political skills required to survive a Ph.D. program. See: **www.cs.unc.edu/~azuma/hitch4.html**. *(azuma@isl.hrl.hac.com)*

Lawrence Bercini (M.S. 1977) attended the World Championships of Country and Western Dance held in Nashville, Tenn., in January, where he became the Grand Champion of the Male Newcomer Silver division, winning over approximately 30 other finalists from eight countries. He also competed in the ProAm competition and received gold medals in all six of the Universal dance categories. *(lbercini@tuc.com)*

Pam Bremer (née Johnson) (M.S. 1991) has been working since 1995 at Silicon Graphics in Zurich, Switzerland. She was recently promoted to European Business Development Manager for the Chemical and Pharmaceutical markets. She sets the marketing and business development strategies for these markets in Europe and oversees partnerships with leading customers and solutions providers. *(pam@zurich.sgi.com)*

Ritu Chadha (Ph.D. 1991) is a research scientist at Bellcore in Morristown, N.J. *(chadha@bellcore.com).* She has a recent paper:

Chadha, R., and S. Wuu. "Incorporating Manageability into Distributed Software," *Proc. Fifth IFIP/IEEE International Symposium on Integrated Network Management,* San Diego, Calif., 12-16 May 1997, 489-502.

John Crawford (M.S. 1977) has worked at Intel Corp. since 1977, where he has either led or co-led the design teams that created three generations of Intel's micro-processors: the 386, 486, and Pentium. Recently, he has been working on a multi-billion-dollar effort to build a next-generation microprocessor architecture called IA-64 that is being developed jointly with Hewlett-Packard Corp. An article about John and his current work appeared in the 10th October 1997 issue of *The Wall Street Journal.*

Stuart Faulk's (Ph.D. 1989) title was incorrectly reported in our fall issue. He is a research associate member of the faculty at the Department of Computer and Information Science at the University of Oregon in Eugene, Ore. *(faulk@cs.uoregon.edu)*

Annette Foster (M.S. 1975) is at Duke University where she is working on installing SAP (an enterprise application software from SAP-AG in Germany) for the university and for the Duke Health System. *(annette.foster@duke.edu)*

Susan Gauch (Ph.D. 1990) reports that her Web search engine, ProFusion, won an Editor's Choice award from PC Magazine in December for being the best advanced meta-search engine. For information about ProFusion, see: **profusion.ittc.ukans.edu/**. *(sgauch@ittc.ukans.edu)*

Gopal Gupta (Ph.D. 1992) and his wife Deepa have a son, Rohan, who was born on 21 January 1998. Last fall, Gopal was promoted to associate professor at New Mexico State University. He continues to do research in computational logic, parallel processing, and programming languages. *(gupta@cs.nmsu.edu).* Some of his recent publications include:

Gupta, G. "Software Engineering, Logic Programming, and Denotational Semantics" (invited talk), to appear in *Proc. Workshop on Strategic Directions in Logic Programming.*

Gupta, G., and E. Pontelli. "A Constraint-based Approach to Specification and Verification of Real-time Systems," *Proc. IEEE Real-time Symposium*, December 1997.

Pontelli, E., and G. Gupta. "A Concurrent Constraint Framework for Internet Programming," *Proc. IEEE International Conference on Tools with AI,* November 1997.

Pontelli, E., and G. Gupta. "Implementation Mechanisms for Dependent And-parallelism," *Proc. International Conference on Logic Programming,* July 1997, 123-137.

Gupta, G. "ACE: A High Performance Parallel Prolog System" (invited talk), *Proc. Joint Conference on Declarative Programming,* Grado, Italy, June 1997, 25-31.

Subodh Kumar (Ph.D. 1996), an assistant professor at Johns Hopkins University, recently received a Career Award from the National Science Foundation. *(subodh@cs.jhu.edu)*

Peter Litwinowicz (M.S. 1987) is working at Mass Illusions in Alameda, Calif., doing computer graphic post-production work for feature films. Recently, he has been working on painting effects for the movie "What Dreams May Come," starring Robin Williams and Cuba Gooding, Jr., which is due out later this year. *(litwinow@best.com)*

Ryutarou Ohbuchi (Ph.D. 1994) works for IBM Corp. in Japan, where he recently received a promotion. *(ohbuchi@trl.ibm.co.jp)* He also has recently published the following papers:

Ohbuchi, R., H. Masuda, and M. Aono. "Embedding Data in 3D Models," *Proc. of the IDMS '97,* Darmstadt, Germany, September 1997. *Lecture Notes in Computer Science,* #1309, Springer Verlag, 1-11.

