News & Notes from Sitterson Hall

Issue Twenty-Three, Winter 1998-1999

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

In this issue

Chairman's corner

1998 was a busy year for our Department. As you've seen in our recent newsletters and will see here, we're doing some exciting research, and our faculty and students continue to win awards and publish interesting papers.

Changes are coming. The UNC system is planning to increase enrollments during the next decade. 6,000 new students are proposed for the Chapel Hill campus: 4,000 undergraduate and 2,000 graduate students. These increases will bring the need for new buildings, additional faculty, and other infrastructure changes and improvements.

After many years of plans and proposals, an undergraduate major in computer science is closer to a reality than ever before. Our proposal for the new major will be presented to the General Administration office in January.

The Department will conduct its external review in February. I'd like to thank all of the alumni who returned the survey forms with comments about the Department. Alumni feedback is an important component of the review process, and I sincerely appreciate your taking the time to respond.

Read on for more of our recent and upcoming activities. We wish you a very happy 1999. As always, stop by and visit us if you are in the area.

Stephen F. Weiss

Teleclassroom upgrade underway

In our fall issue we reported that the Frances C. and William P. Smallwood Foundation had awarded our Department a $50,000 grant to upgrade the equipment in the Hugh Holman Teleclassroom (room 011). The first phase of the upgrade has been completed. **David Musick**, network coordinator, and **David Harrison**, electronics technician for graphics, installed new cameras and projection equipment. The new cameras have greatly improved the clarity of our video broadcasts on the NC-REN network, as well as the quality of our internal video signals. Later phases will make the equipment more user friendly and will provide further improvements in video quality. The next phase will add an AMX multimedia control system, allowing the user to control lighting, screens, and projectors from a single console.

Sally Muller, Smallwood Foundation trustee, presents the $50,000 grant to Stephen F. Weiss, professor and chairman (right) and Timothy L. Quigg, associate chair for administration and finance. (Photo: Todd Gaul)

Established in 1968, the Smallwood Foundation provides funds for programs, research, or scholarships in medicine, science, education, commerce, economics, industry, and the arts. The foundation's generous grant will significantly improve the ability of our researchers to participate in the many research group seminars and colloquia that we conduct in collaboration with other universities. Two important ongoing series that rely on the teleclassroom equipment are the NSF Science and Technology Center for Computer Graphics and Scientific Visualization's lecture series, and the Triangle Computer Science Distinguished Lecturer Series.

Distinguished lecturer Randy Pausch, associate professor at Carnegie Mellon, gives the first talk to be broadcast with the new equipment in Sitterson 011. (video still)

Welcomes and farewells

New students, Spring 1999

Dean A. Herington, Philip L. Holman, and Xiaosi Li

New Staff

Mike Carter, electronics technician, joined us in November. He services our computers, copiers, and printers. He previously worked for UNC's Electronic Office Service Center.

Aron Helser (M.S. 1998), research engineer on the nanoManipulator project, joined us full time in January. He had been a temporary employee on the project since receiving his master's from us last May.

Donna Knighten, accounting assistant, joined our administrative staff in November. She provides support to the accounting staff and assists in the personnel area. She previously worked for UNC's Department of Rheumatology and the Office of Contracts and Grants.

Warren Robinett, research scientist, rejoined us in December. He is working with the nanoManipulator project team, and is also working on some of the underlying software used by all our virtual environments projects. This spring he is teaching COMP 239: "Exploring Virtual Worlds." Warren worked here from 1989 to 1992 as the manager of the virtual reality lab.

Laura Schutz, systems administrator, joined us in November. She provides user support in the Technical Support Center; provides systems support on Macs; and runs backups of UNIX and Mac systems. She received a B.S. in mathematics with a physics minor from UNC in 1992 and previously worked for the University's Academic Technology and Networks office.

Visiting Researchers

Sonja Jeter, a visiting researcher from Intel Corp., joins us from September 1998 to March 1999 as a liaison to facilitate communication and to assist with technology sharing in several areas, including collision detection, occlusion culling, 3D sound, animation, and portals. At Intel, she is a senior software design engineer in the Microcomputer Graphics Laboratory in Santa Clara, Calif.

Sandeep Sen, a visiting research associate professor, is on sabbatical with us from September 1998 through July 1999. He is an associate professor of computer science and engineering at IIT, Delhi, India. His area of expertise is algorithms, and he works with Siddhartha Chatterjee, assistant professor, on the TUNE project.

We say Thanks and Farewell to . . .

Candice McDaniel, receptionist, who left in December to join the Office of Graduate Professional Education at UNC Hospitals. She had been with us since March 1995.

Robert Palmer, electronics technician for the Microelectronic Systems Laboratory, who left in January to work at Chip2Chip Inc. in Milpitas, Calif. He had been with us since August 1998.

