News & Notes

Spring 2011 ◆ Issue Forty-seven

CompSci @ Carolina

Dear Friends,

Another semester has come and gone here at UNC, and with the end of the semester came the task of saying farewell to another graduating class of students.

We recently received approval to begin offering a Bachelor of Arts degree in Computer Science, and will welcome our first class of B.A. majors this fall. The new B.A. degree will better allow students to combine computer science with other disciplines and is a less math-intensive program than the B.S. degree. Our hope is to continue to successfully grow our undergraduate program through offering a variety of degree options, with the traditional B.S., the new B.A., the CS minor and the B.S.-M.S. combined program.

In December 2010, we wished our colleague John B. Smith a happy retirement with a celebration in his honor. John taught in our department for more than 25 years, and, though we were sad to see him go, we are appreciative of all he gave the department in his time here and we hope he is enjoying his retirement!

Speaking of retirees, Steve Weiss made it back to this year's spring commencement ceremony both to help cut the cake at the reception and to present the 2011 Stephen F. Weiss Award for Outstanding Achievement in Computer Science to undergraduate Stephanie Zolayvar. The Weiss Award provides a $500 scholarship to a deserving rising senior in the department, and was awarded for the first time last year at Steve's retirement party. Donations for the scholarship fund are always welcome, so please consider making a donation in honor of Steve and in support of our undergrads. Be sure to look for other ways you can help support the department in the next edition of our newsletter.

As always, stay in touch and be sure to visit when you are in Chapel Hill!

Anselmo Lastra

THE GENETICS OF MICE AND MEN

Professor Wei Wang's background is in data mining, but her primary research focus today is computational biology, running the "CSBio" group of over 20 staff, postdocs and students, jointly with Associate Professor Leonard McMillan. Still, she views many of the problems faced by her colleagues in genetics, cell biology, pharmacy and biostatistics as data mining problems.

One project the CSBio group is working on is genome ancestry inference, or determining which part of a resulting DNA sequence is inherited from which founder DNA sequence. The research uses both real and simulated data from the Collaborative Cross, a mouse facility housed at UNC-Chapel Hill with hundreds of mouse lines that originated from eight different founders. The Collaborative Cross seeks to represent the genetic diversity of humans through controlled breeding of the mice strains, to allow for research about inheritance and diseases. For example, knowing which piece of the genome came from which ancestor might allow for determining blood pressure inheritance. However, due to the large amount of data involved, computations are expensive and time consuming, which is one problem faced by researchers.

To help solve this problem, one of Wang's students, Eric Yi Liu, has found a way to efficiently infer genome ancestry, using a Hidden Markov Model that derives the ancestry probabilities without explicitly modeling every generation bred. His method accurately estimates a probability distribution of the founder origin of every base

continued on page 2

In this issue

Genetics, continued from page 1

in each chromosome in a few seconds, meaning he can compute the entire ancestry map for each mouse in a matter of minutes. The method can also be used to spot mistakes made in the breeding assignment and/or genotyping process.

Another area of research deals with determining which genes influence disease. While there are a few diseases that are influenced by only one gene, many diseases are influenced by multiple genes, and figuring out which genes affect, for example, hypertension, is a formidable job, because of the sheer number of genes on the human genome.

To approach this problem, Wang's student Xiang Zhang created an algorithm that can be used to quickly examine the effect of gene-gene interaction (called epistasis) when examining associations across the entire human genome. Where it would typically take a supercomputer seven-to-ten years to compute such interactions, Zhang's algorithm can accomplish the task in a matter of hours, due to using convex optimization and efficient indexing to determine which epistases are possibly statistically significant and then computing only those that have the potential to be statistically significant.

Mice from the Collaborative Cross are bred in such a way as to represent the genetic diversity of humans, so that they can be used in studying human disease.

TECHNOPRENEURSHIP TAKES OFF AT CAROLINA

Information technology startup companies are getting a boost from the Carolina Launch Pad, a UNC-based pre-commercial business accelerator designed to assist early-stage IT startups from the UNC community to develop business plans and working prototypes of their products. Carolina Launch Pad offers entrepreneurial expertise via a partnership between the Renaissance Computing Institute (RENCI), the UNC Office of Technology Development and UNC's Kenan-Flagler Business School.

