News & Notes from Sitterson Hall

Issue Twenty-Eight, Fall 2000

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

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Chairman's Corner

This fall marks the start of our 14th year in Sitterson Hall. There are some exciting developments ahead. We have begun to plan an addition to the south end of the building, which will increase our office, classroom, and lab space by about 50 percent. We also continue to develop our undergraduate program.

We are now soliciting applications for tenure-track faculty at all ranks to begin in fall 2001 or spring 2002. In particular, we invite applications from candidates with expertise in hardware systems, operating systems and networking, embedded systems, and ubiquitous computing. Outstanding candidates who would strengthen other existing research groups in the department will also be welcomed. We are also soliciting applications for fixed-term lecturer positions. Please visit **http://www.cs.unc.edu/Admin/Faculty/Recruiting/** for details.

Congratulations to **Gary Bishop** (Ph.D. 1984), associate professor, who has been awarded tenure; to **Ming Lin** and **Anselmo Lastra**, who have each been promoted to associate professor

with tenure; and to **Kevin Jeffay** and **Dinesh Manocha**, who have each been promoted to full professor.

Congratulations to **Nicholas Vallidis** (M.S. 2000), this year's recipient of our Computer Science Alumni Fellowship. Read about Nick's research on page 3. This fellowship is made possible by generous contributions from alumni and friends. We thank you very much for your support.

Please stay tuned to our web site for the latest news about us, or stop by if you are in the Chapel Hill area.

Stephen F. Weiss

SIGGRAPH Alumni Reunion

Alumni Phil Amburn (left) of Qualia Computing, Doug Schiff of 3rdTech, and John Austin of Numerical Design Ltd. at our reunion party held during SIGGRAPH 2000 in New Orleans, La. (Photo: Mike Pique)

Students Michael North (left), Mark Foskey, Sang-Uok Kum, Brent Insko, and Alexandra Bokinsky at the reunion party. (Photo: Michelle Taylor)

Welcomes and Farewells

New Students, fall 2000

Greg Coombe, Maxim Garber, Qiong Han, Justin Hensley, Adrian Ilie, Scott Larsen Nguyen-Tuong Long Le, Shawn Liu, Peter Lorenzen, Dorian Miller, Nathan Moon, Samir Naik, Miguel Otaduy, Vincent Scheib, Stephan Sherman, Michael Strauss, Avneesh Sud, Kelly Van Busum, Gokul Varadhan, Kelly Ward, and Chang Zhao

Median credentials for our new students:

Quantitative GRE:	93rd percentile
Verbal GRE:	76th percentile
Analytical GRE:	93rd percentile
GPA (undergraduate):	3.4/4.0

New Staff

Caroline Green joined us as a research associate in August. She is the UNC site coordinator for the NSF Science and Technology Center (STC), whose projects include Tele-Immersion (see "Research Highlights"). Prior to completing her degree in mathematics in May at UNC, Caroline spent two years part-time as the STC's site coordinator. She is also UNC's research lead in the Jot/Alpha_1 design and manufacturing research group, in which our department collaborates with the computer science departments at Brown University and the University of Utah.

Leaves of Absence

John G. Eyles, research associate professor, **John Poulton,** research professor, and **Stephen G. Tell** (M.S. 1991), senior research associate, each have been granted extensions to their off-campus assignments at Chip2Chip, through 30 June 2001.

Thanks and farewell to . . .

Debra Core, secretary, who left in June to join Underwriters Laboratories in Research Triangle Park, N.C., where she is an assistant to engineers conducting computer safety tests. She had been with us for a year.

Darlene Freedman, administrative assistant to Frederick P. Brooks Jr., who left in September to become the executive assistant to the dean of the School of Public Health at UNC. She had been with us five years.

Congratulations to...

Gary Bishop (Ph.D. 1984), associate professor, and **Kevin Jeffay**, S. S. Jones distinguished term associate professor, recipients of the 1999-2000 Computer Science Students Association teaching award.

Katrina Coble, who was promoted to University Administrative Manager II, effective 20 November 2000.

David Harrison, who was promoted to Computer Network Coordinator, as of 11 September 2000.

William Jiang, who was promoted to Systems Programmer II, effective 30 June 2000.

Vincent Scheib, graduate student, who has received a 2000 Dan Drew Scholarship award from Upsilon Pi Epsilon, the honor society for the computing sciences.

Laura Schutz, who was promoted to Computing Consultant I, as of 31 July 2000.

And to our May and August graduates:

Ph.D. (May)
Kevin Arthur, "Effects of Field of View on Performance with Head-Mounted Displays" (adviser: Frederick P. Brooks Jr.)