Congratulations to . . .

- **Rui Bastos** (M.S. 1997), graduate student, who is the 1998-1999 SGI Fellowship winner.
- **Ming C. Lin**, assistant professor, who was awarded a Junior Faculty Development Award from UNC in November.
- **Stephen M. Pizer**, Kenan professor, who was awarded a Kenan leave for spring 2000.
- **David Plaisted**, professor, who was asked to be an area editor for automated deduction in the new *Journal of Computational Logic*, and to serve on the review panel for a special issue of the *Journal of Automated Reasoning*.
- **Julian Rosenman**, M.D., adjunct professor, and professor of radiation oncology, who was among the UNC physicians named on the survey, "The Best Doctors in America 1998 to 1999," compiled by Woodward/White, Inc.
- **Jack Tang**, B.S. MSci. undergraduate, who was inducted into Phi Beta Kappa in November.
- **To those faculty and staff who reached the following levels of state service during 1998:**

  20 years: Henry Fuchs, Janet Jones
  5 years: James Anderson, Prasun Dewan, Nick England, Bil Hays, William Jiang, and Stephen Tell (M.S. 1991)

- **And to our December 1998 graduates:**

  Ph.D.

- **Jonathan D. Cohen**, "Appearance-Preserving Simplification of Polygonal Models" (Advisor: Dinesh Manocha)
- **George J. Kalarickal**, "Theory of Cortical Plasticity in Vision" (Jonathan A. Marshall)
- **Mark A. Livingston**, "Vision-Based Tracking with Dynamic Structured Light for Video-See-Through Augmented Reality" (Henry Fuchs)
- **David Luebke**, "View-Dependent Simplification of Arbitrary Polygonal Environments" (Frederick P. Brooks, Jr.)
- **Hansong Zhang**, "Effective Occlusion Culling for the Interactive Display of Arbitrary Models" (Frederick P. Brooks, Jr., and Dinesh Manocha)

M.S.
Amaury Alvarez, Herman Harjono, Kwang-Soo Kim, Adam Lake, Renee Maheshwari, Yufei Qian, Ellen Scher Zagier*, and **Anshu Sharma**

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

- **Title Changes**
  Effective 1 January 1999:
  John G. Eyles, research associate professor
  Prasun Dewan, professor
  David Stotts, associate professor, associate chair for academic affairs

Research highlights

Distributed nanoManipulator Project Funded

A supplement to the GRIP grant, funded by the National Institutes of Health, is allowing the nanoManipulator project to expand its scope to include studying the effectiveness of telecollaboration technology in helping scientists work together across distances. **Frederick P. Brooks, Jr.,** Kenan professor, is the principal investigator on the grant, "Interactive Graphics for Molecular Studies and Microscopy--Supplement for Collaboratory." The project brings together both graphics and networking researchers in our Department, as well as researchers from several other departments at UNC and at the National Institute of Environmental Health Sciences (NIEHS) in Research Triangle Park, N.C.

Researchers will study existing collaborations between the Department of Chemistry at UNC and NIEHS, as well as collaborations between UNC's Gene Therapy Center and the Department of Physics and Astronomy. Currently, investigators have been walking or driving between sites to collaborate. The project provides them with shared applications, televideo, and remote control of the nanoManipulator, allowing them to work together without leaving their laboratories.

New investigators on the project are **Kevin Jeffay**, associate professor, and **Don Smith** (Ph.D. 1978), research professor, who are studying the network issues; **Eileen Kupstas-Soo** (M.S. 1992), graduate student, and **Diane Sonnenwald**, assistant professor in the School of Information and Library Science, who are studying the effectiveness of the collaboration; and **Dorothy Erie**, assistant professor in the Department of Chemistry, and **Jude Samulski**, associate professor of pharmacology and director of the Gene Therapy Center, who are using the remote nanoManipulator system to collaborate over the network. For more information, see **www.cs.unc.edu/Research/nano/.**

GRIDS Project

On 16 October, **Gary Bishop** (Ph.D. 1984), associate professor, and **Gregory F. Welch** (Ph.D. 1997), research assistant professor, represented the UNC Tracker team at a successful year-end progress meeting for the Defense Advanced Research Projects Agency's GRIDS (Geospatially Registered Information for Dismounted Infantry) project. The Tracker team is developing technologies for tracking the position and orientation of a person's head, both indoors and outdoors, with the aim of demonstrating a system that operates remotely and autonomously, without aid from energy-emitting components (i.e., a self-tracker system). For more information about the team's work, see **www.darpa.mil/eto/wv/98overviews/unc.html.** Results presented at the year-end meeting are available at **www.cs.unc.edu/~tracker/y1_progress/.**

