News & Notes from Sitterson Hall

Issue Thirty, Fall 2001

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

In This Issue

Chairman's Corner

Many thanks to all of our alumni and friends who were able to join us in Chapel Hill in October for the Toolsmith Conference, honoring **Frederick P. Brooks Jr.,** Kenan professor. It was wonderful to see you all. Read about the conference **below**.

We have many faculty changes to report. We welcome **Montek Singh**, assistant professor. **Anselmo Lastra**, formerly a research associate professor, has joined our tenure-track faculty as an associate professor. We also welcome several new adjuncts: **Pankaj K. Agarwal, Elizabeth Bullitt M.D., Herbert Edelsbrunner**, and **Diane H. Sonnenwald**. We say goodbye to **Turner Whitted**, who leaves after nearly 20 years as an adjunct professor. We wish **Siddhartha Chatterjee** well at IBM T. J. Watson Research Center in Yorktown Heights, N.Y., and are happy to have him remain on our faculty as an adjunct. Several faculty have received promotions. **Gregory F. Welch** (Ph.D. 1997) was promoted to research associate professor in

September and **Jim Anderson** and **Jan Prins** become full professors in January. **Sanjoy Baruah**, associate professor, has been awarded tenure.

Congratulations to graduate student **Paul Yushkevich** (M.S. 2000), recipient of the 2001-2002 Computer Science Alumni Fellowship. For more about his research, see **"Research Highlights"**. Generous contributions from alumni and friends help make this fellowship possible. We thank you for your past support and hope we can count on you in the future. Your tax-deductible contributions will help maintain the vitality of the department and will count towards the university's current fund-raising campaign.

We hope you will visit our web site for the latest news about us, or stop by if you are in the Chapel Hill area.

Stephen F. Weiss

Portrait of J. Carlyle Sitterson Installed

This spring, we were very pleased to accept **Mrs. Nancy Sitterson's** kind donation of a portrait of her husband, **Joseph Carlyle Sitterson**, for whom our building is named. Mrs. Sitterson and her son, **Joseph Jr.** (pictured at right with **Stephen F. Weiss**, department chair), attended the portrait's unveiling in the lobby of Sitterson Hall, at the department's commencement ceremony on 20th May.

Dr. Sitterson had a lifelong association with UNC-Chapel Hill. He received all his degrees: an A.B. in 1931, an M.A. in 1932, and a Ph.D. in 1937 here. From 1935 until his retirement in 1981, he was a professor in the Department of History. He served as dean of the College of Arts and Sciences from 1955 to 1961; as the university's vice chancellor from 1965 to 1966; and as chancellor from 1966 to 1972.

Welcomes and Farewells

New Faculty

Pankaj K. Agarwal, adjunct professor (professor, Computer Science, Duke University), Ph.D. 1989, NYU (Courant). *Computational and combinatorial geometry; GIS and global change; computational biology; robotics; visualization.*

Elizabeth Bullitt, adjunct professor (professor, Surgery, UNC-Chapel Hill), M.D. 1975, Colorado. *Computer-aided surgery; computer-aided diagnosis.*

Herbert Edelsbrunner, adjunct professor (professor, Computer Science, Duke University), Ph.D. 1982, Graz Technical (Austria). *Algorithms; data structures; discrete and computational geometry; combinatorial and computational topology; geometric modeling; structural biology.*

Montek Singh, assistant professor, Ph.D. 2001, Columbia. *High-performance and low-power digital systems; asynchronous circuits and systems; system-on- a-chip design; and VLSI CAD.*

Diane H. Sonnenwald, adjunct associate professor (associate professor, Information and Library Science, UNC-Chapel Hill), Ph.D. 1993, Rutgers. *Collaboration among multi-disciplinary, cross-organizational teams; collaboration across distances; collaboration technology; human information behavior; digital libraries.*

New Students

Jay Aikat, David Borland, James Branigan, Tong Chao, Umamaheswari Devi, Jeffrey Feasel, Charalampos Fretzagias, Abhishek Ghosh, Naga Govindaraju, Youn Joo Heo, Andrea Hilchey, Jun Huan, Ja Yeon Jeong, Jason Jerald, Julien Jomier, Sunyong Kim, Tae-Kyung Kim, Theodore Kim, Andrew Leaver-Fay, Mark Lindsey, Jinze Liu, Marcelinus Prastawa, Andrew Raij, Kent Rosenkoetter, Sunayana Saha, Brian Salomon, Thorsten Scheuermann, Woo Jin Seok, Spencer Shepard, Joshua Stough, Jeff Townsend, Fang-Yi Tsai, Yethiraja Sampath Vetsa, Suzanne Vogel, Rong Xie, Hua Yang, and Sung-Eui Yoon.

New Staff

Alan Forrest, computing consultant, joined our Computer Services staff in June to do Macintosh and PC administration. Formerly, he managed an information technology help desk at IFG Companies in Burlington, N.C. Alan has an M.A. in Music from East Carolina University.

David Marshburn (M.S. 2000), became a permanent member of our staff in October, as a research engineer with the nanoManipulator project. He received his M.S. from our department last year.

Ann Neville, assistant to several faculty, began working with us in June. She comes to us from TBM Consulting Group in Durham, N.C., where she assisted engineering consultants and planned seminar events. Prior to TBM, she was with the American Express Travel Center in Durham.

