News & Notes from Sitterson Hall

Issue Thirty-One, Spring 2002

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

In This Issue

Chairman's Corner

We welcome **Richard Superfine** and **Sean Washburn** of the Department of Physics and Astronomy at UNC-Chapel Hill to our faculty as adjuncts. Both already have a long association with our department, as advisers and directors of our graduate and undergraduate students, and as principal or co-principal investigators on grants.

John Eyles and **John Poulton** became adjuncts in December. During the past two years, both were on off-campus assignment while they worked at Velio Communications, Inc., and both chose to stay full time with the company at the end of that period. Velio designs innovative signaling and switch-fabric integrated circuits.

We are sorry to say goodbye to **James Coggins**, former associate professor, who has joined NetIQ Corp. in Research Triangle Park, N.C. James had been with us since 1986 and had served six years as associate chairman for academic affairs. We wish him well in his new endeavor.

Several of our students recently received awards and honors. See inside for details.

Many thanks to all of our faculty, staff, and students who in December generously donated canned goods and money to help needy families in Orange County. I was able to deliver 20 bags of groceries to the Inter-Faith Council for Social Service in Carrboro. Administrative manager **Katrina Coble**, who organized the donation effort, collected enough $30 donations to feed 12 needy families. Thanks to all for your generosity during the holiday season to help the less fortunate.

Spring has arrived in Chapel Hill; truly one of the most beautiful times to be here. Please visit us if you have the chance!

Stephen F. Weiss

"Bandwidth Farming:" Graduate students Felix Hernandez Campos and Long Le prepare to rake through a tangle of networking cable. More about the department's network upgrade project below. (Photo: Kevin Jeffay)

Welcomes and Farewells

New Faculty

Richard Superfine, Adjunct Associate Professor (Associate Professor, Physics and Astronomy, UNC-Chapel Hill), Ph.D. 1991, Berkeley. *Condensed matter physics; biophysics; microscopy.*

Sean Washburn, Adjunct Professor (Lyle V. Jones Professor, Physics and Astronomy; Chair, Applied and Materials Sciences, UNC-Chapel Hill), Ph.D. 1982, Duke. *Condensed matter physics, materials science.*

New Students, Spring 2002

Richard Mukherjee, Jason Stewart, Jingyu Yan, and Bingzhao Yang.

Thanks and farewell to . . .

Robert-Paul Berretty, postdoctoral researcher, who worked with Jack Snoeyink, professor, in the area of computational geometry from January to December 2001. He is now a research scientist with Philips Research in Utrecht, The Netherlands. *(berretty@cs.unc.edu)*

Donna Knighten, accounting assistant, who left in February 2002 to join Construction Management in Facilities Services at UNC-Chapel Hill. Her new position, as Administrative Secretary II, is a promotion. Donna had worked with us since November 1998. *(dknighten@fac.unc.edu)*

Congratulations to...

Faculty and Staff

Linda Houseman, computing consultant and help desk supervisor, **Janet Jones**, graduate student services manager, and **Madelyn Mann**, program assistant, who each received "Star Heel" awards from UNC-Chapel Hill for excellence in their work for our department. Each was nominated by co-workers.

Kevin Jeffay, S. S. Jones professor, who was presented with an award for service to the real-time systems community at the 22nd annual IEEE Real-Time Systems Symposium in December 2001.

Madelyn Mann, who was promoted to Program Assistant V, effective 25 February 2002.

Tammy Pike, who was promoted to Office Assistant IV, effective 19 November 2001.

Graduate Students

Bill Baxter (M.S. 2000) and **Ruigang Yang**, who received Link Foundation Fellowships.

Felix Hernandez Campos (M.S. 2001), who was awarded a fellowship grant from the Computer Measurement Group, Inc.

Michael Rosenthal, who received a Leadership Award from the American Medical Association Foundation (see below).

Vincent Scheib, who was awarded a National Science Foundation Graduate Research Fellowship.

Our December Graduates

Ph.D.
Gopi Meenakshisundaram, "Theory and Practice of Sampling and Reconstruction of Manifolds with Boundaries" (adviser: Jack Snoeyink)

Mark A. Parris, "Class-Based Thresholds: Lightweight Active Router-Queue Management for Multimedia Networking" (Kevin Jeffay)

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

M.S.:
Bonnie Danette Allen*, Felix Hernandez Campos*, Chad T. Petty, Adam A. Seeger*, Andrew G. Zaferakis

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

B.S. Computer Science:
Christopher Schenck

B.S. Mathematical Sciences (CS Option):
Chandra Graham, Phillip Kinnaird, Sarath Kolluru, Andrew Mackelfresh, Sahil Parikh, Jonathan Pence, and Adam S. Ross.