Carl M. Erikson, "Hierarchical Levels of Detail to Accelerate the Rendering of Large Static and Dynamic Polygonal Environments" (Dinesh Manocha)

Carl Mueller, "The Sort-First Architecture for Real-Time Image Generation" (Anselmo Lastra)

Manuel M. Oliveira, "Relief Texture Mapping" (Gary Bishop)

Ph.D. (August)
John Keyser, "Exact Boundary Evaluation for Curved Solids" (Dinesh Manocha)

Master of Science
May: Chandna Bhatnagar, Steven Boles, Christopher Dwyer*, Stephen Ehmann*, Benjamin Elgin, John Glotzer, Mark Harris*, Zhu He, Amy Henderson, Wesley Hunt, Vibhor Jain, Zac Kohn, Naveen Koorakula, Christopher McCue, Ramkumar Parameswaran, Praveen Patnala, Sriram Sellappa, Anand Srinivasan*, Nicholas Vallidis*
August: Matthew Waibel

*Continuing on to Ph.D. at UNC

B.S. Mathematical Sciences (CS Option)
May: Eugenia Alexandris, Christopher Arrington**, Joseph Barefoot, Waymoth Boyd, Jeffrey Brubaker*, Travis Burnette, Aaron Bush, Jason Cheek, Justin Clark, Troy Davis, Rupinder Gill, Bradford Hinson, Michael Hirschel, Cheryl Hom, John Hurlbutt, Theodore Jenks, Wesley

Johnson, Jonathan Long, Jason Luck, Richard Mai, Rebecca Martin, Hongcheng Mi**, Stephen Millender II, Mickey Miller, Robin Munesato, Se Joon Ohh, Tejas Patel, Eric Seitlin, David Shuart, Paul Suh, Xiaohu Tang, Bradley Timmers*, Patrick Tollison, Ashley Webb, Gary Whitehurst, Davie Yang, Bong Joo Yi*, Ming Chieh Yu
August 2000: Jaime Jackson, Alicia Tribble

Phi Beta Kappa: Christopher D. Arrington
*With Honors **With Highest Honors

2000-2001 Student Fellowships and Special Awards

Alexandra Bokinsky	Silicon Graphics Inc., Fellowship
Jessica Crouch	Lucent Technologies Fellowship (4th year)
Susan Fisher	UNC Board of Governors Fellowship (2nd year)
Kenneth Hoff	Intel Fellowship
Philip Holman	IBM Fellowship
Brent Insko	Link Foundation Fellowship
Aditi Majumder	Link Foundation Fellowship
Michael Meehan	UNC Graduate School Dissertation Fellowship
Olufisayo Omojokun	AT&T Labs Fellowship Grant (2nd year)
Miguel Otaduy	Government of the Basque Country Fellowship
Erin Parker	Lawrence Livermore Graduate Fellowship
Voicu Popescu	Link Foundation Fellowship
Sharif Razzaque	UNC Board of Governors Fellowship (3rd year)
Vincent Scheib	UNC Board of Governors Fellowship
Josh Steinhurst	NVIDIA Fellowship
Nicholas Vallidis	Computer Science Alumni Fellowship
Andrew Wilson	National Science Foundation Fellowship (2nd year)

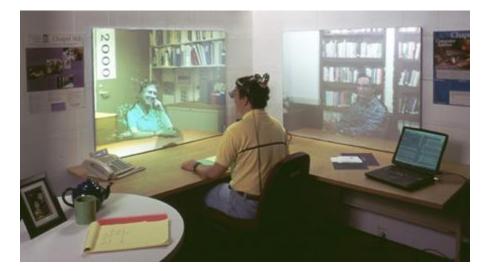# Research Highlights

Advances in Tele-immersion

This summer, researchers in the Office of the Future project completed and demonstrated an unprecedented proof-of-concept, distributed, tele-immersive system. The system operates between UNC, the University of Pennsylvania (UPenn) in Philadelphia, Pa., and Advanced Network and Services (ANS) in Armonk, N.Y. UPenn and ANS are UNC's partners in the National Tele-Immersion Initiative (NTII). The project's goal is to create a high-fidelity, life-sized, three-dimensional tele-collaboration system that will enable collaborators in remote locations to see and hear each other as clearly as if they are together in the same physical location.

The photograph (below) shows one of several recent experiments with the system. Sitting in our department's Graphics and Image Lab, graduate student **Ruigang Yang** (center) uses the tele-immersion system to communicate with **Amela Sadagic** (left) at ANS in New York, and fellow graduate student **David Gotz** (right) in another UNC lab. The 3D backgrounds of the remote sites were created from high-fidelity samples of a real environment that were obtained off line using UNC's own scanning laser rangefinder system. Researchers collected more than 20 million samples and transformed them to approximately 30 thousand triangles and 48 megabytes of associated color texture for rendering. The remote participants (Amela and David) are rendered from dynamic 3D reconstructions using remote cameras and real-time computer vision techniques. Although these reconstructions are lower fidelity than the backgrounds, they are generated on line at interactive rates (1-2 updates per second) and are continually transmitted over Internet2 between the different sites.