Chester Stephen, electronics technician, joined our Computer Services staff in July. He maintains PCs, printers, and copiers, and coordinates recycling efforts. Previously, he worked for Materials Management at UNC-Chapel Hill. He has 20 years experience as an electronics technician for DEC and Labcorp.

Anna Washington, educational media specialist and outreach coordinator, joined us in May. She is coordinating research demonstrations and designing the lobby museum. Previously, she was a senior specialist in technical education at Nortel Networks and, before that, a media specialist at UNC-Chapel Hill's School of Nursing.

Postdoctoral Researchers

David Hsu joined us in June to work with Jack Snoeyink, professor, on motion representations for proteins. He received his Ph.D. in fall 2000 from Stanford University, on applications of motion planning in robotics and computer animation.

Conglin Lu joined us this fall to work with Stephen M. Pizer, Kenan professor, and the MIDAG group. He received his Ph.D. in applied mathematics this fall from Brown University, on the subject of 3D curvature flows and stochastic curve models.

Thanks and farewell to . . .

Martin Guthold, postdoctoral researcher, who joined the Physics Department at Wake Forest University in August as an assistant professor. He had worked with us since 1997 on the nanoManipulator project. *(gutholdm@wfu.edu)*

Lutz Kettner, postdoctoral researcher, who left in September to join the Max-Planck-Institut für Informatik in Saarbrücken, Germany. He was with us for two years, working with Jack Snoeyink on computational geometry projects. *(kettner@mpi-sb.mpg.de)*

Stephen G. Tell (M.S. 1991), senior research associate, who left in July to continue working with Velio Communications, Inc. (formerly Chip2Chip), with whom he had been on off-campus assignment for the past year. Velio designs innovative signaling and switch-fabric integrated circuits. *(tell@cs.unc.edu)*

Turner Whitted, adjunct professor, who left at the end of June. Turner is a senior researcher in Microsoft Research's hardware devices and graphics groups. He had been with us since 1983.

Anna Washington (left), Tammy Pike, Jack Snoeyink, and Katrina Coble get into the Halloween spirit! (Photo: Herman Towles)

Family Matters

Dennis Brown (M.S. 1998) and **Lisa Cox** married on 8 September 2001 in Silver Spring, Md. *(brownde@cs.unc.edu)*

Peter Calingaert, professor emeritus, and **Isabel Alper** married on 31 October 2001 in Chapel Hill, N.C. *(pc@cs.unc.edu)*

Alan Zhan Chen was born on 5 August 2001 in Raleigh, N.C., to Jun Chen (M.S. 1997) and Tianli Fan (M.S. 1997). *(chenju@cs.unc.edu)*

Lora Erin and **Daniel Tyler Coggins** were born on 12 September 2001 in Durham, N.C., to James Coggins, associate professor, and Leslie Coggins. *(coggins@cs.unc.edu)*

William Jiang, systems administrator, and **Anna Kung** married on 27 August 2001 in Hillsborough, N.C. *(jiang@cs.unc.edu)*

Kurtis Keller, research associate, and **Joni Julian** married on 13 October 2001 in Chapel Hill, N.C. *(keller@cs.unc.edu)*

Shannon Elise Keyser was born on 21 October 2001 in Bryan, Texas, to John Keyser (Ph.D. 2000) and Michelle Keyser. *(keyser@cs.tamu.edu)*

Jim Mahaney, computing consultant, and **Lori Rodman**, former computing consultant, married on 19 May 2001 in Florida. *(mahaney@cs.unc.edu)*

Declan Simon McCoy was born on 15 September 2001 in Ottawa, Ontario, Canada, to Brendan McCoy and Nalini D'Souza (B.S. MSci. 1994). *(nalini_dsouza@hotmail.com)*

Ransom Murphy (B.S. MSci. 1990, M.S. 1993) and **Bridgett Hicks** married on 29 September 2001 in Raleigh, N.C. *(gmurphy@lucent.com)*

Rasika Obla was born on 14 March 2001 in Kirkland, Wash., to Pritvinath Obla (M.S. 1995) and Vijaya Obla. *(pritobla@microsoft.com)*

Joel Sgro (B.S. MSci. 1999) and **Helen Clement** married on 18 August 2001 in Raleigh, N.C. *(arbys_lover@hotmail.com)*

Congratulations to...

Jim Anderson, who has been promoted to full professor, as of 1 January 2002.

Sanjoy Baruah, associate professor, who has been awarded tenure, as of 1 January 2002.

Frederick P. Brooks Jr. , Kenan professor, who was named a Fellow of the Computer Museum History Center in Palo Alto, Calif.

William Jiang, systems administrator, who became a U.S. citizen on 23 August 2001.

Scott Larsen, graduate student, who is the 2001-2002 president of the Computer Science Students Association.

Anselmo Lastra, who became an associate professor on 1 July 2001.

Jim Mahaney, who was promoted to a computing consultant II on 10 May 2001.

Jan Prins, who has been promoted to full professor effective 1 January 2002.

Gregory F. Welch (Ph.D. 1997), who became a research associate professor on 1 September 2001.

