Dear Friends,

It has been a busy and exciting fall, to say the least, here in the UNC Department of Computer Science. In addition to our usual fall semester routine of welcoming new graduate and undergraduate students, resuming a full schedule of classes after the summer break and just getting back into the swing of an academic year, we were also busy settling into a new building! The Frederick P. Brooks, Jr. Computer Science Building opened for business over the summer and was officially dedicated on October 24. We were pleased that so many of you were able to join us for the celebration.

The opening of the Brooks Computer Science Building gives the department the space we have long needed to expand, both in personnel and in research. Not only has the 30,000-square-foot building provided us with a new state-of-the-art graphics simulation center, an updated Office of the Future research space, and a new computer security research area, among other things, but it has also allowed us to repurpose some of the space in Sitterson Hall to accommodate growing areas of research, including robotics, medical image processing and bioinformatics.

The department also gained some classroom space in the new building, including the Stephen F. Weiss Seminar Room, honoring our former chairman. The room is the ideal size for many of our popular freshman seminar courses, and acknowledges Steve’s passion for teaching.

I would like to personally thank all of you who helped make the Brooks Building a reality through your generosity. If you haven’t yet had a chance to look around, please be sure to stop by when you’re in the area.

Joe F. Prins
When Professor Gary Bishop imagined Tar Heel Reader, the virtual library for older beginning readers with disabilities, he dreamed big. He hoped that by the end of the first year, he’d have 1,500 books available online. But there are few resources for older readers at the kindergarten reading level, and the concept became so popular that in less than six months, the online library has nearly 1,600 books, with about 100 more added each week.

Free registration at the site allows users to read and to create books which are nearly all very short, illustrated page sequences for kindergarten-level readers. Creation is simple; search Flickr® for images of a desired subject—say, turtles or baseball. The search will turn up hundreds of photos; selecting one creates a new page for the book. Write a word or simple sentence in the text area under the photo and move on to the next page. Save it, and it becomes the newest book available on Tar Heel Reader. At the moment the work is completed, it is available to thousands of young readers. The books can be read out loud by a computer.

It has changed the way some children learn, Bishop points out. “I’ve gotten reports about some kid who didn’t like to read, didn’t read at all and now reads thirty minutes at school and another thirty minutes at home. Now that’s worth something!”

Though Tar Heel Reader was originally designed for children with motor impairments, it’s also used by a community of parents and teachers of children with autism. “If you have a kid who’s only interested in blue trains, you can make a book that pictures only blue trains to help him learn reading.” Bishop gets a lot of feedback from teachers, and their requests have prompted him to add more features, such as Spanish speech, and he’d like to develop a similar program for create-your-own-adventure books, in which readers choose options to make the story. He’s delighted that currently there are books written in German, French, Spanish, Japanese and Hebrew, and that books have been read in 50 countries worldwide.

Bishop prefers that readers and teachers generate the books. He collaborates with Dr. Karen Erickson, director of the Center for Literacy and Disability Studies, who, like Bishop, is one of UNC’s Faculty Engaged Scholars. She is helping to devise a system for educators to review the books and to keep the best ones the most visible on the opening pages. She also reported to Bishop, after returning from an assistive technology conference, that more than twenty of the sessions included Tar Heel Reader. That’s worth something indeed.

Check out Tar Heel Reader at tarheelreader.org.

Tar Heel Reader Explodes in Popularity

Dr. Fabian Monroe brings systems-oriented approach to computer security group

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Tar Heel Reader Explodes in Popularity

The sun is shining on MegaWatt Solar, a Hillsborough, NC-based manufacturer of solar power-generating solutions with roots in the department of computer science. Dr. Russell Taylor was enlisted by three partners, all involved in energy issues, who were forming a business to anticipate and solve problems for power companies. Daniel Gregory is a power-systems engineer; Dr. J. Christopher Clemens is a UNC astrophysicist; and Dr. Charles Evans is a UNC physicist.

