

M. Cobbie Behrend**B.S. MATH '00**

After graduation, I worked for Compuware Corporation, Inc. as a J2EE Java consultant. I stayed with Compuware for a little over two years and then moved to a smaller company, Centare Group, LLC. In the summer of 2005, I moved to a smaller company still, Corporate Technology Solutions, Inc. (<http://www.consult-cts.com>), where I became a managing partner in January of 2007. Consulting is a great career choice for me, because it provides me with the opportunity to interact with two different domains: people and corporate environments. It also demands role versatility: developer, designer, mentor, tester, recruiter, business analyst, project manager, and salesperson. In 2003, I spoke on automated web testing at the No Fluff Just Stuff symposium. I'm considering speaking again at the NFJS tour this fall (2007) or next year. Currently, I am still focused on J2EE Java development, and I've just started learning .NET development as well. Agile Development is my passion, and I specialize in Agile Development techniques, such as Test Driven Development, which I have been practicing since graduation from Marquette.

Albin Laga**M.S. COMPUTING '06**

Does missionary and service work in Tanzania.

Songlin Tan**M.S. MSCS '00**

I wanted to let you know that with your help, I have moved to Chicago and work with Discover Financial Service. It is a similar data warehouse position as my previous job, but the systems, procedures, and tools are much more complex. I am looking forward to, and enjoying, the challenges. I don't know how to say "thank you" enough. I appreciate your help from my heart, and feel fortunate that I can always turn to you for help on my career growth.

Kimberly Aksamit**B.S. MATH '07**

Graduate school [at the University of Colorado Denver] is going well. I was really overwhelmed at first and didn't quite trust that I could do it, but I'm now settled in and absolutely loving it.

In addition to school, I'm also working two very part-time jobs: as a private tutor for a 10th grader and as an instructor for Sylvan Learning Center where I teach SAT/ACT preparatory courses, and also do individual tutoring. I presented a talk, *In the Pipeline*, at the Mathematics and Science Symposium at Minnesota State Community and Technical College in Fergus Falls, Minnesota in May, 2007.

This summer, I worked as a teaching assistant for the Johns Hopkins University's Center for Talented Youth (CTY) in Easton, PA. CTY summer programs consist of two 3-week sessions geared towards fostering the educational development of gifted children. I was employed for both sessions, helping to plan and give classroom instruction for two courses: Mathematical Modeling and Chaos Theory and Fractals.

WHERE IN THE WORLD IS DR. JONES?

Your memory of the last picture in "Where in the world is Dr. Jones?" may be pretty foggy by now, unlike the picture itself. It was from Mount Hood, in Oregon. Dan Kumprey (B.S. Mathematics, 1991) picked it up right away and gets "the prize". The quiz in this issue is not going to stump too many of you, I suspect, but prizes to the first three of you with correct answers anyway.



We would like to know where you are and what you are doing.
Please e-mail us at newslet@mscs.mu.edu

Colloquia (2007)

January 19: Tetyana Berezovski, Mathematics Education, Simon Fraser University, Canada: *Towards Effective Teaching: The Case for Logarithms*.

January 26: Douglas Harris, Department of Mathematics, Statistics and Computer Science, Marquette University: *PreProPer*.

February 02: Chris Hruska, Department of Mathematical Sciences, University of Wisconsin, Milwaukee, WI: *Nonpositively Curved Spaces with Isolated Flats*.

February 09: Joseph Bockhorst, Department of Electrical Engineering and Computer Science, University of Wisconsin, Milwaukee, WI: *Computational Methods for Learning Diversity Models of Biological Sequences and Their Role in the Search for a Malaria Vaccine*.

February 21: Denise B. Forrest, The Ohio State University-Newark, Newark, OH: *Re-searching Mathematics Teachers' Verbal Communication*.

March 30: Hong Yu, College of Health Sciences, University of Wisconsin, Milwaukee, WI: *Question Answering Systems for Physicians and Biomedical Researchers*.

April 13: Suzanne Hruska, Department of Mathematical Sciences, University of Wisconsin, Milwaukee, WI: *Holomorphic Motions and Complex Dynamics*.