Faculty and staff who reached milestones of state service in 2000 and 2001:

5 years: Murray Anderegg (M.S. 1991), Mike Carter, Donna Knighten, John Sopko, Marie Tarjan, Mary Whitton, Gregory F. Welch

10 years: Charlie Bauserman, Anselmo Lastra, Lars Nyland, Don Smith (Ph.D. 1978), Andrei State

15 years: James Coggins, Madelyn Mann, Jeannie Walsh

20 years: Linda Houseman, John Poulton, Leandra Vicci

25 years: Catherine Perry

30 years: Stephen F. Weiss

And to our May and August graduates:

Doctor of Philosophy

May
Brent E. Insko, "Passive Haptics Significantly Enhances Virtual Environments" (adviser: Frederick P. Brooks Jr.)

Michael J. Meehan, "Physiological Reaction as an Objective Measure of Presence in Virtual Environments" (Frederick P. Brooks Jr.)

Voicu S. Popescu, "Forward Rasterization: A Reconstruction Algorithm for Image-Based Rendering (Anselmo A. Lastra).

August
Chun-Fa Chang, "LDI Tree: A Sampling Rate Preserving and Hierarchical Data Representation for Image-Based Rendering" (Gary Bishop).

Martin A. Styner, "Combined Boundary-Medial Shape Description of Variable Biological Shapes" (Guido Gerig).

Master of Science

May: Michael Bell, Christopher Brooks, John Carpenter, Parag Chandra, Wei-Chao Chen*, Jason Clark, Swaha Das*, Susan Fisher*, Mark Foskey, Yonatan Fridman*, Shelby Funk*, Ashes Ganguly, David Gotz*, Kenneth Hoff III*, Huajun Luo, Olufisayo Omojokun*, Erin Parker*, Christopher Riley, Stefan Sain, Liang-Wei Su, Srihari Sukumaran, Randal Whitehead

August: Thomas Bodenheimer, Joohi Lee*, Sungwook Park

*Continuing on to Ph.D. at UNC

B.S. Mathematical Sciences (CS Option)

May: Elizabeth R. Allen, Charles C. Bailey, Irvin T. Blanchard IV, Brian D. Boyd, Steven K. Broughton, Anne C. Burns, Melissa A. Chadburn, Benjamin Z. Chen, Anthony C. Chow, Bryan A. Crumpler, Jason E. Evanoff, Jacobe D. Foster, William C. Hall, Harry R. Halpin*, Andrew D. Hans, Dawn M. Hogan, Jason W. Howell, Michael J. Manalo*, Saakait N. Mathur, Jeffrey W. McLamb**, Heather Morgan, Alison S. Naylor, Steven D. Park, Karen E. Parker, Kalpesh S. Patel, Scott E. Phillips, Sean C. Rielly, Jessica L. Roberts, William P. Safcik III, Eric M. Sanks, Xiaoli Shi, Jefferson R. Smith, Michael W. Smith, Jill N. Struble*

August: Sandra J. Hall, Evelyn G. Salazar*

*With Honors **With Highest Honors

Ph.D. graduates John Keyser (August 2000) and his wife, Michelle, and Timothy Culver (December 2000) and his wife Kathleen, returned to Chapel Hill on 20th May to attend the department's commencement ceremony. (Photo: Claire Stone)

Dr. Kevin Jeffay with Evelyn G. Salazar, a graduate in the computer science option of the Mathematical Sciences Curriculum. (Photo: Claire Stone)

2001-2002 Student Fellowships and Special Awards

Wei-Chao Chen	Link Foundation Fellowship
Susan Fisher	UNC-Chapel Hill Graduate School Board of Governors Fellowship (3rd year)
Mark Harris	NVIDIA Fellowship

Jason Jerald	National Physical Sciences Consortium Fellowship
Mark Lindsey	UNC-Chapel Hill Graduate School Board of Governors Fellowship
Benjamin Lok	Link Foundation Fellowship
Olufisayo Omojokun	AT&T Labs Grant (3rd year)
Miguel Otaduy	Government of the Basque Country Fellowship (2nd year)
Erin Parker	Lawrence Livermore Graduate Fellowship (2nd year)
Joshua Steinhurst	National Science Foundation Fellowship
Andrew Wilson	UNC-Chapel Hill Humphreys Graduate Fellowship (3rd year)
Paul Yushkevich	Department Alumni Fellowship

Research Highlights

Alumni Fellowship Recipient

Paul Yushkevich (M.S. 2000) is the recipient of the 2001-2002 Computer Science Alumni Fellowship. The fellowship is awarded annually to a Ph.D. candidate, in his or her final year of study, allowing the student to work full time on dissertation research. Generous contributions by alumni and friends help to make this fellowship possible.

Paul is working on a dissertation on 3D statistical shape analysis, under the direction of **Stephen M. Pizer**, Kenan professor. His research involves finding a novel representation for object shape; matching this representation to organs in 3D medical images at multiple levels of detail; and measuring the probability distributions on the parameters of the shape representation. His goal is to be able to describe visually and intuitively the shape variability of organs in the brain across populations of patients. Paul's dissertation builds upon the work of many members of the Medical Image Display and Analysis Group (MIDAG) at UNC-Chapel Hill, especially on the medial representation of shape developed by Pizer and others.