In addition to business advice, Carolina Launch Pad participants are provided with office space and supplies in the RENCI facility, as well as web site hosting space and web design services. Currently, three UNC Computer Science spin-off companies are benefiting from the services the Launch Pad provides.

Altometrics, Inc.

Jeff Terrell (Ph.D. 2009) and his business partner, Sir Robert Burbridge, started Altometrics, Inc., in 2010. The company is based on Terrell's dissertation research, in which he developed a novel approach to managing the performance of servers within large networks, such as cloud providers, broadly and cheaply.

Terrell and Burbridge are interested in solving a problem most people have experienced: trying to pull up a web page or network server that seems to take forever to load. To deal with this problem, they are developing a technology that will provide companies—especially those in cloud computing environments—with an effective and efficient way to manage the performance of applications that run over networks. Data structures and algorithms created by Altometrics will not only be able to track performance data but will also identify and diagnose server performance issues in cloud infrastructures without straining server resources.

Altometrics, Inc., has already received over $250,000 in private and public capital—including a $150,000 grant from the National Science Foundation as a part of its Small Business Innovation Research (SBIR) program. The company also moved out of the RENCI-supplied office space and into their own space in Durham, N.C. You can find out more at *http://altometrics.com*.

Rheomics, Inc.

Rheomics Inc. was founded in December 2010 by Rich Superfine, professor of physics and astronomy and adjunct professor of computer

continued on page 3

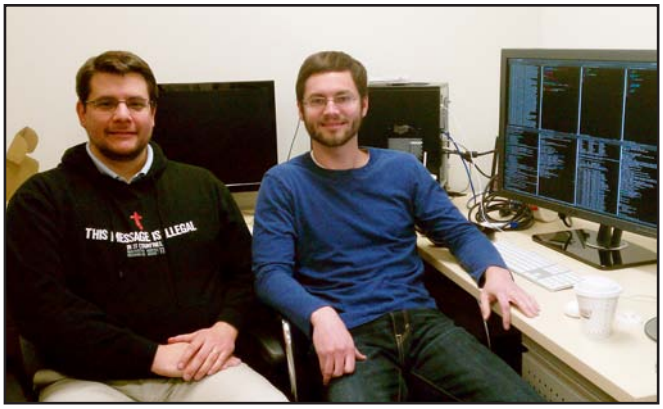
Technopreneurship, continued from page 2

science, Russell Taylor (Ph.D. 1994), research professor of computer science, Ricky Spero, a postdoctoral research associate in physics and astronomy, and Suresh Balu, a Kenan-Flagler Business School alumnus and former CS graduate student. The company grew out of the research conducted by the Center for Computer-Integrated Systems for Microscopy and Manipulation (CISMM), an NIH-funded national resource led by Superfine and Taylor, that conducts biophysics research and builds and disseminates bioinstrumentation.

Rheomics is creating diagnostic tools for clotting disorders and cancer metastasis. The company's patented technologies make it possible to pull on blood clots, individual cells, or small particles—the size of a bacterium or smaller—with precise forces. Rheomics sees a market opportunity for this technology in new cancer diagnostics, point-of-care blood clotting analysis, biofluid rheology and lab instruments to advance biological research.

Wavebridge Technology, Inc.

Computer science Ph.D. students Anish Chandak and Lakulish Antani recently started Wavebridge Technology, Inc., with Dinesh Manocha and Ming C. Lin, distinguished professors of computer science. The company is creating software tools for sound synthesis and sound propagation that can be used by artists for generation of realistic sound contents for video games and movies. They can also be integrated directly into games to automatically generate an infinite variety of sound contents at run-time.



Jeff Terrell (Ph.D. 2009), right, and his business partner, Sir Robert Burbridge, started Altometrics, Inc., in 2010, with help from the Carolina Launch Pad. The company recently received a $150K Small Business Innovation Research Grant from the National Science Foundation.