Research Highlights

Network Traffic Analysis and Characterization Research

Kevin Jeffay, S. S. Jones professor, and **Don Smith**, research professor (Ph.D. 1978), have received a renewal of their grant from Cisco Systems to continue their work on network traffic analysis and characterization. Their work is part of a larger project in which researchers from the Department of Statistics at UNC-Chapel Hill are also involved. A critical element of Internet simulations, or test-bed measurements, is the process by which synthetic traffic is generated and injected into the network. Their research concerns capturing and analyzing large-scale collections of Internet traces of TCP/IP protocol headers to create contemporary source-level models for traffic generation. They are concerned with doing this with low-cost, low-overhead methods that can be used at multiple sites as an ongoing effort to create up-to-date models, because Internet applications (and their uses) continue to evolve rapidly.

To address the problem, graduate student **Felix Hernandez Campos** (M.S. 2001) is creating a framework of application-class models, in which each class is distinguished by the common paradigm of how it is a source of network traffic. For each class, he is creating a single stochastic model to reflect the aggregated characteristics of all TCP applications that are members of that class. The researchers hope to represent a very large number of applications with a relatively small number of class-based models because--given this set of models and the desired proportion

of each class--one can generate synthetic traffic for network simulations with an arbitrary mix of applications. In his research, he is collaborating with **Andrew Nobel**, associate professor of statistics.

Whitaker Foundation Funds Surgical Simulation System

Stephen R. Aylward (Ph.D. 1997), assistant professor of radiology and adjunct assistant professor of computer science, is the principal investigator on a new three-year grant, "Vessel Visualization and Quantification for Partial-Organ Transplant Planning and Evaluation," funded by the Whitaker Foundation. The goal of the project is to develop a surgical simulation system that will help with planning partial liver transplants between a patient and a living donor related to that patient; specifically when both donor and recipient are adults. Donations from living parents to their children have been extremely successful, but adult-to-adult transplant surgery has been much more difficult for the donor to tolerate since the survival of an adult recipient relies upon a larger graft donation than that required for a pediatric recipient. Studies show that 30 to 67 percent of livers have anomalous hepatic vascular anatomy. Because reviewing 2D slices of MR or CT scans is often insufficient to detect these anomalies, Aylward and his colleagues are developing software that will allow a surgeon to interactively visualize 3D models of a liver's vascular network based on MR and CT scans; to analyze them; and to specify a surgical path through them in 3D. The software will also help the surgeon to predict the outcome of a potential transplant. Researchers hope that surgeons also will be able to use the system to plan many other minimally invasive procedures that are driven by an organ's vascular network, such as partial-lung transplants, liver lesion ablations, and brain tumor resections. *(caddlab.rad.unc.edu)*

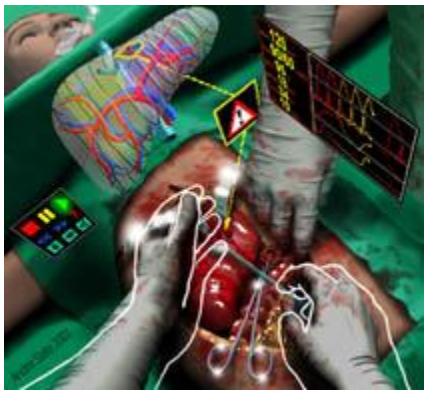
Visualization for liver transplant cutting path assessment. The Whitaker Foundation is funding a new simulation system to help surgeons plan partial liver transplants.

New Tele-Immersion Project to Train Surgeons Using VR

Researchers at UNC-Chapel Hill and Brown University are collaborating on a new project to develop tele-immersion technology for training surgeons. **Andries Van Dam**, professor, of Brown is principal investigator and **Gregory F. Welch** (Ph.D. 1997), research associate professor, of UNC-Chapel Hill is co-principal investigator on the project, "Electronic Books for the Tele-Immersion Age: A New Paradigm for Teaching Surgical Procedures," which received one of the National Science Foundation's competitive Information Technology Research awards. **Henry Fuchs**, Federico Gil professor, and **Herman Towles**, senior research associate, are also participating at UNC-Chapel Hill. Colleagues from the University of Pennsylvania will also

collaborate indirectly. The project will involve both computer scientists and medical professionals and will build on prior work by the computer scientists.

The researchers recognized that with the dramatic increase in the pace of surgical innovations, mechanisms for training and re-training surgeons on the new methods have become inadequate. The limitations of traditional videotaped instruction make it an ineffective training tool, but having the surgeon actually observe the new procedure is often not practical. They envision an immersive "time machine"; a virtual environment that allows the trainee to walk freely and naturally around a life-sized, high-fidelity, 3D graphical reconstruction of a past surgical procedure, pausing or stepping forward or backward in time to satisfy curiosity or allay confusion. The environment would incorporate commentary from the original surgeon or another instructor, integrated 3D illustrations, annotations, and relevant medical metadata. Although they are concentrating on trauma surgery, the researchers envision many other possible applications for the technology. *(www.cs.brown.edu/research/graphics/research/itr/#eBook)*



In a new tele-immersion project, researchers will develop technology to train surgeons. (Image: Andrei State)

nanoManipulator Team Goes Back to School

In February, nanoManipulator team members spent a week at Orange High School in Hillsborough, N.C., conducting instructional workshops for approximately 120 students. Students listened to presentations by scientists, learned about the nanoscale science at the heart of the project, and used the nanoManipulator to experiment with viruses. Each student had the opportunity to interview two of the scientists or computer scientists on the team, which consisted of UNC-Chapel Hill faculty and students in the departments of Computer Science and Physics and Astronomy, the School of Education, and the Curriculum in Applied and Materials Sciences. Team members looked at the impact on the students of using the nanoManipulator across a live Internet connection to the Atomic Force Microscope, compared to using saved stream files. They also investigated the impact of haptic feedback on students' conceptions of viruses.