April 20: Matt Insall, Department of Mathematics, University of Missouri, Rolla, MO: *Differentiation in Some Topological Structures*.

April 27: Matt Mutka, Department of Computer Science and Engineering, Michigan State University, East Lansing, MI: *Service Discovery in Pervasive Computing Environments*.

September 21: Phil McGachey, Purdue University, West Lafayette, IN: *Transparent Distribution of Java Applications*.

October 5: Pippa Simpson, PhD, Department of Pediatrics, Medical College of Wisconsin, Milwaukee, WI: *Branching Out with Trees to Analyze Data*.

October 12: Bart Kastermans, Department of Mathematics, University of Wisconsin, Madison, WI: *On Cofinitary Groups*.

October 26: Wesley Johnson, PhD., Department of Statistics, University of California, Irvine, CA: *Bayesian Non-Proportional Hazards Survival Analysis*.

November 9: Matthew Jackson, Department of Mathematics, Lawrence University, Appleton, WI: *Using Algebraic Logic to Understand the Sheaf of Measures*.

November 26: Marta Magiera, Department of Mathematics and Science Education, Illinois Institute of Technology-Chicago, IL: *Metacognition in Solving Complex Problems: A Case Study of Situations and Circumstances that Prompt Metacognitive Behaviors*.

December 5: Jennifer A. Kaminski, Center for Cognitive Science, Ohio State University, Columbus, OH: *Promoting Transfer of Mathematical Knowledge*.

December 14: Levi Molenje, Mathematics Education, Syracuse University, Syracuse, NY: *High School Mathematics Teachers' Use of Multiple Representations When Teaching Functions in Graphing Calculator Environments*.

BIRTHS: Larkin Jasna Struble 9/6/07
Gillian Nancy Rolli (Sanders) 5/16/07
Harrison Walter Jolley 8/23/07
Nora Brazauskas (Bajorunaite) 11/27/07
Sheridan Scott Joseph (Scott) 1/21/07

MARRIAGE: Praveen Madiraju to Srilaxmi Malladi 7/7/07

RETIREMENT: John Simms 12/31/07

Mathematics, Statistics and Computer Science

Helen Way Klingler College of Arts and Sciences



MARQUETTE
UNIVERSITY

FALL 2007 NEWSLETTER

Systems Lab Unveils Experimental Embedded Operating System

Dr. Dennis Brylow wants to change the way that core systems courses are taught in the computer science major, and he doesn't care how many wireless routers have to be sacrificed to do it.

Recipient of an \$80K grant from Cisco Systems for "Creation Of An Embedded Systems Curriculum And Laboratory", Brylow has been building up the hardware and software infrastructure needed to refocus outdated computing courses on the technology of the future.

"With the proliferation of wireless networking, wireless access points have become ubiquitous on campuses, in businesses, even in people's homes," says Dr. Brylow. "While this kind of consumer electronic device used to be made out of special purpose circuitry, it now contains an embedded processor. It's a computer inside; more powerful than desktop PC's were in the early 1990's. It is readily available at retail electronic stores at the reasonable price of approximately \$50. Somebody needs to build the software for these devices, and that somebody is going to be people like our graduates."

"Up until recently, it was assumed that only large, state-funded research Universities could afford the specialized equipment needed to provide practical lab experience with a lot of these kinds of embedded devices," Dr. Brylow explains. "Our work here at Marquette has now shown that we can build a top-notch experimental operating systems lab that targets embedded platforms at a fraction of the cost of the larger institutions, and without the huge investment in specialized lab space."

Student involvement in the research is one of Dr. Brylow's top priorities. "Eight students are currently involved directly on the project, both graduate and undergraduate, either working off of the grant, or earning independent study credit. Another six students are working on associated senior design projects. Students meet twice weekly during the semester to discuss current related research, design new system components, formally review their completed software, and troubleshoot practical obstacles to the groups goals."

Dr. Brylow's idea has already had a significant impact on the sophomore year sequence of hardware systems and operating systems courses, and is beginning to be duplicated at other universities. "Our goal was not just to lead the way in building this curriculum, but to pave the way for those who would follow." A dedicated team of student research assistants released the first version of the Embedded XINU operating system this past summer, and have amassed a significant body of support documentation on the project's website.

