News & Notes from Sitterson Hall

Issue Seventeen, Spring 1996

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

In this issue

Chairman's corner

This year marks the 50th anniversary of the ENIAC computer. Our Department hasn't been around quite so long, but UNC-Chapel Hill was one of the first universities to establish an independent graduate computer science program, and we are now into our 32nd year.

We are pleased to report that, in its 1996 guide to *America's Best Graduate Schools*, U.S. News and World Report has ranked us second in the country for user-interaction graphics, tied with Brown and Carnegie Mellon universities. We placed 18th in the country as an overall department, higher than in previous years.

We are sorry to say goodbye to **Jannick Rolland**, research assistant professor, who has been a member of our research faculty since 1991. We wish her all the best in her new job at the University of Central Florida. For more on Jannick's future plans and on other staff departures, see page 2.

This fall we hope to welcome a new tenure-track faculty member. We are recruiting for a hardware specialist who will work with the staff of the Microelectronic Systems Laboratory (MSL) and teach courses in our proposed new hardware curriculum. For many years the MSL has provided an excellent facility for building one-of-a-kind hardware systems, but until now the Department has lacked a hardware curriculum to complement it. The new faculty member will also be important to the MSL because three of the lab's current members have joined the local office of Division Inc., in order to facilitate the development of PixelFlow. See page 4 for more on this collaboration.

Our association with Division represents a growing trend. In these days of shrinking state support and government grant resources, we are finding that collaborative research with industry is increasingly important. It is a great way to give our students some practical experience and to put our research results into practice. We are actively collaborating with more than a dozen companies and are always looking out for new opportunities.

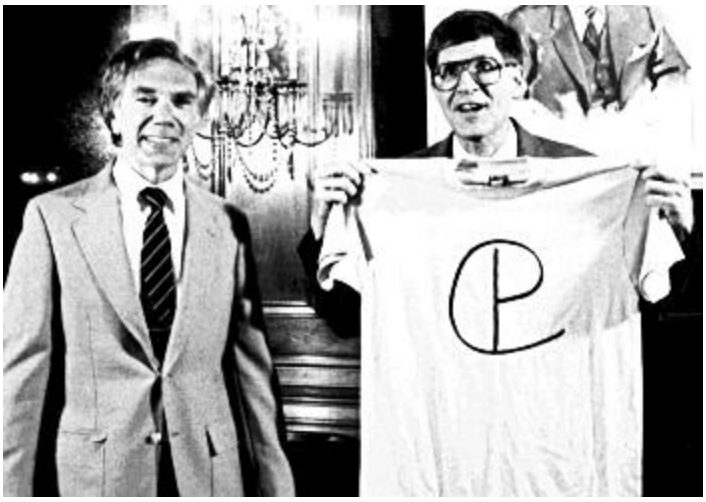
This spring we will hold our first candidates day for newly admitted students. Many of the students we have admitted for fall 1996 will come for a weekend to learn more about us and our research. We hope that seeing Chapel Hill at its best, in the spring, will convince them to join us!

As the number of computer science programs grows, so does competition for the best students. We welcome alumni input in our recruiting efforts. If you are willing to talk to prospective students who live in your area, please contact me at 919-962-1888, or via e-mail at *weiss@cs.unc.edu.*

Many thanks to our alumni and friends for your generous support. A list of recent donors appears on page 8. We will soon select our 1996- 97 Alumni Fellow. Watch for details in the fall newsletter.

We always enjoy hearing from our alumni and friends. Visiting us has been made easier by the recent renovation of the Carolina Inn, located just across the street from Sitterson Hall. After being closed for nearly a year, the Inn has been enlarged, modernized, and restored to its former splendor! Please stop by to see us whenever you are in the area.

Steve Weiss



At Peter Calingaert's retirement reception last May, Steve Weiss presents Peter with the T-shirt that we secretly had printed with his well-known and distinctive signature. See page 3 for a transcript of Fred Brooks's speech honoring Peter. (Photo by Li-Yun Yu)

Welcomes and farewells

New students, spring 1996

Shoji Okimoto
Voicu Popescu
Lei Wang

We say thanks and farewell to:

Dixie Bloom, secretary, who left in January for a position as a public information assistant in the School of Public Health at UNC- Chapel Hill. She works in the dean's office, for the director and assistant director for development.

Darlene Freedman, technology transfer and outreach secretary for the Graphics and Image Lab, who left in February to join the School of Law at UNC-Chapel Hill, where she is administrative assistant to the dean.

