

News & Notes

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

from Sitterson Hall

SPRING 2007 • ISSUE THIRTY-EIGHT

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Save the Date!

**The Siggraph 2007
Alumni Reception
will be held on
Monday, August 6**

**Location details
coming soon!**

If you are not on our email list
and would like to be,
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Chairman's corner



It's another beautiful spring here in Chapel Hill. The flowers are blooming, students are enjoying the warm and sunny weather, the sound of construction

work fills the air outside of Sitterson Hall...

Construction on Sitterson South is imminent. With the prep work nearly finished, footings for the building will be laid soon, followed shortly thereafter by steel girders going up. If everything goes according to plan, the department will hopefully be occupying the building in fall 2008, a prospect about which we are thrilled.

We have spent the spring semester interviewing many impressive candidates for a new faculty position, to be filled soon. We are also proud to have another distinguished professor among our ranks – Ming Lin was recently named a Beverly W. Long Distinguished Term Professor. Congratulations, Ming!

In other good news, Dr. Michael Reiter, a leading researcher in computer security, will join the department this summer as the Lawrence M. Slifkin Professor of Computer Science. Michael is currently Professor of Electrical and Computer Engineering and Computer Science at Carnegie Mellon University. Look for more information about him in the fall *News & Notes*.

At the same time, we will soon be saying farewell to two members of our faculty. Guido Gerig, who works with

the MIDAG group, is heading to the University of Utah. He will, however, retain a connection to the department as an adjunct faculty member. Also, Marc Pollefeys, who works in computer vision, will be going to ETH-Zürich this summer.

Our students continue to impress. As you will read about on page three, undergraduates Tao Xie, Jared Brothers, and Philip Kelley, along with Professor Kevin Jeffay, attended the 31st ACM International Collegiate Programming Contest World Finals in Tokyo, Japan, over Spring Break, after placing third in the regionals in October 2006.

We were recently visited by 32 prospective graduate students for this year's Candidates' Day. Partly in preparation for the event, some improvements were made in Sitterson, including new carpet and some fresh paint in the zero level and first floor lobby areas, as well as new study tables and chairs. In addition, large pictures depicting department life now decorate the first floor hallways and a display called "Faces of Sitterson," which honors our alumni, can be found on the zero level.

As you can see, exciting things are happening in Sitterson Hall, but we still need your help as we continue to grow. I hope you will consider making a donation to the department to show your support. We will also be announcing additional giving opportunities in regards to Sitterson South in the near future. Finally, remember that all donations to the department count toward the University's Carolina First campaign. Your help is most appreciated.

Jan F. Prins

2 Welcomes and farewells

NEW FACULTY APPOINTMENTS

Morgan Giddings, adjunct assistant professor (assistant professor, Departments of Microbiology & Immunology and Biomedical Engineering, UNC-Chapel Hill), Ph.D., Bioinformatics, University of Wisconsin.

John Lavery, adjunct professor (Mathematics Division, Army Research Office), Ph.D., University of Maryland.

Frank Mueller, adjunct associate professor (associate professor, Computer Science, NC State), Ph.D., Computer Science, Florida State University.

NEW STAFF APPOINTMENTS

Anna Bulysheva, research associate working with the Liver RFA project, who became a permanent employee in February 2007.

Tricia Robinson, assistant student services manager, who joined the department in October 2006.

THANKS AND FAREWELL TO...

Jean-Sébastien Franco, postdoctoral researcher working with Marc Pollefeys.

Guido Gerig, Taylor Grandy Professor of Computer Science and Psychiatry, who is joining the faculty at the University of Utah. Guido will retain an adjunct position at UNC.

Marc Pollefeys, associate professor, who is joining the faculty at ETH-Zürich in summer 2007.

Congratulations to...

FACULTY AND STAFF

Kim Jones, who was promoted to Administrative Assistant working for Steve Pizer.