Keck Foundation Award to Aid Nanoscience Research

The W. M. Keck Foundation of Los Angeles has awarded a $1 million gift to UNC-Chapel Hill that will help nanoscience team researchers to establish the Atomic Imaging Manipulation System and to purchase new instruments to improve on the current nanoManipulator system, which uses virtual reality technology to provide a visual, 3D image of nanoscale molecules. The next-generation nanoManipulator will give clearer and more precise images of structures and operations at the atomic level and will allow researchers to conduct experiments in real time-- where the manipulation of molecules occurs simultaneously with the imaging of the experiment on the screen. The principal investigators are **Russell M. Taylor II** (Ph.D. 1994), research associate professor of computer science, **Richard Superfine**, associate professor of physics, and **Sean Washburn**, professor of physics. According to Superfine, the Atomic Imaging Manipulation System will give UNC-Chapel Hill researchers "capabilities unmatched for

nanoscale science and technology in the world." UNC-Chapel Hill has provided matching funds of $200,000 to cover equipment installation costs and student and staff time to engineer and assemble the equipment.

dAb: Haptic Painting

A novel haptic painting system, dAb, developed by members of the GAMMA (Geometric Algorithms for Modeling, Motion, and Animation) research group, goes beyond existing computer-based painting systems by providing an intuitive haptic interface that makes users feel they are painting on actual canvas. Graduate students **William Baxter** (M.S. 2000) and **Vincent Scheib** developed the system, under the direction of professors **Ming Lin** and **Dinesh Manocha.** The system allows users to paint with a virtual paintbrush with a 3D stylus that provides them with force feedback cues, allowing them to make complex brush strokes just as naturally as they would with a real brush. Users can choose from several brushes of varying sizes and shapes and can add complex blends of paint to a brush, applying them to the virtual canvas in realistic ways. The shape of the brush alters as the user increases or decreases pressure on the stylus. The system runs on a standard high-end personal computer with a commodity OpenGL 3D graphics accelerator and a haptic device made by SensAble Technologies. The researchers are working to improve the quality of human-computer communication and to enhance the level of usability for computer interfaces. They hope that dAb will contribute to these efforts. Their research is supported in part by the U.S. Army Research Office, the U.S. Department of Energy ASCI Program, Intel Corp., the National Science Foundation, and the Office of Naval Research. **(www.cs.unc.edu/Research/geom/dab)**

Graduate students William Baxter (right) and Vincent Scheib use their dAb haptic painting system to put the finishing touches on a portrait of the Old Well, a well-known landmark at UNC-Chapel Hill. (Photo: Larry Ketchum)

New Contracts and Grants

Stephen Aylward (Ph.D. 1997), adjunct assistant professor, principal investigator (PI). "Vessel Visualization and Quantification for Partial-Organ Transplant Planning and Evaluation," Whitaker Foundation.

Gary Bishop (Ph.D. 1984), associate professor (PI), and **Gregory F. Welch** (Ph.D. 1997), research associate professor (Co-PI). "Technology for Full-Body Tracking," Naval Research Lab.

Henry Fuchs, Federico Gil professor (PI), **Herman Towles**, senior research associate, and **Gregory F. Welch** (Co-PIs). "Real-Time Long Distance Terascale Computation for Full Bandwidth Tele-Immersion," National Science Foundation (NSF), subcontract to University of Pennsylvania and Carnegie Mellon University.

Kevin Jeffay, S. S. Jones professor, et al. Equipment Grant, IBM Corp.

Ming C. Lin, associate professor (PI), and **Dinesh Manocha**, professor (Co-PI). "Visualization: High Fidelity Virtual Touch: Algorithms, Applications and Evaluation," NSF.

Ming C. Lin. "Real-Time Physically Based Modeling and Interaction," Intel Corp.

Dinesh Manocha. "Instrumentation for Interactive Display of Complex Datasets," U.S. Army Research Office.

Ketan Mayer-Patel, assistant professor. "Fellowship Grant," NCNI.

Jack Snoeyink, professor. "Pentatope Meshes for Compression and Progressive Transmission of 4D Data Sets," University of California.

David Stotts, associate professor. "An Object-Oriented Integrated Framework for Multi-Discipline Ecosystem Modeling," U.S. Environmental Protection Agency.

Gregory F. Welch. "Compensating for Color Variations Across Multi Projector Displays," Argonne National Laboratories, University of Chicago.

Other News

New Professors Ride the Bus

In May, **Ketan Mayer-Patel**, assistant professor, and **Jack Snoeyink**, professor, were among around 30 new UNC-Chapel Hill faculty and administrators to take the annual Tar Heel Bus Tour. The weeklong trip is designed to give participants a closer look at the history, culture, and commerce of North Carolina and a better understanding of the state's varied communities, which provide UNC-Chapel Hill with about 80 percent of its undergraduates. Stops highlighted North Carolina's economy and culture and included a tobacco farm in Louisburg, a hog farm in Clayton, a spinning and dyeing plant in Mount Holly, corporate offices in Charlotte, and a NASCAR track in Rockingham. Another member of our faculty, professor **Prasun Dewan** went on the first bus tour in 1997.

3rdTech Wins Again

In our spring issue we reported that 3rdTech's **HiBall-3000 Wide Area Tracker** and **DeltaSphere-3000 Scene Digitizer**--products based on technology developed in our department--had each won awards. A third product also based on research at UNC-Chapel Hill--the **NanoManipulator DP-100 Visualization and Control System**--has also been honored. *R&D Magazine* has selected it as an *R&D 100 Award* winner for 2001. Winners are chosen for "their importance, uniqueness, and usefulness." The DP-100 consists of a SensableTechnologies PHANTOM(TM) Desktop force-feedback device, a PC with 3D graphics, and extensive software, integrated with a scanning probe microscope. Its first commercial installation was this summer at NASA-Langley Research Center. For more on 3rdTech's products, see www.3rdtech.com.