Jannick Rolland, research assistant professor, who left in March to join the University of Central Florida (UCF) in Orlando, Fla. She has a primary appointment in the Electrical and Computer Engineering Department, a joint appointment in the Computer Science Department, and an assignment with UCF's Center of Excellence in Research and Education in Optics and Lasers. Jannick joined us in June 1990 as a postdoctoral student and became a member of our research faculty two years later. While here, she researched image quality for medical imaging, perception in virtual environments, and optics for head-mounted displays. Her new e-mail address is *rolland@creol.ucf.edu.*

Melanie Stecker (M.S. 1990), Macintosh administrator with Computer Services, who left in February to take a job as a Macintosh and UNIX administrator at Glaxo Wellcome in Research Triangle Park, N.C.

Peggy Wetzel, video editor, who left in March to become the director of production and client services for Alternate Realities Corp., in Research Triangle Park, N.C., where she directs the production of video and animation to be played on the company's dome-shaped digital theatre. She can be reached at *peggyw@virtual- reality.com.*

Alumni news

Frank Ackerman (Ph.D. 1972) recently accepted the position of QA Manager with VeriSign, a new Silicon Valley start-up. VeriSign develops and operates Certificate Authority systems (certificate authorities issue digital IDs to assure the identity of buyers and sellers in electronic commerce).

Dick Craddock (M.S. 1986) left Radius, Inc. in September 1995 to join Microsoft Corp. in San Jose, Calif. He is on a new software development team forming in the Bay Area to develop internet and multimedia software for the Macintosh. He can be reached at *craddock@ablecom.net,* and has a web page at http://www. ablecom.net/users/craddock.

Thom Haynes (M.S. 1989), his wife Andrea, and children Alex (5), and Ethan (3), have moved back to the Research Triangle area and now live in Apex, N.C. Thom still works with IBM Corp. He is in the Consumer Division where he works on software preloads for Aptiva home computers. Andrea is a therapist at Western Wake Pediatric Center. Thom's e-mail address is *thaynes@vnet.ibm.com.*

Cezary Z. Janikow (Ph.D. 1991), an assistant professor at the University of Missouri, recently received grants from the National Aeronautics and Space Administration for "Constrained Genetic Programming," and from the National Science Foundation for "Fuzzy Decision Trees." He also received support from the Texas A&M Research Foundation. Cezary and his wife had their second child, Arthur Cezary, in August 1995.

Audra D. Sugerman (M.S. 1995) worked as a contractor in the visual computing research group at Hewlett Packard Labs in Palo Alto, Calif., from June to November 1995. She currently resides in Sunnyvale, Calif., and works on motion capture algorithms and tools for animation and interactive entertainment at Electronic Arts in San Mateo, Calif. She can be reached at *asugerman@ea.com.*

Mary Szymkowski (M.S. 1991) left IBM Corp. in March 1995, after 10 years, to start on a career transition into veterinary medicine. She now works as a programmer at the College of Veterinary Medicine at NC State University, on a project to create a "paperless" veterinary hospital. She reports that, by 1 July 1996, the hospital will have a network for entering medical

records; for ordering lab procedures, consultations, and prescriptions; for viewing lab results; and for communicating clinician orders to technicians. Mary is also completing her pre-veterinary course requirements at Meredith College, and is volunteering at Wake Medical Center and Chatham Rest Home in Cary with her registered therapy dog, Holly. She plans to apply to veterinary school this fall. Her husband, **Lindsey Puryear**, completed his Ph.D. in the Department of Operations Research at UNC-Chapel Hill in May 1995. They live in Cary with their two dogs and two cats.

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 *News & Notes*, Department of Computer Science, CB#3175, Sitterson Hall, UNC-Chapel Hill, Chapel Hill, NC 27599-3175.

Some of our alumni now have their home pages linked to the Department's page at http://www.cs.unc.edu. If you'd like us to add a link to your home page, please send your URL to us via e-mail at *pubs@cs.unc.edu.*

Former faculty news

Akira Nakamura is currently serving as chair of the Computer Science Department at Meiji University in Kawasaki, Japan. He recently spent his winter vacation in his hometown of Hiroshima, visiting his children and grandchildren. Akira was a visiting assistant professor with us from 1966 to 1968. He sends his best wishes and congratulates us on the Department's growth.

Peter Calingaert: friend, educator, computer scientist

Following is a transcript of the comments made by Fred Brooks at Peter Calingaert's retirement reception, held at the State Dining Room in the Morehead Building at UNC-Chapel Hill on 16 May 1995.

We gather to honor Peter Calingaert, on the occasion of his retirement after 27 years of service to the Department and to the University of North Carolina.

Harvard. Peter received his bachelor's degree with high honors from Swarthmore in 1952. He then spent a year studying mathematics at the University of Nancy and entered Harvard in 1953

as one of Howard Aiken's Ph.D. students. He completed the Ph.D. in two years, a record at the Harvard Computation Laboratory and a model for our graduate students.