This visit was the latest of several that the nanoManipulator team has made to Orange High. Past visits have shown that the project has been successful in increasing students' interest in science, and their understanding of various fields of science and what scientists do. Students have reported enjoying the chance to meet and interact with UNC-Chapel Hill faculty and students. *(www.cs.unc.edu/Research/nano/)*

RTSS 2001

The 22nd Annual IEEE Real-Time Systems Symposium (RTSS) took place in London, England, in December 2001. RTSS is the premier technical conference for real-time systems research. **Kevin Jeffay**, S.S. Jones professor, was the general chair of the conference. The program committee included **Jim Anderson**, professor, **Sanjoy Baruah**, associate professor, and **Giuseppe Lipari**, a former visiting graduate student at UNC-Chapel Hill, who is currently on the faculty at Scuola Superiore Santa Anna in Pisa, Italy. The IEEE Technical Committee on Real-Time Computing gave Jeffay an IEEE Service Award, in recognition of his services to the real-time systems community.

At RTSS 2001, seated (from left): UNC-Chapel Hill computer science faculty Kevin Jeffay and Sanjoy Baruah, with Gerhard Fohler of Malardalen University in Sweden. Standing (from left): Giorgio Buttazzo of the University of Pavia in Italy, and Guiseppe Lipari of the Scuola Superiore Santa Anna in Italy. (Photo: Maya Jerath)

Several papers had UNC-Chapel Hill links. Graduate student **Shelby Funk** (M.S. 2001) presented "On-Line Scheduling on Uniform Multiprocessors," co-authored with her adviser, Baruah, and former departmental visitor **Joel Goossens**. Graduate student **Phil Holman** presented "Guaranteeing Pfair Supertasks by Reweighting," co-authored with his adviser, Anderson. **Bjorn Andersson**, a student at Chalmers University in Sweden, presented "Static-Priority Scheduling Upon Multiprocessors," co-authored with Baruah and **Jan Jonsson** (also of Chalmers). Both Lipari and **Gerardo Lamastra**, who visited UNC-Chapel Hill for several months during 2000 and who is currently at Telecom Italia, also presented papers.

RTSS 2002 will be held this December in Austin, Texas. Baruah will chair the program committee, which will once again have a significant UNC-Chapel Hill presence. *(www.cs.unc.edu/~baruah/Meetings/2002-RTSS/)*

Graduate student Shelby Funk takes time out from RTSS 2001 for some London sightseeing. (Photo: Kevin Jeffay)

Short Bits

AMA Foundation Award

Graduate student **Michael Rosenthal** has been selected by the American Medical Association (AMA) Foundation as one of the 50 outstanding young medical professionals to receive its Leadership Award this year. The award is given annually to 25 medical students and 25 residents and fellow physicians for their exceptional leadership among their peers and their achievements in non-clinical community activities. Among his many activities, Rosenthal is national chair of the Association of American Medical Colleges' Organization of Student Representatives. He is pursuing both a medical degree and a Ph.D. in computer science.

Best Panel Award

Professor **Dinesh Manocha** participated in the "Commodity Graphics Accelerators for Scientific Visualizations" panel, which received the "Best Panel" award at IEEE Visualization 2001. Other panelists were **Tom Funkhouser** of Princeton, **Greg Humphreys** of Stanford, and **Joe Kniss** of Utah. The panelists discussed the role of modern graphics hardware in future visualization research.

Best Paper at Web3D Symposium

Graduate student **Martin Isenburg** and professor **Jack Snoeyink** received the best paper award at the 2002 Web3D Symposium for "Coding Polygon Meshes as Compressable ASCII." Their encoding allows the benefits of geometric data compression in text-only file formats such as VRML, an issue that has been without an agreed-upon solution since 1996.

Sonnenwald on Fulbright

Diane Sonnenwald, adjunct associate professor, is spending this spring on a Fulbright fellowship at the University of Tampere in Finland. She is teaching a short course on the socio-technical aspects of collaboration, including the design and evaluation of collaboration technology. Sonnenwald is presenting a number of talks at Tampere and at the University of Oulu. She is also spending time writing and visiting several industrial research labs.

Teaching Portfolio Used as Model

Jeannie Walsh, lecturer and director of general studies, has had her teaching portfolio selected by the new Center for Teaching and Learning at Pohang University of Science and Technology in South Korea. The center's director, **Sang-il Choi**, formerly a physics professor at UNC-Chapel Hill, will use her portfolio to help train his faculty.