National Tele-Immersion Initiative

On 26 October, **Henry Fuchs**, Federico Gil professor, **Kevin Jeffay**, associate professor, **Herman Towles**, senior research associate, and **Gregory F. Welch** (Ph.D. 1997), research assistant professor, hosted a successful year-end National Tele-Immersion Initiative site visit. The site visit was conducted by **Al Weis** and **Jaron Lanier** of Advanced Networks and Services (ANS). Tele- immersion research at UNC focuses on the Office of the Future, a proposed immersive environment that would provide collaborators in physically different locations with a true sense of being in each other's presence. ANS and the National Science Foundation (the NSF Science and Technology Center for Graphics and Visualization) are the major sponsors of UNC's research on this project. For more information, see **www.cs.unc.edu/Research/stc/teleimmersion/.**

SGI Reality Monster Speeds Things up

In November, the Department enhanced its parallel computing facilities with the arrival of the Reality Monster. Designed by Silicon Graphics, the Reality Monster has 32 R10000 processors, 16 gigabytes of main memory, eight InfiniteReality2 graphics subsystems, and more than 200 gigabytes of disk space. It will be used for several interactive graphics research projects, including augmented reality, image-based rendering, nanoManipulator, Office of the Future, and Walkthrough. Already researchers have put the Reality Monster to good use as they prepared for the SIGGRAPH '99 submission deadline. Funding for the machine comes from a National Science Foundation grant, from University funds, and from **Henry Fuchs's** Departmental trust funds. It will be named Evans, in honor of **David C. Evans**, the computer graphics pioneer and educator. A dedication ceremony is being planned.

Hettleman Prize Winners

Dinesh Manocha, associate professor, is one of three winners of the 1998 Phillip and Ruth Hettleman Prize for Artistic and Scholarly Achievements by Young Faculty. The Hettleman Prize, founded by the late Phillip Hettleman, a New York investment broker and UNC alumnus, recognizes achievement by junior tenure-track faculty or recently tenured faculty. Other 1998 winners were **Richard Superfine** of the Department of Physics and Astronomy, who has an ongoing collaboration with our researchers on the nanoManipulator project, and **Carolyn Connor** of the Department of Classics. Each received a $5,000 stipend and was honored by Chancellor Michael Hooker at a Faculty Council meeting in September. Dinesh and Richard presented public lectures on their research on 13 November.

In his nominating letter, **Stephen F. Weiss**, professor and chairman, wrote, "Dinesh is a superb researcher who has already accomplished much in a very short time and shows no signs of slowing down." Since joining us in 1992, Dinesh has pursued research in computer graphics and computational geometry. He has won grants worth more than $4 million and has produced a number of journal articles, book chapters, software products, and videos. Robotics simulation systems vendors are using his algorithm, and his work on topics such as collision detection has been applied in Department of Defense laboratories.

Faculty Participate in Medical Conferences

On 8 and 9 October in Boston, Mass., **Henry Fuchs**, Federico Gil professor, **Guido Gerig**, Taylor Grandy professor, **Stephen M. Pizer**, Kenan professor, and **Julian Rosenman**, M.D., adjunct professor, participated in the workshop on 3-D Image Processing and Computer-Aided Diagnosis via Cancer Imaging in Women. Stephen Pizer co-organized the workshop, which was sponsored by the Health and Human Services Office of Women's Health and the National Cancer Institute.

During the same week, Henry, Guido, and Steve attended the Conference on Medical Image Computing and Computer-Aided Interventions in Cambridge, Mass., where Steve presented a tutorial on object shape with two colleagues from the University of Manchester.

PixelFlow Update

Hewlett-Packard Corp. has given the Department an additional three racks of PixelFlow, meaning that we now have all of the existing PixelFlow hardware. Researchers will build a bigger PixelFlow machine for their work in interactive graphics.

Distinguished Lecturer Series

The Triangle Computer Science Distinguished Lecturer Series, sponsored by the U.S. Army Research Office, is going strong in its fourth year. For information on recent and upcoming speakers, see **www.cs.unc.edu/Info/Events/DistLectures/.**

Visualization '98 Conference

A number of faculty, staff, students, and alumni attended IEEE Visualization '98 from 18-23 October in Research Triangle Park, N.C. Among those with accepted papers were **Dinesh Manocha**, associate professor, **Anselmo Lastra**, research associate professor; students **Daniel G. Aliaga** (M.S. 1993), **Gopi Meenakshi** (M.S. 1998), **Manuel de Oliveira Neto** (M.S. 1998), and **Voicu Popescu**; and alumni **David C. Banks** (Ph.D. 1993), **Michael Capps** (M.S. 1996), and **Greg Turk** (Ph.D. 1992). **Andrei State** (M.S. 1991), senior research associate, served on the panel, "Multi-Source Data Analysis Challenges." **Turner Whitted**, adjunct professor, gave the capstone address, "Draw on the Wall." Several alumni also served on the papers committee and as expert reviewers. **Henry Fuchs**, Federico Gil professor, was on the program committee. **Amitabh Varshney** (Ph.D. 1994) and **Russell M. Taylor II** (Ph.D. 1994), research assistant professor, served on conference committees, as did **Bil Hays**, network manager.