Vivek Kwatra, postdoctoral researcher working with the GAMMA group, was recently awarded the Georgia Tech College of Computing Outstanding Dissertation Award for the year 2005-2006.

GRADUATE STUDENTS

Ph.D. student **Nico Galoppo**, under the advisory of Prof. Ming Lin, has been selected to receive the AMD/ATI Graduate Fellowship for Academic Year 2007-2008, for his Ph.D. dissertation on "Layered Representations and Simplified

Physics-based Models for Simulating Soft Articulated Characters."

M.S. student **Stephen Olivier** is the recipient of a 2007 National Defense Science and Engineering Graduate (NDSEG) Fellowship. The fellowship is sponsored and funded by the Department of Defense (DoD) and is a three-year fellowship. Stephen's advisor is Jan Prins.

UNDERGRADUATE STUDENTS

Undergraduate student **Erik Andersen**, who has been working with professors Ming Lin and Dinesh Manocha for the last two years, was selected to receive a multi-year NSF Graduate Fellowship for his graduate study. He has been admitted to Ph.D. programs at several top universities.

Grants and Contracts

Dinesh Manocha (PI), and Ming Lin (Co-PI). Interactive Onesaf Computations Using COTS Graphics Hardware (CLIN 010), Naval Air Warfare Center.

Ming Lin (PI), and Dinesh Manocha (Co-PI). CI-Team Implementation; Collaborative Research: Cyber-Infrastructure for Engineering Informatics Education, NSF.

Henry Fuchs (PI), and Greg Welch (Co-PI). Prototype for Two-station, Four-Person, Proper Eye-Gaze Telepresence System, Cisco Systems, Inc.

James Anderson (PI), and Sanjoy K. Baruah (Co-PI). CSR--EHS: Real-Time Computing on Multicore Platforms, NSF.

Marc Pollefeys (PI), and Greg Welch (Co-PI), 3D Content Extraction from Video Streams (VACE), US Department of the Interior.

PATENTS

7,191,092, "Methods and systems for controlling motion of and tracking a mechanically unattached probe," Leandra Vicci and Richard Superfine.

7,189,969, "Methods and systems for controlling motion of and tracking a mechanically unattached probe," Leandra Vicci and Richard Superfine.

7,200,251, "Methods and systems for modeling objects and object image data using medial atoms," Sarang Joshi,

Edward L. Chaney, Stephen M. Pizer, Thomas P. Fletcher, and Andrew Thall.

7,182,465, "Methods, systems, and computer program products for imperceptibly embedding structured light patterns in projected color images for display on planar and non-planar surfaces," Henry Fuchs, Daniel Cotting, Martin Naef, and Markus Gross.

Family matters

Mark Parris (Ph.D. 2001) married **Amy Frederick** on 26 August 2006, at Mordecai Park in Raleigh. (mparris@nc.rr.com)

Miriam and **Jan-Michael Frahm**, post-doctoral researcher in 3D Computer Vision Group, welcomed their son, **Lukas William**, on 4 December 2006. Lukas joins big brothers **Joshua**, age seven, and **Noah**, age five. (jmf@cs.unc.edu)

Ada Lindsay Duggan was born on 14 December 2006 to **Laura** and **Adam Duggan** (M.S. 1995). Ada has two big sisters; **Samantha** and **Eliza**. (acduggan@gmail.com)

Christine and **Ketan Mayer-Patel**, associate professor, welcomed **Darshan Paul Mayer-Patel** to their family over the Christmas holiday, travelling to India to get him and completing an adoption process that started almost 18 months earlier. Darshan turned two years old in March. Older sister **Sejal** is quite pleased. (kmp@cs.unc.edu)

Pawan Kumar (M.S. 1998) and his wife **Rashmi Verma** are expecting a second baby in July 2007. They have a four-year-old daughter named **Shreya**. (pawan@yaboo.com)

Leigh Atkinson, former receptionist for the department, and her husband **Jeffrey** are expecting a little girl this summer. Their new daughter will join big brother, **Will**, who is three. (leighstulack@hotmail.com)

Undergrad CS team competes in world finals of ACM computer programming contest

Three computer science undergraduate students traveled to Tokyo during spring break to compete in the world finals of a collegiate computer programming contest that was held March 12-16.

