

News & Notes

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

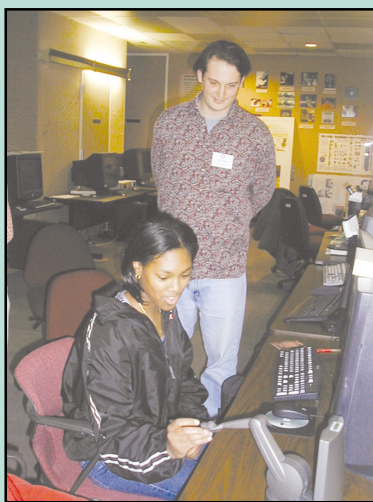
from Sitterson Hall

SUMMER 2003 • ISSUE THIRTY-TWO

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Ph.D. student Dorian Miller looks on as a middle school student learns about dB. The student was part of the Women and Math Mentoring program that visited the department in February 2003. (photo Kelli Gaskill)


Chairman's corner

Five new faculty and three new adjunct faculty members joined our department this year. We welcomed Associate Professor **Leonard McMillan** (Ph.D. 1997) back to the department. **Marc Pollefeys**, assistant professor, comes to us from Belgium. **Mark Foskey** joins us as an adjunct from the Department of Radiology, and adjuncts **Stephen Marron** and **Andrew Nobel** are both members of the Department of Statistics.

In addition, this has been a banner year for women in our department. We welcomed assistant professors **Jasleen Kaur**, **Maria Papadopouli** and **Wei Wang** this year. We also congratulated three female Ph.D. graduates: **Alexandra Bokinsky**, **Aditi Majumder** and **Michele Weigle**, this year's Alumni Fellowship recipient, who will be remaining in the department as a visiting assistant professor. You can read more about Michele on page 3.

Also, we saw the graduation of 11 other Ph.D. students, along with 25 M.S. students, 31 B.S. students and 25 B.S. MSci. students.

Despite recent state budget cuts, our department is growing. To help us continue to prosper, I would like to encourage you to make a gift to the department. It is through generous contributions from alumni and friends that we are able to fund programs like the Alumni Fellowship and recognize outstanding students for their hard work.

We thank you for your past support and hope we can count on you for the future. Your donation is tax-deductible and will count toward the University's current fund-raising campaign, Carolina First. 

Stephen F. Weiss

Welcomes and farewells

NEW FACULTY

Jasleen Kaur, Assistant Professor, Ph.D. 2002, Texas-Austin.

Design of networks and operating systems; specifically, resource management for providing service guarantees, Internet measurements, overlay and peer-to-peer networks, router architectures.

Leonard McMillan, Associate Professor, Ph.D. 1997, UNC-Chapel Hill.

Computer graphics, image processing, computer vision, multimedia, microelectronics, computer organization.

Maria Papadopouli, Assistant Professor, Ph.D. 2002, Columbia.

Mobile computing, pervasive computing, Internet real-time and multimedia services and protocols, ad hoc networks, caching protocols.

Marc Pollefeys, Assistant Professor, Ph.D. 1999, K.U. Leuven, Belgium.

Computer vision, 3D modeling, geometry, camera (self-)calibration, stereo, image-based approaches, virtual reality, augmented reality and applications.

Wei Wang, Assistant Professor, Ph.D. 1999, UCLA.

Bioinformatics, mining sequential data, mining temporal-spatial data, web caching, object management, text database.

Mark Foskey, Adjunct Research Assistant Professor (Research Assistant Professor, Department of Radiology), Ph.D. 1994, UC-San Diego.

Computer-aided surgical planning, computer-aided diagnosis, geometric computation.

Family matters

Noor Baruah Jerath was born in Durham on February 28, 2003, to **Sanjoy Baruah**, associate professor, and Maya Jerath. (baruah@cs.unc.edu)

Katharina Bremer was born February 5, 2002, in Zurich, Switzerland to Andreas and **Pamela Johnson Bremer** (M.S. 1991). (Pam.Bremer@brilleoncapital.ch)

Nathalie Chang was born at National Taiwan University Hospital on April 11, 2002, to Chia-Lin Yang and **Chun-Fa Chang** (Ph.D. 2001). (cbunfa@cs.ntbu.edu.tw)

Samir Baumgartner Joshi was born in Chapel Hill on June 16, 2002, to Karin and **Sarang Joshi**, adjunct assistant professor. (sarang@radonc.unc.edu)

Shreya P. Kumar was born in Atlanta, Ga., on August 9, 2002, to **Pawan Kumar** (M.S. 1998) and Rashmi Verma. (pawank@yahoo.com)

Teresa Lejia Lu-Romeo was born in Durham on November 19, 2002, to Monica Romeo and **Conglin Lu**, postdoctoral research associate. (lu@cs.unc.edu)

Leif Matthew Nyland was born in Chapel Hill on November 22, 2002, to Lauren and **Lars Nyland**, research associate professor. (nyland@cs.unc.edu)

Sejal Mayer-Patel was born on May 31, 2002, in Durham, to Christine and **Ketan Mayer-Patel**, assistant professor. (kmp@cs.unc.edu)

Ian Michael Stone was born on April 17, 2002, in Durham, to **Donald Stone** (Ph.D. 1995) and **Claire Stone**, former publications manager. (clairestone@bellsouth.net, dstone@rateintegration.com)

Ethan Michael Talley was born on April 17, 2002, in Arkansas to Michelle and **Terry Talley** (Ph.D. 1997). (talley@acm.org)

Leo Franklin Schneewind Tindall was born on January 2, 1998, in Chapel Hill to **Bruce Tindall** (B.S. MSci. 1977) and Sarah Schneewind. (tindall@pamix.com)

Nicholas Cameron Turk was born on February 14, 2003, to **Greg Turk** (Ph.D. 1992) and Mary McFarlane. (turk@cc.gatech.edu)