Sound is crucial to immersing a user into a video game or movie. Sounds that are repetitive or "don't sound right" break a player's suspension of disbelief. Developers spend a lot of time in content creation: recording common sounds and tuning audio filters to create environmental echo and reverberation effects. This workflow costs time and money and fails to capture the infinite variation in real-world sounds. Chandak hopes that Wavebridge Technology can help bring the latest sound technology to the next generation of video games and sound effects in movies and provide a much richer sound experience for the user. For more information, visit *http://www.wavebridge.org*.

Above: 2011 CS graduate Kristen Janick and Research Professor Diane Pozefsky (Ph.D. 1979) pose for a photo at the 2011 CS Commencement reception. Pozefsky received the 2010-2011 Computer Science Club Undergraduate Teaching Award.

Left: Computer science undergraduate and 2011 Weiss Award recipient Stephanie Zolayvar demos one of her games at Maze Day 2011, an event that brings in blind and visually impaired children from kindergarten through high school to play games created just for them. The event is the brainchild of Professor Gary Bishop (Ph.D. 1984).

DEPARTMENT NEWS

WELCOME

New Staff

Katie-Rose Repp is proposal and outreach coordinator working with the Research Support and Communications team. She joined the department in March 2011.

Cory Quammen (M.S. 2006) is a senior software engineer working with Marc Niethammer and Russell Taylor in the CISMM group.

Visiting Researchers and Faculty

Jay Aikat (Ph.D. 2010) is a postdoctoral research associate working with Kevin Jeffay.

Adrian Ilie (Ph.D. 2010) is a postdoctoral research associate working with Greg Welch.

Young Jun Kim is a visiting researcher working with Dinesh Manocha and the GAMMA group.

Jungeun Lee is a visiting scholar working with Dinesh Manocha and the GAMMA group.

THANKS AND FAREWELL

Jenni Clark, proposal and outreach coordinator, left the department in July 2010.

Linda Houseman, technical support analyst, left the department in December 2010.

David Marshburn (M.S. 2000), research scientist with the CISMM group, left the department in February 2011.

John Smith, professor, retired from the department in December 2010.

CONGRATULATIONS

Faculty

Dinesh Manocha, Phi Delta Theta/Matthew Mason Distinguished Professor, was named a fellow of the American Association for the Advancement of Science.

Diane Pozefsky (Ph.D. 1979), research professor, was the recipient of the 2010-2011 Computer Science Club Undergraduate Teaching Award.

Marc Niethammer, assistant professor, and **Kevin Jeffay**, professor, were the recipients of the 2010-2011 Computer Science Student Association awards for excellence in teaching.

Graduate Students

Luis Torres was named the TA of the Year for 2010-2011. Luis is also the recent recipient of an NSF Graduate Research Fellowship. His research is on motion planning for snake-like medical robots, working with Assistant Professor Ron Alterovitz.

December 2010 M.S. recipients:
Camelia Simona Bacanu, Elizabeth Barnes Cavazos, Susu Li, Liang Shan, Chad Samuel Spensky, Jeremy Robert Wang, Xiaoyang Wen, Zhaojun Zhang.

December 2010 Ph.D. recipients:
Jayashree Aikat. *An Investigation of the Effects of Synthetic Traffic Generation on Network Performance.* Advisor: Kevin Jeffay.

Brian Sanderson Clipp. *Multi-Camera Simultaneous Localization and Mapping.* Advisors: Marc Pollefeys & Jan-Michael Frahm.

David Yishon Feng. *Visualization of Uncertain Multivariate 3D Scalar Fields.* Advisor: Russell M. Taylor II.

Adrian Dumitru Ilie. *On-Line Control of Active Camera Networks.* Advisor: Gregory Welch.

Christian Lauterbach. *Interactive Ray Tracing of Massive and Deformable Models.* Advisor: Dinesh Manocha.

May 2011 M.S. recipients:
Jason Lamont Carter, Chen-Rui Chou, Jeremy Paul Erickson, Alexander Lee Jackson, Yi-Hung Jen, Anson Yuanxi Liang, Deepika Mahalingam, Ravish Mehra, Robert Griffins Mills, Charles Gabriel Noneman, Chris Selzo, Peter Jacob Stein, Chiung-Yi Tseng, Andrew Maxwell White, Yue-ling Wong, Gu Ye, Jinghe Zhang, Zhaoyu Zhang.