Seniors Jared Brothers, Philip Kelley and Tao Xie competed against 87 teams from around the world in the Association for Computing Machinery (ACM) International Collegiate Programming Contest, sponsored by IBM. They were accompanied by their coach, Professor Kevin Jeffay.

The team name was Pantone278, the official color for Carolina blue, according to UNC Trademarks and Licensing. (Graphic designers use the Pantone color system to communicate specific colors to clients and printers.)

Jared came up with the Pantone278 team name, but Philip is the

fastest typist, and the team relied on his keyboarding as part of their strategy when they won the regional competition.

"Because each team had at their disposal only one computer, our strategy was to assign Philip, who can type the fastest, the role of flawlessly implementing solutions, while Tao and I mulled over the conceptual aspects of different problems, thereby obtaining solutions to give to Philip," Jared said.

The students competed in the regionals — the Mid-Atlantic USA Programming Contest — in Durham in October 2006, and placed third in order to advance to the finals. The team was pitted against more than 130 teams to solve eight computer programming problems as quickly as they could. It was the third year Jared, Philip and Tao competed in the regional competition, but the first time they competed on the same team.

Pantone278 received an honorable mention at the finals.

This is the second time a team from the department has made it to the world finals. In 2002, undergraduates John Ehrhardt, Nate Massey, and Chris Schenck received an honorable mention at the finals held in Honolulu, Hawaii.

ALUMNI FELLOWSHIP RECIPIENT

Eli Broadhurst (M.S. 2005) is the recipient of the Spring 2007 Computer Science Alumni Fellowship. The fellowship is awarded annually to a Ph.D. candidate in his or her final year of study, allowing the student to work full time on dissertation research. Generous contributions by alumni and friends help to make this fellowship possible.

Eli is pursuing a dissertation under his adviser Stephen M. Pizer. His research involves the segmentation of organs from 3D CT images for radiation treatment planning. Automatic segmentation methods would enable more accurate treatment of prostate cancer by updating organ positions before each daily treatment. Successful segmentation methods learn the object's appearance in images through examples. His work describes a novel representation of distributions of image features that efficiently models object appearance by learning both the object's average appearance and how it typically varies. Eli has also applied these statistical techniques to other computer vision tasks, such as the identification of textured materials.



(Left to right): Tao Xie, Jared Brothers and Philip Kelley compete at the ACM International Collegiate Programming Contest in Tokyo.



4 Recent publications

Burns, E. and F. P. Brooks, Jr. "Perceptual sensitivity to visual/kinesthetic discrepancy in hand speed, and why we might care," Proc. ACM Symposium on Virtual Reality Software and Technology, 3-8, VRST '06, ACM Press, New York, NY.

Cascio, C., M. Styner, R.G. Smith, M. Poe, G. Gerig, H. Hazlett, M. Jomier, R. Bammer and J. Piven. "Reduced relationship to cortical white matter revealed by tractography based segmentation of the corpus callosum in young children with developmental delay," *Am. J. Psychiatry*, (163) 2157-2163, December 2006.

Cevitanes, L.H., L.J. Bailey, S.F. Tucker, M.A. Styner, A. Mol, C.L. Phillips, W.R. Proffit and T. Turvey. "Three-dimensional cone-beam computed tomography for assessment of mandibular changes after orthognathic surgery," *Am. J. Orthod. Dentofacial Orthop.*, 131(1):44-50, January 2007.

Crouch, J., S.M. Pizer, E.L. Chaney, Y. Hu, G.S. Mageras and M. Zaider. "Automated Finite Element Analysis for Deformable Registration of Prostate Images," *TMI*, 2007.