Donal Estuardo Welch was born April 4, 2001, in Santa Catarina Pinula, Guatemala, C.A., and joined the family of Linda and **Greg Welch** (Ph.D. 1997) in August 2002. (welch@cs.unc.edu)

Evan Hanchi Yang was born in Chapel Hill on May 28, 2002, to Rebecca and **Ruigang Yang** (Ph.D. 2003). (ryang@cs.unc.edu)

Welcomes and farewells

M. Gail Jones, Adjunct Associate Professor (Associate Professor, School of Education), Ph.D. 1987, North Carolina State University. *Science education, gender and science, high-stakes assessment nanotechnology education, bapitics and learning.*

J. Stephen Marron, Adjunct Professor (Distinguished Professor, Department of Statistics), Ph.D. 1982, University of California, Los Angeles. *Smoothing methods for curve estimation.*

Andrew B. Nobel, Adjunct Associate Professor (Associate Professor, Department of Statistics), Ph.D. 1992, Stanford University. *Statistical analysis of microarrays, analysis of internet traffic, non-parametric inference, pattern recognition: clustering and classification.*

Diane Pozefsky, Visiting Professor (IBM), Ph.D. 1979, UNC-Chapel Hill. *Computer-supported cooperative work, distributed systems, mobile computing, networking, software engineering and environments.*

Michele Clark Weigle, Visiting Assistant Professor, Ph.D. 2003, UNC-Chapel Hill. *TCP congestion control, Internet traffic measurement, application-level network performance measurements.*

NEW STAFF

Kelli Gaskill, publications manager, joined our staff in October 2002.

Sandra Neely, accounting assistant, joined the accounting team in April 2002.

Missy Wood joined our staff in December 2002 as an office assistant for Dinesh Manocha, Ming Lin, Lea Vicci, Gary Bishop, Leonard McMillan, Montek Singh, and Anselmo Lastra.

Myra Gwin-Summers, project director for Henry Fuchs and his research projects, joined the staff in April 2003.

Audrey Rabalais joined our staff in March 2003 as support for Fred Brooks, Russell Taylor, Mary Whitton and Rich Superfine.

POSTDOCTORAL RESEARCHERS

Goopeel Chung joined us as a postdoctoral research associate in August 2002. He is currently working with Prasun Dewan, professor, on Log-based Collaborative Infrastructure.

Stephanie Redon joined us as a postdoctoral research associate in December 2002.

Harald Schmidl joined us as a postdoctoral research associate in September 2002.

VISITING SCHOLARS

Enrico Bini, visiting scholar working with

Sanjoy Baruah, joined our department in March 2003. He is studying for a Ph.D. at the Scuola Superiore Sant'Anna di Studi Universitari e di Perfezionamento in Pisa, Italy.

THANKS AND FAREWELL TO . . .

Robert Paul Berretty, who left at the end of his postdoctoral research appointment on January 31, 2002.

Stephen Brumback, research electronics engineer, who left on August 9, 2002.

Joe Capowski, lecturer, who left on June 30, 2002.

Caroline Green, research associate working with Henry Fuchs, who left on July 31, 2002, and is now enrolled in the graduate program in Manufacturing Engineering at NC State University.

David Hsu, postdoctoral research associate, who left on November 18, 2002. (dybsu@cs.unc.edu)

Paul Morris, administrative assistant, who left January 31, 2003. Paul had been with the Department since Fall 2000 working for Dr. Fred Brooks, Mary Whitton and Rich Superfine and now plans to attend graduate school in the fall.

Duncan Riley, systems programmer administrator I, who left on August 30, 2002.

Scott Russell, administrative assistant, who left on July 31, 2002.

Claire Stone, publications and publicity manager, who left in October 2002 to stay home with her son, Ian Michael, born April 17, 2002.

Anna Washington, educational media specialist I, who left the Department on June 28, 2002. Anna was the coordinator of our outreach efforts and also the coordinator of virtual reality demonstrations. ☞



Students from Henry Fuchs' COMP 6 Freshman Seminar prepare to compete against each other with the robots they built from Legos. (photo Kelli Gaskill)

FACULTY AND STAFF

The following staff, who celebrated significant anniversaries with UNC this year:

25 yrs, **Catherine Perry**
 20 yrs, **Katrina Coble**
 20 yrs, **David Harrison**
 20 yrs, **Fred Jordan**
 15 yrs, **Graham Gash**
 15 yrs, **Brian White**
 10 yrs, **Kurtis Keller**

This year's Star Heels Award winners for Computer Science: **Donna Boggs, Chester Stephen, Karen Thigpen, John Thomas, Herman Towles.**

Stephen Aylward, who was promoted to an adjunct associate professor.

Delphine Bull who was promoted to an administrative assistant I, effective November 4, 2002. Delphine works with Drs. Pizer and Gerig and the MIDAG group of faculty who span multiple departments on campus.

Andrea Bunn, who earned her M.S. in Organizational Change and Leadership from Pfeiffer University in August 2002. Andrea also presented the first of many awards called the "Andrea Smith Bunn Service Award" to selected 8th graders at the Smith Middle School here in Chapel Hill on June 6, 2002. The middle school, which opened in August 2001, was named in honor of the combined 75 years of teaching her parents served in the Chapel Hill-Carrboro City School System.

Nick England, who was named 2002 Entrepreneur of the Year by the Eastern North Carolina IEEE Section.

Ming Lin, who won the 2002 Phillip Hettleman Prize for Artistic and Scholarly Achievement. This is one of the University's most prestigious acknowledgments for faculty excellence. Ming was also honored with the 3rd Best Paper Award in Eurographics 2002 for a paper she co-authored titled "Efficient Fitting and Rendering of Large Scattered Data Sets Using Subdivision Surfaces."

Catherine Perry, who was reclassified from an Accounting Technician III to an Accounting Technician IV, effective September 9, 2002.

Tim Quigg, who has been appointed as a member of the Society of Research Administrators International (SRA) Distinguished Faculty and president of the Southern Section of the SRA. Quoting the letter from the SRA president, "This appointment acknowledges your internationally recognized expertise, your excellence in developing and delivering professional development training, and your many significant contributions to the profession of research administration."