Ohbuchi, R., H. Masuda, and M. Aono. "Watermarking Three-Dimensional Polygonal Models," *Proc. ACM Multimedia '97,* Seattle, Wash., November 1997, 261-272.

Karl Owen (M.S. 1992) and his wife Susan Buchanan have a baby girl, Jordan Buchanan Owen, who was born on 22 October 1997 in Durham, N.C. Jordan already has her own Web page: **www.geocities.com/ResearchTriangle/4710/baby.html** *(owen@dg-rtp.dg.com)*

Paulette Bush Recktenwald (M.S. 1988) and her husband John had their first child, John James, on 23 July 1997. Paulette is a software engineer with Vertex Development. The family lives in Fredericksburg, Va. *(paulette@ pentathalon.vertexdev.com)*

Jeanne Sawyer (Ph.D. 1990) *(jsawyer@sawyerpartnership.com)* recently published the paper:

Sawyer, J. "Partnership by Design," *Business & Economic Review,* 44(1), October-December 1997, 22-25.

Yen-Ping Shan's (Ph.D. 1990) book, *Enterprise Computing with Objects: From Client/Server Environments to the Internet,* was recently published by Addison Wesley. He is currently working in Software Solutions at IBM Corp. in Research Triangle Park, N.C. *(shan@us.ibm.com)*

Raymond Van Dyke (M.S. 1989, J.D. 1990) was recently promoted to the position of partner in the firm of Jenkens and Gilchrist, located in Dallas, Texas. He is a patent attorney with the firm. *(vandyke@jenkens.com)*

John Q. Walker, II (Ph.D. 1991) is one of the founders of Ganymede Software, located in Research Triangle Park, N.C., where he is currently vice president of software development. The company's products are used to measure and manage network performance. John reports that in the past three years the number of Ganymede employees has grown from its four founders to about 60 people. The company is always looking to hire good software programmers and testers. *(johnq@GanymedeSoftware.com).* He has a recent refereed paper:

Wood, J. L., C. D. Selvaggi, and J. Q. Walker, II. "Testing the Performance of Multiple TCP/IP Stacks," *Proc. Computer Measurement Group '97,* Vol. 1, 626-638.

Undergraduate alumni

Mark Buford (B.S. MSci. 1985) lives in Columbia, S.C., where he works as an executive with Renaissance Interactive, one of the Southeast's largest Internet development and consulting firms. Since graduating in 1985, he first worked with Texas Instruments and then with two consulting firms. Mark reports that his fondest memory of taking classes at UNC-Chapel Hill was being in Steve Weiss's COMP 14 class, where he was inspired to switch from pursuing a math degree to pursuing the computer science option of the Math Sciences curriculum. *(mark@ricommunity.com)*

Nevin Fouts (B.S. MSci. 1981) is the associate dean for information technology at Duke University's Fuqua School of Business, where he is involved in some interesting projects dealing with technology-enhanced education. *(nevin@mail.duke.edu)*

Humayun Lari (B.S. MSci. 1995) and his brother Mihail are owners of Lari Software Inc. (**www.larisoftware.com**) in Chapel Hill, N.C., where they develop multimedia design software. They earned national recognition last year with a contest designed to promote the continued use of the Macintosh. They asked people to buy OS 8, Apple Computer's latest operating system, and to create ads for it. They reported that their contest Web site had more than a million hits and that more than 1,000 people had posted ads on their own Web sites. An article about the Lari brothers' efforts appeared in the Raleigh, N.C. *News and Observer* last fall:

Park, A. "Graphic artists still fiercely loyal," *The News & Observer*, Thursday, 13 November 1997, 8C-9C.
Michelle Torian (B.S. MSci. expected May 1998) is heading to Atlanta, Ga., to take a job with IBM Corp. Michelle has worked part-time in our Department for the past three years for Frederick P. Brooks, Jr., Kenan professor, and his assistant Darlene Freedman; and she has also served as a lab assistant for lecturer Jeannie Walsh's COMP 4 class for two semesters.

Alumni and friends on line

Visit the Alumni home page at **www.cs.unc.edu/People/Alumni/** and check out the Alumni Directory to find out what many of your former classmates are up to now. Please use the on-line registration form to add your own entry!

Our Friends Directory is ready to accept entries. We invite our former faculty, staff, and colleagues to visit the page at **www.cs.unc.edu/People/Friends/** and to fill out the registration form.