Dr. Brylow further added, "Faculty at other schools want to show students how to modify code for a real system, and run it on an actual embedded processor -- we can show them how to do that now."

There's no need to simulate modern RISC architectures for courses in machine organization -- we've got the real thing here." In addition to the practical education deliverables, the project is now beginning to produce research dividends. Several conference publications have already come out of the project, and several more are planned. The research group will accompany Dr. Brylow to the top computer science education conference in Portland this March where he will present his SIGCSE Paper, "An Experimental Laboratory Environment for Teaching Embedded Operating Systems".

The Embedded XINU Project webpage is at <http://xinu.mscs.mu.edu/>.



The Systems Lab Crew. l. to r. Justin Picotte, Aaron Gember, Dr. Brylow, Paul Hinze, Michael Schultz

FROM THE CHAIRS

Although Steve Merrill has been Acting Chair this fall, while I take a sabbatical, I thought I would include a few words, since I will be back at my desk come January. It has been somewhat of a tumultuous semester, and I have actually been at my desk more than I hoped would be the case (but less than I feared). The Sword of Damocles hanging over our doctoral program -- a picture of which I included in my Annual Report for last year -- came down rather sharply in September. Our two-headed chairmanship has vigorously counterattacked by instead proposing that we realign the program along the lines of Computational Science, rather than simply Mathematics, thereby integrating the strands of our department much more tightly into a program that would be at the vanguard of a movement towards interdisciplinary doctoral studies across the nation. Through our hiring over the past seven years, particularly in computer science, we have the foundations of a program that would be unique in that its core - mathematics, statistics and computer science - would be housed within one department, while incorporating faculty from various disciplines within sciences and engineering in an integral way. As I write, we have received great encouragement to proceed from the Board of Graduate Studies, but given the administration's desire to close our program, the status is very unclear.

Peter Jones, Chair

Dept. of Mathematics, Statistics and Computer Science

A department is composed of many parts -- the names that appear on faculty and staff lists, lists of students and majors, as well as labs and offices. A department also is defined by its connections to other entities in the University and community through research and teaching activities.

Another aspect of a department is its history -- alumni, former faculty, and programs which have shaped what exists today. As with a human, the path to adulthood matters. The experiences, education, people you meet, and your family have an indelible influence on the person you are to be.

The Department of Mathematics, Statistics and Computer Science through this Newsletter, acknowledge your contribution in the past and interest in the future of the Department. We welcome your continued participation.

Stephen J. Merrill, Acting Chair

Dept. of Mathematics, Statistics and Computer Science

IN THIS ISSUE

Letters from the Chairs.....	1
Undergraduate News.....	2
Activities and Awards.....	2
Research and Publications.....	3
Graduate News.....	3
Graduations.....	3
Alumni News.....	4
MSCS Updates.....	4
Where In the World Is Dr. Jones?.....	4

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This newsletter is a publication written by students and MSCS faculty for alumni of the Department of Mathematics, Statistics, and Computer Science Marquette University.

ACTIVITIES & AWARDS

Sheikh Iqbal Ahamed

Presented: *High Confidence Software Technologies*, Peking University, organized by Key Laboratory of High Confidence Software Technologies, Peking, China, July 2007.

Ruta Bajorunaite

Presented: *Method of Trimmed Moments for Robust Fitting of Parametric Failure Time Models*, Joint Statistical Meetings, Salt Lake City, UT, August, 2007.

Attended: The Redesign Alliance First Annual Conference, Orlando, FL, March, 2007.

Awarded: *Co-PI: Techniques for Modeling Complex Longitudinal Studies*, (Principal Investigator: John P. Klein, Division of Biostatistics, Medical College of Wisconsin), National Institute of Health, 2007 - 2011.

Paul Bankston

Presented: *On Continuous Images of Acyclic Continua*, Spring Topology and Dynamics Conference 2007, University of Missouri, Rolla, MO March 2007; *Chainability and Unidimensionality from a Model-Theoretic Perspective*, Canadian Math. Society and MITACS Joint Conference, University of Manitoba, June, 2007.