Dinan, J., S. Olivier, J. Prins, G. Sabin, P. Sadayappan and C.-W. Tseng. "Dynamic Load Balancing of Unbalanced Computations Using Message Passing," Proc. 6th Intl. Workshop on Performance Modeling, Evaluation, and Optimization of Parallel and Distributed Systems (PMEO-PDS 2007), 2007.

Fisher, J. K., L. Vicci, J. Cribb, E. T. O'Brien, R. M. Taylor and R. Superfine. "Magnetic force micromanipulation systems for the biological sciences," *NANO*, vol. 1, no. 3, pp. 191-205, November 2006.

Galoppo, N., M. Otaduy, S. Tekin, M. Gross and M. Lin. "Haptic Rendering Using Dynamic Deformation Textures," invited submission, Proc. of Human Computer Interface International Symposium on Virtual Reality, July 2007.

Glencross, M., C. Jay, J. Feasel, L. Kohli, M. Whitton and R. Hubbard. "Effective Cooperative Haptic Interaction over the Internet," Proc. IEEE Virtual Reality 2007, March 2007.

Govindaraju, N., I. Kabul, M. C. Lin and D. Manocha. "Fast Continuous Collision Detection among Deformable Models using Graphics Processors," invited submission as Best Papers, in *Computers & Graphics*, Jan/Feb 2007.

Huan, J., J. Prins and W. Wang. "Local Structure Comparison of Proteins," *Computational Biology and Bioinformatics*, C.-W. Tseng (ed.), *Advances in Computers* 68, pp 178 - 251, Elsevier AP, 2006.

Kim, T. and M. Lin. "Fast Animation of Lightning Using Adaptive Meshes," *IEEE Trans on Visualization and Computer Graphics*, Vol. 13, Issue 2, pp. 390-402, 2007.

Liu, J., Q. Zhang, W. Wang, L. McMillan and J. Prins. "Poclustering: lossless clustering of dissimilarity data," Proc. 7th SIAM Conference on Data Mining (SDM), 2007.

Liu, X., R.E. Broadhurst, Q. Han, J.H. Levy, J.V. Stough, R. Saboo, J.Y. Jeong, E.L. Chaney and S.M. Pizer. "Refined Segmentation in Statistical Multiscale Framework," 2007.

Lu, C., S.M. Pizer, S. Joshi and J-Y. Jeong. "Statistical Multi-object Shape Models," *Int. J. Computer Vision*, 2007.

Olivier, S., J. Huan, J. Liu, J. Prins, J. Dinan, P. Sadayappan and C.-W. Tseng. "UTS: An Unbalanced Tree Search Benchmark," 19th International Workshop on Languages and Compilers for Parallel Computing (LCPC), 2006.

Olivier, S., J. Prins, J. Derby and K. Vu. "Porting the GROMACS Molecular Dynamics Code to the Cell Processor," Proc. 8th IEEE Intl. Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC-07), March 2007.

Otaduy, M.A., and M.C. Lin. *High-Fidelity Haptic Rendering*, Morgan & Claypool Publishers.

Pizer, S.M., R.E. Broadhurst, J-Y. Jeong, Q. Han, R. Saboo, J. Stough, G. Tracton and E.L. Chaney. "Intra-Patient Anatomic Statistical Models for Adaptive Radiotherapy," *MICCAI Workshop From Statistical Atlases to*

Personalized Models: Understanding Complex Diseases in Populations and Individuals, pp. 43-46, Oct 2006.

Raghuvanshi, N. and M. Lin. "Physically-based Sound Synthesis for Large-Scale Virtual Environments," invited submission, *IEEE Computer Graphics and Applications*, Vol. 27, No. 1, pp. 14-18, Jan/Feb 2007.

Sonnenwald, D.H., H. Maurin, B. Cairns, J. Manning, E. Freid, G. Welch and H. Fuchs. "Experimental Comparison of the use of 2D and 3D Telepresence Technologies in Distributed Emergency Medical Situations," Proc. American Society of Information Science and Technology (ASIS&T 2006), November 3-9, 2006.