Peter's Ph.D. dissertation was on the simplification of logic circuits. One of his memorable student papers was a study of the American Airlines (manual) reservation system and how it might be computerized, done in collaboration with Rick Gould.

Another paper, of interest and importance today for all pipelined processors, was a study of how programs can do decision-making without branching, by non-linear arithmetic operations such as absolute value. He described 11 such elementary choice functions, and showed how they could be used to evaluate piecewise-linear functions, such as a utility rate. This was important in those days, too, because instructions were stored on drums and a branch cost half a revolution, on average.

Howard H. Aiken, architect of the Harvard Mark I, II, III, and IV computers (1944-1952), was a giant among computer pioneers. He recognized Peter's talent and hired him for the Harvard faculty. During his years at Harvard, Peter produced various research papers and, with colleague Robin Esch, the best manual ever written for the Univac I computer.

IBM, SRA. After six years on the Harvard faculty, Peter joined IBM as a computer architect. He was one of the patentors of the IBM System/360 family of computers. He transferred to IBM's subsidiary, Science Research Associates, where he helped develop APL materials for high school education. He joined our Department as a professor in 1968.

UNC-Chapel Hill: Teaching. Peter has made many contributions to our teaching of computer science -- teaching all over the curriculum. His courses and lectures have been notable for their meticulous preparation, clean logical organization, their clarity, and the careful use of exercises. Peter has paid special attention to helping underprepared students, often from minority backgrounds. His patient work has ensured that they fully overcame their initial handicaps, meeting fully the regular, unrelaxed standards for graduation.

UNC-Chapel Hill: Writing. Peter's lifelong commitment to education has led him to devote most of his scholarly effort to writing textbooks. This has been an especially important activity in our young discipline. His expository books include:

- *Principles of Computation,* Addison-Wesley, 1965
- *Introduction to A Programming Language [APL]*, Science Research Associates, 1967
- *Assemblers, Compilers, and Program Translation,* Computer Science Press, 1979
- *Operating System Elements: A User Perspective,* Prentice-Hall, 1985
- *PC-DOS Fundamentals for Diskette-Based Operation,* Prentice-Hall, 1986
- *Program Translation Fundamentals: Methods and Issues,* Computer Science Press, 1988

Besides writing books, Peter also served as the editor of the Education Department of *Communications of the ACM.*

UNC-Chapel Hill: Research. Peter's principal research projects include the development of computer-assisted instruction and the national metrics for its evaluation in the '70s, a substantial collaboration with his Ph.D. student William Hetzel on methods for evaluating the performance of computer systems, the development of CAD tools for VLSI at UNC-Chapel Hill and at MCNC, and techniques for computer-supported collaborative work, both at UNC-Chapel Hill and at the CSIRO/Flinders Joint Research Centre in Information Technology, in Adelaide, South Australia.

UNC-Chapel Hill: Service. Peter has provided all of our faculty a model and a high standard for service to our Department. As director of graduate studies, he established many of the carefully articulated policies we follow today. More important, he defined that role to be not just the stimulator of progress toward graduation, but also the student's advocate and lawyer in dealing with the Graduate School bureaucracy and its rules. He served four years on the Graduate School Administrative Board.

As acting chairman in 1970 and 1975, Peter recruited Steve Weiss and Gyula Mago for us. His other trailblazing service has been on the committees on written exams and on curriculum.

Character. Our admiration and affection for Peter derives not so much from his accomplishments as from his character. We know him to be honest, plain-spoken without flattery or guile, and always willing to share his views with clarity.

We enjoy interacting with Peter's Renaissance mind and its broad interests -- a musician, a linguist, fluent to varying degrees in French, Russian, German, Spanish, and Dutch/Afrikaans.

We admire his commitment to education and his commitment to quality work in all he undertakes. His work is thorough, meticulous, correct, and complete.

In his retirement, Peter will continue to pursue his passions for education and linguistics, teaching English as a second language. We wish him much happiness in his activities and look forward to his visits.

Research highlights

Ultrasound visualization

The ultrasound group is working to develop a system that will allow a physician wearing a head-mounted display to see directly into a patient's body to view a cyst or tumor. The research uses augmented- reality display technology, which involves combining computer graphics and virtual reality with video imagery of the real world. While performing a procedure such as a breast biopsy the physician will be able to see both the patient and computer graphics, showing the cyst or tumor imaged by the ultrasound system, superimposed on the patient in the correct location. It

is hoped that the completed system will greatly improve the physician's ability to perform the procedure accurately.

Researchers are working to improve the system's tracking and registration capabilities. They have done successful tests on a model of a breast and are now testing the system on actual patients. At the most recent human subject test, in January, they were able to create 3D images of a cyst by taking a series of 2D images (slices of the cyst) and putting them together to make the 3D image. Two papers describing their work have been accepted at Siggraph '96.