Dennis Brylow

Presented: *Experimental Operating System Lab on a Dime*, at the faculty poster session; *Linking Secondary Mathematics and Post-Secondary Computer Science*, co-discussion leader, SIGCSE 2007 (Technical Symposium on Computer Science Education, Covington, Kentucky, March 2007).

Awarded: *Creation of an Embedded Systems Curriculum and Laboratory*, Cisco Systems, \$80,000, 2007; *Faculty Development Award*, Marquette University Klingler College of Arts and Sciences, \$5000, 2007.

Anne Clough

Awarded: *Lung Metabolism: Multiple Indicator Dilution*, (Co-Investigator) National Institutes of Health: NHLBI, PI: Said Audi (BIEN), \$200,000, 2007 – 2011.

Kim Factor

Presented: *Local Out-Tournaments with Upset Tournament Strong Components: Equal Matrix Ranks of Less than N*, at the 38th Southeastern International Conference on Combinatorics, Graph Theory and Computing, Boca Raton, FL, March, 2007.

Attended: Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, NE, February, 2007.

Douglas Harris

Presented: in the track, Foundations in Computer Science, at the 2007 World Conference in Computer Science, Computer Engineering and Applied Computing, Las Vegas, NV, July 2007.

Peter Jones

Attended the national conference as a delegate of the Marquette Chapter of SIGMA XI, the Scientific Research Society, Orlando, FL, November, 2007.

Gary Krenz

Presented: Poster, *Mathematical Modeling of Redox Enzyme Kinetics in Pulmonary Endothelial Cells*, at the International Meeting of the American Thoracic Society, San Francisco, CA, May 2007.

Attended: 8th World Congress for Microcirculation, Milwaukee, WI, August 2007; 1st Annual Midwest Symposium on Computational Biology and Bioinformatics, Northwestern University, Evanston, IL, October 2007.

John Moyer

Presented: *Algebraic Thinking Around the World; Fostering High Quality Teaching in Daily Practice through the Lens of a Research Protocol; Teachers' Use of Reform Materials and Traditional Textbooks and Designing Longitudinal Studies of Curricula: Insights from Three NSF-Funded Projects*; at the National Council of Teachers of Mathematics 2007 Annual Meeting and Exposition, Atlanta, GA March 2007.

Facilitated: *Algebraic Thinking and Structures for Teachers* at the Conference on Mathematical Preparation for Middle School Teachers of Mathematics: A Wisconsin Concern, sponsored jointly by the Wisconsin Department of Public Instruction and the Milwaukee Mathematics Partnership, Wisconsin Dells, WI, October 2007.

Attended: Association of Mathematics Teacher Educator Eleventh Annual Conference, Irvine, CA, January 2007; Shared Futures/Common Ground: Science, General Education and Global Learning, Summer institute of the Association of American Colleges and Universities Shared Futures Initiative, Sonoma, CA, July 2007. (See photo below.)

Craig Struble

Attended: Second BioCreative Challenge Evaluation Workshop, Madrid, Spain, April 2007; 1st Annual Midwest Symposium On Computational Biology & Bioinformatics, Chicago, IL, October 2007. (See photo below.); Computation in Biology and Medicine (CIBM) Retreat, Madison, WI, October 2007.



Jack Moyer at Shared Futures



Craig Struble at BioCreative Challenge in Madrid

UNDERGRADUATE NEWS

PI MU EPSILON

Congratulations and welcome to our new inductees of 2007-2008:

Brian Arnold
Greg Brockway
Aaron Gember

Mohammad U. Khan Emma Lee Riesterer Joshua Vinduska
Sarah Kuchta Kristin Rudnick Andrew Walloch
Robert Leimbach Adrianna Stanley Kari Diandra Watson
Cheryl Perich Benjamin Sturm Jon Wittrock
Mariel Ponseti Katherine Szczesniak



Pi Mu Epsilon Inductees 2007-08

MATH CLUB AWARD

Sarah Schmitt is the 2007 recipient of the Math Club award. Sarah is currently working on her Ph.D. in Optimization at the University of Colorado Denver.