NTII is led by chief scientist **Jaron Lanier** of ANS, **Kostas Daniilidis** of UPenn, **Andries van Dam** of Brown University, and **Henry Fuchs** of UNC. Other major participants in the tele-immersion research are **Amela Sadagic** of ANS; **Jane Mulligan** of UPenn; and a team at UNC led by Henry, **Gregory F. Welch**, research assistant professor, **Herman Towles**, senior research associate, and **Kevin Jeffay**, S.S. Jones distinguished term associate professor. The UNC team includes a number of graduate students and a staff of research and technical people. **(http://www.cs.unc.edu/Research/stc/office/**, **http://www.advanced.org/teleimmersion.html)**

In the Graphics and Image Lab, Ruigang Yang (center) uses the tele-immersion system to communicate with Amela Sadagic (left) at ANS in New York, and fellow graduate student David Gotz (right) in another UNC lab. (Photo by Larry Ketchum)

Alumni Fellowship Winner

Nicholas Vallidis (M.S. 2000) is the recipient of the 2000-2001 Computer Science Alumni Fellowship. This fellowship is awarded annually to a Ph.D. candidate in the final year of study, allowing him or her to work full time on dissertation research. Generous contributions to the Alumni Trust Fund, made by alumni and friends of the department, help to make this fellowship possible.

Nick is working on his dissertation under the guidance of **Gary Bishop** (Ph.D. 1984), associate professor. He is working on a novel method for body-centric 3D tracking. Tracking hands and feet relative to the body is useful in immersive virtual environments, but also has potential as a general purpose input device. Most existing trackers require line of sight between sensors and emitters, have high latency, or require the use of a cumbersome mechanical structure. The acoustic system that Nick is developing has the potential for low latency and high update rates (multiple kHz). It also has the potential to operate without direct line of sight.

NCNI-Cavner Grant

Ketan Mayer-Patel, assistant professor, has received a grant to develop network analysis tools. The grant, which was awarded by the North Carolina Networking Initiative (NCNI) and the Center for Advanced Video Network Engineering and Research (CAVNER), also provides funding for graduate student **David Ott** (M.S. 1999).

Ketan and David are researching how the performance of an application run over the Internet--such as video conferencing--can be anticipated in advance. It is very difficult to get good performance estimates of applications run over the Internet because it is such a dynamic environment. They plan to develop a tool that will allow engineers to test how well video conferencing applications can exchange information and find performance bottlenecks in the network. The tool will also provide feedback to users of video conferencing applications to show where problems may exists as network conditions change. In addition to these practical applications, the work will also be used to evaluate new, experimental systems that Ketan is developing as part of his research.

UNC and new Companies Sign Licensing Agreements

In June, UNC signed technology licensing agreements with three new start-up companies--DeltaSphere Inc., HiBall Tracker Inc., and NanoManipulator Inc.--that will commercialize computer graphics technology developed by computer science researchers. The agreements provide for ongoing technology transfer between the university researchers and the start-up companies. The researchers continue to improve the technologies, while the start-ups are commercializing them through hardware and software engineering, feature enhancement, and manufacturing. Initial product development and marketing is being carried out by 3rdTech Inc., a business incubator that develops new technologies into businesses and products. 3rdTech's founder, president, and chief executive officer is **Nick England**, adjunct research professor. Staff at 3rdTech include alumni **Kevin Arthur** (Ph.D. 2000), **Ben Elgin** (M.S. 2000), **Aron Helser** (M.S. 1998), and **Doug Schiff** (M.S. 1984). This summer, 3rdTech demonstrated products from all three companies at trade shows. It shipped the first DeltaSphere and HiBall systems to customers in November. Recently, the HiBall received a 2000 Innovation Award from Computer Graphics World magazine. **(http://www.3rdTech.com)**

Mobile Computing

Prasun Dewan, professor, and **Olufisayo Omojokun**, graduate student, are working on how mobile devices, such as small handheld computers, can be used to control arbitrary electronic

appliances, such as TVs, washing machines, thermostats, lights, and projectors. They are looking at the ways in which a mobile computer can learn about the events that the appliance is responding to--by using a technique called computation reflection--and then can generate a user interface for controlling the device, based on these events. In such cases, the mobile computer would not need to be bound to any kind of device, which would allow it to control arbitrary appliances.

In the photo below, Olufisayo uses a mobile computing device to operate a television and a videocassette recorder. The device can also control appliances it has never seen before. In this demonstration, an enlargement of the display Olufisayo sees on his handheld device is projected onto the screen at left. The user interface on the mobile device is generated automatically from the object that represents the appliance. **(http://www.cs.unc.edu/Research/Mobile/**)

Olufisayo Omojokun uses a mobile computing device to operate a television and videocassette recorder. (Photo: Larry Ketchum)

Nanomanipulator Demo popular at BioMems 2000

In mid-September, at BioMEMS and Biomedical NanoTechnology World 2000 in Columbus, Ohio, **Aron Helser** (M.S. 1998) of 3rdTech Inc., and **Martin Guthold**, postdoctoral researcher, of the UNC nanoManipulator team, gave a tutorial on the nanoManipulator system. Martin described the experiments researchers have done with fibrin--an essential molecule in blood-clotting--using the nanoManipulator. Aron described the system's features and demonstrated its capabilities by cutting through a sample of fibrin that was physically located in an Atomic Force Microscope at UNC; a process made possible via a live Internet2 connection. The tutorial is available as a QuickTime movie at: **nanotech.osu.edu/nnn.htm.** Their demonstration was also filmed by Ohio State University's public television station. Aron reports that UNC, the nanoManipulator, and 3rdTech Inc. all received excellent exposure.