Chatterjee Pursues New Research Opportunities at IBM

Siddhartha Chatterjee joined IBM T. J. Watson Research Center in Yorktown Heights, N.Y., in July. He is the manager of the High Performance Software Environments group in the Emerging System Software department. He leads the group in developing compilers and tools for IBM's emerging high-performance architectures. Formerly an associate professor, Chatterjee continues with us as an adjunct. He has been with us since 1994. *(sc@us.ibm.com)*

Recent Publications

Avenhaus, J., and D. Plaisted. "General Algorithms for Permutations in Equational Inference," *Journal of Automated Reasoning,* 26(3), April 2001, 223-268.

Bandyopadhyay, D., R. Raskar, and H. Fuchs. "Dynamic Shader Lamps: Painting on Real Objects," *Proc. International Symposium on Augmented Reality,* Oct. 2001.

Baruah, S. "Scheduling Periodic Tasks on Uniform Multiprocessors," *Information Processing Letters,* 80(2), 2001, 97-104.

Baxter, W., V. Scheib, M. Lin, and D. Manocha. "DAB: Haptic Painting with 3D Virtual Brushes," *Computer Graphics: Proc. SIGGRAPH 2001,* 461-468 (also in video proceedings).

Cheng, B.-C., A. Stoyenko, T. Marlowe, and S. Baruah. "Bounds on Tardiness in Scheduling of Precedence-Constrained Unit Real-Time Task Systems," *Computers and Electrical Engineering,* Vol. 27, 2001, 345-354.

Dershowitz, N., and D. Plaisted. "Rewriting," *Handbook of Automated Reasoning,* Vol. 1, A. Robinson and A. Voronkov, eds., North-Holland, 2001, 535-610.

Ehmann, S., A. Gregory, and M. Lin. "A Touch-Enabled System for Multiresolution Modeling and 3D Painting," *Journal of Visualization and Computer Animation,* 2001.

Ehmann, S., and M. Lin. "Accurate and Fast Proximity Queries Between Polyhedra Using Convex Surface Decomposition," *Computer Graphics Forum: Proc. Eurographics 2001,* 20(3), 2001.

Fisher, S., and M. Lin. "Deformed Distance Fields for Simulation of Non-Penetrating Flexible Bodies," *Computer Animation and Simulation 2001,* Cani, Thalmann, and Thalmann, eds., Springer-Verlag, 2001, 99-111.

Foskey, M., M. Garber, M. Lin, and D. Manocha. "V-Plan: A Voronoi-Based Hybrid Motion Planner," *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems,* Oct. 2001.

Goossens, J., and S. Baruah. "Multiprocessor Preprocessing Algorithms for Uniprocessor On-Line Scheduling," *Proc. IEEE 21st International Conference on Distributed Computing Systems,* April 2001.

Isenburg, M. "Triangle Strip Compression," *Computer Graphics Forum,* 20(2) June 2001, 91-101.

Isenburg, M., S. Gumhold, and C. Gotsman. "Connectivity Shapes," *Proc. IEEE Visualization 2001,* Oct. 2001, 135-142.

Isenburg, M., and J. Snoeyink. "Compressing the Property Mapping of Polygon Meshes," *Proc. Pacific Graphics 2001,* Oct. 2001, 4-11.

Jeffay, K., and H. Zhang, eds. *Readings in Multimedia Computing and Networking,* San Francisco: Morgan Kaufman, 2001, 863 pp.

Krishnan, S., M. Foskey, T. Culver, J. Keyser, and D. Manocha. "PRECISE: Efficient Multi-Precision Evaluation of Algebraic Roots and Predicates for Reliable Geometric Computation," *Proc. ACM Symposium on Computational Geometry,* 2001, 274-283.

Lipari, G., and S. Baruah. "A Hierarchical Extension to the Constant Bandwidth Server Framework," *Proc. IEEE Real-Time Technology and Applications Symposium,* May 2001, 26-35.

Majumder, A., and G. Welch. "Computer Graphics Optique: Optical Superposition of Projected Computer Graphics," *Proc. Fifth Immersive Projection Technology Workshop,* May 2001.

Otaduy, M., and M. Lin. "User-Centric Viewpoint Computation for Haptic Exploration and Manipulation," *Proc. IEEE Visualization,* Oct. 2001.

Raskar, R., G. Welch, K.-L. Low, and D. Bandyopadhyay. "Shader Lamps: Animating Real Objects With Image-Based Illumination," *Proc. 12th Eurographics Workshop on Rendering,* June 2001.

Styner, M., and G. Gerig. "Medial Models Incorporating Object Variability for 3D Shape Analysis," *Proc. IPMI 2001,* June 2001.

Yang, R., D. Gotz, J. Hensley, H. Towles, and M. Brown. "PixelFlex: A Reconfigurable Multi-Projector Display System," *Proc. IEEE Visualization 2001,* Oct. 2001.