Recent Publications

Andersson, B., S. Baruah, and J. Jonsson. "Static-Priority Scheduling on Multiprocessors," *Proc. IEEE Real-Time Systems Symposium,* December 2001, 193-202.

Baruah, S., J. Haritsa, and N. Sharma. "On-Line Scheduling to Maximize Task Completions," *Journal of Combinatorial Mathematics and Combinatorial Computing,* Vol. 39, 2001, 65-78.

Brooks, F. P. "The History of IBM Operating System/360," *Proc. SD&M Software Pioneers Conference,* 2001.

Fisher, S., and M. Lin. "Fast Penetration Depth Estimation for Elastic Bodies Using Deformed Distance Fields," *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems,* October 2001.

Foskey, M., M. Otaduy, and M. Lin. "Touch-Enabled 3D Model Design," *Proc. IEEE VR Conference,* March 2002.

Funk, S., J. Goossens, and S. Baruah. "On-Line Scheduling on Uniform Multiprocessors," *Proc. IEEE Real-Time Systems Symposium,* December 2001, 183-192.

Guthold, M., J. Mullin, S. Lord, R. Superfine, R. Taylor, and D. Erie. "Investigating the Mechanical Properties of Individual Fibrin Fibers with the Nanomanipulator AFM," *Biophysical Journal,* Vol. 80, 2001, 1274.

Guthold, M., R. Superfine, and R. M. Taylor II. "The Rules are Changing: Force Measurements on Single Molecules and how they Relate to Bulk Reaction Kinetics and Energies," *Biomedical Microdevices,* Vol. 3, 2001, 9-18.

Holman, P., and J. Anderson. "Guaranteeing Pfair Supertasks by Reweighting," *Proc. IEEE Real-Time Systems Symposium,* December 2001, 203-212.

Isenburg, M., and J. Snoeyink. "Spirale Reversi: Reverse Decoding of Edgebreaker Encoded Meshes," *Computational Geometry: Theory and Applications,* 20(1-2), October 2001, 39-52.

Isenburg, M., and J. Snoeyink. "Coding Polygon Meshes as Compressable ASCII," *Proc. Web3D Symposium 2002,* 1-10. (best paper)

Jeffay, K., T. Hudson, and M. Parris. "Beyond Audio and Video: Multimedia Networking Support for Distributed, Immersive Virtual Environments," *Proc 27th EUROMICRO Conference,* September 2001, 300-307.

Kim, Y., M. Otaduy, M. Lin, and D. Manocha. "Six-Degree-of-Freedom Haptic Display Using Localized Contact Computations," *Proc. IEEE Haptics Symposium,* March 2002.

Low, K.-L., G. Welch, A. Lastra, and H. Fuchs. "Life-Sized Projector-Based Dioramas," *Proc. ACM Symposium on Virtual Reality Software and Technology,* November 2001.

Mascarenhas, A., S. Ehmann, A. Gregory, M. Lin, and D. Manocha. "Six Degree-of-Freedom Haptic Visualization," *Touch in Virtual Environments,* McLaughlin, Hespanha, and Sukhatme, eds., Prentice Hall, 2002.

Miller, D., and G. Bishop. "Latency Meter: A Device for Easily Monitoring VE Delay," *Proc. SPIE Electronic Imaging Symposium,* January 2002.

O'Brien, D., S. Fisher, and M. Lin. "Simulation Level of Detail for Automatic Simplification of Particle System Dynamics," *Proc. Computer Animation 2001,* 210-219.

Ozdag, R., M. Singh, P. Beerel, and S. M. Nowick. "High-Speed Non-Linear Asynchronous Pipelines," *Proc. Design, Automation and Test in Europe,* March 2002.

Raskar, R., and K.-L. Low. "Interacting with Spatially Augmented Reality," *Proc. ACM AFRIGRAPH 2001.*

Rosenthal, M., A. State, J. Lee, G. Hirota, J. Ackerman, K. Keller, E. D. Pisano, M. Jiroutek, K. Muller, and H. Fuchs. "Augmented Reality Guidance for Needle Biopsies: A Randomized, Controlled Trial in Phantoms," *Proc. Medical Image Computing and Computer-Assisted Intervention 2001,* 240-248.

Seeger, A., S. Paulson, M. Falvo, A. Helser, R. M. Taylor II, R. Superfine, and S. Washburn. "Hands-On Tools for Nanotechnology," *Journal of Vacuum Science & Technology,* Vol. B19, 2001, 2717-2722.

State, A., J. Ackerman, G. Hirota, J. Lee, and H. Fuchs. "Dynamic Virtual Convergence for Video See-Through Head-Mounted Displays: Maintaining Maximum Stereo Overlap Throughout a Close-Range Work Space." *Proc. International Symposium on Augmented Reality 2001,* 137-146 + 2 color plates, front cover.

Taylor II, R. M., T. C. Hudson, A. Seeger, H. Weber, J. Juliano, and A. T. Helser. "VRPN: A Device-Independent, Network-Transparent VR Peripheral System," *Proc. ACM Symposium on Virtual Reality Software & Technology 2001*.