Stough, J., R.E. Broadhurst, S.M. Pizer and E.L. Chaney. "Clustering on Local Appearance for Deformable Model Segmentation," *ISBI*, 2007.

Sud, A., E. Andersen, S. Curtis, M. Lin and D. Manocha. "Real-time Path Planning for Virtual Agents in Dynamic Environments," Proc. of IEEE Virtual Reality, March 2007. (Cover Image)

Ward, K., F. Bertails, T.-Y. Kim, S. Marshner, M.-P. Cani and M. Lin. "A Survey on Hair Modeling: Styling, Simulation, and Rendering," *IEEE Trans on Visualization and Computer Graphics*, Vol. 13, Issue 2, 2007.

Welch, G., B.D. Allen, A. Ilie and G. Bishop. "Measurement Sample Time Optimization for Human Motion Tracking/Capture Systems," Proc. Trends and Issues in Tracking for Virtual Environments, Workshop at the IEEE Virtual Reality 2007 Conference (Gabriel Zachmann, ed.), Shaker, March 11, 2007.

Welch, G., M. Noland and G. Bishop. "Complementary Tracking and Two-Handed Interaction for Remote 3D Medical Consultation with a PDA," Proc. Trends and Issues in Tracking for Virtual Environments, Workshop at the IEEE Virtual Reality 2007 Conference (Gabriel Zachmann, ed.), Shaker, March 11, 2007.

Wendt, J., W. Baxter, I. Oguz and M. Lin. "Finite-Volume Flow Simulations in Arbitrary Domains," *Graphical Models*, Vol. 69, No. 1, pp. 19-32, 2007.

M.S. AND PH.D. ALUMNI

Ken Bell (M.S. 1976) is currently a senior vice president and the chief information officer for Orbital Sciences Corporation, where he was responsible first for consolidating the IT organizations and then for working through renovation of the enterprise systems and computing infrastructure. Orbital is well established in several areas of space science and has recently won work contributing to the next generation of manned vehicles designed to enable a return to the moon and possibly a manned landing on Mars. Ken says that it is a great time to be alive. (*Bell.Ken@orbital.com*)

Rodger Blair (M.S. 1969) is a Product Design Analyst for Per-Se Technologies, Inc. in Pittsburgh, Penn., a company that designs and constructs pharmacy software systems for managing high volume mail order pharmacies. He says he is still enjoying working in the software industry, now for 40+ years. (*rbblair@hotmail.com*)

William Brown (M.S. 1990) works for Boeing Mathematics & Computing Technology in Seattle, Wash., developing software in support of numerous projects, especially in 3D Graphics and Computer Vision. (*william.j.brown2@boeing.com*)

At the end of August 2006, **Paul Clements** (M.S. 1980) concluded a year as a visiting faculty member at the Indian Institute of Technology in Mumbai. (*clements@sei.cmu.edu*)

R. Kent Dybvig (Ph.D. 1987) was recently selected an ACM Distinguished Engineer. He is currently a professor of computer science at Indiana University. (*dyb@cs.indiana.edu*)

Susan M. Fisher (M.S. 2001) was named Rendering Lead for the film after Ratatouille at Pixar Animation Studios. She also underwent a pancreas transplant on Feb. 9, 2007 and is still recovering.

Rich Holloway (Ph.D. 1995) is now a project manager at NVIDIA

in Durham, N.C. He reports that he still has four kids and sleeps occasionally. (*holloway@cs.unc.edu*)

Anantha Kancherla (M.S. 1996) was in Las Vegas in January 2007 to receive the Technical Emmy In the "Advanced Media Technology/Video Gaming" category, awarded to Microsoft Direct 3D 9 & 10 for Pioneering Work in Near and Real-Time Fully Programmable Shading via Modern Graphics Processors. (*anankan@windows.microsoft.com*)

Pawan Kumar (M.S. 1998) has founded Doquent Inc. to help bring content management to the mainstream through open source. (*pawank@yahoo.com*)