Don Smith and **Jim Anderson**, recipients of the 2001-2002 CSSA Teaching Awards, and **Sanjoy Baruah** and **Ketan Mayer-Patel**, recipients of 2002-2003 awards.

Wei Wang and **Montek Singh**, who have each been awarded \$5,000 Junior Faculty Development Awards (awarded through the Office of the Provost).

Stephen Weiss, who was awarded the Robert Byrd Award for Academic Integrity, given annually to a member of the UNC-Chapel Hill community who has demonstrated honor and integrity on the campus. Dr. Weiss was honored for his years of service in support of the Honor System.

Brian White who was named editor of *InTouch*, the Employee Forum Newsletter.

GRADUATE STUDENTS

Dr. John Glotzer (M.S. 2000) has generously funded an award to be given annually to an outstanding teaching assistant. The TA of the Year receives a cash award and has his or her name added to a plaque in Sitterson lobby. **Theodore Kim** and **Eileen Kupstas Soo** were the recipients of the 2001-2002 Outstanding Teaching Assistant of the Year award, and **Suzanne Vogel** was the 2002-2003 recipient.

Ruigang Yang, who was awarded a Link Fellowship for 2002-2003.

Sang-Uok Kum, who received a Link Fellowship for 2002-2003.

Aditi Majumder, who won the Argonne Young Scientist Award in October 2002.

Monica Kum, who was awarded the Paul Hardin Dissertation Fellowship for the 2003-2004 academic year.

Mark Harris, who was awarded the NVIDIA Fellowship for 2002-2003 for the second year in a row.

AND TO OUR GRADUATES...

May 2002

Ph.D.: Peter Brown, Robert Katz, Benjamin Lok

M.S.: Scott Cooper, Thomas Lassanske, Paul McLaurin, Nathan Moon, Stephan Sherman, Hans Weber

August 2002

Ph.D.: David McAllister, Nicholas Vallidis
M.S.: Ibrahim Salama, James Van Verth, Zhi Chen

December 2002

Ph.D.: Goopeel Chung, Gentaro Hirota, Ramesh Raskar, Andrew Wilson

M.S.: Angus Antley, Adrian Ilie, Peter Lorenzen, Kok-Lim Low, Dorian Miller, Thorsten Scheuermann, Woo Jin Seok, Christopher Weigle

B.S.: Carlos Flor, Yuan-Chen Ho, John Roam, Bennett Rogers

B.S. MSci.: Emeka Asika, Ryan Barrier, Aaron Bednar, Christopher Collazo, David Cooper, Catherine Kassens, Charles McGaw, Benjamin Rogers, Jeremy Watson.

May 2003

Ph.D.: Christopher Dwyer, Paul Rademacher, Paul Yushkevich

M.S.: David Borland, James Branigan, Tong Chao, Uma Devi, Charalampos Fretzagias, Sunyong Kim, Long Le, Mark Lindsey, Spencer Shepard, Michael Strauss, Sampath Vetsa, Suzanne Vogel, Rong Xie


B.S.: Michael Brian Albritton, Smriti Santosh Bhotika, Youngwon Byun, Phillip Liang-Hai Chang, Benjamin Lindley Ehrlich, Linda Jasmine Gardea, Julia Haven Grace, Ryan Michael Hillman, Steven Daniel Hopper, Aaron Wood Houghton, Shawn Allyn Hunter, Gregory Ryan Lanier, Benjamin Henry Lee Mappen, Virat Vijaykumar Mehta, Amnon Meiri, Dominic F. Montazemi, Jared Michael Pace, Jeremy Stephen Parker, Anthony George Penta, Richard Benjamin Pierce, Daniel Scott Plaisted, Stephen Paul Ridgill II, Brian Michael Rogers, Michael Raymond Roswell, Tatsuhiro Segi, Brian Lee Smith, Leon Michael Sujata

B.S. MSci.: Anthony Alfonso DeLuca, Drew Hyun Hale, Alex T. Jenkins, Stefan J. Kessler, Sarah Khanani, Erik Louis Laurenceau, J. Taylor Rankin, Jonathan Ray Shores, Allyson Blake Silver, Howard Ben Tat, William Matthew Vaughn, Britney Shea Wallace, Joseph Matthew Walters, Ze Heng Xiao, Jessica Lee Young.

August 2003 Candidates

Ph.D.: Alexandra Bokinsky, Aditi Majumder, Vassil Roussev, Michele Weigle, Ruigang Yang

M.S.: Dean Herington

B.S. MSci.: Mirza M. Nagji 

ALUMNI FELLOWSHIP RECIPIENT

Michele Weigle (M.S. 1998) is the recipient of the 2002-2003 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.

Michele is working on a dissertation investigating the use of synchronized clocks to improve TCP congestion control under the direction of Kevin Jeffay. Her research uses synchronized clocks at end systems to determine the exact one-way transit time (OTT) between the two hosts. Michele's goal is to use the OTTs obtained during a file transfer to detect and react to congestion before packet loss occurs. Her variant of TCP, called Sync-TCP, makes more efficient use of network resources and improves the overall performance of the Internet.

Research highlights

INTERACTIVE GEOMETRIC COMPUTATIONS USING GRAPHICS HARDWARE

Fast graphics hardware, including dedicated vertex processing, 3D rasterization, texturing, and pixel processing, is becoming as ubiquitous as floating-point hardware. The development time between new generations of graphics processor units (GPUs) is currently much less than the development cycle for CPUs. Moreover, the rasterization performance of the GPUs appears to be progressing at a rate faster than Moore's law. Along with multi-pass capabilities, programmability and fast readback bandwidth, the GPUs are becoming useful co-processors for diverse applications that are beyond the conventional domain of image synthesis.