Tierno, J., A. Rylyakov, S. Rylov, M. Singh, P. Ampadu, S. Nowick, M. Immediato, and S. Gowda. "A 1.3 GSample/s 10 tap Full-Rate Variable-Latency Self-Timed FIR Filter With Clocked Interfaces," *Proc. International Solid State Circuits Conference Digest of Technical Papers*, February 2002.

Varadhan, G., W. Robinett, D. Erie, and R. M. Taylor II. "Fast Simulation of Atomic-Force-Microscope Imaging of Atomic and Polygonal Surfaces Using Graphics Hardware," *Proc. SPIE Electronic Imaging Symposium*, January 2002.

Undergraduate News

Undergraduate Computer Science Major Underway

Our new undergraduate major, the Bachelor of Science in Computer Science began officially last fall. The degree is designed to prepare students for graduate school in computer science and for technical careers in software development, computational science, networking, information systems, and electronic commerce. Graduates will be well suited for professional employment in traditional computer and communications industries, as well as in such diverse industries as financial services and consulting practices in which computing and information management is central to the operation of the enterprise.

Students majoring in computer science will receive rigorous training in the foundations of the field and related mathematics, with ample opportunity to specialize in software systems, programming languages, theoretical computer science, or applications of computing technology in science, applied mathematics, medicine, or business. Students will be required to take a sequence of courses in computer science as well as in related disciplines including mathematics, physics, and statistics. According to **Kevin Jeffay,** S. S. Jones professor and director of undergraduate studies, the new major will offer new courses and has the flexibility to respond to changes in the field over time.

Currently about 30 juniors and seniors are enrolled in the new major. Although the size of the program may grow over time, Jeffay said that the department will always foster a sense of community among undergraduates, graduate students, and faculty, including one-on-one mentoring relationships; a distinct advantage over an undergraduate computer science program at a large engineering school.

To gain admission to the major, students must obtain a grade of C or better in the core courses in physics, mathematics and computer science. To graduate with a B.S. in computer science,

students must achieve a C average or better in all junior/senior courses, and receive no grade lower than a C- in any of these courses.

In addition to taking classes, undergraduates can participate in many departmental and university activities. They may enhance their learning experiences by joining one of the department's research projects, or pursue self-directed research with a faculty member. They can also serve as lab assistants or teaching assistants for computer science courses, or gain valuable work experience as assistants on the Computer Services staff. Activities, such as the annual ACM programming contest (see article below), give students the chance to test their skills and knowledge against their peers at other universities.

Previously, students interested in computer science selected the computer science option offered by the Curriculum in Mathematical Sciences. The mathematical sciences major is being phased out and is being replaced by the computer science major and by a new program in decision sciences being offered by the departments of Operations Research and Statistics.

For more on the new major, see: *www.cs.unc.edu/Bachelors/.*

ACM Programming Contest

Two teams of undergraduates from UNC-Chapel Hill competed in the regionals of the annual ACM Programming Contest last fall and one team made it all the way to the finals this spring. **John Ehrhardt, Derek Hartman, Nate Massey, Chris Schenck, Mike Trinh,** and **Matt Vross** competed in the Mid-Atlantic USA Programming Contest in Durham, N.C., in November. The team of Ehrhardt, Massey, and Schenck, placed sixth, earning them a trip to the ACM International Collegiate Programming Contest World Finals, held in Honolulu, Hawaii, in March, along with 63 other regional championship teams. Trinh accompanied them as an alternate, and professors **Kevin Jeffay** and **Ketan Mayer-Patel** went along as coaches. To win the joint ACM/IBM-sponsored contest, teams from all over the world raced against the clock to solve nine complex, real-world problems in five hours. Although a team from Shanghai JiaoTong University were the ultimate contest winners, the UNC-Chapel Hill contestants did receive an honorable mention. *(icpc.baylor.edu/icpc/finals/)*

The two teams at the regional programming contest in November, from left: Derek Hartman, Mike Trinh, Chris Schenck, John Ehrhardt, Nate Massey, and Matt Vross.

In Hawaii, the programming team enjoys time off from the contest. Back (from left): Students Mike Trinh, Nate Massey, John Ehrhardt, and Chris Schenck. Front: Professors Ketan Mayer-Patel and Kevin Jeffay.

Phi Beta Kappa Inductions

Congratulations to our undergraduates who were inducted into Phi Beta Kappa during this academic year. **Sachin Patel** and **Nolan Walker,** computer science majors, and **Courtney McCarthy,** math sciences (computer science option) major, were inducted on 19 November 2001. **Gregory R. Lanier,** computer science major, was inducted on 9 April 2002.

Students Sachin Patel and Courtney McCarthy, and professor Kevin Jeffay at the November induction ceremony for Phi Beta Kappa.