Tom Lassanske (M.S. 2002) is Director of Worldwide Developer Relations for AGEIA Technologies, Inc. He works out of the San Francisco Bay Area, with video game developers integrating PhysX SW & HW simulation support into their titles. (*murphske@yahoo.com*)

Pete Litwinowicz (M.S. 1987), along with his business partner Pierre Jasmin, were honored with a Technical Achievement Award from the Academy of Motion Picture Arts and Sciences®. The award is for the design and development of the RE: Vision Effects family of optical flow-based image manipulation software tools. The A.M.P.A.S. reviewing committee recognized RE:Vision Effects' products for their unique user interface and affordable cost that led to the company's success in making the technology ubiquitous. (*pete@revisionfx.com*)

Jennifer Longstaff (M.S. 1982) recently moved to Bellingham, Wash. She is still working for Xilinx, and is based out of the Colorado office. She reports that she needed to relocate for other reasons, and Xilinx (great company that it is) is now letting her work remotely. She's been with the company for nearly 10 years and is working in software product marketing. (*jkl@xilinx.com*)

Ajith Mascarenhas (Ph.D. 2006) received the best applications paper award at the 2006 IEEE

Visualization Conference, held in Oct.-Nov. 2006, for his paper titled "Understanding the Structure of the Turbulent Mixing Layer in Hydrodynamic Instabilities," co-authored by Daniel Laney, Peer-Timo Bremer, Paul Miller and Valerio Pascucci. Ajith works for Lawrence Livermore National Laboratories.

Charles (Chuck) Mosher (M.S. 1987) was named Director of Federal Architecture & Solutions at MetaMatrix, Inc. in January 2007. MetaMatrix is a private software company that markets a metadata-based, model-driven solution for data integration. Chuck splits his time between his home office in Chapel Hill and MetaMatrix's Federal office in Vienna, VA. (*cmosher@alumni.unc.edu*)

William Oliver (M.S. 1990) left the Armed Forces Institute of Pathology in 1990 because of changes there (the Institute is being disestablished), and is now the Northwest Regional Medical Examiner for the Georgia Bureau of Investigation. He still does image-related work as a private consultant for local and federal law enforcement, and also does remote system administration for a small federal network. William also reports that he took up the folk harp while in DC, has become active in his church, and is enjoying the good life in the Georgia mountains. He invites C.S. alumni to drop by if you are in his area! (*billio@radix.net*)

Ramesh Raskar (Ph.D. 2000) was the keynote speaker at the 5th IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR) Oct 2006 held at University of California at Santa Barbara. He also received the Mitsubishi Electric Invention Award 2006 for his research on radio frequency identity and geometry (RFID) tags. (*raskar@merl.com*)

Chris Schleter (M.S. 1981) wrote from Beijing to say he recently finished working on baseball and softball results for the 2008 Olympic Games. His next appointment takes him to Vancouver where he will work as the On Site Project Manager

6 Department news

(continued from page 5)

for Swiss Timing for the 2010 Winter Games. (sprtstat@ix.netcom.com)

Mary Szymkowski (M.S. 1991) is a veterinarian at the Animal Hospital of Peak Plaza in Apex, N.C. Her husband, Lindsey Puryear, (Ph.D. 1995, UNC Operations Research) is working at SAS in the OR department. Their four-legged family has grown to two dogs, seven cats, and a rabbit. She invites fellow alums to stop by for a visit and a tour of the clinic when in Apex! (drmls@mindspring.com)

Ben Wilde (M.S. 2006) reports that he made the big move from North Carolina to Seattle, Wash., and is

currently working at Microsoft. He welcomes fellow alums to get in touch if anyone is taking a trip out to the great Northwest. (wilde@cs.unc.edu)

Sung-Eui Yoon (Ph.D. 2005) is currently working at Lawrence Livermore National Laboratories as a post-doctorate. (sungeui@gmail.com)

UNDERGRADUATE ALUMNI

Christopher Edward Collazo (B.S. 2002) is working as a developer for a document management solution company and still watching every UNC basketball game.