Sarah Schmitt

MIRIAM CONNELLAN MATHEMATICS EDUCATION AWARD

Anne Candioto is the 2007 winner of the Miriam Connellan Mathematics Education Award (no photo available). Anne is currently a doctoral student in mathematics at the University of Wisconsin, in Madison.

PME Officers for 2007-2008: Matthew Westphal, President; Elizabeth Nieman, Vice-President; Stephanie Brescia, Treasurer; Erica Eaton, Secretary; Dr. Rebecca Sanders, Advisor

ROAD TRIP



Dr. Kim Factor with students Kimberly Aksamit (middle) and Sarah Schmidt (right)

Dr. Kim Factor along with undergraduates Kimberly Aksamit and Sarah Schmitt set out on a road trip to the Nebraska Conference for Undergraduate Women in Mathematics, held from February 9th to the 11th at the University of Nebraska - Lincoln. Sarah presented her paper, *An Application of Dominating Sets*, before an audience of 40 attendees, regarding the new research she had performed in her Discrete Mathematics course at Marquette. She received 'rave' reviews from the audience who requested more information about doing independent research in an undergraduate setting.

The undergraduate women attended research presentations representing a cross-section of mathematicians in academia, government and industry. This was the 9th conference of its kind with more than 200 participants. It was a wonderful opportunity for Kimberly and Sarah. Of course, Dr. Factor had a great time with the young ladies as well!

Complete publication listing is available at: www.marquette.edu/research/

Iqbal Ahamed

A software-based trust framework for distributed industrial management systems, (with Mohammad Zulkernine, and Steve Wolfe), Journal of System and Software 2007, Elsevier publications, 2007, pp. 1621-30.

An Omnipresent Formal Trust Model (FTM) for Pervasive Computing Environment, (with Munirul Haque), Proceedings of the 31st Annual International Computer Software and Applications Conference (COMPSAC 2007), IEEE CS Press, Beijing, China, July 23-27, pp. 49-56. [Beginning 2006, COMPSAC is designated as the IEEE Computer Society Signature Conference on Software Technology and Applications] (**Best Paper Award from 325 submissions**).

An Authentication based Lightweight Device Discovery (ALDD) Model for Pervasive Computing, (with Munirul Haque, Haifeng Li, and KM Asif), Proceedings of the 31st Annual International Computer Software and Applications Conference (COMPSAC 2007), IEEE CS Press, Beijing, China, July 23-27, pp. 57-64.

Ruta Bajorunaite

Two-sample Tests of the Equality of Two Cumulative Incidence Functions (with Klein, J.P.), Computational Statistics and Data Analysis, 51, (9), 2007, pp. 4269-4201.

Racial and Ethnic Variation in the Provision of Dental Procedures (with Okunseri, C., Matthew, R., Iacopino, A.M.), Journal of Public Health Dentistry, 67, (1), 2007, pp.20-27.

Comparison of Nanoindentation Measurements Between Osteogenesis Imperfecta Type III and Type IV and Between Different Anatomic Locations (Femur/Tibia versus Iliac Crest) (with Fan, Z., Smith, P.A., Harris, G.F., Rauch, F.), Connective Tissue Research, 48, (2), 2007, pp. 70-75.

Naveen Bansal

Decision Theoretic Bayesian Hypothesis Testing with the Selection Goal, Statistics & Decisions, vol. 25, pp. 19-39, 2007.

Dennis Brylow

An Experimental Laboratory Environment for Teaching Embedded Hardware Systems, Proceedings of WCAE 2007: Workshop on Computer Architecture Education, pp. 44-51, San Diego, CA, June, 2007.

Jim Factor

Domination Graphs of Extended Rotational Tournaments: Chords and Cycles, Ars Combinatoria, 82 (2007), pp. 69-81.

Kim Factor

Digraphs with Isomorphic Underlying and Domination Graphs: Connected $UG^C(D)$, (with Larry Langley), Discussiones Mathematicae: Graph Theory, 27 (1), (2007), pp.51 – 67.

Characterization of Digraphs with Equal Domination Graphs and Underlying Graphs, (with Larry Langley), Discrete Mathematics, (doi:10.1016/j.disc.2007.03.42.)