Carl V. Page memorial scholarship

The family of **Carl V. Page** has established a memorial scholarship in his name at Michigan State University. Carl, who died in June 1996 at the age of 58, was an assistant professor in our Department from 1966 to 1967 and was our second full-time tenure track faculty member (after Fred Brooks). He was one of the founding members of the Department of Computer Science at Michigan State. The scholarship will be provided to outstanding computer science students who demonstrate academic excellence and financial need. To contribute to the scholarship fund, send your donations to: Carl V. Page Memorial Scholarship/Fellowship Fund, Department of Computer Science, Michigan State University, 3115 Engineering Building, East Lansing, MI 48824-1226.

Family matters

William Maxwell (Max) Fritsch was born on 8 July 1997 in Raleigh, N.C., to Daniel and Jackie Fritsch.

Rohan Gupta was born on 21 January 1998 in Las Cruces, N.M., to Gopal Gupta (Ph.D. 1992) and Deepa Gupta.

Fred and Nancy Brooks have a new grandchild (their fifth), **Anna Kerper La Dine**, born on 6 November 1997 in Hampton, Va., to Jeff and Barbara La Dine.

Jordan Buchanan Owen was born on 22 October 1997 in Durham, N.C., to Karl Owen (M.S. 1992) and Susan Buchanan.

John James Recktenwald was born on 23 July 1997 in Fredericksburg, Va., to John Recktenwald and Paulette Bush Recktenwald (M.S. 1988).

Luke Everett Riley was born on 22 October 1997 in Durham, N.C., to Duncan and Kathy Bugg Riley. He has two older sisters, Holly and Katie.

Amélie Gwendolyn Stürzlinger was born on 14 December 1997 in Chapel Hill, N.C. to Wolfgang and Véronique Stürzlinger. She has an older brother, Florian, who is one-and-a-half years old.

Department honors Don Stanat

Chair Steve Weiss presents Don Stanat with the "General Recursion" T- shirt and a book of memories from friends at his retirement party in November. Photo by J. M. Walsh.

On 14 November 1997, we honored recently-retired professor **Donald F. Stanat** with a reception in Sitterson Hall. About 140 current and former faculty, staff, and students were on hand to thank Don for his 30 years of service to our Department and for his contributions to teaching and research, and to wish him well in his retirement.

Don joined us as an assistant professor in 1967 after receiving a Ph.D. in communication sciences in 1966 from the University of Michigan. He became an associate professor in 1972, and a full professor in 1982. He served as acting chairman in the latter half of 1983 and from July 1984 to June 1985. He was associate chairman for academic affairs from 1985 to 1989. He has taught countless undergraduate and graduate students. His book, *Discrete Mathematics in Computer Science,* written with David F. McAllister (Prentice-Hall, 1977) is one of the seminal books in the field.

At the reception, Steve Weiss presented Don with a "General Recursion" T-shirt (see photo above) promoting him from "Captain Recursion" (see photo below of the T-shirt Don would wear to class when he taught recursion). Don also received a certificate, signed by more than 100

faculty, staff, and students, honoring his years of service and recognizing his achievements. He also received a notebook of letters from former students and colleagues sharing their fond memories of him. Some of their comments are presented:

Frederick P. Brooks, Jr., Kenan professor
"Generations of students have been blessed by your clear instruction and warm concern. Your commitment to first our students and then to careful and diligent teaching has played a major role in setting the spirit of the department."

Ritu Chadha (Ph.D. 1991)
"I will always be grateful to Don for the personal interest he took in nominating me for the ACM Distinguished Dissertation Award in 1992. His efforts made it possible for my nomination to be accepted even though it was three weeks late. He invested a lot of time and effort in collecting letters of recommendation from various people to support my nomination."

Kevin Denelsbeck (M.S. 1992)
"Don Stanat is amazing in the classroom; he's always moving, he's always funny, and he makes hard lecture topics go down easy."

Richard R. Gross (Ph.D. 1985)
"You may remember that we met in the hall of New West on one morning during those years, a morning in which I was apparently displaying a somewhat discouraged countenance. To your inquiry as to how things were going, I responded I was 'surviving.' Your reply was just what I needed: 'Rick, sometimes survival is success' . . . I've recalled it many times both at UNC and following to help get through some particularly tough problem."

Lib Moore Jones, Department's first secretary
"My heart often rejoiced when I heard your distinctive step pass my door as I knew that you were 'real,' a caring man with a heart for our students, faculty, department staff, and University housekeeping folks."

Jay Nievergelt, former chairman 1985-1988
"When I stepped into the job . . . coming from across an ocean to a place I knew very little about, Don Stanat soon became my most trusted adviser and dearest friend. I was tremendously impressed by Don's integrity, high principles, devotion to his tasks, and sense of fairness. Among the many fond memories . . . Don and Sylvia's friendship stands out as the most cherished memory."