Researchers on the project are **Henry Fuchs**, Federico Gil professor (principal investigator), **Andrei State**, senior research associate, **Stephen M. Pizer**, Kenan professor (investigator), **Etta D. Pisano**, M.D., associate professor of radiology and chief of breast imaging at UNC Hospitals (medical collaborator), **Mary Whitton**, research assistant professor and project manager for virtual environments research, and **William Garrett**, **Gentaro Hirota**, and **Mark Livingston**, graduate research assistants. The work is funded by the Advanced Research Projects Agency.

Etta D. Pisano, M.D., wearing a head-mounted display with cameras, examines a patient in preparation for a biopsy procedure. The ultrasound probe is attached to a mechanical tracking arm. (Video still by Peggy Wetzel).

Cray grant awards

Several faculty and graduate students have been chosen to participate in the 1996 Cray Grant program, sponsored by Cray Research.

Jan Prins, associate professor, and **Lars Nyland**, research assistant professor, have received a grant for "High Performance Irregular Algorithms using High-Level Notations and Novel Compilation Techniques." They are working to develop compiler techniques for the parallel execution of irregular problems on high- performance vector machines. The grant provides

computer time on the Cray supercomputers at the North Carolina Supercomputing Center (NCSC), and supports graduate student **Rik Faith** (M.S. 1994) as a 1996 Cray Research Fellow.

Siddhartha Chatterjee, assistant professor, has received a grant for "Parallelization of an Individual-Based Model Simulating the Population Dynamics of Cod and Haddock on Georges Bank." His grant also provides computer time on the Cray supercomputers at NCSC, and supports graduate student **Tom White** as a 1996 Cray Research Fellow.

Modeling group

In fall 1995, the Modeling Group released the I_COLLIDE collision detection system as a public-domain package. The system already has more than 400 users worldwide. Some of the prominent users are at Sandia National Labs, Lockheed Martin, Ford Motor Company, Division, Engineering Animation, Army Research Labs, White Sands Missile Range, Evans and Sutherland, and several academic institutions. It has been used for varied applications in areas such as robotics, simulation, graphics, virtual environments, and computational geometry. **Dinesh Manocha**, assistant professor, and **Ming Lin**, adjunct assistant professor, are the project leaders. More information on the package is available at: http://www.cs.unc.edu/~geom/I_COLLIDE.html.

Division collaboration

John Eyles (Ph.D. 1982), research assistant professor, **Steven Molnar** (Ph.D. 1991), research assistant professor, and **John Poulton** (Ph.D. 1980), research professor, have joined the staff at the Chapel Hill office of Division, Inc. They continue to hold their faculty positions at UNC-Chapel Hill, under the university's "external assignment" policy, which allows employees to work for an external entity for some period of time. All three will be 80 percent Division employees and will work at the Computer Science Department one day a week. They intend to retain their ties to the Department, while being in a better position to put in the effort and time that will be required to get PixelFlow finished and out on the market as a commercial product. It is expected that the technology transfer that results from their closer interaction with Division will be beneficial both to our Department and to Division.

Other news

David Plaisted, professor, is on the program committees of two conferences: the Thirteenth Conference on Automated Deduction, and the Seventh International Conference on Rewriting Techniques and Applications, both to be held in Rutgers, N.J., during 1996. He is on the organizing committee of the latter conference and is also publications director.

The universities of Buffalo and Iowa have invited David to give talks during April 1996. He has also been invited to speak at the Workshop on the Satisfiability Problem at the University of Siena, Italy, to be held from 29 April to 3 May 1996, and at the DIMACS Workshop on the Satisfiability Problem: Theory and Applications, in March 1996 in Rutgers, N.J.

Upcoming conferences

1996 conferences being co-organized by Department faculty members include:

ACM Workshop on Applied Computational Geometry, Philadelphia, Pa., 27-28 May. Ming Lin, adjunct assistant professor, and Dinesh Manocha, assistant professor, program co-chairs (http://www. cs.unc.edu/~geom/wacg96.html).

Second IEEE Real-Time Technology and Applications Symposium, Boston, Mass., 10-12 June. Kevin Jeffay, associate professor, program chair (http://www.cs.unc.edu/~jeffay/rtas.html).

Mathematical Psychology Conference, Chapel Hill, N.C., 1-4 August, Jonathan Marshall, assistant professor, co-chair (http://www.cs. unc.edu/~marshall/math.html).

Recent publications

Abdel-Wahab, H., I. Stoica, and F. Sultan. "Universal Internet Conference Information System," *Journal of Information Science,* 91(1/2), May 1996, 1-16.

Abdel-Wahab, H., and M. Gouda. "Systems of Recall Broadcast," *Journal of Information Science,* 90(1/4), April 1996, 1-17.