On 22 October the Department hosted an open-house reception and demos for conference participants, giving us the opportunity to show our graphics and imaging research to the international visualization community. More than 200 conference attendees visited Sitterson Hall for demos of a number of projects, including collision detection, depth extraction, haptic feedback, image-based rendering, medical imaging, molecular dynamics, morphing, nanoVIZ, nanoWorkbench, the Office of the Future, protein interactive theater, the power plant walkthrough, ultrasound, and the new walking experience.

Visualization '98 Open House: Jarek Rossignac, professor in the College of Computing and director of the Graphics, Visualization and Usability Center at Georgia Tech, tries out the Walking Experience, with the assistance of Rui Bastos, graduate student. (Photo: Todd Gaul)

New contracts and grants

Gary Bishop (Ph.D. 1984), associate professor, **Ming C. Lin**, assistant professor, and **Dinesh Manocha**, associate professor. "Gift to Support Research in Collision Detection, Interactive Walkthroughs and Image-based Rendering," Intel Corp.

Frederick P. Brooks, Jr., Kenan professor, et al. "Interactive Graphics for Molecular Studies and Microscopy--Supplement for Collaboratory," National Institutes of Health.

Henry Fuchs, Federico Gil professor, et al. "MRI: Acquisition of a Graphics Supercomputer for Synthetic Environments Serving Science and Engineering," National Science Foundation (NSF).

Henry Fuchs. "MRI Equipment Grant for Science and Technology Center for Computer Graphics and Scientific Visualization," NSF, University of Utah.

Ming C. Lin. "Efficient Geometric Algorithms for Computer Simulated Environments," NSF.

Recent publications

Anderson, J., R. Jain, and K. Jeffay. "Efficient Object Sharing in Quantum-Based Real-Time Systems," *Proc. 19th IEEE Real-Time Systems Symposium,* 2-4 December 1998, 346-355.

Anderson, J., R. Jain, and D. Ott. "Wait-Free Synchronization in Quantum-Based Multiprogrammed Systems," *Proc. 12th International Symposium on Distributed Computing,* September 1998, 34-48.

Arthur, K., T. Preston, R. M. Taylor II, F. P. Brooks Jr., M. C. Whitton, and W. V. Wright. "Designing and Building the PIT: a Head-Tracked Stereo Workspace for Two Users," *Proc. Second International Immersive Projection Technology Workshop,* 11-12 May 1998. UNC Department of Computer Science Technical Report TR98-015.

Falvo, M. R., G. Clary, A. Helser, S. Paulson, R. M. Taylor II, V. Chi, F. P. Brooks Jr., S. Washburn, and R. Superfine. "Nanomanipulation Experiments Exploring Frictional and Mechanical Properties of Carbon Nanotubes," *Microscopy and Microanalysis,* 4(5), 1998.

Goddard, S., and K. Jeffay. "Managing Memory Requirements in the Synthesis of Real-Time Systems from Processing Graphs," *Proc. Fourth IEEE Real-Time Technology and Applications Symposium,* June 1998, 59-70.

Gopi, M., and D. Manocha. "A Unified Approach for Simplifying Polygonal and Spline Models," *Proc. IEEE Visualization '98,* 18-23 October 1998, 271-278, 543.

Jeffay, K., F. D. Smith, A. Moorthy, and J. Anderson. "Proportional Share Scheduling of Operating System Services for Real-Time Applications," *Proc. 19th IEEE Real-Time Systems Symposium,* 2-4 December 1998, 480-491.

Paramasivam, M., and D. A. Plaisted. "Automated Deduction Techniques for Classification in Description Logic Systems," *Journal of Automated Reasoning,* 20(3), June 1998, 337-364.

Parris, M., K. Jeffay, F. D. Smith, and J. Borgersen. "A Better-Than-Best-Effort Service for Continuous Media UDP Flows," *Proc. Eighth International Workshop on Network and Operating System Support for Digital Audio and Video,* July 1998, 193-197.

Popescu, V. S., A. Lastra, D. G. Aliaga, and M. de Oliveira Neto. "Efficient Warping for Architectural Walkthroughs Using Layered Depth Images," *Proc. IEEE Visualization '98,* 18-23 October 1998, 211-215, 535.

Taylor II, R. M. "Network Access to a PHANToM Through VRPN," *Proc. PHANToM User's Group Workshop,* 3-6 October 1998.