May 2011 Ph.D. recipients:
David Robert Gallup. *Efficient 3D Reconstruction of Large-Scale Urban Environments from Street-Level Video.* Advisors: Marc Pollefeys & Jan-Michael Frahm.

Xiaoxiao Liu. *Shape-correlated Statistical Modeling and Analysis for Respiratory Motion Estimation.* Advisor: Stephen Pizer.

Jason Douglas Sewall. *Efficient, Scalable Traffic and Compressible Fluid Simulations Using Hyperbolic Models.* Advisor: Ming C. Lin.

Changchang Wu. *Geometry-driven Feature Detection for Improving Geometric Reconstruction.* Advisor: Jan-Michael Frahm.

Undergraduate Students

Stephanie Zolayvar is the recipient of the Stephen F. Weiss Award for Outstanding Achievement in Computer Science for 2011.

August 2010 B.S. recipients:
Reuben Matthew Ayres, William Eric Vogler.

December 2010 B.S. recipients:
Joshua Philip Kon, Caitlyn Mcleod Losee*, Michael Joseph Palmer, Ezra Galen Stuetzel.

May 2011 B.S. recipients:
Michael Abashian, Richard Allred, Max Beckman-Harned*, Eric Boren, Rebecca Brown, Benjamin Hawks, Kristen Janick, Maxmilian Kramer, Mary K. La, Leander Lanzo, Duncan Lewis, Rebecca Lovewell, David Lee Marron, Luke Moffett, Joshua Morton, Nathan Haynes Riddick, Elizabeth E. Sams, Abhishek Sarkar*, Hila Shemer, Michael Sumner, Cameron Swaim*, Zhe Zhang, Margaret Zhou*.

**With Honors*

UPCOMING WORKSHOPS

Jasleen Kaur is a co-chair for the 18th IEEE International Workshop on Local and Metropolitan Area Networks (LANMAN 2011), to be held in October in Chapel Hill.

NEW PATENTS

United States Patent 7,822,458
Title: Distal bevel-tip needle control device and algorithm
Inventors: Robert J. Webster, III; Allison M. Okamura, Noah J. Cowan, Gregory Chirikjian, Kenneth Y. Goldberg, Ron Alterovitz
Assignee: The Johns Hopkins University

United States Patent 7,913,007
Title: Systems, Methods, and Computer Readable Media for Preemption in Asynchronous Systems Using Anti-Tokens
Inventors: Montek Singh, Manoj Kumar Ampalam
Assignee: The University of North Carolina, Chapel Hill

RECENT SPONSORED RESEARCH AWARDS

Enabling Next-Generation Multicore Platforms in Embedded Applications, PIs: James Anderson and Sanjoy Baruah. Air Force Research Laboratory.

Interactive Computational Algorithms for Acoustic Simulation in Complex Environments. PI: Dinesh Manocha. Co-PI: Ming Lin. U.S. Army Research Office.

Predictive Modeling for Treatment of Upper Airway Obstruction in Young Children. PIs: Stephanie Davis (Pediatrics, UNC School of Medicine) and Richard Superfine. Co-PI: Russell Taylor. National Institutes of Health.

Ultra-Vis Phase 2A. PI: Jan-Michael Frahm. Subcontract to Applied Research Associates, Inc.

Vision Methods for Open-Universe Datasets. PI: Svetlana Lazebnik. U.S. Dept of the Interior.

IN MEMORIAM

Nancy H. Sitterson, 91, of Kinston, N.C., died on November 29, 2010, at Carol Woods Retirement Community in Chapel Hill. Nancy was the wife of the late J. Carlyle Sitterson, Professor of History and then Chancellor, who passed away in 1995 and for whom Sitterson Hall was named. Nancy received a master's degree at UNC from the School of Social Work. She was a member of the first Public Library board, organizer for Meals on Wheels, member of Chapel of the Cross Episcopal Church, and co-founder of the Carol Woods rose garden.