Roy Pargas (Ph.D. 1982)
"You always seemed to be in tune with your students, and always seemed to be looking out for them. . . . You made students feel comfortable, Don. Whether you realized it or not, you were able to bridge the gap which often separates students from faculty . . . . I can't help but feel a little sorry for all future UNC graduate students—they missed the chance to learn from one of the best teachers I've ever known."

Now that he is retired, Don enjoys spending time with his two young grandsons, who live next door. He and Sylvia have been traveling to faraway places, such as the Galapagos Islands, Bali, and Botswana. He reports also that he is playing the role of "garden grunt" to Sylvia's "landscape designer."

Don in earlier days attends a Department spring picnic dressed as "Captain Recursion." Photo by Mike Pique.

Research highlights

UNC participates in National Tele-immersion Initiative

The Department has received a gift of $190,000 from Advanced Networks and Services as part of the National Tele-immersion Initiative. **Al Weis**, chief executive officer of Advanced Networks, and virtual reality pioneer **Jaron Lanier**, also of Advanced Networks, are overseeing the project.

The idea behind tele-immersion is to enable users in different locations to collaborate in a shared, simulated environment as if they were in the same physical room. In a tele-immersive environment, computers would recognize the presence and movements of individuals and objects, track those objects, and then permit them to be rendered in realistic, multiple, geographically distributed immersive environments where individuals can interact with each other and with computer-generated models.

Henry Fuchs, Federico Gil professor, and **Gregory F. Welch**, research assistant professor, are the UNC-Chapel Hill faculty leaders of the project. They will work with other experts in virtual reality and networking at several universities—Brown, Carnegie Mellon, Columbia, Illinois at Chicago, Southern California, Utah, and Yale—to identify the issues, to develop plans to build a

national tele-immersive research infrastructure, to investigate promising approaches, and to conduct experiments. For more information, see: **www.advanced.org/ tele-immersion/**.

Parallel computing project receives a 1998 Cray Grant

Siddhartha Chatterjee, assistant professor, and **Jan F. Prins**, associate professor, are the principal and co-principal investigators on the project, "Nested Data Parallelism in Fortran 90," which was one of several proposals recently selected for funding in the 1998 Cray Grant program. The program, which is sponsored jointly by Cray Research Inc., and the North Carolina Supercomputing Center (NCSC), provides research and development support to North Carolina faculty, graduate students, and research associates in computational science and engineering. Awards are made through a competitive grant-proposal process.

The grant provides research time on the Cray supercomputers at NCSC and support for a student participating in the project. Graduate student **Brian Blount**, who will work on the project, has been named a 1998 Cray Fellow. He will participate in the Cray Research Symposium next spring.

Sid, Jan, and Brian will experiment with nested data parallelism—a technique for accomplishing irregular computations on parallel computers. The NCSC supercomputers will significantly reduce the time the researchers need to perform the complex calculations needed by allowing those calculations to be performed concurrently rather than consecutively.

Cooperative research in high-performance computing

In addition to their Cray Grant, **Jan F. Prins** and **Siddhartha Chatterjee** are receiving support from the National Science Foundation to collaborate with researchers at the Technische Universitat in Berlin, Germany, on a project to integrate nested data parallelism into High Performance Fortran and Fortran 95. Their grant will bring the Berlin researchers to Chapel Hill and take our researchers to Berlin several times in the next two years. Postdoctoral scholar **Martin Simons**, who joined us in April for a year, will also be working on the project.

nanoManipulator goes international

Russell M. Taylor, II (Ph.D. 1994), research assistant professor, traveled to Belgium in February to install a nanoManipulator system at the Catholic University of Leuven's Chemistry Department. The university has purchased an SGI Octane graphics engine and a PHANToM force-feedback device to go with the Topometrix microscope it already owns.

Grant takes nanoManipulator to local high school

Faculty from the departments of Computer Science and Physics and Astronomy and from the School of Education at UNC-Chapel Hill are collaborating with Orange County High School in Hillsborough, N.C., on a project that will place the nanoManipulator system in an Advanced Placement Biology class, giving students an intuitive feel for the science they are studying

through valuable hands-on experiences. The initiative is funded by a UNC Chancellor's Award for Instructional Technology.

The project will look at what the students gain from their experience of using the system: Will they have any better idea of what a virus is if they can actually see and manipulate it? **Gail Jones**, associate professor in the School of Education, one of the project's principal investigators, will study whether the students' hands-on use of a tool such as the nanoManipulator makes learning more intuitive for them. She plans to survey the students both before and after the system is placed in the school.