In the media

A variety of articles about our news and research, including augmented reality, nanoManipulator work with carbon nanotubes, and other subjects appeared during 1998 in the *News and Observer* of Raleigh and in two UNC publications, the *Carolina Alumni Review* and *Endeavors.*

Our virtual reality research appears in a book in the Facts on File Science Sourcebooks series: Grady, Sean M. *Virtual Reality: Computers Mimic the Physical World,* New York: Facts on File, 1998, chapters 3, 5, 6, and 7.

A photograph of former graduate student **Mark Mine** (Ph.D. 1997) "flying through molecules" appears in a fifth-grade social studies textbook, part of the "Living in Our World" series: *The Americas,* Raleigh, NC: North Carolina State University Humanities Extension/Publications Program, 1998, 305.

A description of our augmented reality work and quotes by **Henry Fuchs**, Federico Gil professor, appear in Charlene Marietti's article, "Advanced Medical Techniques and Technologies are on their Way to a Facility Near You," in *Healthcare Informatics,* January 1998, 38-46.

A brief article about our nanotube research, "Nanotubes sous Contrainte," appeared in *Science et Vie*, No. 964, January 1998, 14.

Other news

Advanced Programming Class introduced to ARCTIC

Students in the fall 1998 Advanced Computer Programming course (COMP 190-031), taught by **James Coggins**, associate professor, learned much more than advanced computer programming. They also gained experience in making formal presentations of their solutions to classic programming problems. These presentations were held in Sitterson 011 and used the computer display facilities to present PowerPoint slides and demos of their programs in action.

The students were also able to observe James's struggle to get his ARCTIC distributed programming environment into usable shape before the final student's presentation, which relied on ARCTIC. Several lectures concerned design issues that arose during the final push to make ARCTIC work. ARCTIC ran its first fully distributed application two days before the final presentation. For information on ARCTIC, visit **www.cs.unc.edu/Research/ARCTIC/.** James expects to announce its release for general use in the near future.

During the course, students studied classic problems and developed solutions using advanced object-oriented programming techniques. Problems included the k-Queens Problem, the Knight's Tour, the Perfect Shuffle Problem, Deferred-Response 20 Questions, TopSpin, the 15-Puzzle, the L-Game, Sequence Comparison, the Sieve of Eratosthenes, the Monte Hall Problem, and some distributed implementations of simple problems such as Readback and WAR. For problem definitions, see **www.cs.unc.edu/~coggins/Teaching/Classics.**

New Internet2 Initiative

In September, the Internet2 project announced the Internet2 Middleware Initiative to accelerate the development of advanced network applications. As part of this new initiative, IBM Corp. will provide its state-of-the-art high-speed storage devices to the Internet2 Distributed Storage Infrastructure initiative (I2-DSI). Additional support for the I2-DSI will be provided by StorageTek, a new Internet2 corporate sponsor, as well as Cisco Systems, Sun, and Novell. For the initial I2-DSI testbed, IBM servers with approximately 1 terabyte of storage and 1 gigabyte of RAM are being installed at high-speed backbone access points in North Carolina, Hawaii, Indiana, South Dakota, and Tennessee. Collaborations with Canadian, European, and Japanese networks are under discussion. IBM will also contribute a host of advanced supercomputer and video technologies to the International Center for Advanced Internet Research (iCAIR) for the Internet2 Digital Video Network Initiative (I2-IDV), which will develop and deploy advanced network technology to establish a national higher education video network service.

The I2-DSI initiative will develop and refine advanced server system technology located throughout the network to store and deliver efficiently terabytes of data to users at any Internet2 campus. It is led by **Micah Beck** and **Terry Moore** of the University of Tennessee and **Bert Dempsey**, assistant professor in the School of Information and Library Science and adjunct assistant professor of computer science at UNC.

Internet2 is being designed to provide research and educational institutions with next-generation inter-networking and to better serve traffic requirements by creating a high-capacity point of presence (GigaPOP). Our Department's Multimedia Networking Lab is the network's point of presence at UNC. For more information, see **www.internet2.edu** and **http://dsi.internet2.edu.**

Coggins Retires as Associate Chair

At a party in his honor, James Coggins, associate professor, reads his "Top 10" list of things he learned during his six years as the Department's associate chair for academic affairs. For the list, see **www.cs.unc.edu/~coggins/Service/AssocChair/TopTenList.html.** David Stotts, associate professor, took over James's role as associate chair in January.

James leaves for a sabbatical in Manchester, England, in February, along with his wife Leslie and his daughter Caitlin (right). He will work at the Wolfson Image Analysis Unit of the Department of Medical Biophysics at the University of Manchester. (Photos: Jai Glasgow)

Family matters

Colton Ray Brandt was born on 12 November 1998 in Boulder, Colo., to Andrew Brandt (M.S. 1993) and Lisa Brandt.