Nancy Weiss Stegman (M.S. 1976) of Chapel Hill, N.C., passed away December 19, 2010, at the age of 69. She was born in Brooklyn, N.Y., and received bachelor's degrees in English and Human Ecology from Cornell University. In 1965, she and her husband, Michael, moved to Chapel Hill where he accepted a faculty position at UNC. Nancy earned a master's degree in Computer Science in 1976, where she was advised by Dr. Stephen Weiss. At that time, she was one of the few women to hold such a degree. She went on to work in computer technology at the National Institute of Environmental Health Sciences in Research Triangle Park, N.C., as a contractor and career employee. She retired in 2008 after a fulfilling career spanning two decades.

Sharon W. Surles, 41, died September 13, 2010, after a rapid progression of breast cancer. She was born in Saxapahaw, N.C., and graduated from San Diego State University. She worked in the MSL in the Department of Computer Science at UNC from 1986-1992, and later worked at Qualcomm. She is survived by her best friend and husband of 22 years, Mark Surles (Ph.D. 1992), of Fredericksburg, Va. Sharon was an active member of Torrey Pines Christian Church in La Jolla, Calif., where she was an Elder and leader of small groups. She maintained a positive outlook throughout her four-year battle with cancer.

John Burton Zimmerman (Ph.D. 1985) died February 9, 2011, in Sacramento, Calif., after a brief illness. He grew up in Sweetwater, Tenn. He received a bachelor's degree from the University of Tennessee and studied Astrophysics at the University of Illinois. After reevaluating his career path, he earned his master's and doctorate degrees in computer science from UNC, where he was advised by Dr. Stephen Pizer. John went on to accept professorship positions at Washington University and Mallinckrodt Institute of Radiology. He also worked at Sun Microsystems for 14 years. At the time of his death, he held a professorship at the University of California, at Davis Medical Center, in Sacramento. He is survived by his wife, Dr. Rosalie Haggi.

FAMILY MATTERS

Graduate student **Isa Kemal Pakatci** married Aysenur Ozkan on 18 July 2010 in Aydin, Turkey. (*kemal@cs.unc.edu*)

Elise (London) Carmichael (B.S. 2005) and her husband, Patrick, welcomed Anastasia Caroline on 15 October 2010. (*elondon@gmail.com*)

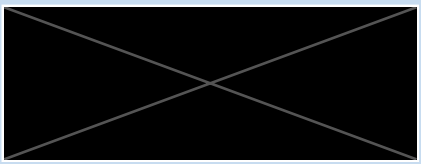
Greg Coombe (Ph.D. 2007) and his wife, Kavita, welcomed Surina Dave Coombe on 22 October 2010, in San Francisco, Calif. (*greg.coombe@gmail.com*)

Benjamin Lok (Ph.D. 2002) and his wife, Laura, welcomed Kevin Soon Ming Lok on 12 November 2010. Kevin joins twin siblings Sophia and Brandon, who are almost 2. (*lok@cise.ufl.edu*)

Lenwood Heath (Ph.D. 1985) married Deanie Harris Dunbar on 18 December 2010 in Bethel, N.C. (*heath@vt.edu*)

David Gotz (Ph.D. 2005) and his wife, Anne, welcomed Issac Arthur Gotz on 27 December 2010. Issac joins big sister, Sarah, who is 2. (*dgotz@us.ibm.com*)

Adrian Ilie and his wife, Barbara, welcomed Gabriel Robert Ilie on 30 December 2010. (*adyilie@cs.unc.edu*)



Postdoctoral researcher **Pierre Fite-Georgel** and his wife, Virginie, welcomed Charly Marcel Fite-Georgel on 6 April 2011. (*pierre.georgel@gmail.com*)

Amitabh Varshney (Ph.D. 1994) and his wife, Poonam, welcomed Somil Varshney on 3 May 2011. Somil joins big brother, Ayush, who is 8. (*varshney@umiacs.umd.edu*)

Professor Emeritus **Steve Weiss**, and his wife, Iris, welcomed a second grandson, Elliot Austin Weiss, on 6 May 2011. Elliot's parents are Heather and Jeremy Weiss. (*weiss@cs.unc.edu*)