Other faculty involved in the project are **Kevin Jeffay**, associate professor, **Don Smith**, research professor, and **Russell M. Taylor, II**, research assistant professor, of our Department; and **Richard Superfine**, assistant professor of the Department of Physics and Astronomy. Kevin and Don will explore the problems that a system, such as the nanoManipulator, which has low latency and high throughput requirements, faces when it has to operate over the congested Internet. Rich Superfine will present several lectures to the class.

3D imaging of the brain

Elizabeth Bullitt, M.D. , associate professor of neurosurgery in the Department of Surgery, and **Stephen M. Pizer**, Kenan professor of our Department, have been developing a new 3D imaging technique that will help neurosurgeons to identify the brain's structures much more clearly and easily. The new 3D images will allow surgeons to discern the spatial relationships between blood vessels, allowing them to treat problems such as aneurysms more successfully.

The researchers are combining two existing techniques—X-ray angiography and magnetic resonance imaging (MRI), both of which have been used individually for visualizing the brain's structure, but each of which has certain limitations. X-ray angiography produces sharp, clear pictures, but only in 2D. MRI produces 3D images but with lower resolution. The new method works by converting a traditional 3D MRI image to 2D, then enhancing it using the high-resolution X-ray image. The information from the two scans is combined to construct a clear 3D image. Another advantage of this new method, which is still a few years away from being ready, is that its software will run on a desktop computer, whereas existing techniques require larger, more powerful machines.

IPL programming framework

James Coggins, associate professor and associate chairman for academic affairs, has completed a programming framework called IPL that is being used in Comp 14 on both the Windows 95 and Windows NT operating systems. IPL allows introductory programming students to write graphical programs and to run them in a user-friendly windowed environment under Windows. This extension to the IPL environment has been used on the Macintosh for more than a year.

Recent conferences

IEEE Visualization '97
Several faculty and students participated in IEEE Visualization '97, which was held in Phoenix, Ariz., from 19-24 October. **Anselmo Lastra**, research associate professor, and **Daniel Aliaga**, graduate student, presented their paper, "Architectural Walkthroughs Using Portal Textures." **Dinesh Manocha**, associate professor, and graduate students **Jonathan Cohen** and **Marc Olano** presented their paper, "Simplifying Polygonal Models Using Successive Mappings." **Mark Livingston**, graduate student, presented a case study, as did **Russell M. Taylor, II**, research associate professor, co-authored with several of his colleagues. For more information, see **"Recent publications"**.

Several alumni also participated in the conference. **David Banks** (Ph.D. 1993) of Mississippi State University presented a case study. **David Ellsworth** (Ph.D. 1996) of NASA Ames Research Center co-authored a paper. **Vicky Interrante** (Ph.D. 1996) of ICASE co-authored a paper and presented a case study; she also co-taught a tutorial on "Perception for Visualization." **Subodh Kumar** (Ph.D. 1996) of Johns Hopkins University co-authored a paper. **Penny Rheingans** (Ph.D. 1993) of the University of Mississippi presented a paper and a case study, and served on a panel. **Amitabh Varshney** (Ph.D. 1994) of SUNY-Stony Brook co-authored a paper.

Multimedia Computing and Networking Symposium
Kevin Jeffay, associate professor, was one of the co-chairs of the 1998 Multimedia Computing and Networking Symposium, along with **Dilip Kandlur** of IBM T. J. Watson Research Center, and **Timothy Roscoe** of Persimmon I.T. Inc. The symposium took place in San Jose, Calif., from 26-28 January.

Current and former UNC-Chapel Hill participants included **Henry Fuchs**, Federico Gil professor, who delivered the keynote address on "Enhanced Display Environments for Telecollaboration and Personal Computing in the Office of the Future," and alumnus **Injong Rhee** (Ph.D. 1994) of N.C. State University who co-authored a paper. The purpose of the symposium, which is co-sponsored by SPIE and ACM's special interest group on multimedia (SIGMultimedia), is to bring together researchers, developers, and practitioners working in all facets of multimedia computing and networking and to serve as a forum for the dissemination of state-of-the-art research, development, and implementations of multimedia systems, technologies, and applications.

Research and study leaves

Frederick P. Brooks, Jr. , Kenan professor, spent the fall semester on sabbatical at University College London in England, visiting Professor Mel Slater and his virtual reality research group. While at University College London, Fred attended research group meetings and presented several lectures. He also drafted a number of chapters for a book of essays that will be published under the title *The Design of Design.* Fred also attended four conferences, and visited several laboratories of British enterprises, including the British Air flight simulator facility, British Telecom, Brown and Root, CADCentre at Cambridge, Manchester University, and Unilever Research.