Yang, R., and G. Welch. "Automatic Projector Display Surface Estimation Using Every-Day Imagery," *Proc. Ninth International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision 2001.*

Best Student Paper Awards

Kim, Y.-J., and J. Anderson. "A Time Complexity Bound for Adaptive Mutual Exclusion," *Proc. 15th International Symposium on Distributed Computing,* Oct. 2001.

Wilson, A., K. Mayer-Patel, and D. Manocha. "Spatially-Encoded Far-Field Representations for Interactive Walkthroughs," *Proc. ACM Multimedia Conference,* Oct. 2001, 348-357.

New Course: Research Administration for Scientists

Computer science and other science students planning a career in academia, need to gain experience in three important areas during their time in graduate school: (1) their field of science; (2) how to teach; and (3) the field of research administration: how to operate in the complex environment of research grants, intellectual property laws, conflict of interest policies, etc. While science departments at UNC-Chapel Hill have traditionally done an excellent job with the first two, until this fall there has been no structured way for students to learn about the third.

A new course, **Research Administration for Scientists** (COMP 290-083) offered for the first time during fall 2001, covers all the important topics in this area. Students are learning about the many ways to fund research, including contracts, grants, cooperative agreements, direct versus indirect costs, and cost-sharing, among others. Other topics include grant proposal writing, budget development, the NSF peer review process, contract negotiation, misconduct in science, conflicts of interest, an introduction to intellectual property law--including copyright and patent law--developing patent applications, technology transfer, nondisclosure agreements, material transfer agreements, new company start-ups, and venture capital.

The course is being taught by **Timothy L. Quigg**, the department's associate chair for administration and finance, who has built up a wealth of experience in these subjects, during a rich career in higher education administration, the private sector, and state government in North Carolina. Quigg's motivation for creating the class grew out of the six years he has worked with faculty and students in the department, and a recognition that university science professors must be managers of both people and money and must make efficient use of resources, while striving to become effective researchers and teachers.

This fall's course has been well attended, with 16 enrolled and a number of faculty and administrators sitting in on several classes. Quigg plans to offer his course every fall. All students in the sciences are invited to enroll. While the emphasis is on students planning careers in academia, many topics will also apply to those who will be working in non-profit research institutes, government, and the commercial sector.

Toolsmith Conference

From left: Dave Tolle (Ph.D. 1981), Helen Williams, Hollins Williams (Ph.D. 1981), Judy Popelas (Ph.D. 1983), Ava Nackman, Maris Pargas, and Roy Pargas (Ph.D. 1982). (Photo: Lee Nackman [Ph.D. 1982])

The Toolsmith Conference, held at UNC-Chapel Hill in mid October, celebrated the many accomplishments and continuing contributions of **Frederick P. Brooks Jr.**, Kenan professor, to the field of computer science. Approximately 250 current and former faculty, staff, and students, and many friends, came together for the two-day event during which speakers reminisced about the role Brooks had played in their professional and personal lives and discussed new directions in computer science.

Keynote speaker at the Thursday luncheon, which opened the conference, was **Ivan Sutherland**, vice president and Fellow of Sun Microsytems, who spoke about "Computing and the March of Time." At the Thursday evening banquet, Brooks's keynote speech, "Life Sentences," looked back at the most influential statements others had made to him during his life.

Alumni speakers included **Steven M. Bellovin** (Ph.D. 1982) of AT&T Labs Research; **John Crawford** (M.S. 1977) of Intel Corp.; **Craig Mudge** (Ph.D. 1973) of Pacific-Challenge; **Mike Pique** (M.S. 1980) of The Scripps Research Institute; **Diane Pozefsky** (Ph.D. 1979) of IBM Corp.; **Jim Sneeringer** (Ph.D. 1975) of Conclusive Strategies; and **Cheryl Sneeringer** (Ph.D. 1975). Other special guest speakers included **Gerrit Blaauw**, professor emeritus of the University of Twente; **Bob Evans**, chair of the Cambridge Technology Group; **Henry Fuchs**, Federico Gil professor of UNC-Chapel Hill; **Ken Iverson**, inventor of the APL and J programming languages; **Dick Sites** of Adobe Systems, Inc.; and **Sam Williamson**, president emeritus of Sewanee, The University of the South.

The department-sponsored conference received generous support from the College of Arts and Sciences at UNC-Chapel Hill, NVIDIA, the Mathematical and Computer Science Division of the U.S. Army Research Office, U.S. Army STRICOM (Simulation, Training & Instrumentation Command), and alumnus John Q. Walker (Ph.D. 1991). **Elizabeth Smithwick**, special projects coordinator, was the conference organizer. **(www.cs.unc.edu/Toolsmith)**

Parke Godfrey (B.S. MSci. 1984) and Mark Hutchinson (B.S. MSci. 1981) catch up during a session break. (Photo: Claire Stone)

Dr. Fred Brooks (center) celebrates his career in computer science with many of the assistants who have worked with him through the years. From left: Rebekah Westover (1983-1987), Paul Morris (2000-present), Lib Moore Jones (1964-1980), Darlene Freedman (1996-2000), and Fay Ward (1988-1996). (Photo: Kevin Jeffay)

Alumni News

M.S. and Ph.D. Alumni

Alex Blate (B.S. MSci. 1999, M.S. 2000) has left Cisco Systems to become director of Quality Assurance at Interval Research Corp. in Palo Alto, Calif. He lives with his longtime friend and partner, Ruthie Rudek. *(blate@cs.unc.edu)*