Anderson, J., and J.-H. Yang. "Time/Contention Tradeoffs for Multiprocessor Synchronization," *Information and Computation,* 124(1), Jan. 1996, 68-84.

Anderson, J., S. Ramamurthy, and K. Jeffay. "Real-Time Computing with Lock-Free Shared Objects (Extended Abstract)," *Proc. 16th IEEE Real-Time Systems Symposium,* Pisa, Italy, Dec. 1995, 28- 37.

Burbeck, C. A., S. M. Pizer, B. S. Morse, D. Ariely, G. S. Zauberman, and J. P. Rolland. "Linking Object Boundaries at Scale: A Common Mechanism for Size and Shape Judgments," *Vision Research,* 36, 1996, 361-372; also our technical report TR94-041, 1994.

Hoffman, D., S. Laiter, R. K. Singh, I. Vaisman, and A. Tropsha. "Rapid Protein Structure Classification Using One-dimensional Structure Profiles on the BioSCAN Parallel Computer," *Computer Applications in the Biosciences,* 11(6), 1995, 675-679.

Jeffay, K., and D. Bennett. "A Rate-Based Execution Abstraction For Multimedia Computing," *Proc. Fifth International Workshop on Network and Operating System Support for Digital Audio and Video,* Durham, N.H., April 1995. *Lecture Notes in Computer Science 1018,* Springer-Verlag: Heidelberg, Germany, 64-75.

Ladd, B., M. Capps, D. Stotts, and R. Furuta. "Multi-Head Multi-Tail Mosaic: Adding Parallel Finite Automata Semantics to the Web," *Proc. Fourth Annual World Wide Web Conference,* Boston, Mass., Dec. 1995, 433-440.

Laiter, S., D. Hoffman, R. K. Singh, I. Vaisman, and A. Tropsha. "Pseudotorsional OCCO Backbone Angle as a Single Descriptor of Protein Secondary Structure," *Protein Science,* 4(8), 1995, 1633-1643.

Lin, M. C., and D. Manocha. "Fast Interference Detection Between Geometric Models," *Visual Computer,* 11(10), 1995, 542- 561.

Maly, K., H. Abdel-Wahab, R. Mukkamala, A. Gupta, A. Prabhu, H. Syed, and C. S. Vemuru. "Mosaic + XTV = CoReview," *Computer Networks and ISDN Systems Journal,* 27(6), April 1995, 849-860.

Moir, M., and J. Anderson. "Wait-Free Algorithms for Fast, Long-lived Renaming," *Science of Computer Programming,* 25(1), Oct. 1995, 1-39.

Nyland, L. S., and J. H. Reif. "An Algebraic Technique for Generating Optimal CMOS Circuitry in Linear Time," *Computers and Mathematics with Applications,* 31(1), 1996, 85-108.

Omondi, A., and D. Plaisted. "A Model for the Parallel Execution of Subset-equational Languages," *Future Generation Computer Systems,* 11(3), June 1995, 295-320.

Palmer, D. W., J. F. Prins, S. Chatterjee, and R. E. Faith. "Piecewise Execution of Nested Data-Parallel Programs," *Proc. Fifth Workshop on Languages and Compilers for Parallel Computing,* Columbus, Ohio, 10-12 Aug. 1995. *Lecture Notes in Computer Science 1033,* Springer-Verlag, 1996, 346-361.

Pizer, S. M., E. Bullitt, and A. Liu. "3D Image-Guided Surgery via Registration of Intraoperative and Preoperative Images," our technical report TR95-040, 1995; also keynote paper to appear in *Proc. Conference on Interactive Technology in Surgery and Medicine,* Leeds, U.K., 1995.

Plaisted, D. A., ed. *Fundamenta Informaticae: Special Issue on Term Rewriting Systems,* 24(1/2), Sept./Oct. 1995, 207 pp.

Riely, J., J. Prins, and S. Iyer. "Provably Correct Vectorization of Nested Parallel Programs," *Massively Parallel Programming Models: Suitability, Realization and Performance,* W. Giloi, ed., IEEE, 1995, 213-232.

Rolland, J. P., and C. S. Helvig. "Visual Search in Angiograms: Does Geometry Play a Role in Saliency?," *SPIE 2712, Proc. 1996 International Symposium in Medical Imaging.*

Rolland, J. P., K. Muller, and C. S. Helvig. "Visual Search in Medical Images: A New Methodology to Quantify Saliency," *SPIE 2436,* 1995, 40-48.

Sheffler, T. J., R. Schreiber, W. Pugh, J. R. Gilbert, and S. Chatterjee. "Efficient Distribution Analysis via Graph Contraction," *Proc. Fifth Workshop on Languages and Compilers for Parallel Computing,* Columbus, Ohio, 10-12 Aug. 1995. *Lecture Notes in Computer Science 1033,* Springer-Verlag, 1996, 377-391.