Research and Study Leaves

Kye Hedlund, associate professor, is on an off-campus assignment from 1 July 2000 to 30 June 2001. He is spending his time at the Department of Entomology at N.C. State University, where he is developing computer-based tools to help entomologists who are researching the distribution, evolution, and identification of insects. Part of his work involves looking at

applications of the World Wide Web to entomological systematics. Kye also spends one day a week at UNC.

John Smith, professor, is on a research and study leave from 1 July 2000 to 31 December 2000. During that time he is working on a distance learning project and also is completing work on a new course concerned with e-commerce technology. He plans to offer the course during the spring 2001 semester.

Distinguished Lecturer Series

The Triangle Computer Science Distinguished Lecturer Series is now in its sixth year. The series began in 1995 with an idea by **Jim Anderson**, associate professor. It is a collaborative effort between the computer science departments at Duke University, N.C. State University, and UNC-Chapel Hill. Each university hosts three speakers. In addition to giving a presentation at his or her host school, each speaker visits the other two schools during a two-day visit to the Triangle. The series is sponsored by the U.S. Army Research Office.

Speakers who have already presented in the 2000-2001 series are **Krishan Sabnani** of Bell Labs, **Jon Bentley** (Ph.D. 1976) of Avaya Labs, **Christos Papadimitriou** of the University of California at Berkeley, **Amir Pneuli** of the Weizmann Institute of Science, and **Bernard Chazelle** of Princeton University and the NEC Research Institute. Speakers who will visit in the spring are **Ed Catmull** of Pixar Animation Studios, who will speak about the "Creative Process Behind Animated Feature Films" on 5 February; **Susan Eggers** of the University of Washington who visits on 12 February to present a talk on "Managing Thread-Shared Hardware Resources on Simultaneous Multithreaded Processors"; **Takeo Kanade** of the Robotics Institute at Carnegie Mellon University, who speaks about "Virtualized Reality: 4D Digitization of a Time-Varying Real Event and its Application" on 19 February; and **John Knight** of the University of Virginia, who will present the talk "Survivability of Critical Infrastructure Systems" on 5 March.

For more information about the individual speakers and their talks, and for directions and locations, see **http://www.cs.unc.edu/Events/DistLectures/**

Recent Publications

Anderson, J., and A. Srinivasan. "Early-Release Fair Scheduling," *Proc. 12th Euromicro Conference on Real-Time Systems,* Stockholm, Sweden, June 2000, 35-43.

Anderson, J., and Y.-J. Kim. "Adaptive Mutual Exclusion with Local Spinning," *Proc. 14th International Symposium on Distributed Computing,* Toledo, Spain, October 2000, 29-43.

Baruah, S. "Scheduling Periodic Tasks on Uniform Multiprocessors," *Proc. EuroMicro Conference on Real-Time Systems,* Stockholm, Sweden, June 2000, 7-14.

Bishop, G., and G. Welch. "Working in the Office of 'Real Soon Now'," *IEEE Computer Graphics and Applications,* July/August 2000, 76-78.

Chen, D., A. Mok, and S. Baruah. "Scheduling Distributed Real-Time Tasks in the DGMF Model," *Proc. Real-Time Technology and Applications Symposium,* Washington, D.C., May 2000, 14-22.

Chen, W.-C., H. Towles, L. Nyland, G. Welch, and H. Fuchs. "Toward a Compelling Sensation of Telepresence: Demonstrating a Portal to a Distant (Static) Office," *Proc. IEEE Visualization 2000,* Salt Lake City, Utah, 8-13 October 2000, 327-332.

Gregory, A., A. Mascarenhas, S. Ehmann, M. C. Lin, and D. Manocha. "Six-Degree-of-Freedom Haptic Display of Polygonal Models," *Proc. IEEE Visualization 2000,* Salt Lake City, Utah, 8-13 October 2000, 139-146.

Guthold, M., M. R. Falvo, W. G. Matthews, S. Paulson, S. Washburn, D. A. Erie, R. Superfine, F. P. Brooks Jr., and R. M. Taylor II. "Controlled Manipulation of Molecular Samples with the nanoManipulator," *IEEE/ASME Transactions on Mechatronics,* 5(2), June 2000, 189-198.