Gary Krenz

Influence of Pulmonary Arterial Endothelial Cells on Quinone Redox Status: Effect of Hyperoxia-Induced NAD(P) H:Quinone Oxidoreductase 1, (with Merker, M.P., Audi, S.H., Bongard, R.D., Lindemer, B.J.), Am J Physiol Lung Cell Mol Physiol, 290 (3), (2006 Mar), L607-19.

Role of mitochondrial electron transport complex I in coenzyme Q1 reduction by intact pulmonary arterial endothelial cells and the effect of hyperoxia, (with Merker, M.P., Audi, S.H., Lindemer, B.J., and Bongard, R.D.), Am J Physiol Lung Cell Mol Physiol, 293 (3), (2007 Sept), L809 – 19.

Praveen Madiraju

A Framework for Constraint Checking Involving Aggregates for Multiple XML Databases using Schematron, (with Albin Laga), Proceedings of 16th International Conference on Software Engineering and Data Engineering (SEDE-2007), July 9 – 11, 2007, Las Vegas, NV.

John Moyer

Developing Algebraic Thinking in Earlier Grades: Some Insights from International Comparative Studies, National Council of Teachers' of Mathematics 70th Yearbook (2008): Algebra and Algebraic Thinking in School Mathematics.

Stephen Merrill

To Again Feel the Creative Voice, International Journal of Science and Mathematics, ed., 5 (2007), pp. 145-164.

Craig Struble

Combined Conditional Random Fields and n-gram Language Models for Gene Mention Recognition, (with Richard J. Pavinelli, Michael T. Johnson, Dina Berchanskiy, Jidong Tao, and Marek Trawicki), Proceedings of the Second BioCreative Challenge Evaluation Workshop (2007) 81-83.

Molecular targets of 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin (TCDD) within the zebrafish ovary: Insights into TCDD-induced endocrine disruption and reproductive toxicity, (with Tisha C. King Heiden, Matthew L. Rise, Martin J. Hessner, Reinhold J. Hutz and Michael J. Carvan III), Reproductive Toxicology, in press.

Synergistic use of compound properties and docking scores in neural network modeling of CYP2D6 binding: predicting affinity and conformational sampling, (with Bazeley, P.S., Prithvi, S., Pavinelli. R.J., Sem, D.S.), J. Chem. Inf. Model (2006) Nov-Dec 46(6) 2698-2708.

December 2006

B.S. in INAM
Ousman Kondeh

B.S. in Computer Science
Gregory Godachy
Stephen Luppi
Richard Zheng

B.S. in Mathematics
Rebecca Kohler
Jessica Reavis
Scott Shander

B.S. in Teaching Mathematics
Ashley Guralski

M.S. in MSCS
Devin Sigulinsky
Pooja Gautham

May 2007

B.S. in Computational Mathematics
Ashley Baranowski **

B.S. in Computer Science
Michael Rodney*
Elias Peterson
Justin Rawson
Timothy Bindas
Phillip VanHoven

B.S. in INAM
Katie Stolpa*

B.S. in Mathematics
Kimberly Aksamit
Ryan Biros
Nicole Halama***
Christopher Langietti
Patrick McFadden
Sarah Schmitt***
Kevin Chovanec**
John Cleaveland

B.S. in Mathematics (Computer Science)
Michael Schultz

B.S. in Teaching Mathematics
Anne Candioto**
Kate Schulte
Steven Flasz

M.S. in Computing

Mark Carter
Sumedha Nandedkar
Sabitha Y. Reddy
Alexander J. Pezewski
Sreekanth Balasubramanian
Pinky Patanaik
Al. L. Pezewski
Javen A. Syed
Jae Eun Kim
Cynthia Maxel

M.S. in MSCS (Computer Science)
Md. Munirul Haque

August 2007

B.S. in Mathematics
Bryan Balzer

M.S. in Bioinformatics
Kurt A. Heilman

M.S. in Computing
Sailaja Bulusu
Jie Shen

M.S. in MSCS (Mathematics)
Timothy A. Chumley
Fang Song
Yan Guo

M.S. in MSCS (Computer Science)
Haifeng Li

* cum laude
**magna cum laude
***summa cum laude