ALUMNI NEWS

M.S. and Ph.D. Alumni

Kathryn Britton (M.S. 1977) is a co-editor of a recently published book, *Gratitude: How to Appreciate Life's Gifts - http://tinyurl.com/GratitudeBook*. This is the second in a series published by Positive Psychology News. She also co-edited the first book in the series released in 2009, *Resilience: How to Navigate Life's Curves - http://tinyurl.com/ResilienceBook*. Both books emerged from her work as associate editor for the online publication, Positive Psychology News Daily -- *http://positivepsychologynews.com*. (*britton.kathryn@gmail.com*)

Hala Fauzi (M.S. 1987) was interviewed by NBC Bay Area regarding the revolution in Egypt. You can see the interview on YouTube at *http://www.youtube.com/watch?v=4KCEi9vp1Zw* (*thehala@gmail.com*)

Raymond Van Dyke (M.S. 1989), an intellectual property/technology attorney in Washington, D.C., Texas and Maryland, was a recent delegate at a World Intellectual Property Organization meeting in Geneva, appointed to the Washington, D.C., Intergovernmental Group Advisory Board, and re-appointed the Greater Washington, D.C., and Northern Virginia Chapter Chair of the Licensing Executives Society. (*vandyke@acm.org*)

John Q. Walker (Ph.D. 1991) was featured in the "Dream Jobs" issue of the *IEEE Spectrum* magazine in February 2011: *http://spectrum.ieee.org/geek-life/profiles/dream-job-john-q-walker-ii*. The company he co-founded, Zenph Sound Innovations, was also featured in the April 2011 issue of *The Absolute Sound* magazine. John is currently chairman and chief technology officer at Zenph Sound Innovations. (*johnq@zenph.com*)

Tim Gramling (M.S. 1995) began pursuing a Doctorate in Law and Policy at Northeastern University in July 2010. The focus of his research is socioeconomic factors in graduation rates at for-profit universities. You can find out more about this program at *http://cps.neu.edu/degree-programs/graduate/doctoral/doctorate-law-policy.php?/law*. Tim was also elected to a three-year term on the board of directors at the Metropolitan Organization to Counter Sexual Assault beginning in January 2011. The mission of this Kansas City-based non-profit is to counter the ill effects of sexual assault and abuse through prevention, education, treatment, intervention and advocacy. You can find out more about this organization at *http://www.mocsa.org*. Tim is currently president of Colorado Technical University, Kansas City campus. (*TGramling@kc.coloradotech.edu*)

Julia Grace (M.S. 2007) is now part of the Visual Analytics Research group at IBM Almaden Research Center in San Jose, Calif., focusing on information visualization. Julia gave a keynote talk at the Web 2.0 Expo in New York City in fall 2010 and a keynote talk at the Where 2.0 Conference in Santa Clara, Calif., in April 2011. She is part of the Computer History Museum's Next Generation Advisory Board, and sits on the Industry Advisory Board for the California Polytechnic State University Computer Science Department in San Luis Obispo, Calif. She can be found online at *juliahgrace.com* and in person in Mountain View, Calif. (*jewelia@gmail.com*)

Jeff Terrell (Ph.D. 2009) is co-founder and CTO of Altometrics, Inc., which recently received a Small Business Innovation Research (SBIR) grant from the National Science Foundation. You can read more about Altometrics, Inc., on page 3. (*jeff.terrell@acm.org*)

Undergraduate Alumni

Del Greco Wood (B.S.M.Sci. 1985) recently changed jobs to be CIO at Retail Data in Richmond, Va. Previously, he was COO at Musictoday in Charlottesville, Va. (*delgrecowood@gmail.com*)

Robin Munesato Chan (B.S.M.Sci. 2000) was recently promoted to Platform Software Manager at Tekelec. (*rcmariko@gmail.com*)

Courtney McCarthy Ramey (B.S.M.Sci. 2002) was promoted to Executive Director at Jabian Consulting in fall 2010. (*courtney.ramey@gmail.com*)