Hirota, G., R. Maheshwari, and M. Lin. "Fast Volume-Preserving Free-Form Deformation Using Multi-Level Optimization," *Computer Aided Design* (special issue on solid modeling), 32(8/9), July/August 2000, 499-512.

Isenburg, M. "Triangle Strip Compression," *Proc. Graphics Interface 2000,* May 2000, 197-204.

Isenburg, M., and J. Snoeyink. "Face Fixer: Compressing Polygon Meshes with Properties," *Proc. SIGGRAPH 2000,* New Orleans, La., 23-28 July 2000, 263-270.

Isenburg, M., and J. Snoeyink. "Spirale Reversi: Reverse Decoding of the Edgebreaker Encoding," *Proc. Canadian Workshop on Computational Geometry 2000,* August 2000, 247-256.

Keller, K., and J. Ackerman. "Real-Time Structured Light Depth Extraction," *SPIE Photonics West, Three-Dimensional Image Capture and Applications III,* January 2000, 11-18.

Keyser, J., T. Culver, D. Manocha, and S. Krishnan. "Efficient and Exact Manipulation of Algebraic Points and Curves," *Journal of Computer-Aided Design,* 32(11), 2000, 649-662.

Krishnan, S., and D. Manocha. "Partitioning Trimmed Spline Surfaces into Non-Self-Occluding Regions for Visibility Computation," *Graphical Models,* 62(4), July 2000, 283-307.

Lin, M. C. "Fast and Accurate Collision Detection for Virtual Environments," *Proc. IEEE Scientific Visualization,* 171-180.

Lipari, G., and S. Baruah. "Efficient Scheduling of Real-Time Multi-Task Applications in Dynamic Systems," *Proc. Real-Time Technology and Applications Symposium,* Washington, D.C., May 2000, 166-175.

Lipari, G., and S. Baruah. "Greedy Reclaimation of Unused Bandwidth in Constant-Bandwidth Servers," *Proc. EuroMicro Conference on Real-Time Systems,* Stockholm, Sweden, June 2000, 193-200.

Majumder, A., Z. He, H. Towles, and G. Welch. "Achieving Color Uniformity Across Multi-Projector Displays," *Proc. IEEE Visualization 2000,* Salt Lake City, Utah, 8-13 October 2000, 117-124.

Matusik, W., C. Buehler, R. Raskar, S. J. Gortler, and L. McMillan. "Image-Based Visual Hulls," *Proc. SIGGRAPH 2000,* New Orleans, La., 23-28 July 2000, 369-374.

Oliveira, M. M. "Relief Texture Mapping," *Department of Computer Science technical report TR00-009,* University of North Carolina, March 2000.

Oliveira, M. M., G. Bishop, and D. McAllister. "Relief Texture Mapping," *Proc. SIGGRAPH 2000,* New Orleans, La., 23-28 July 2000, 359-368.

Plaisted, D. A. "Elements of Theorem Proving Intelligence," *Proc. Workshop on Model Computation, 17th Conference on Automated Deduction,* Pittsburgh, Pa., June 2000.

Plaisted, D. A., and Y. Zhu. "Ordered Semantic Hyper-Linking," *Journal of Automated Reasoning,* 25(3), October 2000, 167-217.

Popescu, V., J. Eyles, A. Lastra, J. Steinhurst, N. England, and L. Nyland. "The WarpEngine: An Architecture for the Post-Polygonal Age," *Proc. SIGGRAPH 2000,* New Orleans, La., 23-28 July 2000, 433-442.

Popescu, V., A. Lastra, and J. Eyles. "Sort-First Parallelism for Image-Based Rendering," *Proc. Third Eurographics Workshop on Parallel Rendering and Visualization,* Girona, Spain, 28-29 September 2000, 93-101.

Styner, M., and G. Gerig. "Hybrid Boundary-Medial Shape Description for the Analysis of Biologically Variable Shapes," *Proc. 2000 IEEE Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA 2000),* Hilton Head Island, 10 June 2000.

Weigle, C., W. G. Emigh, G. Liu, R. M. Taylor II, J. T. Enns, and C. G. Healey. "Oriented Texture Slivers: A Technique for Local Value Estimation of Multiple Scalar Fields," *Proc. Graphics Interface 2000,* Montreal, Canada, May 2000.

Welch, G., H. Fuchs, R. Raskar, M. Brown, and H. Towles. "Projected Imagery In Your 'Office in the Future'," *IEEE Computer Graphics and Applications,* July/August 2000, 62-67.

Wilson, A., D. Manocha, M. Lin, B.-L. Yeo, and M. Yeung. "A Video-Based Rendering Acceleration Algorithm for Interactive Walkthroughs," *Proc. ACM Multimedia 2000,* Los Angeles, Calif., October 2000, 75-84.

New Contracts and Grants

Jim Anderson, associate professor, principal investigator (PI), and **Sanjoy Baruah**, associate professor, **Kevin Jeffay**, S.S. Jones distinguished term associate professor, and **Russell M. Taylor II**, research associate professor, co-principal investigators (Co-PIs). "ITR: Rate-Based Scheduling Technology for Latency-Sensitive Graphics Applications," National Science Foundation (NSF).