Michael D. Bradshaw (M.S. 1993) was recently promoted to director of business processes and systems supporting worldwide software sales and fulfillment operations at IBM Corp. He divides his time between IBM's New York, Connecticut, and Research Triangle Park offices, as well as

making trips abroad. His son, Andy, is enjoying the third grade and his daughter, Johanna, recently had her first birthday. *(mbradsha@us.ibm.com)*

Dennis Brown (M.S. 1998) worked for a year at IBM Corp. in Research Triangle Park, N.C., following graduation, then moved to Washington, D.C., two years ago to join the Naval Research Laboratory. He works on the Battlefield Augmented Reality project. He recently married (see **"Family Matters"**). (*http://dgbrown.h-body.org/* , *brownde@cs.unc.edu).*

Ta-Ming Chen (M.S. 1992) was granted the patent, "Integrated Telecommunication Collaboration System" (U.S. Pat. No. 6256389), in July. He left Nortel Networks in January and is currently working for Cisco Systems in Research Triangle Park, N.C., as a software developer in the VoIP group. *(chent@cs.unc.edu)*

Paul Clements (M.S. 1980) co-authored two books published recently by Addison Wesley: *Software Product Lines: Practices and Patterns,* and *Evaluating Software Architectures: Methods and Case Studies.* Both are part of the Software Engineering Institute's series. *(clements@sei.cmu.edu)*

John Colotta (M.S. 1981) received his MBA from the University of Dallas with a specialization in International Management. He works with Lockheed Martin Aeronautics Co. in Fort Worth, Texas, where he is a principal software engineer. *(john.a.colotta@lmco.com)*

John Crawford (M.S. 1977) of Intel Corp., managed the joint Intel/Hewlett-Packard project to develop the Itanium Family Architecture. Currently, he is leading the debug of McKinley, the second-generation Itanium processor. Itanium, released in May, is designed for workstations and servers that power Web sites, sift through data, and run scientific applications. *(john.h.crawford@intel.com)*

Joel Dunn (M.S. 1995) has been named interim executive director for the North Carolina Networking Initiative. He also has a "day job" as systems director for Administrative Information Services at UNC-Chapel Hill, where he has worked for several years. *(joel_dunn@unc.edu)*

John Gauch (Ph.D. 1989) was recently awarded the patent, "Real-Time Feature-Based Video Stream Validation and Distortion Analysis System Using Color Moments" (U.S. Pat. No. 6,246,803 B1), for research done at the University of Kansas where he is a professor. The patent is used in software that continuously compares broadcast television at the uplink and downlink locations to notice when the broadcast signal is not being received by the cable subscriber. *(jgauch@eecs.ku.edu)*

Thom Haynes (M.S. 1989) was recently awarded the designation of IBM "Master Inventor." He is close to his 14th invention plateau. He has 10 issued U.S. patents, 21 issued non-U.S. patents, and several patents that have been identified as being in the top 10 percent of the IBM portfolio. Thom is the lead of the User-Centered Design group for IBM WebSphere Edge Server and Host Publisher. He lives in Apex, N.C., with his wife of 14 years, Andrea, and children, Alex (10) and Ethan (8). *(haynest@us.ibm.com)*

Bradley Hemminger (M.S. 1985) has joined the School of Information and Library Science at UNC-Chapel Hill as an assistant professor. In addition to teaching, he is being funded by a new genome science and bioinformatics program, and will be starting an Informatics and Visualization research laboratory at the school. Brad continues to work in medical imaging and medical informatics and is continuing his relationship with the Department of Radiology at UNC- Chapel Hill as an adjunct assistant professor. *(bmh@ils.unc.edu)*

Roger Horton (M.S. 1990) has been with American Dental Partners, Inc. (ADPI), since 1997. In January, he was promoted from director to vice president of Information Systems. ADPI is a national management company providing services to large dental group practices. Roger's work is in wide area network development, data warehousing and decision support systems, and the development of an on-line patient record. *(hortonr@attglobal.net)*

John Jacobs (M.S. 1971) and his wife, Cozette, spent the spring in the Bahamas on their thirty-six foot sailboat. John retired six years ago after 31 years of federal service. With the U.S. Air Force, he was on the steering committee for the development of the ARPA network (which evolved into the Internet). His work for the National Oceanic and Atmospheric Administration (NOAA), included the implementation of hierarchical data storage systems and making data archived by NOAA's National Environmental Data Centers available on the Internet. He now works as a private consultant and is involved in a project to make the archives of large array data sets--such as satellite and radar data gathered by NOAA and NASA--available over the Internet. He and Cozette have two sons, John Jr., and Stephen. *(john@sailorjohn.com)*

David F. McAllister (Ph.D. 1972) co-authored the paper, "Predictor Surfaces for Lip Synchronization Animation of Voiced Input," which won the best paper award in the session on Robotics and Control Systems I at the joint Fifth World Multi-Conference on Systemics, Cybernetics and Informatics and the Seventh International conference on Information Systems, Analysis and Synthesis. He also wrote an entry on "Stereo and 3D Display" that will appear in the forthcoming *Encyclopedia of Imaging Science and Technology* (Wiley, 2002). *(David@cmonline.com)*