Singh, R. K., D. L. Hoffman, and A. Tropsha. "Rapid Comparison and Classification of Protein 3D Structures Using One-dimensional Structure Profiles," *Proc. Pacific Symposium on Biocomputing '96,* Hawaii, 3-6 Jan. 1996, 743-744.

Singh, R. K., I. I. Vaisman, and A. Tropsha. "Delaunay Tessellation of Protein Structure: Implications for Four-body Potential and Inverted Structure Predictions," *Proc. Third Albany Conference on Computational Biology,* 28 Sept.-1 Oct. 1995, Rensselaerville, N.Y.

Tropsha, A., R. K. Singh, I. I. Vaisman, and W. Zheng. "Statistical Geometry Analysis of Proteins: Implications for Inverted Structure Prediction," *Proc. Pacific Symposium on Biocomputing '96,* Hawaii, 3-6 Jan. 1996, 614-623.

Welch, G. "A Survey of Power Management Techniques in Mobile Computing Operating Systems," *ACM SIGOPS-Operating Systems Review,* Oct. 1995, 29(4), 47-56.

ZeinElDine, O., A. Wadaa, and H. Abdel-Wahab. "A New Approach for Interfacing Different Multicasting Protocols," *Journal of Computing and Information,* 12(5), June 1995, 622-652.

Recent Ph.D. titles

Geoffrey Alexander, "Proving First-Order Equality Theorems with Hyper-Linking," our technical report TR96-019, 1996. (David A. Plaisted, advisor).

Robert Cromartie, "Structure-Sensitive Contrast Enhancement: Development and Evaluation," Dec. 1995. (Stephen M. Pizer, advisor).

Patent issued

Gilbert, J. R., S. Chatterjee, and R. S. Schreiber. "Method of Compilation Optimization using an N-Dimensional Template for Relocated and Replicated Alignment of Arrays in Data-Parallel Programs for Reduced Data Communication During Execution," U.S. Pat. No. 5,475,842, issued 12 Dec. 1995.

New contracts and grants

Jim Anderson, assistant professor. Research Fellow award from the Alfred P. Sloan Foundation.

Siddhartha Chatterjee, assistant professor. "Parallelization of an Individual-Based Model Simulating the Population Dynamics of Cod and Haddock on Georges Bank," from Cray Research.

Siddhartha Chatterjee. Junior Faculty Development Award from UNC-Chapel Hill.

Siddhartha Chatterjee. Grant to develop a new undergraduate laboratory course in computer science, from the John T. Lupton Opportunity Fund.

Prasun Dewan, associate professor, and **Kevin Jeffay**, associate professor. "Flexible Shared Windows," from the National Science Foundation.

Kye Hedlund, associate professor. Grant to revise COMP 14, "Introduction to Programming," from the John T. Lupton Opportunity Fund.

Dinesh Manocha, assistant professor. "Interactive Collision Detection for Simulated Environments," from Ford Motor Co.

Dinesh Manocha. Career Award from the National Science Foundation.

Dinesh Manocha. "Model Construction and Interactive Walkthrough of Large CAD Models," from the U.S. Army Research Office.

Jonathan Marshall, assistant professor. "Visual Relative Motion Perception: Binding, Steering, Self-Organization, and Applications," from the Office of Naval Research.

Jan Prins, associate professor, and **Lars Nyland**, research assistant professor. "High Performance Irregular Algorithms using High-Level Notations and Novel Compilation Techniques," from Cray Research.

Jan Prins. "Software Infrastructure for the Rapid Development of Interactive and Collaborative Educational Simulations," from the Advanced Research Projects Agency.

Special visitors

We recently hosted several groups of international visitors interested in research and collaboration:

On 6 March 1996, three **Israeli** visitors from the Magnet Program for Broadband Communication met with several faculty, including Kevin Jeffay, who spoke about distributed systems and multimedia research; John Smith, who discussed computer-supported collaboration; Henry Fuchs, who described graphics and virtual reality research; and James Coggins, who reviewed other research in the Department.

On 28 February 1996, visitors from **South Korea**, working on a six-month government-sponsored study of research and development in the world's leading virtual reality research organizations, were given overviews of current graphics and imaging research projects.

A delegation from the **Thai Ministry of University Affairs** visited on 9 February 1996. They heard presentations by James Coggins and Kevin Jeffay and saw demos in the Graphics and Image Lab. They also visited other academic and industry locations in the Triangle and elsewhere in the U.S.

Other recent visitors:

Lorena Beeze and several of her students from the Biochemistry Department at Duke University visited the GRIP project on 3 October 1995.