Stephen Brumback and Melissa Dewey married on 17 October 1998 in Elmira, N.Y.

Seth David Gooding was born on 30 August 1998 in Raleigh, N.C., to David Gooding and Shannon Stephenson Gooding (B.S. MSci. 1992).

Breanne Rachel Hewitt was born on 5 January 1998 in Raleigh, N.C., to W. Joe Hewitt (B.S. MSci. 1988) and Susan King Hewitt (B.S. MSci. 1987).

Elizabeth Lakey Holloway was born on 9 September 1998 in Durham, N.C., to Richard Holloway (Ph.D. 1995) and Barbara Holloway. She has two older sisters, Alexa and Bergen.

Helen Wenyi Jiang was born on 2 January 1999 in Chapel Hill, N.C., to William Jiang and Anna Kung.

Selina Kyle McDaniel was born on 11 October 1998 in Chapel Hill, N.C., to Jason and Candice McDaniel.

Stuart Whitaker Petty was born on 14 July 1998 in Chapel Hill, N.C., to Chad and Joy Petty.

Anameeka Singh was born on 19 December 1998 in Cary, N.C., to Raj and Ranjana Singh. She has an older brother, Ashutosh, who is five.

Cassandra Lauren Turk was born on 1 October 1998 in Atlanta, Ga., to Greg Turk (Ph.D. 1992) and Mary McFarlane.

Chelsea Lan Yu was born on 16 October 1997 in Orlando, Fla., to Liyun Yu and Ruihua Zhang. She has an older sister, Lily, who is eighteen.

Alumni news

M.S. and Ph.D. Alumni

Daniel G. Aliaga (M.S. 1993) has joined the Visual Communications Research Group at Lucent Technologies Bell Laboratories in New Jersey. He will receive his Ph.D. in May. *(aliaga@research.bell-labs.com)*

Ron Azuma (Ph.D. 1995) presented a recent paper, co-written with, among others, some UNC alumni and current UNC faculty: Azuma, R. T., B. R. Hoff, H. E. Neely III, R. Sarfaty, M. J. Daily, G. Bishop, V. Chi, G. Welch, U. Neumann, S. You, R. Nichols, and J. Cannon. "Making Augmented Reality Work Outdoors Requires Hybrid Tracking," *Proc. First International Workshop on Augmented Reality*, 1 November 1998. *(azuma@HRL.com)*

Edoardo S. Biagioni (Ph.D. 1992), assistant professor at the University of Hawaii at Manoa, now lives on a 47-foot sailboat. See **www.ics.hawaii.edu/~esb/pers.html** for pictures. *(esb@hawaii.edu)*

Randy Brown (M.S. 1990) has joined SouthPeak Interactive as a senior systems developer. He is co-developing a car-driving simulator application using the company's Video Reality(TM) technology. *(randy@southpeak.com)*

Jonathan D. Cohen (Ph.D. 1998) is an assistant professor at Johns Hopkins University. He taught "Rendering Techniques" in the fall semester and is teaching "Visual Computing" this spring. *(cohen@cs.jhu.edu)*

L. Annette Foster (M.S. 1975) is the Year 2000 Compliance Officer for Duke University and is wondering why we didn't start using four-digit years sooner than now! *(annette.foster@duke.edu)*

Geoffrey A. Frank (Ph.D. 1979) is principal scientist at the Center for Digital Systems Engineering at the Research Triangle Institute. He recently co-edited the book, *Rapid Prototyping of Application Specific Signal Processors* (Kluwer), and co-wrote one of its chapters. His paper, "Tools for Rapid Construction of VHDL Performance Models for DSP Systems," co written with F. Gail Gray and his students at Virginia Tech., won the Best Paper Award at the 1998 International Verilog HDL Conference and VHDL International Users Forum. *(gaf@rti.org)*

Gopal Gupta (Ph.D. 1992) has been named to the editorial board of the *Journal of Logic Programming.* He is organizing the First International Workshop on Practical Aspects of Declarative Languages to be held with the ACM Principles of Programming Languages Conference in San Antonio, Texas. Gopal is also the general chair of the 16th International Conference on Logic Programming to be held in Las Cruces, N.M. He invites those who are interested to attend both events. See **www.cs.nmsu.edu/~gupta** for details. *(gupta@cs.nmsu.edu)* Some of his recent papers are:

Gupta, G., E. Pontelli, A. Lara, and R. Cardenas. "Automatic Derivation of a Parallelizing Compiler," *Proc. International Conference on Parallel Processing,* August 1998, 579-586.

Karshmer, A., G. Gupta, S. Geiger, and C. Weaver. "A Framework for Translation of Braille Nemeth Math to LaTeX," *Proc. ACM Conference on Assistive Technologies,* April 1998, 136-143.