“Usually, when power companies want to work with universities, they go to electrical engineering to get the next increment of development,” explains Taylor. “This team wanted to form a consulting group of scientists, and they needed someone who knew computers to run systems and make models.” So Taylor became a cofounder of MegaWatt Solar, which has just installed its first commercial solar power-generating site. Work in the early days, in 2006, was almost like a scout project—if the scouts had seed money and were extremely clever. “We bought a passive heat sink and solar cells on eBay,” says Taylor. “Then we went to the Solotube store and bought a reflector, and some 80-20 Tinker Toy-like things to build the trusses. It was like ‘Four Guys Solar Company.’ We made our own first version by hand to prove our concept, and then rented a truck to drive it to Hillsborough, where we’d rented some space at Dimmock’s Mill.”

The first version proved the concept, but didn’t do everything they’d hoped for. The beta version got the group much closer to their goal of “making something that was robust, inexpensive and effective.” After identifying a cheap mirror surface that met their needs, they purchased professional material and hired engineers to design and build units with 4×8’ mirrors on “trees.” Invention money came in 2007 from Scatec, a Norwegian firm that invests in and advises renewable energy companies.

In October, MegaWatt Solar—now with 36 employees—completed the mechanical construction of a field of solar collectors in Caswell County in conjunction with Piedmont Electric Membership Corporation. The collectors concentrate solar radiation by a factor of 20 onto solar cell receptors. It’s anticipated that the solar plant will generate 50 kW of electricity, enough for about 12 houses, when it is commissioned in December 2009.

As VP of Systems, Taylor still has work to do in making the field of collectors work as a power plant—writing code and coordinating communication protocols—but he sees an end to it. “My intention is to hand it off to production engineers, maybe in another year, then we’ll go on to the next thing.”
UNC technology enables Morphormics to partner with robotic radiosurgery maker to improve prostate cancer treatment

Technology developed at UNC has enabled medical software developer Morphormics Inc. to apply its medical image analysis and software products made by Accuray Inc., a leader in robotic radiosurgery devices.

Morphormics’ “autocontouring” technology will be integrated into Accuray’s CyberKnife Robotic Radiosurgery System. The combination will improve radiation treatment of prostate cancer by increasing treatment efficacy and lowering potential side effects.

Morphormics’ technology allows radiation oncologists to make three-dimensional anatomical maps of the prostate and nearby organs. The maps allow physicians to keep radiation beams focused on cancer tumors while avoiding other organs, such as the bladder and rectum, which could be harmed by radiation exposure.

Traditionally, clinicians use CT scans and MRIs to “contour” or draw out by hand a patient’s anatomy on up to 50 individual images. The process can be challenging and time consuming because of the difficulty involved in trying to translate 50 related two-dimensional images into a 3-D anatomical representation. The poor contrast of CT images also makes it difficult to distinguish the boundaries of the respective organs.

“Morphormics’ method of extracting the objects in 3-D is much quicker and more accurate,” said Professor Stephen Pizer, the company’s vice president of science, Renate Professor of Computer Science and Radiation Oncology at UNC, and member of the Lineberger Comprehensive Cancer Center. Pizer founded Morphormics along with Edward Chaney, Ph.D., professor of radiation oncology in the School of Medicine and Lineberger member, and Sarang Joshi, a former UNC associate professor of radiation oncology, now at the University of Utah.

Methods employed in the software were developed by faculty, graduate students and staff of the UNC departments of computer science and radiation oncology, together with members of several other departments in the College of Arts and Sciences and the schools of medicine and public health.

Morphormics’ team of professional software development engineers is now advancing this work even further.

“We are excited to have Accuray as our first customer and look forward to partnering with them to achieve FDA approval and bring our autocontouring technology to clinical use,” Pizer said. “As a computer scientist who has focused for decades on treatment and diagnosis using medical image processing, I am excited that our advances will now significantly help patients battle their prostate cancer.”

According to Thomson, the CyberKnife system is the world’s only robotic radiosurgical system designed to treat tumors anywhere in the body non-invasively. To date, it has been used to treat more than 50,000 patients and more than 140 systems have been installed in leading hospitals in the Americas, Europe and Asia, he said.