John Greeson II (B.S. M.Sci. 1987) currently works for SAS in Cary

as an SQL Server Database Administration. In addition, he serves in the Air Force Reserves. (johngreson@gmail.com)

Susan King Kellogg (B.S. M.Sci. 1987) is currently the Associate Dean of Information Technology for the Kenan-Flagler Business School at UNC-Chapel Hill. She also has a nine-year-old daughter and says it is good to be home again. (susan_kellogg@kenan-flagler.unc.edu)

Christopher Schenck (B.S. 2001) is currently working as an attorney in the intellectual property group at Preston Gates & Ellis in Seattle, Wash. (christophers@prestongates.com)

Technology Without Borders

Technology Without Borders (TWB) is a student organization at UNC that works to bridge the digital divide by setting up computer labs in developing countries and teaching computer education. The club, which was founded in November 2005, petitions companies for donations of computers to be used in community centers accessible to people in impoverished areas, in an effort to provide job-based computer skills to students whose schools lack a public system of computer education. TWB also works locally with El Centro Latino, where the group assists with an after school program for ESL kids. Computer Science senior lecturer Jeannie Walsh is the organization's faculty advisor.

During the months of May and June 2006, three students from the student organization TWB implemented a project to spread computer education to the town of Matamoros, Mexico. This project involved driving ten computers from Chapel Hill to Matamoros, and setting up a computer lab in a small community center in the city. There, the group taught computer education classes for one month to students ages six to 60, covering basic computer literacy and word processing. Classes were taught for a total of seven hours per day, to over 160 students. After the group departed from Mexico, the lab remained open as a resource for the community, and computer education classes continue to be taught there

one day per week by a local teacher in Matamoros.

In summer 2007, TWB plans to set up two additional computer labs for the purpose of teaching computer education. A ten-computer lab will be set up in a community center in Piedras Negras, Mexico. There, four volunteers from TWB will spend two-to-three weeks setting up the lab and teaching classes. Also, a four-computer lab will be set up in Toffo, Benin (Africa) for the same purpose, though this project will be implemented by a Peace Corps volunteer from UNC in Benin.

For more information on Technology Without Borders, please visit studentorgs.unc.edu/twb



Volunteers from TWB teach typing skills to elementary school children in Matamoros, Mexico. The goal of TWB is to establish a sustainable computer lab in a different developing community every year.



This computer lab was set up as a free center for teaching job-based computer skills, and is the only free source of computer education for students within three counties.

Laser Scanning at Herculaneum

In October 2005, the department of computer science sent a DeltaSphere laser scanner to Italy for use by the Herculaneum Conservation Project (HCP). HCP is a joint project of the Soprintendenza Archeologica di Pompeii, the Packard Humanities Institute and the British School at Rome, which aims to safeguard and conserve, to enhance, and to advance the knowledge, understanding and public appreciation of the ancient site of Herculaneum and its artifacts.

The town of Herculaneum, located on the Bay of Naples, was buried by the same explosion of Mount Vesuvius in 79 A.D. as was the well-known town of Pompeii. A pyroclastic flow covered the site of Herculaneum, and affected the town in a different manner from the ash and debris that covered Pompeii. However, the features that make the little town of Herculaneum such a vivid evocation of the past – the survival of houses to several stories, and the astonishing preservation of organic matter like wood, cloth and papyrus – also render the site exceptionally difficult to preserve

for future generations, hence the desire to scan the site with the DeltaSphere.

Participants working on the project include the HCP archaeological surveying team from Akhet, an Italian consulting company specializing in survey and 3D modeling. Anselmo Lastra went to Italy in November 2005 to show project members how to use the instrument, and they continued gathering data for several months after he left.