Pontelli, E., and G. Gupta. "Efficient Parallel Implementation of Backtracking," *Proc. International Conference on Parallel Processing,* August 1998, 338-345.

Pontelli, E., G. Gupta, J. Wiebe, and D. Farwell. "Natural Language Multiprocessing: A Case Study," *AAAI National Conference on Artificial Intelligence,* MIT Press, July 1998, 78-84.

Lenwood S. Heath (Ph.D. 1985) has several recent journal publications:
Ganley, J. L., and L. S. Heath. "An Experimental Evaluation of Local Search Heuristics for Graph Partitioning," *Computing,* Vol. 60, 1998, 121-132.

Heath, L. S., and J.P.C. Vergara. "Edge-Packing in Planar Graphs," *Theory of Computing Systems,* Vol. 31, 1998, 629-662.

Heath, L. S., and J.P.C. Vergara. "Edge-Packing Planar Graphs by Cyclic Graphs," *Discrete Applied Mathematics,* Vol. 81, 1998, 169-180.

Lenny, an associate professor at Virginia Tech. in Blacksburg, Va., is co-principal investigator on a three-year National Science Foundation grant, "A System for Symbolic Computation in Hopf Algebras." *(heath@cs.vt.edu)*

Ellen Johnson (M. S. 1981) retired in January from the Department of Molecular and Cell Physiology at UNC, where she was an analyst programmer. During her 17 years in the department she developed software for the acquisition and display of neuroanatomical and electrophysiological data, and published articles on the use of computers in neurobiological research. ***(emjo@med.unc.edu)***

Peter Litwinowicz (M.S. 1987) co-developed the Motion Paint(SM) system that was used for 8 1/2 minutes of special effects in the film "What Dreams May Come." He worked on the "Painted World" sequence where Robin Williams's character wakes up in a world of wet, and not-so-wet, paint. He is co-founding a company, RE:Vision Effects, Inc., to develop software products for the moving image authoring industry using image processing, computer vision, non-photorealistic rendering, and image-based modeling, rendering, and animation. ***(litwinow@best.com)***

Mark Livingston (Ph.D. 1998) defended his dissertation in October and joined Hewlett-Packard Laboratories in Palo Alto, Calif. ***(livingst@cs.unc.edu)***

Tom Palmer (M.S. 1987) has joined Interpath Communications, Inc., in Research Triangle Park, N.C., where he consults, and also manages Web development projects. ***(tom.palmer@interpath.net)***

Chris Schleter (M.S. 1981) is a manager of Sport Services for the Sydney 2000 Olympic Games. His group is responsible for the interface between sport and technology, including result systems, entry systems, and communications. ***(sprtstat@ix.netcom.com)***

Yen-Ping Shan (Ph.D. 1990) recently left IBM Corp. in Research Triangle Park, N.C., to join Automatic Data Processing in Roseland, N.J., as vice president of Client Server Development/Network Computing. ***(yen-ping_shan@es.adp.com)***

Nancy Stegman (M.S. 1976) recently completed her first year as chief information officer and chief of the Computer Technology Branch at the National Institute of Environmental Health Sciences in Research Triangle Park, N.C. ***(stegman@niehs.nih.gov)***

Undergraduate Alumni

Andrew Certain (B.S. MSci. 1992) is at Amazon.com, working on statistical analyses of the Web site's usage patterns. ***(certain@manifoldgraphics.com)***

Philip R. Fittante (B.S. MSci. 1987), a test pilot in the U. S. Air Force, is currently stationed at Edwards Air Force Base, Calif., where he performs test flights in the B-1 and B-2. He was recently promoted to major. Philip is married with two children. ***(pfittante@prodigy.net)***

Chris Helvig (B.S. MSci. 1995) received his M.S. in computer science from the University of Virginia in May 1998. He attended conferences in France, Italy, and California and wrote a

number of publications (see www.cs.virginia.edu/~csh5t). He now develops computer games at Volition, Inc. *(chris@volition-inc.com)*

W. Joe Hewitt (B.S. MSci. 1988) recently joined Premier Systems Integrators as their professional services manager. He and his wife Susan King Hewitt (B.S. MSci. 1987) live in Raleigh, N.C., with their daughter Breanne (see "Family Matters"). *(joe.hewitt@premier-systems.net, shewitt@interpath.com)*

Mark Hutchinson (B.S. MSci. 1981) is a self-employed contract software instructor and consultant. He is the founder and contact person for the RTP-Delphi Interest Group. *(Aikimark@aol.com)*