Family Matters

Fred and **Nancy Brooks** added a seventh grandchild on 23 December 2001. Ann Caroline Brooks was born in Irvington, N.Y., to Roger and Ann Brooks. She joins siblings Marie, Phil, and Henry. *(brooks@cs.unc.edu)*

William London Carr was born on 19 August 2001 in Kenmore, Wash., to Michael Carr (M.S. 1991) and Susie Carr. *(mwc67@hotmail.com)*

Garrett William Hudson was born on 30 January 2002 in Wilmington, N.C., to Tom Hudson (M.S. 1997) and Challe Hudson. *(hudsont@uncwil.edu)*

Lorin Elizabeth Larsen was born on 26 February 2002 in Chapel Hill, N.C., to Scott and Amy Larsen. *(larsene@cs.unc.edu)*

Brina Marissa Lemke was born on 21 October 2001 in Palo Alto, Calif., to Steve Lemke and Audra Lemke (ne Sugerman) (M.S. 1995). *(audra@lemkeville.org)*

Dylan Frederick Pausch was born on 31 December 2001 in Pittsburgh, Pa., to Randy Pausch and Jai Glasgow Pausch, former outreach coordinator. *(jaipausch@hotmail.com)*

Stephen and Lyn Pizer have their first grandchild: Carina Jiaxin Luo born on 7 March 2002 in San Diego, Calif., to Roger and Tonia Luo. *(pizer@cs.unc.edu)*

Aditi Ramsisaria was born on 13 September 2001 in Chandigarh, India, to Alok Ramsisaria (M.S. 1991) and Neeta Ramsisaria. She has an older brother, Rishabh (4). *(alok@konstruct.com)*

Anand Srinivasan (M.S. 2000) and Chandna Bhatnagar (M.S. 2000) married in Cary, N.C., on 26 October 2001. *(anands@cs.unc.edu, bhatnag@cs.unc.edu)*

Alexandre Daniel Townsend was born on 3 October 2001 in Chapel Hill, N.C., to Jeff and Claire Townsend. *(townsend@cs.unc.edu)*

New School Named for Staff Member's Parents

The newest middle school in the Chapel Hill-Carrboro City School district--the R. D. and Euzelle Smith Middle School, which was officially dedicated on 11 November 2001--is named for the parents of **Andrea Bunn**, accounting assistant. Between them, the Smiths have given 75 years of service in various roles to the community's secondary education program. The two were honored at the dedication with a plaque and portrait, which will be permanently installed at the school.

Alumni News

M.S. and Ph.D. Alumni

Ronald Azuma (Ph.D. 1995) co-authored the recent paper: Azuma, R., Y. Baillot, R. Behringer, S. Feiner, S. Julier, and B. MacIntyre. "Recent Advances in Augmented Reality," IEEE Computer Graphics and Applications, 21(6), Nov/Dec 2001, 34-47. *(azuma@HRL.com)*

Chandna Bhatnagar (M.S. 2000) works at Cisco Systems in Research Triangle Park, N.C. She and current graduate student Anand Srinivasan (M.S. 2000) recently married (see "Family Matters"). *(bhatnag@cs.unc.edu)*

Randy Brown's (M.S. 1990) car--a 1994 Pontiac Firebird Formula (530 hp engine naturally aspirated and 700 hp on nitrous oxide)--appears on the May 2002 cover of *GM High-Tech*

Performance magazine *(www.gmhightechperformance.com)*, with an accompanying four-page feature article inside. *(rbrown@rti.org)*

Michael Carr (M.S. 1991) is still at Amazon.com, managing the Software Platform team. He and his wife, Susie, had their first child last August (see "Family Matters"). *(mwc67@hotmail.com)*

Ritu Chadha (Ph.D. 1991) is director of Service Management Research at Telcordia Technologies. She has been working on the design of Operations Support Systems for large service providers for provisioning IP services. During the past two years, Ritu has given several invited talks and tutorials on directory-enabled networks, policy-based management, and management of MPLS traffic engineering at various industry conferences. She lives in Hillsborough, N.J., with her husband, Arindam, and their four-year old daughter, Trisha. *(chadha@research.telcordia.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. He and his wife are expecting a baby girl, their second child in April. *(chang@cs.unc.edu)*

Rich Holloway (Ph.D. 1995) is vice president of Computer Systems Technology at 3rdTech, Inc. *(www.3rdtech.com)*. At his previous job, with Volumetrics Medical Imaging, Inc., he was co-author on the patent, "Methods and Systems for Determining Velocity of Tissue Using Three-Dimensional Ultrasound Data" (U.S. Pat. No. 6,241,675). A brief description of the real-time volume-rendering project he worked on at Volumetrics appeared in *Time* magazine (see *www.cs.unc.edu/~holloway* for a copy) *(holloway@3rdtech.com)*

Tom Hudson (M.S. 1997) is finishing his Ph.D. and has begun a tenure-track position in the Department of Computer Science at UNC-Wilmington. He and his wife, Challe, had their first child in January (see "Family Matters") *(hudsont@uncwil.edu)*