A group from **Bell Northern Research** in Research Triangle Park, N.C., visited the Modeling Group on 13 October 1995. Dinesh Manocha was their host.

On 31 January 1996, several visitors toured the Graphics and Image Lab, including **Skip Bollenbacher**, associate vice chancellor for research development, **Garland Hershey**, vice chancellor for health affairs, **Fran Meyer**, associate vice chancellor and director of the Office of Technology Development, and **Tom Meyer**, vice chancellor for graduate studies and research, all at UNC-Chapel Hill; **Rick Carlyle**, senior policy advisor to Governor Jim Hunt, and **William Lee**, chair of the Governor's Economic Development Board. Tim Quigg was their host.

Jon Fjeld, Doug Green, Bill Tao, and **Doug Williams** of NetEdge Inc. visited the DiRT group for a technical briefing on 24 October 1995. Kevin Jeffay was their host.

Dennis Gannon of Indiana University visited on 6 November 1995. He met with faculty and students and gave a distinguished lecture on "High Performance Computing: Life after the HPCC Program." Siddhartha Chatterjee was his host.

The **GRIP Advisory Committee**, a group of external advisers for the project, met in Sitterson Hall on 26 January 1996.

Claude Jablon, chief scientist, and **Philippe Zaccagnino**, manager of information science and technology, at Elf Aquitaine, Inc., visited the GRIP Project on 10 November 1995. William V. Wright (Ph.D. 1972) was their host.

Stanislaus Komenko of the Institute of Systems Programming in Moscow, Russia, visited on 4 and 5 November 1995. Fred Brooks was his host.

H. T. Kung of Harvard University visited on 19 February 1996 as part of the Distinguished Lecturer Series. He met with faculty and students and spoke on "Traffic Management for Very High-Speed Networks." Jim Anderson was his host.

Monica Lam of Stanford University visited on 3 October 1995 to meet with faculty and students, in conjunction with her distinguished lecture on "The Stanford SUIF Parallelizing Compiler," which she broadcast from Duke University the previous day.

On 16 February 1996, **Dick Lampman**, director of Hewlett Packard's Computer Research Center, **Steve Wallach**, founder of Convex, and **Ted Wilson** from Hewlett Packard in Corvallis, Ore., visited the PixelFlow group. Anselmo Lastra was their host.

Jorg Liebeherr of the Department of Computer Science at the University of Virginia visited on 7 February 1996 and spoke on "Design Issues for Networks with Deterministic Delay Guarantees to VBR Video Traffic."

Mitchell Marcus of the University of Pennsylvania visited on 21 November 1995 to meet with faculty and students, in conjunction with his distinguished lecture on "New Trends in Natural Language Processing," which was broadcast from Duke University on 20 November.

Mike Muuss and **Paul Stay** from the U.S. Army Research Labs (ARL) visited from 27 November to 2 December 1995 to collaborate with the Modeling Group. Dinesh Manocha was their host. ARL is integrating its software system, BRL-CAD, with the Modeling Group's BOOLE, a solid modeling system.

Michael Myler, head of virtual reality research at Daimler- Benz in Cambridge, Mass., visited on 13 October 1995 and participated in an informal discussion at Graphics Lunch.

Representatives from **Persimmon Information Technology** in Research Triangle Park, N.C., visited on 27 October 1995. Jan Prins was their host.

Franco P. Preparata of Brown University visited on 23 January 1996 to meet with faculty and students. His distinguished lecture, "Horizons of Parallel Computing," was broadcast from Duke University the previous day.

Carlo Sequin from UC-Berkeley visited from 13-19 November 1995. He gave two seminars and collaborated with the Walkthrough and Modeling groups. Dinesh Manocha was his host.

John A. Stankovic of the University of Massachusetts visited on 6 February 1996 to meet with faculty and students, in conjunction with his distinguished lecture on "Key Dilemmas in Real-Time Systems" which he broadcast from NC State on 5 February.

Laurent Vigneron, a postdoctoral student at SUNY-Stony Brook, originally from INRIA in France, visited on 4 October 1995 and presented a talk entitled "Automated Deduction Modulo Regular Theories." David Plaisted was his host.

Ross Whitaker (Ph.D. 1993) of the European Computing- Industry Research Centre in Munich, Germany, visited from 14-15 November 1995 to collaborate on research. He gave a talk on "Volumetric Deformable Models for 3D Reconstruction." Stephen Pizer was his host.

Congratulations to . . .

Gary Bishop (Ph.D. 1984), research associate professor, who was reappointed for a five-year term, effective 15 May 1996.

Rik Faith and **Tom White**, graduate students, who have both been named 1996 Cray Fellows (see article on page 4).

William Mark and **Ellen Scher Zagier**, graduate students, who are recipients of the 1996-97 Link Foundation Fellowship in Advanced Simulation and Training.