Siddhartha Chatterjee, assistant professor, will be on a research and study assignment during fall 1998 in order to collaborate more closely with his colleagues at Duke University on their project: "TUNE: System Support for Memory-Friendly Programming." For more on the project, see: **www.cs.unc.edu/Research/TUNE/**.

James Coggins, associate professor and associate chairman for academic affairs, has been awarded a Reynolds Leave, one of only 16 funded sabbatical leaves available from UNC-Chapel Hill for the academic year 1998-99. He plans to spend the time at the University of Manchester in England, doing research in medical image analysis at the Wolfson Image Analysis Unit at the university's medical school.

New contracts and grants

Siddhartha Chatterjee, assistant professor, and **Jan F. Prins**, associate professor. "Nested Data Parallelism in Fortran 90," Cray Research Inc., and North Carolina Supercomputing Center.

Kevin Jeffay, associate professor, **Richard Superfine**, assistant professor (Physics and Astronomy), and **Gail Jones**, associate professor (Education). "Internet Access to UNC-CH Advanced Microscopy Facilities for Science Education Outreach," Chancellor's Award for Instructional Technology, UNC-Chapel Hill.

Dinesh Manocha, associate professor. "Instrumentation for Interactive Synthetic Environments," U.S. Army Research Office.

Jan F. Prins and **Siddhartha Chatterjee**. "U.S.-Germany Cooperative Research Effort: High-Performance Execution of Nested Data Parallelism in Fortran Programs," National Science Foundation.

Richard Superfine, assistant professor (Physics and Astronomy), **Russell M. Taylor, II**, research assistant professor, and **Sean Washburn**, Lyle V. Jones professor (Physics and Astronomy). "The nanoLaboratory: An Integrated Manipulation/Microscopy System for the Nanometer Scale," U.S. Army Research Office.

Otto Zhou, assistant professor, and **Sean Washburn** (Physics and Astronomy) (PIs), **Stephen M. Pizer**, Kenan professor, **Russell M. Taylor, II**, research assistant professor, and 11 other faculty in the departments of Chemistry and Physics and Astronomy at UNC-Chapel Hill and in the departments of Physics, and Materials Science and Engineering at N.C. State University. "Science and Technology of Nanotube-based Materials and Devices," Office of Naval Research.

Recent publications

Aliaga, D. G., and A. A. Lastra. "Architectural Walkthroughs Using Portal Textures," *Proc. IEEE Visualization '97,* Phoenix, Ariz., 19-24 October 1997, 355-362, 560.

Anderson, J., and M. Moir. "Using Local-Spin k-Exclusion Algorithms to Improve Wait-Free Object Implementations," *Distributed Computing,* 11(1), 1997, 1-20.

Anderson, J., R. Jain, and S. Ramamurthy. "Wait-free Object-Sharing Schemes for Real-Time Uniprocessors and Multiprocessors," *Proc. 18th IEEE Real-Time Systems Symposium,* December 1997, 111-122.

Chen, J., C. DiMattia, M. Falvo, P. Thiansathaporn, R. Superfine, and R. M. Taylor, II. "Sticking to the Point: A Friction and Adhesion Model for Simulated Surfaces," *Proc. Sixth Annual Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems,* Dallas, Texas, 17-18 Nov. 1997, 167-171.

Cohen, J., D. Manocha, and M. Olano. "Simplifying Polygonal Models Using Successive Mappings," *Proc. IEEE Visualization '97,* Phoenix, Ariz., 19-24 October 1997, 395-402, 564. Also Department of Computer Science technical report TR97-011, University of North Carolina at Chapel Hill, 1997.

Cox, D., B. Sturmfels, D. Manocha, T. Sederberg, X. Kramer, R. C. Laubenbaches, R. Thomas, and J. Little. *Applications of Computational Algebraic Geometry,* American Mathematical Society, 1997.

Keller, K. "Efficiency and Cost Tradeoffs Between Aluminum and Zinc Die Cast Heatsinks," *Proc. InterPack Conference, Advances in Electronic Packaging,* Kohala, Hawaii, June 1997, 1883-1888.

Krishnan, S., M. Gopi, D. Manocha, and M. Mine. "Interactive Boundary Computation of Boolean Combinations of Sculptured Solids," *Proc. Eurographics '97,* Budapest, Hungary, 4-8 September 1997, *Computer Graphics Forum (special issue),* 16(3), C67-C78.

Livingston, M. A. "Visualization of Rotation Fields," *Proc. IEEE Visualization '97,* Phoenix, Az., 19-24 October 1997, 491-494, 584.