The recent research of **Ming Lin** and **Dinesh Manocha** has focused on using GPUs for solving geometric and scientific computation. It includes developing real-time algorithms for different geometric problems including intersection queries, Voronoi diagrams and distance fields, penetration depth computation, robot motion planning, visibility determination and model simplification. They are also investigating fast algorithms for some scientific computing problems, including solving linear and non-linear algebraic equations and a class of partial differential equations that can effectively utilize the SIMD capabilities and treat GPUs as an efficient processor of images. The main challenges, as compared to CPU-based implementations, include lack of general-purpose programming tools for the GPUs, limited precision and storage. Our current algorithms have been used for these algorithms to fast physically-based simulation, real-time navigation of dynamic environments, and interactive display of complex 3D environments. Their long-term goal is to provide real-time solutions for many computationally challenging problems and also develop a new computing paradigm for different geometric and scientific applications.

More information about their projects can be found at gamma.cs.unc.edu. 

Recent publications

Baxter B., A. Sud, N. Govindraj and D. Manocha. "GigaWalk: Interactive Walkthrough of Complex 3D Environments," *Proc. of Eurographics Workshop on Rendering*, 2002.

Fletcher, P.T., S.M. Pizer, G. Gash, and S. Joshi. "Deformable M-rep segmentation of object complexes," *Proc. IEEE International Symposium on Biomedical Imaging*, 2002.

Foskey M., D. Manocha, T. Culver, J. Keyser, and S. Krishnan. "Reliable Geometric Computations with Algebraic Primitives and Predicates," *Uncertainty in Geometric Computations*, Sheffield, Kluwer Publishers, 2002, 12 pages.

Garber M., and M. Lin. "Constrained-Based Motion Planning for Virtual Prototyping," *Proc. ACM Symposium on Solid Modeling and Applications*, June 2002, 257-264.

Gerig, G., and M. Styner. "Statistical Shape Models for Segmentation and Structural Analysis," *Proc. IEEE International Symposium on Biomedical Imaging*, July 2002.

Gotz D., K. Mayer-Patel and D. Manocha. "IRW: Incremental Representation for Image-Based Walkthroughs," *Proc. of ACM Multimedia*, 2002.

Ho, S., E. Bullitt, and G. Gerig. "Level Set Evolution with Region Competition: Automatic 3-D Segmentation of Brain Tumors," *Proc. 16th Int Conf on Pattern Recognition ICPR 2002*, IEEE Computer Society, Eds. R. Kasturi, D. Laurendeau, and C. Suen, August 2002, 532-535.

Izenburg M., and J. Snoeyink. "Coding with ASCII: compact, yet text-based 3D content," *Proc. 1st IEEE International Symposium on 3D Data Processing, Visualization and Transmission*, June 2002, 609-616.

Joshi S., P. Lorenzen, G. Gerig, and E. Bullitt. "Structural and radiometric asymmetry in brain images," *Medical Image Analysis*, Vol. 7 (2), June 2003, 155-170.

Keyser J., T. Culver, M. Foskey, S. Krishnan, and D. Manocha. "ESOLID - A System for Exact Boundary Evaluation," *Proceedings of the ACM Conference on Solid Modeling*, 2002.

Kim Y., M. Otaduy, M. Lin and D. Manocha. "Six-Degree-of-Freedom Haptic Display using Localized Contact Computations," *Proc. Tenth Symposium on Haptic Interfaces For Virtual Environment and Teleoperator Systems*, 2002.

Lin M., and D. Manocha. "Collision and Proximity Queries," *Handbook of Computational Geometry*, Eds. J. O'Rourke and T.N.T. Goodman, CRC Press, 2003, 20 pages.

Majumder A. "Computer Graphics Optique: Optical Superposition of Projected Computer Graphics," *Energy, Simulation Training and Ocean Engineering: Research Papers of the Link Foundation Fellows*, Vol. 2, Ed. B.J. Thompson, University of Rochester Press.

Manocha D., Ed. "Interactive Geometric Computations with Graphics Hardware," *ACM SIGGRAPH*, 2002.

Mascarenhas A., S. Ehmann, A. Gregory, M. Lin and D. Manocha. "Six Degrees-of-Freedom Haptic Visualization," *Touch in Virtual Environments: Haptics and the Design of Interactive Systems*, Prentice-Hall, 2002, 95-118.

Moon, N., E. Bullitt, van Leemput, K., and G. Gerig. "Model-Based Brain and Tumor Segmentation," *Proc. 16th Int Conf on Pattern Recognition 2002*, Eds. R. Kasturi, D. Laurendeau, and C. Suen, IEEE Computer Society, August 2002, 528-531.

Pizer S.M., P.T. Fletcher, A. Thall, M. Styner, G. Gerig, and S. Joshi. "Object Models in Multiscale Intrinsic Coordinates via M-reps," *First International Workshop on Generative-Model-Based Vision*, 2002, AEC Pece, ed. Technical Report DIKU-TR-2002/01: 1-9. Also, to appear in IVC Special Issue on Generative Model-based Vision.

Plaisted D., A. Biere, and Y. Zhu. "A satisfiability procedure for quantified Boolean formulae," *Discrete Applied Mathematics*, in press, available online April 2003.

Plaisted, D., and A. Yahya. "A Relevance Restriction Strategy for Automated Deduction," *Artificial Intelligence*, Vol. 144 (1-2), March 2003, 59-93.


Scheib V., J. Haber, M. Lin, and H.P. Seidel. "Efficient Fitting and Rendering of Large Scattered Data Sets Using Subdivision Surfaces," *Computer Graphics Forum* (Proc. of Eurographics), Vol. 21(3), 10 pages, 2002.

Shenton, M.E., G. Gerig, R.W. McCarley, G. Szekely, and R. Kikinis. "Amygdala-Hippocampus Shape Differences in Schizophrenia: The application of 3D shape models to volumetric MR data," *Psychiatry Research Neuroimaging*, 2002, 115:15-35.