Morphormics and Accuray demonstrated Morphormics’ prostate cancer autocontouring technology during the 50th American Society for Therapeutic Radiology and Oncology annual meeting, held in Boston in September 2008.

For more information about Morphormics, visit www.morphormics.com.

For more information about Accuray and the CyberKnife System, go to www.accuray.com.

NEW FACULTY APPOINTMENTS

Fabian Monrose is an Associate Professor and part of the department’s computer security research group. You can read more about Fabian on page 8.

Tessa Nicholas is a full-time Lecturer teaching in both Computer Science and in the Dept. of English. She received her BA in English/Sociology at Hobart and William Smith College, and Creative Writing/Poetry at the University of Illinios at Urbana-Champaign and her PhD in English at UNC-Chapel Hill. She has worked for our department for a number of years as Jeanne Walsh’s TA for the class she is now teaching - COMP 590.

NEW STAFF APPOINTMENTS

Yun Fan is a research engineer working with Michael Reuter. Yun joined the department in September. She previously worked in the Department of Biology and the Gene Therapy Center at UNC.

Courtney Ferriter joined the department in October as Administrative Support to Faculty. Courtney had been working as a Tar Heel Temp in the department since August. She received her BA in English from UNC in May 2009.

Wayne Greene joined the Computer Services staff in May 2008 as a Systems Analyst. Wayne has worked for the University for 20 years, most recently doing systems administration with his time split between the Departments of Orthodentics and the School of Dentistry.

Dorothy Thorpe-Turner joined the department as Faculty Support Manager in October 2008. Dorothy joined us from UNC Hospitals where she worked for the past 5 years.

VISITING RESEARCHERS

Enrique Dunn is a visiting postdoctoral researcher working with the 3D Computer Vision Group. He received his Ph.D. in 2006 in Electronics and Telecommunications from the CICISE Research Center.

Arnold Irshara is a postdoctoral researcher working with Ian Michael Frahm and Marc Pollefeys. He is a Ph.D. Candidate at the Institute for Computer Graphics and Vision, Graz University of Technology.

Seon-Joo Kim is a postdoctoral research associate working with Jan Michael Frahm and Marc Pollefeys. He defended his dissertation in August here at UNC.

Julina Stefa is a Research Scholar visiting Michael Reuter. She is here to conduct research under his supervision on computer vision services. She is presently a graduate computer science student at the Sapienza University of Rome, conducting research in distributed systems.

Fu Che (James) Wu is here as a Visiting Researcher working with Anselmo Lasstra. James finished his Ph.D. at National Taiwan University in Computer Graphics and Computer Vision and is working closely on many research projects with Anselmo.

THANKS AND FAREWELL

Kim Jones, faculty support for the medical imaging and display analysis group, left the department in April 2008 to begin working for the Sponsored Programs Office of the UNC School of Medicine as a Proposal/Contracts Administrator.

After 23 1/2 years of Service to UNC—Chapel Hill, Madelyn Mann left the Department of Computer Science due to health issues.

Whitney Vaughan, administrative support to faculty, left the department in August to continue pursuing her Master’s degree in writing at Johns Hopkins University. Whitney is now working in the Information Technology Support office of the Breast Cancer Research Center at JHU. ([2007-2008]@jhu.edu).

CONGRATULATIONS FACULTY AND STAFF

Katrina Cole was a recipient of the annual Chancellor’s Award for Excellence in Human Services. Katrina was honored for her many contributions to our department as staff and business manager, to the university and state through her association with the North Carolina Society of Research Administrators, and to the American Red Cross through her development and management of the Carolina Blood Drive.

Bill Hays was named manager of the merged Communications and Hardware subgroups of Computer Services.

Kevin Jeffay was named Gillian Cell Distinguished Professor, effective July 1, 2008. He was also the recipient of the 2008 undergraduate teaching award.

Svetlana Lazebnik and Diane Pozelfsky were recipients of the 2007-2008 Computer Science Student Association teaching award.