Gopi Meenakshisundaram (Ph.D. 2001) has joined the Department of Information and Computer Science at the University of California at Irvine as an assistant professor. *(gopi@ics.uci.edu)*

Ulrich Neumann (Ph.D. 1993), an associate professor in the Department of Computer Science at the University of Southern California, was named director of the university's Integrated Media Systems Center (IMSC) in March. In his new post, he also holds the Charles Lee Powell Chair in Engineering. The IMSC has an $11 million annual budget and is the National Science Foundation's only Engineering Research Center for multimedia and Internet research. *(uneumann@graphics.usc.edu)*

David G. Stahl (M.S. 1993) is now an application developer for Virtual Solutions, Inc. *(www.virtualsolutions.com)* in Camp Hill, Pa. The company has developed a web-based application for verifying data--such as tax forms and credit card bills--that presents only portions of the scanned fields to the on-line data entry personnel. Access to private information--such as a social security number, or home address--is reduced because data is presented piecemeal and out

of context; no one entering data ever sees the entire form. *(d.stahl@ieee.org, dstahl@virtualsolutions.com)*

Amitabh Varshney (Ph.D. 1994) has received tenure at the University of Maryland where he is an associate professor of computer science. *(varshney@cs.umd.edu)*

Andrew Zaferakis (M.S. 2001) has joined TriLunar, a start-up game company in Laguna Hills, Calif., where he is developing state-of-the-art 3D graphics for home videogame consoles. *(andrewz@cs.unc.edu)*

Undergraduate Alumni

Anita Blanchard (B.S. MSci. 1986) is now an organizational psychologist in the Psychology Department at UNC-Charlotte. *(ALBlanch@email.uncc.edu)*

Former Faculty & Staff News

Andrew Ade, former administrative assistant to Henry Fuchs (1996 to 1999), received his Ph.D. in Comparative Literature in December 2001 from UNC-Chapel Hill. His dissertation was on "The Significance of the Prologue from Ancient to Modern Drama in France and England." *(aade2k@hotmail.com)*

John McHugh, former research associate professor (1991 to 1993), recently published the papers:

McHugh, J. "Intrusion and Intrusion Detection," *International Journal of Information Security,* 1(1), August 2001, 14-35.

Meade, N. R., R. C. Linger, J. McHugh, and H. F. Lipson. "Managing Software for Survivable Systems," *Annals of Software Engineering,* Vol. 11, 2001, 45-78.

McHugh, J. "An Information Flow Tool for Gypsy," *Proc. 17th Computer Security Applications Conference,* December 2001. (Invited classic paper).

McHugh is on the Computer Emergency Response Team at the Software Engineering Institute in Pittsburgh, Pa. *(jmchugh@cert.org)*

Akira Nakamura, former visiting assistant professor (1966 to 1968), retired from Hiroshima University in 1991, where he is now an emeritus professor. Currently, he is a part-time professor of computer science at Hiroshima-Denki Institute of Technology. He still collaborates on research in the theoretical field of image processing, with Dr. Azriel Rosenfeld of the University of Maryland. *(akira668@urban.ne.jp)*

Jannick Rolland, former research assistant professor (1991 to 1996), received tenure and a promotion to associate professor in June 2001 from the School of Optics/CREOL at the University of Central Florida (UCF). She also holds a joint appointment in the School of

Electrical Engineering and Computer Science. Rolland received the UCF, Centers and Institutes, Distinguished Researcher of the Year Award for 2000-2001. *(jannick@odalab.ucf.edu)*

BattleBots: Lego Style

Don't let the legislators in Raleigh hear that associate professor **Anselmo Lastra** taught his First Year Seminar students to build robots out of Lego Mindstorm kits and RCX computers: it sounds like a little too much fun for students to be allowed to have. But in order to build those robots, the students taking the course, "What's under the Covers? A Hands-On Introduction to Computers" in fall 2001, did learn some principles of computer operation and about the craft of design. They put their new knowledge to the test by designing and building two different robots: one for the midterm project competition and one for the final.

For the midterm competition, students had to design autonomous robots that would sweep a playing field clear of obstacles (eight empty coke cans). The robot that could clear the field in the shortest amount of time was the winner. **Louie Padgett** won first place with his robot, Zeus' Chariot, which was so fast that it cleared the cans in five seconds. The final contest was played on a mock soccer field with two goals. Robots had to get the maximum number of ping-pong balls (painted black and distributed randomly) into a goal in three minutes. **Yin Song** and **Tristan Willoughby** were the winners with their robot, Ball Grabber. *(www.cs.unc.edu/~lastra/comp006)*

In the midterm competition, Ralph Hunter sets up his robot, Mini-Ralph, to push a set of cans from the circle. (Photo: Gregory F. Welch)

In the final contest, Gabe Gales and the robot he built with Carlos Alves get ready to try putting balls into a goal. (Photo: Claire Stone)

In the Media

As in previous years, during 2001 and early 2002, we received a lot of press coverage. Areas attracting the most interest include augmented reality surgery, the dAb haptic painting system, digital mammography (part of the work of the Medical Image Display and Analysis Group [MIDAG]), image-based rendering, the nanoManipulator, tele-immersion, and walkthrough.