Singh, M., J. A. Tierno, A. Rlyakov, S. Rylov, and S. M. Nowick. "An Adaptively-Pipelined Mixed Synchronous-Asynchronous Digital FIR Filter Chip Operating at 1.3 GigaHertz," *Proc. IEEE 8th International Symposium on Advanced Research in Asynchronous Circuits and Systems*, April 2002.


Styner M., G. Gerig, J. Lieberman, D. Jones and D. Weinberger. "Statistical shape analysis of neuroanatomical structures based on medial models," *Medical Image Analysis*, in press, available online March 2003.

Varadhan G., and D. Manocha. "Out-of-Core Rendering of Massive Models," *Proc. of IEEE Visualization*, 2002.

Yushkevich, P., P.T. Fletcher, S. Joshi, A. Thall, and S. Pizer. "Continuous Medial Representations for Geometric Object Modeling in 2D and 3D," *First International Workshop on Generative-Model-Based Vision*, 2002, AEC Pece, ed. Technical Report DIKU-TR-2002/01: 11-19. 

NEW FIVE-YEAR MIDAG GRANT

The Medical Image Display and Analysis Group (MIDAG) has been awarded a five-year grant of approximately \$8 million by the National Cancer Institute. **Stephen M. Pizer**, Kenan professor, is the principal investigator on the grant, "Structural Image Analysis and Medical Uses," which extends ongoing Medical Image Presentation (MIP) research, now in its 12th year. Research will take place in several departments: Computer Science, Radiation Oncology, Psychiatry, Biostatistics, and Statistics. In addition to Pizer, researchers leading individual projects and groups as part of the grant include **Edward Chaney**, professor in Radiation Oncology, **Guido Gerig**, Taylor Grandy professor in Computer Science and Psychiatry, **Keith**

Muller, associate professor in Biostatistics, and **Graham Gash**, MIP lab manager in Computer Science. Efforts will focus on developing methods for extracting 3D anatomic objects from CT and MR images for radiation treatment planning and psychiatric diagnosis, and the statistical characterization of object shapes to support research in the development and diagnosis of schizophrenia. Researchers will continue to develop methodologies for 3D image-based object extraction and shape characterization that will be widely applicable and that will be based on m-reps; the novel means of representing deformable objects invented by Pizer and his colleagues. (www.cs.unc.edu/Research/MIDAG/) 

GRANTS

"CAREER: Visual 3D Acquisition, Modeling and Rendering of the Real World," NSF, Marc Pollefeys.

"Handling Massive Models: Representation, Real-Time Display and Interaction," Army Research Office, Dinesh Manocha and Ming C. Lin.

"Flexible Fair Scheduling on Multiprocessors," NSF, PIs: Jim Anderson and Sanjoy Baruah.

"Time Complexity Limits for Shared-memory Synchronization," NSF, Jim Anderson.

"Log-based Middleware for Pervasive Application Sharing," NSF, Prasun Dewan.

"Collaborative Research: Rate-based Resource Allocation Methods Real Time Embedded System," NSF, Kevin Jeffay and Don Smith.

"Protocol Coordination for Multistream Applications," NSF, Ketan Mayer-Patel.

Junior Faculty Development Award, Montek Singh.

"3D Force Microscopy for Microrheology and Active Transport/Computer Science," National Institute for Biomedical Engineering, Rich Superfine.

Junior Faculty Development Award, Wei Wang. 

Computer Services News

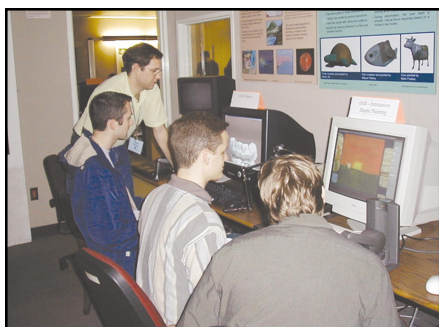
SITTERSON NETWORK UPGRADE COMPLETED

Bil Hays, network manager, managed the upgrade of the Sitterson network, which was completed last summer. We ran all new wireways in the ceilings and new conduits to the offices. Small offices now have at least six data and two voice connections, plus four fibers and video cable; larger offices have more. The process of upgrading involved first installing and testing a new wiring infrastructure throughout the building. Once the new network was verified, Bil moved all the building network connections over to the new wiring, with only very brief disruptions in service as individual systems were moved from one wire to another. We now have switched 100 megabit connections to every desktop, and the wire is capable of handling gigabit speeds when

the switches and network interfaces are upgraded. This was a tremendous project, with workmen visiting every room in the building multiple times, walls being moved to accommodate new or expanded communications gear, and a wide variety of potentially intrusive activities going on throughout the year. Bil planned and implemented the upgrade masterfully and worked with users to keep the disruptions to an absolute minimum.

OS UPGRADES

Murray Anderegg (M.S. 1991), Linux and email systems administrator, upgraded our Linux systems to Red Hat version 7.3. **Charlie Bauserman**, PC systems administrator, upgraded the majority of our PC systems to Microsoft Windows 2000 and Office 2000, and we are now starting on upgrading desktop systems to Windows XP. (*story continued on page 8*)



Prospective students view examples of our research at Candidates' Day 2003. (*photo Kelli Gaskill*)

VIRTUAL MONTICELLO ON DISPLAY AT NEW ORLEANS MUSEUM OF ART


Associate professors **Anselmo Lastra** and **Lars Nyland**, in collaboration with the University of Virginia, are bringing Jefferson's Monticello to life through virtual reality this summer at the New Orleans Museum of Art (NOMA). The exhibit, part of the museum's *Jefferson's America & Napoleon's France* exhibition, will be on display through Aug. 31, 2003.

Visitors to *Jefferson's America & Napoleon's France*, a special exhibition in celebration of the bicentennial anniversary of the Louisiana Purchase, will view a three-dimensional scan of Jefferson's library through two four-by-five-foot windows built in a 55-foot-wide red Monticello façade.