Sanjoy Baruah (PI) and **Jim Anderson** (Co-PI). "Real-Time Scheduling on Heterogeneous Multiprocessors," NSF.

Gary Bishop, associate professor. "Technology for Full-Body Tracking," Office of Naval Research (ONR).

Frederick P. Brooks Jr. , Kenan professor, "Minimal Haptics for Enhancing Virtual Environments," ONR.

Kevin Jeffay and **Don Smith**, research professor, "ITR: Active Queue Management For Scalable Network Services: Theory and Internet Practice," NSF.

Gail Jones (Education) (PI), and **Richard Superfine** (Physics), and **Russell M. Taylor II** (Co-PIs). "Investigating Viruses with Touch: Nanotechnology and Science Inquiry," NSF.

Ming Lin, assistant professor. "Real-Time Interaction With Virtual Environments," ONR.

Dinesh Manocha, associate professor, (PI) and **Ketan Mayer-Patel**, assistant professor (Co-PI). "Video Based Acquisition, Representations, and Rendering of Large Real and Synthetic Environments," ONR.

Lars Nyland, research associate professor, "ITR/ACS: Self-Scheduling N-Body Algorithms," NSF.

Don Smith (PI), **Kevin Jeffay**, and **Paul Jones** (Information and Library Science) (Co-PIs). IBM Shared University Research Grant.

Jack Snoeyink, professor. "ITR: Geometric Structure in Geographic Information Systems and Molecular Modeling," NSF.

Richard Superfine (Physics) (PI), and **Richard Cheney** (Cell and Molecular Physiology), **Edward Salmon** (Biology), **Russell M. Taylor II**, and **Sean Washburn** (Physics) (Co-PIs). "Biomolecular Motor/Nanotube Integration for Actuating Nanotechnology," NSF.

Recent Conferences

NOSSDAV 2000

The 10th International Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV 2000) took place at the Carolina Inn in Chapel Hill, N.C., from 26 to 28 June. Attendance was limited to 75 attendees, who came from all over the world. **Kevin Jeffay**, S. S. Jones distinguished term associate professor, and **Harrick Vin**, associate professor at the University of Texas at Austin, were the conference chairs. The workshop was sponsored by our Distributed and Real-Time Systems Research (DiRT) Group, our department, UNC, AT&T Research, and Microsoft Research of Cambridge, England.

The purpose of the NOSSDAV workshop is to discuss issues relating to the support of the processing and communication of continuous media--media that is generated periodically or quasi-periodically over long durations. At the Chapel Hill meeting, attendees discussed a variety of topics, including file system design for storing and retrieving audio/video streams, processor scheduling for real-time processing, network architectures for quality of service, multicast, and pricing.

Ketan Mayer-Patel, assistant professor, served on the program committee and also presented a paper. Alumnus **Injong Rhee** (Ph.D. 1994) of N.C. State University was also on the program committee. A number of graduate students from the DiRT group assisted with the logistics of the conference. The department hosted an open house in the Graphics and Image Lab, where workshop participants could learn more about UNC's current research in distributed virtual environments.

For more information about the workshop and to order a copy of the proceedings, see **http://www.cs.unc.edu/nossdav2000**.

SIGGRAPH 2000

A number of faculty and alumni participated in SIGGRAPH 2000 in New Orleans, La., in July. Chairing paper sessions were associate professor **Dinesh Manocha** and alumni **David Banks** (Ph.D. 1993) of Florida State University, **Victoria Interrante** (Ph.D. 1996) of the University of Minnesota, and **Marc Levoy** (Ph.D. 1989) of Stanford University. A number of UNC faculty and students had accepted papers (see "Recent Publications"). Several alumni also had accepted papers, including **John Airey** (Ph.D. 1990) of SGI, **Marc Levoy, Leonard McMillan** (Ph.D. 1997) of MIT, and **Marc Olano** (Ph.D. 1998) of SGI. People presenting courses included **Daniel Aliaga** (Ph.D. 1999) of Lucent Technologies Bell Laboratories, **Michael Capps** (M.S. 1996) of

the Naval Postgraduate School, **David Luebke** (Ph.D. 1998) of the University of Virginia, Dinesh Manocha, and Marc Olano.

During the conference, **Frederick P. Brooks Jr.**, Kenan professor, presented his Turing Award lecture, "The Design of Design." Fred was honored at UNC's annual alumni reunion reception on 26 July at the Doubletree Hotel in New Orleans.