Mark Mine (Ph.D. 1997) of Disney Imagineering reports that the company has been beta testing Toontown Online, a multi-player PC game for children aged 7-12 **(www.toontown.com)**. The game won the Entertainment and Online Game categories at the Web 3D Roundup. *(Mark.Mine@disney.com)*

Ben L. Mitchell (M.S. 1976) is the new associate vice chancellor for Institutional Affairs and professor of Health Information Management at the University of Mississippi Medical Center (UMMC) in Jackson, Miss. He supervises several administrative areas including the divisions of Information Systems and Campus Security and Safety. He is also chief academic liaison to the state college board for UMMC's B.S. and M.S. programs. Previously, Ben served as vice president for Finance and Administration and professor of Management Information Systems at Mississippi University for Women, in Columbus, Miss. *(blmitchell@ovc.umsmed.edu)*

Bryan Morse (Ph.D. 1995), **Terry Yoo** (Ph.D. 1996), **Penny Rheingans** (Ph.D. 1993), and **David T. Chen** (Ph.D. 1998), with K. Subramanian, recently co-authored the paper,

"Interpolating Implicit Surfaces From Scattered Surface Data Using Compactly Supported Radial Basis Functions," which was presented at the 2001 International Conference on Shape Modeling and Applications.

Injong Rhee (Ph.D. 1994) received tenure and was promoted to associate professor at N.C. State University. Last year, he founded Togabi Technologies, Inc., which focuses on wireless multimedia delivery over next-generation wireless packet-switched "always-on" networks **(www.togabi.com)**. Injong is taking a leave of absence this fall to serve as the company's chief technical officer. *(rhee@eos.ncsu.edu)*

Jeanne Sawyer (Ph.D. 1990) has a new book, *When Stuff Happens: A Practical Guide to Solving Problems Permanently* (San Jose, Calif.: Sawyer Partnership, 2001, ISBN 0-9700304-0-1). The book is designed to help busy people solve problems quickly. Visit **www.sawyerpartnership.com** for more about the book, to order a copy, or for free information on problem solving. *(jsawyer@sawyerpartnership.com)*

Mary Szymkowski (M.S. 1991) graduated as a doctor of veterinary medicine (DVM) from N.C. State University's College of Veterinary Medicine in May and is now an associate veterinarian in Zebulon, N.C. She did a rotation at UNC-Chapel Hill's Department of Radiation Oncology last fall to learn about software for radiation treatment planning and she is now working to start an oncology program at Zebulon Animal Hospital. *(drmls@mindspring.com)*

Raymond Van Dyke (M.S. 1989, J.D. 1990) is a partner at Dorsey & Whitney in Washington, D.C., where he continues to practice intellectual property and technology law, focusing on software and the Internet. He is also an adjunct professor at Southern Methodist University, where he taught a course last spring in the Computer Engineering Department on "Intellectual Property in the Information Age." He has published and spoken at the Computer Law Association and other conferences on litigation, licensing, client counseling (and many other areas) in high-tech. *(vandyke@acm.org)*

Ross T. Whitaker (Ph.D. 1993) joined the School of Computing at the University of Utah as an assistant professor in July 2000. *(www.cs.utah.edu/~whitaker, whitaker@cs.utah.edu)*

Undergraduate Alumni

Ruth Anderson (B.S. MSci. 1991) joined the computer science teaching faculty at the University of Virginia in fall 2000. She has a master's degree from the University of Washington. *(anderson@cs.virginia.edu)*

Phil Fittante (B.S. MSci. 1987) has a new position as an Air Force test pilot and operations officer in the 586 Flight Test Squadron at Holloman Air Force Base, N.M. *(pfittante@charter.net)*

Mark Hutchinson (B.S. MSci. 1981) is the software architect and head developer at EZ-EMC **(www.ems-plus.com)**, which is about to release Version 2 of its base EMC wave-modelling

software. Version 2 of the advanced version will be released soon. Mark is also incorporating his own business, Skills 'n Tools Solutions, Ltd. *(Aikimark@aol.com)*

Patrice Schwegman Kerkoulas (B.S. MSci. 1984) has a new job as a Programmer/Analyst III for Information Systems at Memorial Sloan-Kettering Cancer Center in New York, N.Y. She recently published the book, *Our Family Prayer;* a prayer for strength with country-inspired photography (32 pp., $12.95 hardback). See **www.pngfarms.com**, or write P+G Farms, P.O. Box 141, Narrowsburg, N.Y. 12764-0141. *(kerkoulp@mskcc.org)*

Scott Leslie (B.S. MSci. 1991) was recently promoted from principal systems developer to software manager at SAS Institute. He manages a group of developers writing Java components to access SAS data and services from web-based applications. *(Scott.Leslie@sas.com)*

Jeff McDermott (B.S. MSci. 1985) had four DVD reviews and a book review of Louis Armstrong published in *Goldmine* magazine's 9 September 2001 issue, which featured Armstrong. Another recent issue featuring Muddy Waters included Jeff's reviews of a couple of Waters' DVDs. Jeff hosts "The Blues is the Blues" on Sundays from 4:00 - 8:00 p.m. on WSHA 88.9 FM, a public radio station based at Shaw University in Raleigh, N.C. *(http://www.wshafm.org/html/gallery/staff/jeff_mcdermott.html, Jeff.McDermott@sas.com)*

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