The early results of this work are documented in the following paper: Brizzi, M., S. Court, A. d'Andrea, A. Lastra and D. Sepio. "3D Laser Scanning as a Tool for Conservation: The Experiences of the Herculaneum Conservation Project," *Proceedings of the 7th*

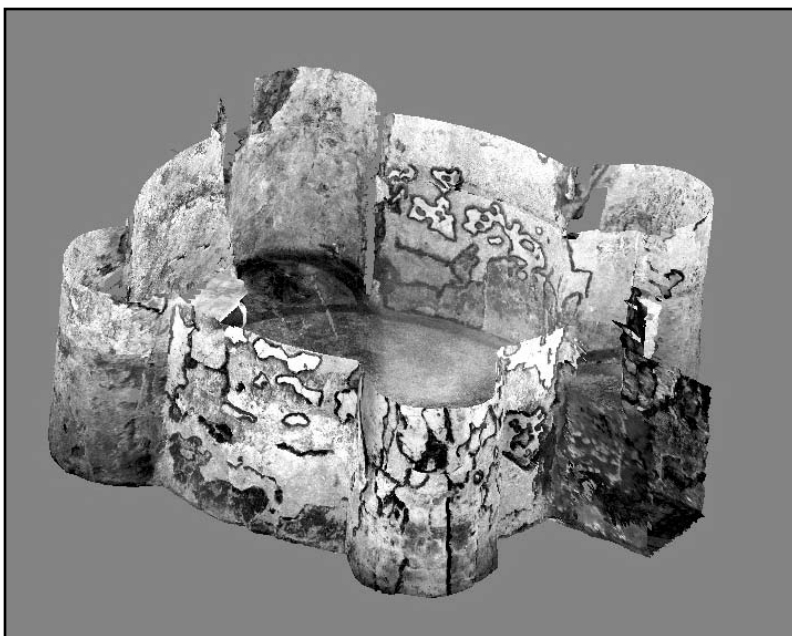


Setting up for a scan. From left to right, Massimo Brizzi, Anselmo Lastra and Ascanio d'Andrea.

International Symposium on Virtual Reality, Archaeology and Cultural Heritage, VAST (2006).

The DeltaSphere, manufactured by 3rdTech (www.3rdtech.com), uses a time-of-flight infrared laser to measure distance. Range is up to 50 feet or so. The density of points that are captured is programmable; typically about 10-15 points per degree are collected. One can capture data from a full hemisphere, except for just below the scanner. In order to add color to the images, researchers use a digital camera and texture map the color to the 3D data using tools from 3rdTech.

The rangefinder was developed here at UNC, primarily by Adjunct Research Associate Professor Lars Nyland, who now works for NVIDIA. Other project members include Professor Anselmo Lastra and former graduate students Kok-Lim Low (Ph.D. 2006), Chad Hantak (M.S. 2004) and Nathaniel Williams (M.S. 2004).



Cutaway view of 3D model of small room in the Suburban Baths by the ancient seashore of Herculaneum. The baths are where the first scanning efforts were concentrated because they've had to be closed to the public due to the deteriorating condition of the structure.

News & Notes

from Sitterson Hall

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In December 2006, members of the real-time group visited Rio de Janeiro in Brazil for the Real-Time Systems Symposium (RTSS), their main conference. Graduate students Hennadiy Leontyev and Björn Brandenburg received first place in a robotics competition during the conference. The competition involved programming a (virtual) robot so that it could find a beacon and return to its home position, in the face of obstacles and certain inaccuracies in sensor data. Hennadiy and Björn beat out 13 other teams (six of which actually dropped out before the competition because they couldn't get a good approach to work). In fact, they wiped out the other competition by a fairly comfortable margin. So, congratulations to Hennadiy and Björn! They really made UNC look good!

(Clockwise from left): Aaron Block, John Calandrino, Sanjoy Baruah, Jim Anderson, Hennadiy Leontyev and Björn Brandenburg are pictured in front of the "Christ the Redeemer" statue, located on the top of Corcovado mountain in the Tijuca Forest National Park, overlooking Rio.