Plaisted, D. A., and G. D. Alexander. "Propositional Search Efficiency and First-Order Theorem Proving," *Proc. Workshop on the Satisfiability Problem: Theory and Applications (DIMACS),* 11-13 March 1996, American Mathematical Society 1997, 335-350.

Poulton, J. "An Embedded DRAM for CMOS ASICs," *Proc. 17th Conference on Advanced Research in VLSI,* Ann Arbor, Mich., 15-17 September 1997, 288-302.

Taylor, R. M., J. Chen, S. Okimoto, N. Llopis-Artime, V. L. Chi, F. P. Brooks, Jr., M. Falvo, S. Paulson, P. Thiansathaporn, D. Glick, S. Washburn, and Richard Superfine. "Pearls Found on the

way to the Ideal Interface for Scanned-probe Microscopes," *Proc. IEEE Visualization '97,* Phoenix, Az., 19-24 October 1997, 467-470, 579.

In the media

- The nanoManipulator has appeared in several recent articles:

  Pescovitz, D. "NanoFeelies," *Wired,* December 1997, 100.

  "Light as a Feather, Stiff as a Board," *The Economist,* 11 October 1997, describes our work on carbon nanotubes.

  Wilson, J. "Shrinking Micromachines," *Popular Mechanics,* 174(11), October 1997, 56, has a picture of the nanoManipulator in action.

  Henson, M. "UNC's Mind-blowing Glimpse of the Future," *The Charlotte Observer,* 3 October 1997, 13A.

- Check your Jan/Feb 1998 issue of the Carolina Alumni Review (p. 52) for a feature article, "Eye of the Needle," about our augmented reality research. Also mentioned in this issue are the donation from Intel Corp. (p. 19), Steve Weiss's teaching award, and the GRIDs grant (p. 21). If you don't get the *Alumni Review,* you can find out how to subscribe or how to read it on-line by visiting the UNC General Alumni Association's Web page at **alumni.unc.edu/**.

Recent special visitors

Molly Broad, UNC System president, visited on 3 February. She observed Steve Weiss's COMP 130 class and saw demos in the Graphics and Image Lab.

James W. Demmel of the University of California at Berkeley visited on 2 February to give a talk for the Triangle Distinguished Lecturer series. Ming Lin was his host.

Eric Foxlin, chief technology officer at Intersense, Inc., visited on 6 November and spoke at Graphics Lunch on inertial tracking and sensor fusion. Hans Weber was his host.

Guido Gerig of ETH in Zurich, Switzerland, made two visits to us in February and March to work with his host, Stephen M. Pizer.

Michael Kerckhove of the University of Richmond met with members of MIDAG (Medical Image Display and Analysis Group) from 9-11 December. Stephen M. Pizer was his host.

Tom Piantanida of SRI International presented a talk on "Human Perceptual Issues and Virtual Reality" on 21 January. Henry Fuchs and Gregory F. Welch were his hosts.

Krithi Ramamritham of the University of Massachusetts visited on 17 February in connection with his talk for the Triangle Distinguished Lecturer series. Kevin Jeffay was his host.

John Reynolds of Carnegie Mellon University visited on 18 November in connection with his talk for the Triangle Distinguished Lecturer series. David Stotts was his host.

Injong Rhee (Ph.D. 1994) of N.C. State University visited on 20 February and spoke at Systems Tea. Michele Clark was his host.

Avi Silberschatz of the Information Sciences Research Center at Bell Labs visited on 4 November in connection with his talk for the Triangle Distinguished Lecturer series. Prasun Dewan was his host.

Seth Teller of MIT visited on 21 October in connection with his talk for the Triangle Distinguished Lecturer series. Dinesh Manocha was his host.

Norm Whitaker, a program manager at DARPA, visited the graphics group on 9 December. Gary Bishop was his host.

Congratulations to . . .

Brian Blount, graduate student, who has been named a 1998 Cray Fellow (see **Research highlights**).

Steven Bowles, undergraduate in Mathematical Sciences (C.S. option) and **Matthew Lesesky**, undergraduate in Applied Sciences (C.S. option), who were inducted into Phi Beta Kappa last fall.

Matthew Cutts and **Ramesh Raskar**, graduate students, who will receive fellowships from the Link Foundation next year.