Henry Fuchs (left) hands the Turing bowl to Fred Brooks at SIGGRAPH 2000. Fred originally received the award earlier in the year at ACM's awards banquet. (Photo: Lagniappe Studios)

Alumni News

M.S. and Ph.D. Alumni

Greg Bollella (Ph.D. 1997) and several colleagues recently published the book, *The Real-Time Specification for Java* (Addison-Wesley, 2000). *(bollella@sunlabs.east.sun.com)*

Ritu Chadha (Ph.D. 1991) is still at Telcordia Technologies, where she was recently promoted to director. She manages the Service Management Research group. Ritu recently gave a tutorial on "Directory Enabled Networks" and chaired a panel on "Directory-Enabled Networking: From Standards to Products" at the 2000 Network Operations and Management Symposium in April in Honolulu, Hawaii. *(chadha@research.telcordia.com)*

Debashish Chatterjee (M.S. 1990) was promoted recently by Oracle Corp. He is now the director of access, queuing and messaging products on the Oracle data server. His group is responsible for delivering the Oracle server infrastructure for building scalable Internet and enterprise applications. He was one of the recipients of a recent patent, "System Using Session Data Stored in Session Data Storage for Associating and Disassociating User Identifiers for Switching Client Sessions in a Server" (U.S. Pat. No. 6,088,728). *(Debu.Chatterjee@oracle.com)*

Vinay Gupta (M.S. 1995) has been with Digital Technology Inc., since leaving UNC. He worked first in the Boston, Mass., office then moved to Calcutta, India, in December 1998 to be

the general manager of Digital Technology's sister company Dynamic Digital Technology Private Ltd. Recently, the two companies, both of which develop network-protocol test solutions, were acquired by Agilent Technologies Inc., of Palo Alto, Calif. Another alumnus, George Kalarickal (Ph.D. 1998) works in the company's Boston office. *(vinay@dtix.com)*

W. Sands (Sandy) Hobgood (M.S. 1969) recently retired from IBM Corp. Currently, he is the organist and choirmaster at Aldersgate Methodist Church in Chapel Hill, N.C., and has been studying music composition at UNC's Department of Music for the last two semesters. Sandy's most recent piece, the "Messe Basse Pour la Neige," is a short mass inspired by the Triangle area's record-breaking snowfall this past winter. He and his dog, Doodlebug, live in Chapel Hill's Lake Forest neighborhood, where Sandy is a former board member of the neighborhood association. *(snady@mindspring.com)* [sic]

Robert Keeler (M.S. 1980) had two poems published in the *Friends Bulletin* (Wittier, Calif.): "I Want to Wring the Day of Song" (1999) and "Thistles" (2000). A book of his poetry will appear in late 2001. Robert is at Boeing Research and Product Development in Seattle, Wash. *(robert.j.keeler@ieee.org)*

Bryan Morse (Ph.D., 1995) is now an associate professor with tenure at Brigham Young University. Bryan spent this summer as a visiting faculty member at the National Library of Medicine (NLM) in Bethesda, Md., where he collaborated with fellow alumni **Terry Yoo (Ph.D. 1996) of NLM and Penny Rheingans (Ph.D. 1993) of the University of Maryland at Baltimore County. He continues to collaborate with them and also with David Chen (Ph.D. 1998), who has joined NLM.** *(morse@cs.byu.edu)*

Carl Mueller (Ph.D. 2000) is at Nintendo Technology Development Inc. in Redmond, Wash. The company develops game consoles. *(mueller@cs.unc.edu)*

Lee Nackman (Ph.D. 1982) was recently named vice president of Application Development Tools of IBM's Software Group. Lee, his wife Ava, and their three children, Rachel (15) Sam (12), and Joel (8), are relocating from White Plains, N.Y. to Chapel Hill, N.C. *(lrn@us.ibm.com)*

Manuel M. Oliveira (Ph.D. 2000) received his doctoral degree in May and joined SUNY Stony Brook's Computer Science Department as an assistant professor. He and his wife, Ana, had their first child in June (see "Family Matters"). *(oliveira@cs.sunysb.edu)*

Renee Rashid (nee Maheshwari) (M.S. 1998) lives in Santa Clara, Calif., and works at Micron Technology, where she develops OpenGL drivers. She was recently married (see "Family Matters"). *(rrashid@micron.com)*

David Stahl (M.S. 1993) thoroughly enjoyed the chance to teach at Dickinson College in Carlisle, Pa., during the past year. He encourages other students and alumni to apply for upcoming openings (http://www.dickinson.edu). David now works with Java, servlets, and Java server pages for a small consulting firm, Collective Intelligence (http://www.cicons.com). *(d.stahl@ieee.org)*

Undergraduate Alumni

Anita Blanchard (B.S. MSci. 1986) received her Ph.D. in organizational psychology in June 2000 from the Claremont Graduate University in Claremont, Calif. She has joined California State University in Northridge as an assistant professor of psychology. *(Anita.Blanchard@csun.edu)*

Jonathan Clark (B.S. MSci. 1987) has been appointed software development manager for the U.S. division of Tokheim Corp. Headquartered in Ft. Wayne, Ind., Tokheim is the world's largest manufacturer of gas pumps and peripheral payment systems. Its software development activities are based in Chesapeake, Va., where Jonathan lives. *(clarkjon@chesapeake.tokheim.com)*