Mahmood Ali Qureshi (B.S. 2005) was recently promoted to Manager at Accenture. He has been working with them for the past three years and specializes in Oracle CRM. (*mahmood.a.qureshi@accenture.com*)

Joel Sutherland (B.S. 2007) and **Kris Jordan** (B.S. 2007) are two of the co-founders of New Media Campaigns, a company that creates web sites for businesses and politicians. In fall 2010, they were named to Bloomberg Businessweek's list of top 25 entrepreneurs under 25: *http://images.businessweek.com/ss/10/09/0923_young_entrepreneurs/21.htm*. Joel and Kris started NMC, along with UNC grad Clay Schossow, in 2006, while they were still undergrads at UNC. (*joel@newmediacampaigns.com*, *kris@newmediacampaigns.com*)

Friends of the Department

Jane Richardson was recently named President-Elect of the Biophysical Society. Richardson is a professor of biochemistry in the Duke University School of Medicine and, along with her husband, David, heads the Richardson Lab. (*dcrjsr@kinemage.biochem.duke.edu*)

Liyun Yu, postdoctoral fellow in 1994-1996 working with Steve Pizer, was elected as the voting Board member and Conference Director for the ISSA Raleigh Chapter, beginning in January 2011. (*liyunyu@med.unc.edu*)

ALUMNI PUBLICATIONS

Ron Azuma (Ph.D. 1995) (*ronald.azuma@nokia.com*):
Jason Wither, Rebecca Allen, Vids Samanta, Juha Hemanus, Yun-Ta Tsai, Ronald Azuma, Will Carter, Rachel Hinman, Thommen Korah. The Westwood Experience: Connecting Story to Locations Via Mixed Reality. *Proceedings of ISMAR Arts, Media and Humanities 2010* (ISMAR AMH 2010, Seoul, Korea, 13-16 Oct. 2010), pp. 39-46.

RECENT PUBLICATIONS

Bastoni, A., B. Brandenburg and J. Anderson. "An Empirical Comparison of Global, Partitioned, and Clustered Multiprocessor Real-Time Schedulers," *Proc. of the 31st Real-Time Systems Symposium*, IEEE Computer Society Press, San Diego, CA, Dec. 2010.

Brandenburg, B., and J. Anderson. "Optimality Results for Multiprocessor Real-Time Locking," *Proc. of the 31st Real-Time Systems Symposium*, IEEE Computer Society Press, San Diego, CA, Dec. 2010.

Brandenburg, B., H. Leontyev and J. Anderson. "An Overview of Interrupt Accounting Techniques for Multiprocessor Real-Time Systems," *Journal of Systems Architecture*, special issue on selected papers from the 15th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications, 2010.

Brandenburg, B., and J. Anderson. "Spin-Based Reader-Writer Synchronization for Multiprocessor Real-Time Systems," *Real-Time Systems*, special issue on selected papers from the 21st Euromicro Conference on Real-Time Systems, 2010.

Clipp, B., J. Lim, J.-M. Frahm and M. Pollefeys. "Parallel, Real-Time Visual SLAM," *IROS 2010.*

Elliott, G., and J. Anderson. "Real-Time Multiprocessor Systems with GPUs," *Proc. of the 18th International Conference on Real-Time and Network Systems*, Toulouse, France, Nov. 2010, pp. 197-206.

Feng D., Y. Lee, L. Kwock and R. Taylor. "Linked exploratory visualizations for uncertain MR spectroscopy data," *Proc. of the Conference on Visualization and Data Analysis*, SPIE 2010.

Feng, D., Y. Lee, L. Kwock, and R. Taylor. "Matching Visual Saliency to Confidence in Plots of Uncertain Data," *TVCG*, 16(6), 2010, pp. 980-989.

Fite-Georgel, P., T. Johnson and J.-M. Frahm, "City-Scale Reality Modeling from Community Photo Collection," *ISMAR 2010* workshop on Augmented Reality Super Models.