Using special polarized glasses, groups of viewers will have the experience of looking directly into a library a thousand miles away. One viewer in each group will wear glasses that include a head-tracking device, and the virtual window will show that visitor's view into the room. For example, as the visitor leans in and looks to the left, more of the left side of the library will be visible. A stereogram image of the library, designed in collaboration with (art)², is also available for viewing without glasses.

Lastra and Nyland, along with collaborator and department alumnus **David Luebke** (Ph.D. 1998) of the University of Virginia, were brought in on the NOMA project after scanning the library in 2000. Using the 3rdTech DeltaSphere laser-range scanner, the professors were able to create a 3D model of the library. The researchers are working to develop methods of real world 3D modeling.

The research project and the Jefferson library exhibit at NOMA are being funded by a grant from the National Science Foundation. Additional support was provided by the Mitsubishi Electric Research Laboratories.

For more information on the Jefferson's American and Napoleon's France exhibit at the New Orleans Museum of Art, visit www.noma.org. 

BLIND AUDIO TACTILE MAPPING SYSTEM

A project known as BATS, or Blind Audio Tactile Mapping System, seeks to help the blind gain greater independence by allowing them to 'read' maps.

In spring 2002, a group of five undergraduate students, led by Associate Professor **Gary Bishop**, created a prototype of the system, using a map of ancient England.

BATS works by adding accessibility features to a digital map, allowing the blind user to gain the same kind of spatial awareness as a sighted user. The user moves a pointer over the map using a mouse, trackball, or tablet input device. The numeric keypad on the keyboard enables the user to perform actions such as listening to environmental sounds or requesting the spelling of a city's name.


Jason Morris, a blind graduate student in the classics department at UNC, was the inspiration for the project. While a few Braille maps were available to Jason, he didn't have access to the maps he needed, and he had begun working with the Ancient World Mapping Center to create better maps for the blind.

After hearing Jason's story, Gary took the idea for BATS back to his undergraduate-level COMP 145 class, Software Engineering Laboratory, where they decided to make it their spring project. Teams were assigned to different areas of the project, including building a system to enable audio and tactile display of ancient maps, allowing Jason to do research, and building a system to transliterate ancient texts in Greek and Latin into an appropriate Braille alphabet.

In addition, a graduate-level class, COMP 261, Elements of Hardware Systems, began work on building a device to measure compass direction, range to an object in front of the user, tilt, and global positioning system coordinates. This would allow Jason to conduct archaeological expeditions for his courses and could also be used for local navigation.

When the semester was over, some of the students decided to keep working on the project, and others joined the effort. Since then, the group has received an unrestricted grant from the Microsoft Corporation, as well as equipment from companies such as Kensington and Intel.

Bishop eventually wants to offer the BATS system as free software.

A demo of BATS can be found on the project Web site, along with additional information. www.cs.unc.edu/Research/assist/bats 

Alumni news

M.S. AND PH.D. ALUMNI

Thomas Alspaugh (M.S. 1980) completed his Ph.D. at NCSU in September 2002 and is now at the University of California, Irvine as tenure-track faculty in Information and Computer Science. (taalspau@unity.ncsu.edu)

Ron Azuma (Ph.D. 1995) was recently published in the 2002 *Proc. International Symposium on Mixed and Augmented Reality (ISMAR 2002)*. His article was titled "Augmented-reality visualizations guided by cognition: Perceptual heuristics for combining visible and obscured information." (azuma@HRL.com)

David Banks (Ph.D. 1993) is the principal investigator for a grant to support research in brain imaging. The goal is to display brain response to stresses and injuries. The project will use data from diffusion weighted MRI and from confocal microscopy of dendritic spine growth in living animals. This research is being conducted with the departments of Statistics and Biomedical Sciences at Florida State University. (banks@mailier.csit.fsu.edu)

Greg Bollella (Ph.D. 1997) was recently promoted within Sun Microsystems Labs to the rank of Distinguished Engineer for his leadership role in the development and use of real-time Java. Greg's contributions to Sun and the industry have been focused on real-time systems architectures including being the driving architect behind the Real-Time Specification for Java (RTSJ, JSR-01). Greg continues to educate the real-time industry and evangelize real-time Java in mission critical class applications such as NASA/JPL's Mars Rover working with NASA/JPL team to create a RTSJ implementation of their Mission Data System software environment; U.S. Navy's Next Generation Destroyer Development Program; U.S. Air Force Research Labs and Boeing developing an RTSJ profile suitable for FAA safety-critical certification; and Siemens power plant control systems. (greg.bollella@sun.com)

Chun-Fa Chang (Ph.D. 2001) joined the Computer Science Department at the National Tsing Hua University, in Hsinchu, Taiwan, as an assistant professor in August 2001. (chang@cs.unc.edu)

Paul Clements (M.S. 1980) has co-authored his third book on software architecture. *Documenting Software Architectures: Views and Beyond* was published by Addison Wesley in September 2002 as part of the SEI series in software engineering. (clements@sei.cmu.edu)

John Gauch (Ph.D. 1989) and Susan Gauch (Ph.D. 1990) have formed a company, Veatros, L.L.C., to commercialize John's patented video authentication software. Currently, the software is licensed to a cable network to verify the broadcast of their commercials to subscribers throughout Latin America. Veatros is pursuing expansion to other cable providers and new markets, specifically Asia. (sgauch@ittc.ku.edu)

Gopal Gupta (Ph.D. 1992) has moved to University of Texas at Dallas, where he is now a

full Professor. Gopal is also the initiator and organizer of the PADL (Practical Aspects of Declarative Languages) series of symposia; the fifth one was held in New Orleans together with ACM POPL on January 13-14, 2003. Gopal does research in areas of logic programming, programming languages, and software engineering. A couple of his recent publications include: E. Pontelli, G. Gupta, D. Ranjan, B. Milligan. "\$\Phi\$Log: A Domain Specific Language for Solving Phylogenetic Inference Problems in Biology," *Proc. First IEEE Computer Society Bioinformatics Conference*, August 2002, 2-10; and "Domain Specific Languages Meet Software Components: A Language-centric Framework for Software Engineering," *Proc. Workshop on Applications of Declarative Metaprogramming to Software Engineering*, September 2002. (gupta@utdallas.edu)