Ellen Wyatt Daniel (B.S. MSci. 1989) is now a senior software engineer at Logicon/Sterling Software in Orlando, Fla. *(edaniel@tacintel.com)*

D. Scott McCrickard (B.S. MSci. 1992) completed his Ph.D. in computer science at Georgia Tech in August 2000. He joined Virginia Tech as an assistant professor this fall. He was recently married (see "Family Matters"). *(mccricks@cs.vt.edu)*

In Memoriam

Lyman Alonzo Ripperton III died on 28 September 2000 in Chapel Hill, N.C., aged 56. He attended UNC-Chapel Hill in the mid-1960s and took classes with our computer science faculty. At the time of his death, he was the manager of Network and Technical Services in the Information Services Division of UNC Hospitals.

Former Faculty & Staff News

Daniel A. Reed, former assistant professor, was recently named director of the National Computational Science Alliance (Alliance). He is also principal investigator for the Alliance's cooperative agreement with the National Science Foundation and is head of the Department of Computer Science at the University of Illinois at Urbana-Champaign. He also oversees the National Center for Supercomputing Applications (NCSA), the Alliance's leading research site. NCSA researchers implement experimental supercomputing and high-performance computing systems and networks and develop innovative applications in high-performance computing, visualization, and desktop software. At Illinois, Dan holds a campuswide named professorship: the Gutsell professor of computer science. *(reed@ncsa.uiuc.edu)*

Liyun Yu, former postdoctoral researcher, has been promoted to Health System User Analyst III in the Center for Health Policy, Law and Management at Duke University. He divides his time between statistical data analysis and networking system management for the N.C. National Significant Project. Liyun was with our department from 1994 to 1996, working with Stephen M. Pizer, Kenan professor. *(yu@hpolicy.duke.edu)*

Family Matters

Daniel Aliaga (Ph.D. 1999) and Leigh Atkinson, former receptionist, married on 20 May 2000 in Lexington, N.C. *(daniel@aliaga.net, leigh@aliaga.net)*

Nathan Chang was born on 15 September 1999 in Durham, N.C., to Chun-Fa Chang and Chia-Lin Yang. *(chang@cs.unc.edu)*

Lawrence D. Chu (B.S. MSci. 1990) and Linda Hadjiaghai married on 8 July 2000 in Camarillo, Calif. *(tarheel@ucla.edu)*

Michele Clark (M.S. 1998) and Christopher Weigle married on 22 July 2000 in Saint Francisville, La. *(clark@cs.unc.edu, weigle@cs.unc.edu)*

Jackson Ryan Goddard was born on 2 June 2000 in Lincoln, Neb., to Stephen Goddard (Ph.D. 1998) and Anne Goddard. *(goddard@cse.unl.edu)*

Jerron Harper was born on 5 August 2000 in Durham, N.C., to Ronnie Harper and Nicole Harper, secretary. He has two sisters, Ashley and Veronica. *(nicole@cs.unc.edu)*

Jeffrey Juliano (M.S. 1999) and Paola Maria Csirke Lozano married on 28 May 2000 in Buffalo, N.Y. *(juliano@cs.unc.edu)*

Renee Maheshwari (M.S. 1998) and Osman Rashid married on 31 March 2000 in Minneapolis, Minn. *(rrashid@micron.com)*

Scott McCrickard (B.S. MSci. 1992) and Lisa Wenner married on 23 September 2000 in Rochester, N.Y. *(mccricks@cs.vt.edu)*

Ana Luisa Griebler Menezes was born on 24 June 2000 in Stony Brook, N.Y., to Manuel M. Oliveira (Ph.D. 2000) and Ana Griebler. *(oliveira@cs.sunysb.edu)*

Maggie Elyse Weber was born on 9 May 2000 in Durham, N.C., to Hans and Katie Weber. She has an older brother, Finn, who is two years old. *(weberh@cs.unc.edu)*

Cameron Kentaro Wheeler was born on 27 July 2000 in Mountain View, Calif., to Rob Wheeler (M.S. 1995) and Kerrie Utsumi. **(http://babywheeler.com)** *(rob_wheeler@yahoo.com)*

Current students, alumni, and friends at Michele Clark and Chris Weigle's wedding in Saint Francisville, La., in July. Front row: (L-R) Adam Lake, Jan Borgersen, Michele and Chris Weigle, Monica Kum, Renee (Maheshwari) Rashid, and Gentaro Hirota. Middle: Amy Wyman, Alexandra Bokinsky, Russell M. Taylor II, Michelle Taylor, Mave Houston, Sang-Uok Kum, Susan Fisher, Kenny Hoff, and Sarah Hoff. Back: Nick Vallidis, Aron Helser, Chris Wynn, Eric Baker, Ben Lok, and Brent Insko.

About News & Notes

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