Frahm, J.-M., M. Pollefeys, S. Lazebnik, B. Clipp, D. Gallup, R. Raguram and C.Wu. "Fast Robust Reconstruction of Large Scale Environments," *CISS 2010.*

Frahm, J.-M., P. Georgel, D. Gallup, T.Johnson, R. Raguram, C. Wu, Y.-H. Jen, E. Dunn, B. Clipp, S. Lazebnik and M. Pollefeys. "Building Rome on a Cloudless Day," *ECCV 2010.*

Gallup, D., J.-M. Frahm and M. Pollefeys. "A Heightmap Model for Efficient 3D Reconstruction from Street-Level Video," *International Symposium for 3D Data Processing, Visualization and Transmission* (3DPVT), 2010.

Gallup, D., J.-M. Frahm and M. Pollefeys. "Piecewise Planar and Non-Planar Stereo for Urban Scene Reconstruction," *IEEE Conference Computer Vision and Pattern Recognition (CVPR)*, 2010.

Gallup, D., M. Pollefeys and J.-M. Frahm. "3D Reconstruction using an n-Layer Heightmap," *DAGM 2010.*

Johnson, T., R. Raguram, P. Georgel and J.-M. Frahm. "Fast Organization of Large Photo Collections using CUDA," *ECCV workshop for Computer Vision on GPUs.*

Kim, S.J., D. Gallup, J.-M. Frahm and M. Pollefeys. "Joint Radiometric Calibration and Feature Tracking System with an Application to Stereo," *Journal of Computer Vision and Image Understanding*, 2010.

Lim, J., M. Pollefeys and J.-M. Frahm. "Online Environment Mapping," *IEEE Conference on Computer Vision and Pattern Recognition*, CVPR 2011.

Liu, C., and J. Anderson. "Supporting Soft Real-Time DAG-based Systems on Multiprocessors with No Utilization Loss," *Proc. of the 31st Real-Time Systems Symposium*, IEEE Computer Society Press, San Diego, CA, Dec. 2010.

Lobaton, E.J., R. Vasudevan, R. Bajcsy, and R. Alterovitz. "Local Occlusion Detection Under Deformations Using Topological Invariants," *Proc. of European Conference on Computer Vision* (ECCV), *Lecture Notes in Computer Science 6313*, Sept. 2010., pp. 101-114.

Narain, R., A. Golas and M.C. Lin. "Free-flowing Granular Materials with Two-way Solid Coupling," *ACM Transactions on Graphics, Proc. of SIGGRAPH Asia*, vol. 29, 2010.

Pan, J., and D. Manocha. "GPU-based Parallel Collision Detection for Real-time Motion Planning," *Algorithmic Foundations of Robotics IX: Selected Contributions of the Ninth International Workshop on the Algorithmic Foundations of Robotics (WAFR), Springer Tracts in Advanced Robotics (STAR)*, vol. 68, 2011, pp. 211-228.

Patil, S. and R. Alterovitz. "Interactive Motion Planning for Steerable Needles in 3D Environments with Obstacles," *Proc. of IEEE RAS/EMBS Int. Conf. Biomedical Robotics and Biomechatronics (BioRob)*, Sept. 2010, pp. 893-899.

Quammen, C. and R. Taylor. "Adapting ITK Framework to fit Parametric Image Models," *Kitware Source*, Issue 16, Jan. 2011, pp. 9-12.

Schissler, C. and D. Manocha. "GSound: Interactive Sound Propagation for Games," *AES International Conference on Audio for Games*, 2011.

Schneider, J., D. Garatly, M. Srinivasan, S.J. Guy, S. Curtis, S. Cutchin, D. Manocha, M.C. Lin and A. Rockwood. "Towards a Digital Makkah - Using Immersive 3D Environments to Train and Prepare Pilgrims," *International Conference on Digital Media and its Applications in Cultural Heritage (DMACH)*, 2011.

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Professor John B. Smith (right) is pictured with UNC women's soccer coach Anson Dorrance. John is a long-time fan and supporter of the UNC women's soccer team, and Coach Dorrance made a surprise appearance at John's retirement party in December 2010. John was presented with a signed soccer ball from the 2009 national champions, as well as a signed copy of Coach Dorrance's biography. John Smith was a professor in the Department of Computer Science from 1984-2010.