Christopher Brant Hyatt (B.S. MSci. 1993) and Stephanie Lanza Hyatt (B.S. MSci. 1992) are both in graduate school. He is working on his MBA at Carnegie Mellon University. *(chyatt@andrew.cmu.edu).* Stephanie received her M.S. in May 1998 in human development methodology from Pennsylvania State University and is working on her Ph.D. Her research is in continuous and categorical latent variable models for analyzing longitudinal data. *(slh@bony.hhdev.psu.edu).*

Gib Johnson (B.S. MSci. 1987) is vice president in charge of all Florida operations for Broadreach Consulting, Inc. (www.BroadreachConsulting.com), a technology consulting company focused on eBusiness Internet Solutions. The company's primary services are management consulting, application solutions, and technology infrastructure. *(Gib.Johnson@BroadreachConsulting.com)*

Karen Roberts Meyer (B.S. MSci. 1987) was recently promoted to second vice president at General Reinsurance Corporation in Chicago, Ill. *(kmeyer@genre.com)*

Richard A Peller (B.S. MSci. 1990) has been promoted to director of development at BridgePoint Incorporated, a CSX Corporation business unit based in Cary, N.C. *(Ric_Peller@Bridge-Point.com)*

David K. Schandler (B.S. MSci. 1988) is operations manager for the Integrated Naval Research Information System project for the Office of Naval Research. He reports needing more developers. Send your resume if you know Oracle and would like to work in the D.C. area. David was recently elected to a second term on the Board of Directors of the Arlington, Va., chapter of the American Red Cross, and was a recipient of the 1998 American Red Cross Chairmen's Award for Inspiration. (www.bigfoot.com/~firewalker) *(firewalker@bigfoot.com)*

Alumnus co-founds Fragile X Foundation

In 1994, after her son had been diagnosed with fragile X syndrome, Katie Clapp (M.S. 1987), her husband Michael Tranfaglia, M.D., and a friend founded the FRAXA Research Foundation to support research for an effective treatment for the disease. Katie, a computer consultant, runs the foundation from her home in West Newbury, Mass. Fragile

X syndrome is the leading hereditary cause of mental retardation affecting approximately 1 in 2,000 males and 1 in 4,000 females from all races and ethnic groups. It is caused by a defective gene that prevents the formation of a special protein normally found in the brain. FRAXA publishes a quarterly newsletter and information booklets, and has a listserv and a Web site, www.fraxa.org. Tax-deductible donations may be sent to: FRAXA Research Foundation, P.O. Box 935, West Newbury, MA 01985 ***(kclapp@fraxa.org)***

Former faculty and staff news

Liyun Yu, former postdoctoral researcher, recently returned to North Carolina from Florida. He works at the Center for Health Policy, Law and Management at Duke University as an analyst programmer, working on health and Medicare-related statistical data analysis and as the system administrator for the N.C. National Significance Integration Project. Liyun worked here from 1994 to 1996 with Stephen M. Pizer, Kenan professor. He and his wife had their second daughter in 1997 (see "Family Matters"). ***(yu@hpolicy.duke.edu)***

Computer Services news

PC installations

Jane Stine, desktop systems manager, and William Jiang, PC systems administrator, headed up the effort to install new systems that converted most of the Department's PCs to Windows NT. They also set up a single Department-wide Windows NT domain. With about 280 installed, PCs are now our largest computer fleet.

Network upgrade project

Bil Hays, network manager, installed most of the new networking hardware provided by UNC's Academic Technology and Networks office (ATN). He and the network planning group are completing the building rewiring plans, which call for providing video and switched 100-megabit connections to all desktops. We are also working out a support level agreement with ATN. Recent improvements include upgrading the campus uplink to 100 megabits/second and providing individual 100-megabit switched connections to all machine room servers. We have also doubled the number of systems on direct switched 10-megabit ports.

Linux support plan

The Departmental Facilities Committee has worked out a plan for supporting Linux, a flavor of UNIX on PCs. Murray Anderegg (M.S. 1991), HP and E-mail systems

administrator, is providing system support. He set up a Linux compute server and worked out a standard installation. He is installing Linux on PCs at users' requests.

Solaris Compute Servers

John Sopko, UNIX systems manager, configured and installed three new dual-processor Solaris compute servers--capefear, eagle, and swift--which have been designated for general logins, class use, and compute-intensive work, respectively. Each has a large playpen disk area available to other systems via NFS. He also set up a dedicated Web server for the WWW programming classes, COMP 117 and 118.

Old Systems Retired

In the past year we retired nearly all the 68030-processor-based Macintosh computers (Mac II and Mac Classic II systems). We reduced the number of DEC systems from 70 to 7. Further reductions are on the way. We also retired our older Sun systems (SPARC 1, SPARC 1+, and SPARC 10/20). The next systems to be retired are the remaining DECs, and also the 68040-based Macintosh Quadras, which cannot run MS Office 98 or the latest Macintosh operating system.

About News & Notes

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