And to our December graduates:

Ph.D.
Gregory Bollella. "Slotted Priorities: Supporting Real-Time Computing Within General-Purpose Operating Systems." (Advisor: Kevin Jeffay)

Shankar Krishnan. "Efficient and Accurate Boundary Evaluation Algorithms for Sculptured Solids." (Dinesh Manocha)

Jonathan Munson. "Synchronization in Collaborative Applications." (Prasun Dewan)

Muthukrishnan Paramasivam. "Instance-Based First-Order Methods Using Propositional Provers." (David Plaisted)

Srikanth Ramamurthy. "A Lock-free Approach to Object Sharing in Real-time Systems." (James Anderson)

M.S.
Alexandra Bokinsky*, Tianli Fan, Qian Li, Boyang Liu, Ritu Nagpal, Peter Nee, Jie Shang, Dongxiang Wu, Jing Xu

**on to Ph.D. at UNC-Chapel Hill*

B.S. in Mathematical Sciences (Computer Science option)

Timothy Cogger, Joseph Dougherty, Brian English, Brian Flynn, Charles Grabowski, Arthur Gregory, Jason Hollingsworth, Ameet Mehta, Michelleta Pleasants, Dugald Wilson

Late-breaking news!
As we go to press we learn that two of our Computer Services staff, **Lori McRae**, computing consultant, and **Jane Stine**, systems programmer, have won 1998 Information Technology Support awards. The awards are presented to outstanding information technology support staff at UNC-Chapel Hill. Congratulations, Lori and Jane!

Computer Services news

Network upgrade project

We recently began work on a significant network upgrade for Sitterson Hall, which will involve all aspects of the network—physical infrastructure, logical network, and protocol management. The upgrade has three main phases: (1) an immediate equipment upgrade to upgrade existing hardware, (2) a planning phase to detail how the building's wiring should be improved, and (3) a wiring phase as those improvements are actually made. For more information see: **www.cs.unc.edu/help/network/upgrade.html**.

Glab rewiring

David Musick, network coordinator, worked with **David Harrison**, electronics technician for the graphics group, faculty members, and staff at the University's Academic Technology and Networks (ATN) office to plan and implement a complete rewiring of the Graphics Lab. This involved putting in new category five wiring as well as a new EtherNet switch, both of which were paid for by ATN. This project was a prelude to the complete rewiring of Sitterson Hall (see previous article).

PC installations

Jane Stine and **William Jiang**, systems programmers, have worked out a standard software configuration for desktop Windows NT systems. They have installed the majority of the first batch (76) of Intel-donated systems with Windows NT. We are currently working out the details of Linux support on PCs. The Intel-donated PC systems are installed in research labs, public labs, teaching assistant offices, researchers' offices, and in various locations as servers.

Solaris upgrades

John Sopko, systems programmer, has upgraded the operating systems on the majority of our Sun systems to Solaris version 2.5.1, allowing us to use the latest Sun hardware and software. Some systems running SunOS will not be upgraded either because they have special device drivers, or because they are old and will be retired in the near future.

Migrating software off DECs

John Sopko, and **Brian White**, Computer Services manager, continue working to remove the remaining software from the DEC servers. Only one license server remains, and it is in the process of being moved to a Solaris system. Two DEC servers remain as client servers and will be retired as we replace the DECstation clients with newer systems.

AFS backups reconfigured

Duncan Riley, system programmer, and **Shelley Poovey**, systems administrator, have shifted AFS backups over to two DLT 7000 tape drives, each of which stores 70 gigabits per tape. This has simplified the backup scheme, which was previously handled with 10 gigabit tapes.

UPS deployment

John Sopko, and **Frederic R. Jordan**, electronic shop supervisor, have set up three Matrix 5000 uninterruptible power source (UPS) units in the main computer room. They moved eleven critical UNIX servers, their consoles, and related communications equipment to the UPS units and set up software for automatic shutdown in case of extended outages. As a result we will be able to recover much more quickly from power outages, which, fortunately, have become less frequent.

About News & Notes

***News & Notes* is published during each fall and spring semester.**

Jeannie M. Walsh, editor, ***walsh@cs.unc.edu***
Claire L. Stone, co-editor, ***stonec@cs.unc.edu***

Keep in touch!
Let us know where you are and what you are doing so that we can include you in our next issue! Send us information via e-mail to *pubs@cs.unc.edu;* fax it to 919-962-1799; or mail it to the address below, c/o *News & Notes.* Please include your e-mail address.

Department of Computer Science
UNC-Chapel Hill
CB#3175, Sitterson Hall
Chapel Hill, NC 27599-3175

General information:
Voice: 919/962-1700
Fax: 919/962-1799
Internet mail: *info@cs.unc.edu*
World Wide Web: ***http://www.cs.unc.edu***

Address corrections, submissions, and for information about our publications:
pubs@cs.unc.edu

Page maintained by: Department of Computer Science, UNC-Chapel Hill
Server Manager: ***webmaster@cs.unc.edu***
Content Manager: ***pubs@cs.unc.edu***
Last Content Review: 11 May 1998

- **To the Department's home page**