Lori McRae, who was promoted to Computer Support Technician II, effective 30 October 1995.

Timothy L. Quigg, lecturer and associate chairman for administration, who was reappointed for a five-year term, as of 28 June 1996.

Mary Whitton, research assistant professor, who was reappointed for a three-year term, effective 1 May 1996.

William V. Wright (Ph.D. 1972), research professor, who was reappointed for a one-year term, beginning on 1 April 1996.

To the faculty and staff members who attained the following levels of State service as of March 1996:

15 years: **Vernon Chi**
5 years: **Dana Kay Smith**

And to our December 1995 graduates:

Ph.D.: **Geoffrey Alexander, Robert Cromartie**
M.S.: **Jyoti Chaudhry, Stephen Goddard*, Amanda Hanes, Anantha Kancherla, Paul Keller, Alan Ve-Ming Liu*,** and **Jonathan McAllister**

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

Family matters

Nikolaus Alan Kreiling was born on 9 February 1995 in Chapel Hill, N.C., to Walter and Amy Kreiling.

Drew Benjamin Fisher Marshall was born on 21 November 1995 in Durham, N.C., to Jonathan and Andrea Marshall. He has two older sisters, Suzanna and Natalie.

Rebecca Diane Petty was born on 9 December 1995 in Chapel Hill, N.C., to Chad and Joy Petty.

Commencement

Graduation exercises for UNC-Chapel Hill will be held at 9:30 a.m. on Sunday, 12 May 1996, at Kenan Stadium. Nobel-prizewinning poet **Seamus Heaney** will be the keynote speaker. The Computer Science Department's own graduation ceremony will take place on the same day at 1:00 p.m. in the lower lobby of Sitterson Hall. Please join us if you are in the area.

CSA news

The Computer Science Students Association (CSA) is planning the Department's spring picnic, currently scheduled for 13 April, at the Faculty Farm in Chapel Hill. All faculty, staff, and students are invited. For details, contact **Mike Capps** at *capps@cs.unc.edu*. At the picnic, the CSA will announce the 1996 CSA Teaching Award recipients. The award is given annually to two professors in recognition of their excellence in teaching.

Computer Services news

New Sun server in, Epoch out

During fall 1995, **John Sopko**, systems programmer, and **Frederic R. Jordan**, electronic shop supervisor, installed a new Sun SPARC 20 file server, running Solaris, the latest Sun operating system. Two 9-gigabyte disk drives are attached to this server. **Michael North**, systems programmer, transferred all the data from our old Epoch optical jukebox server onto the new server, allowing us to retire the Epoch. This spring we will add a 25- gigabyte disk pack and a DLT (20 gigabyte per tape) tape stacker to this system and will set it up as the server for our proposed new commercial backup system.

Video projector changes

Last August, **David Musick**, network coordinator, handled the selection, purchase, and installation of a new Ampro video projector in the Sitterson 011 teleclassroom. The new projector produces a much clearer image, particularly with high scan-rate images, such as those produced by workstations and Pixel-Planes 5. In December, David wired room 014, the larger of

our auditorium-style classrooms, then moved the Electrohome projector from room 011 to room 014. Video and Macintosh output can now be projected in room 014, which will be useful when we need to accommodate large audiences.

HPs in, DEC 2100s out

Last fall, various grants brought in new workstations. **Frederic R. Jordan, Michael North**, and **Mike Stone**, electronics technician, installed new Hewlett Packard workstations, mostly in student offices. This allowed us to retire the last of the DEC 2100 workstations, the least powerful of our still large DEC fleet.

Mac II computers retired

Continuing in the spirit of retiring our oldest computers, the remaining Mac II computers (as opposed to Mac II*xx*) have been removed from service. These machines were the last of the Motorola 68020-processor computers running in the Department. They were gradually replaced via purchases of newer Macs and the resulting "trickle-down" of later model Macs.

New SGI systems installed

Our SGI computer fleet continues to grow, with three more Indigo2 workstations arriving at the beginning of 1996. Like the new SGIs that arrived last semester, these will be deployed in the Graphics and Image Lab. **Amy Kreiling**, systems programmer, worked with research groups to configure these systems, and she is handling software installation and support. **Frederic R. Jordan** is handling the hardware installation.

Network upgrade continues

Phase 2 of the network upgrade continues. We have run fiber to all of the second floor communications closets, preparing them for the installation of ethernet switches. We now have six ethernet switches installed in various locations throughout the building. Another switch has arrived but is not yet installed, and an additional five are on order. These provide dedicated 10-megabit connections to the Sitterson fiber backbone, allowing much greater bandwidth for connected machines.

Thanks for your support!

Many thanks to these alumni and friends for their generous donations to our Department during 1995 and the first part of 1996. We appreciate your support!

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