GRADUATE STUDENTS

Sasa Jumazovic received a National Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship, which is the Canadian equivalent of the NSF fellowship. Sasa is also a Microsoft Research Fellow. His research is on distributed collaboration.

(continued on page 8)

JOHN HALTON AWARDED DOCTOR OF SCIENCE FROM CAMBRIDGE UNIVERSITY

The University of Cambridge has recognized the contribution made by Computer Science Professor John H. Halton by awarding him the degree of Doctor of Science.

The Doctor of Science degree is a higher doctorate and one of the highest academic recognitions any researcher of computer science can receive. It is awarded on the basis of a collection of published works which make a distinct and original contribution to the advancement of science or learning.

Halton’s principal area of research encompasses all theoretical aspects of the Monte Carlo method. He has also done research on various aspects of combinatorial and probabilistic algorithms, including a fast probabilistic algorithm for the Traveling Salesman Problem, numerical analysis, graph theory, statistical tests, large scale scientific computation, and the theory of lubrication. Halton holds a B.A. and an M.A. in Mathematics and Physics from Cambridge in 1953 and 1957, respectively, and a D.Phil. from Oxford in 1960. He joined UNC-CH and is professor of computer science in 1984.
Images from the Brooks Building Dedication
October 24, 2008
Xiang Zhang was lead author on the paper “FastANOVA: An Efficient Algorithm for Genome-Wide Association Study,” which was selected for the Best Paper award at the ACM SIGMOD conference in 2008. Fei Zou and Wei Wang were the co-authors on the paper. Xiang also won a graduate student paper award at ICDM 2008 earlier this year.

Tabitha Peck was lead author on the paper “Evaluation of Reorientation Techniques for Walking in Large Virtual Environments,” which received an honorable mention in the best paper competition at IEEE Virtual Environments 2008. Mary Whitton and Henry Fuchs were co-authors on the paper. Tabitha was also the recipient of a Link Foundation Fellowship for 2008-2009.

The paper “D-Plan: Efficient Collision-Free Path Computation for Part Removal and Disassembly,” by graduate student Yuanxin Zhang and Xiuhua Xin, was a co-recipient of the Link Foundation Fellowship for 2008-2009.

The University of North Carolina (Chapel Hill) is home to a number of distinguished computer scientists. They include researchers in computer science and related fields, such as computer networking, artificial intelligence, and computer vision.

Lee received a PhD in 1979. He did a poster presentation at the Behavior Modeling and Simulation conference of the IEEE Computer Society in 1995. While he has not been doing much with computers since leaving Silicon Graphics in 1990 to have his three daughters, ages 6, 7, and 9, she decided to fill an educational need in her area by starting a bilingual (English/German) school in 1995. While she has not been doing much with computers since leaving Silicon Graphics in 1990 to have her three daughters, ages 6, 7, and 9, she decided to fill an educational need in her area by starting a bilingual (English/German) school in 1995.

As of 2019, Lee has been living in Switzerland for 10 years with IBM Software Group, IT strategy & operations. The business scope is for IBM’s customer fulfillment, professional challenge being retaining high quality talent. Customer expectations are mostly akin—though not identical—to those in the U.S. Jaideep is also in touch with Rajamanik Krishnan, a 1991 IT strategy & operations. The business scope is for IBM’s customer fulfillment, professional challenge being retaining high quality talent. Customer expectations are mostly akin—though not identical—

Jaideep Mirchandani (PhD 1995) has been living in Switzerland since 1995. While she has not been doing much with computers since leaving Silicon Graphics in 1990 to have her three daughters, ages 6, 7, and 9, she decided to fill an educational need in her area by starting a bilingual (English/German) school.
Dr. and Mrs. Brooks were joined by Dr. Brooks’ former assistants at the Brooks Building Dedication. Pictured from left to right, back row: Darlene Freedman, Fred Brooks, Nancy Brooks, Lib Moore Jones; front row: Audrey Rabalais, Fay Ward.