Lenwood S. Heath (Ph.D. 1985) is an associate professor in the Department at Virginia Tech in Blacksburg, Va., and has been moving into the field of bioinformatics, an exciting blend of life sciences, computer science, and statistics, in the past few years. Some recent relevant publications include: Lenwood S. Heath, Naren Ramakrishnan, Ronald R. Sederoff, Ross W. Whetten, Boris I. Chevone, Craig A. Struble, Vincent Y. Jouenne, Dawei Chen, Leonel Merwe van Zyl, and Ruth Grene, "Studying the Functional Genomics of Stress Responses in Loblolly Pine using the Espresso Microarray Management System," *Comparative and Functional Genomics*, 3, 2002, 226-243; and Ruth Grene, Neval Erturk, and Lenwood S. Heath, "Role of Superoxide Dismutase (SODs) in Controlling Oxidative Stress in Plants," *Journal of Experimental Botany*, 53, 2002, 1331-1341. (heath@cs.vt.edu)

Gentaro Hirota (Ph.D. 2002) was recently published in *Presence: Teleoperators and Virtual Environments*. His article was titled "Modeling Real Objects Using Video See-Through Augmented Reality."

Dan Hoffman (Ph.D. 1984) has been promoted to professor at the University of Victoria, B.C., Canada. (dboffman@cs.uvic.ca)

Patsy Schwegman Kerkoulas (B.S. MSci. 1984) published "How to produce EDMS requirements and cost-benefit data," in the August 2002 edition of *Topics in Healthcare Information Management*. (kerkoulp@mskcc.org)

Alan Liu (Ph.D. 1998) is in Silver Spring, Md., working for the DoD building medical simulators for teaching surgeons how to perform trauma procedures because, as he says, practicing on patients can be hard on them (simcen.usubs.mil). He reports that the job is great fun, and there's currently lots of funding for this area. (liu@cs.unc.edu)

Bill Mark (Ph.D. 1999) spent last year at NVIDIA as the lead designer for the 'Cg' language. 'Cg' is a programming language for real-time graphics hardware. He joined the

faculty of the University of Texas at Austin in January 2003 as an assistant professor in the Department of Computer Science.
(billmark@graphics.stanford.edu)

Gopi Meenakshisundaram (Ph.D. 2001) is now an assistant professor in the Department of Information and Computer Science at University of California, Irvine. He joined the department in October 2001. (gopi@ics.uci.edu)

In April 2003, the Governor General of Australia announced the names of Australians who have been awarded a Centenary Medal, which was struck to celebrate the country's first hundred years of federation. **Dr. J. Craig Mudge** (Ph.D. 1973), a former student of Dr. Fred Brooks, was awarded a Centenary Medal "for service to Australian society in microelectronics and telecommunications." In the late eighties Craig was made a Fellow of the Australian Academy of Technological Sciences, which is like the National Academy of Engineering in the U.S. (mudge@pacific-challenge.com)

Dan Palmer (Ph.D. 1996) was recently published in *ROS 2002 IEEE/RSJ International Conference on Intelligent Robots and Systems I, 2002*. His paper was titled "Multi-Agent Control Algorithms for Chemical Cloud Detection and Mapping Using Unmanned Air Vehicles." (dpalmer@jcu.edu)

Will Partain (Ph.D. 1989) changed jobs in April 2003, out of Motorola and into a small company (www.verilab.com). (partain@dcs.gla.ac.uk)

Chris Schleiter (M.S. 1981) is currently in Athens, Greece, consulting with the Organizing Committee for the 2004 Olympic Games. His current project is planning games-wide results print distribution which will print about 24-million pages of results over 16 days. This is his fourth Games (Atlanta (Baseball Results Manager), Sydney (Planning Manager and Baseball Results Manager), Salt Lake (Figure Skating and Short Track Speed Skating Results Manager) and Athens. He expects to go on to Torino, Italy, for the 2006 Winter Games when the 2004 games are over.
(sprtstat@ix.netcom.com)

Ethan Michael Talley was born on April 17, 2002 to Michelle and **Terry Talley** (Ph.D. 1997) in Arkansas about an hour after Claire and **Don Stone** (Ph.D. 1995) brought Ian Michael Stone into the world in North Carolina. These two events once again demonstrate the success of the DiRT research group in enabling synchronous, low latency, long-distance collaboration.
(terry.talley@conwaycorp.net)

Ray Van Dyke (M.S. 1989) lectured last year on technology law at conferences in Buenos Aires, London, and before the Swiss Federal Institute of Technology in Zurich, and continues teaching Intellectual Property law at Southern Methodist

and George Washington Universities. He was a featured speaker on John Dvorak's SiliconSpin show on patent law. He has also worked extensively in bioinformatics, proteomics and related information-based areas on behalf of clients and universities, and recently litigated an Internet patent case.
(VanDyke.Raymond@DORSEYLAW.com)

UNDERGRADUATE ALUMNI

Steven D. Hopper (B.S. 2003) was initiated into Alpha of North Carolina Chapter of Phi Beta Kappa this spring. To be eligible for membership, an undergraduate student must have completed at least 75 semester hours of academic work at UNC with a quality point average of at least 3.750. Students who have completed at least 105 semester academic course hours must have a quality point average of at least 3.650.