Our recent and upcoming print appearances include articles in *Computer Graphics World, Das Compaq Magazin, Discover, The Economist, IEEE Computer, Mechanical Engineering, MIT Technology Review, Popular Science, Scientific American,* and *Wired,* among others; as well as in two publications produced at UNC--the *Carolina Alumni Review* and *Endeavors*--and in several on-line publications. Newspaper coverage has ranged from local dailies, such as the *Chapel Hill News,* the *Herald-Sun* of Durham, and the *News & Observer* of Raleigh, to national and international papers including *The New York Times, The Guardian* (England), *The Star* (Canada), and *Suddeutsche Zeitung* (Germany).

Broadcast coverage of our research has included a February 2001 interview with **Leandra Vicci**, MSL director, about her patent for an automatic emergency warning device and GPS position indicator, which aired on the local NBC affiliate's evening news; and a nationally broadcast CBS Evening News segment in December 2001 on digital mammography, which featured MIDAG member **Etta Pisano**, M.D., of the Department of Radiology. Our nanoManipulator work appeared in *Springboard,* a PBS show airing in April 2001 in the San Francisco area. A three-part BBC television series, *The Virtual World,* broadcast in March and April 2002 in the United Kingdom, featured several of our research projects, including augmented reality surgery, effective virtual environments, nanotechnology, and tele-immersion. An upcoming documentary about nanomedicine being produced for the Discovery health channel will include footage of our nanotechnology work. WGBH-Boston is also featuring nanotechnology in the pilot for a new show, tentatively called *Nova: Leading Edge.*

For a complete list of press coverage, see: *www.cs.unc.edu/Events/News/Media.html*

Computer Services News

Sitterson Network Upgrade

Bil Hays, network manager, is overseeing our building's network upgrade. We are running all new wireways in the ceilings and new conduits to offices. Small offices have at least six data and two voice connections, plus four fibers and video cable; larger offices have more. Desktop data connections will be 100 megabit switched connections initially; wires will be capable of handling gigabit speeds, when switches and network interfaces are upgraded. Work began in October and is proceeding on schedule. We expect the switchover to the new network to occur this summer.

Seeing a new side of Sitterson. One of the contractors working on the network upgrade project disappears into the second floor ceiling. (Photo: Herman Towles)

Operating System Upgrades

John Sopko, UNIX systems manager, upgraded the operating system on our Suns to Solaris 2.7. **Murray Anderegg** (M.S. 1991), Linux and e-mail systems administrator, upgraded our Linux systems to Red Hat version 7.1. **Charlie Bauserman**, PC systems administrator, upgraded the majority of our PC systems to Microsoft Windows 2000 and Office 2000. These upgrades are needed to keep up with the latest hardware and software and to get needed security patches.

Remedy System Improvements

After shifting from our homegrown Problem System to the Remedy System in December 1999, we developed methods to separate user-logged tickets from those logged by Computer Services staff, in order to deal with user issues more quickly. Remedy also escalates the priority of issues as they age and allows us to close tickets twice as quickly as before, cutting our backlog by 80 percent.

Improved Video Class Facilities

In 2001, network coordinators **David Musick** and **David Harrison** rewired the control room for the 011 classroom, set up an AMX control system, and replaced the Alka-Seltzer tablet lights in the room with canister lights. They also set up the 014 classroom for videotaping and broadcasting.

Upgraded Dial-in Service

John Sopko and **David Musick** replaced our old terminal server with one capable of 56-kilobit connections. The new system also provides a simpler dial-in interface and a single number for both PC and Mac users.

In Memoriam

Mark Williams Lumsden (M.S. 1982) of Apex, N.C., died on 1 January 2002 at age 45. He is survived by his wife, Cindy Peters, and his children, Kira Anne and Kenny Peters Lumsden. He had worked at SAS Institute since June 2000, following 13 years at IBM Corp. In addition to an M.S. from our department, he earned a B.A. from UNC-Greensboro, where he was class valedictorian. Mark had been helping to start a new school for autism. Donations may be made in his name to: Mariposa School for Children with Autism, c/o 104 Park Knoll, Apex, N.C. 27502. *(www.rtphome.org/mariposa)*

Russel L. Vernor III (M.S. 1975) of South Jacksonville, Ill., died on 11 December 2001, at age 53. He is survived by his wife, Tina Vernor, and his daughter, Kate Vernor. He was the senior computer scientist for Computer Science Corp. (formerly Cybertek/John Deere Life) in Jacksonville. Before that, he was a professor and chairman of the Computer Science Department at MacMurray College, also in Jacksonville. He was a deacon and chairman of the trustees at the Congregational Church United Church of Christ. Donations in his name may be made to: Congregational Church UCC, 520 W. College Ave., Jacksonville, IL 62650, or Jacksonville Area Community Food Center, P.O. Box 1133, 316 E. State, Jacksonville, IL 62650.

About News & Notes

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

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.

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