Cindy Hong (B.S. MSci. 1996) graduated from Texas A&M University with a Master of Science in Visualization Sciences in May 2002. She is now working for ESC Entertainment in Alameda, Calif., as a color and lighting technical director. The company worked on the two Matrix sequels.
(hong@cs.unc.edu)

Bennett Rogers (B.S. 2002) was awarded a Churchill Scholarship. These are quite competitive scholarships for graduate study in

engineering, mathematics and the sciences at Churchill College at Cambridge, awarded by the Winston Churchill Foundation of the United States. At least 11 scholarships, tenable for one year, are offered annually. Bennett plans to study AI while he is at Cambridge.
(www.thechurchillscholarships.com)

Michael D. Thomas (B.S. MSci. 1995) published his second book, *Oracle XSQL*, earlier this year. (mdthomas@mindspring.com)

Bruce Tindall (B.S. MSci. 1977) received the Master of Fine Arts in Writing degree from Vermont College in July 2002.

FORMER FACULTY & STAFF NEWS

Andrew Ade, former administrative assistant to Henry Fuchs (1996-1999), has recently secured an Assistant Professor position in Comparative Literature at Westminster College in New Wilmington, Pa. He left Chapel Hill in July to begin his position in August 2003.

Former adjunct associate professor **Daniel A. Pitt**, who left in 1992, has been appointed dean of the school of engineering at Santa Clara University. He and his family continue to reside in Palo Alto, California. (dpitt@scu.edu)

Former adjunct professor **Turner Whitted**, who left in 2001, was elected to the National Academy of Engineering.



Left: Associate Professor Anselmo Lastra prepares a member of the Clemson University Board of Visitors for a virtual experience.
(*photo Kelli Gaskill*)

Right: Students gather around the Sitterson snowman after one of the first snowfalls of the season. (*photo Mark Lindsey*)



News & Notes

from Sitterson Hall

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

Keep in touch!

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

Throughout News & Notes, we list degree information for all our B.S., M.S., and Ph.D. Computer Science and Math Sciences alumni.

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Undergraduate news

UELTSCHI SERVICE-LEARNING COURSE, COMP 90

Jeannie M. Walsh, lecturer and director of general studies, was a 2002 recipient of the Ueltschi Service-Learning Course Development Grant offered through APPLES (Assisting People in Planning Learning Experiences in Service). Walsh, in coordination with the APPLES service-learning program, taught a service-learning course, COMP 90, in fall 2002.

Walsh's COMP 90 course consisted of group reflection sessions, reflection papers and daily journal assignments, in addition to a weekly service commitment, where COMP 90 students shared their knowledge of computers from COMP 4 with members of a community organization. COMP 4 covered a broad range of topics, including how computers work, concepts about computer applications, how to program a computer to solve certain problems, and the

computer's potential for use and abuse in our society.

Jim and Jean Ueltschi, UNC-CH alumni, and the Office of the Provost provide the funds that are distributed to grant recipients. The Ueltschi Grant provides stipends, training and assistance with community service placements and course reflection activities. The Ueltschi Grant allows UNC-CH faculty the opportunity to offer students an experience that is both academically enriching, as well as mutually beneficial for the community.

APPLES is a student-sponsored program at UNC-CH that combines students, faculty and community members in service-learning partnerships that address social concerns and needs of North Carolina communities. Begun in 1990 with only three courses, APPLES now offers 20 service-learning courses per semester. ☐

Computer Services News (continued)

Alan Forrest, Mac & Windows systems administrator, along with Bil Hays, upgraded our Macintosh systems to the UNIX-based Mac OS X operating system. All of these OS upgrades were needed to keep up with the latest hardware and software and to get needed security patches. The OS X upgrade also allows us to use same login and password information on the Macs as on our other systems.

SERVER UPGRADES

John Sopko, UNIX systems manager, upgraded the department's web servers from some older Sun and Linux systems to much newer and faster Linux systems. The web servers include our standard www.cs.unc.edu server, a server that runs CGI scripts, and an Apache Tomcat server for running Java servlets (primarily for web classes). John and Murray also set up three new and much faster Linux compute servers to replace our three aging Sun compute servers and to provide RAIDed AFS playpen space. We are phasing out the old Sun departmental

compute servers this year, while we continue to support the Suns used by various research groups.

OFFICE MOVES AND REARRANGEMENTS

Fred Jordan, electronics shop supervisor; electronics technicians **Mike Stone**, **Mike Carter**, and **Chester Stephen**; and undergraduate **Mark Joslin** did a terrific number of moves of people and computers in summer 2002 to fit in five new faculty and about 20 additional graduate students. The work involved converting storerooms and a lab into offices, knocking out walls to make new faculty offices, and moving a great deal of equipment and furniture. We did the majority of the work over the summer to minimize disruptions. We'll be making further rearrangements this summer to squeeze in an additional 20 grad students for a total of about 170 this fall. We expect this to be the maximum until the Sitterson addition is built. ☐

In memoriam

James Morton Alexander, a friend of the department, died March 4, 2002, in Charlotte, N.C. An alumnus of the university, where he majored in chemistry, James was a member of the UNC Board of Visitors from 1990-1994.

SAS Institute executive **Charles H. "Charlie" Dunham** (B.S. MSci. 1975) died suddenly on February 27, 2002. Dunham, age 48, had worked at the software company for 21 years and was Vice President of Information Services. He had been honored for his work at SAS Institute by such industry magazines as CIO Magazine and Information Week. A merit-based scholarship has been established in his honor at UNC. Contributions may be made to the Office of Development, 208 West Franklin St., Chapel Hill, NC 27514, ATTN: Marissa Sears. If you wish to contribute, please make a check out to UNC and specify that it is for the Charles H. Dunham Scholarship.

Michael Alexander McNulty (Ph.D. 1973) died November 9, 2002, in Worthington, Mass., after a long battle with cancer. After graduating from the university, Michael worked and did research in computer science, working for Duke University Medical Center, the National Testing Service, Digital Equipment Corporation, and NASA. He also taught at the University of Alabama at Birmingham and Virginia Commonwealth University.

Harry Wright Smith, III, passed away in January 2003. Harry was an undergraduate journalism major back in the early 70's who took several of our courses. Harry was also a graduate student in this department for a time. Harry lived and worked in Chapel Hill for most of his career. He was co-owner of the Photosynthesis camera shop in University Mall, was an accountant, and remained a good friend of the department.