**Faculty Focus**
by Gary Krenz

Mahdi Maadooliat joined our department as tenure-track Assistant Professor in August 2013. Dr. Maadooliat received the Ph.D. degree in Statistics from the Texas A&S University, where he also served as a post-doctoral fellow. His doctoral research focuses on the dimension reduction and data analysis in non-Gaussian frameworks. Currently, he is working on modeling spherical data structures with application to protein structure prediction and classification. His primary research interests include bioinformatics, machine learning, functional data analysis, and skewed distributions. He is an Associate Editor for the Journal of Statistical Theory and Applications. Dr. Maadooliat was born in East Lansing, Michigan. His family moved back to Tehran soon after his birth. For two years, he and his family lived in Gaziantep, Turkey where he went to primary school. He has some of his handwritten notes in Turkish from that time, that he cannot read now. Dr. Maadooliat received his Bachelor's Degree in Mathematics from Sharif University of Tehran and his Master's Degree in Mathematics from the University of Notre Dame. His research interests include discrete mathematics, combinatorics and graph theory. Dr. Engbers generally works on extremal and probabilistic questions in graph theory. In particular, he has recently been looking at a class of problems related to vertex colorings in graphs. He received his Bachelor's Degree in Mathematics Education from Calvin College in 2006, and his Master's Degree in Mathematics from the University of Tennessee in 2008. Dr. Engbers and his wife, Ruth, have two boys—Samuel (three), and Luke (18 months), as well as another boy due in February, and they have a golden retriever, Lexi. They spend a lot of time at the Milwaukee Zoo, since the boys love animals. Dr. Engbers enjoys playing and watching sports, especially baseball. He is a Detroit Tigers fan, but says he will learn to become a Brewers fan. He enjoys spending time outside and gardening.

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This newsletter highlights a small slice of faculty and students professional accomplishments; page 2 provides a partial snapshot of our funded research, including a major Marquette-led NSF grant that supports a 3-year collaboration to enhance high school computer science education across the State of Wisconsin. On page 3, there are short stories of some of our remarkable undergraduate and graduate students. Page 4 highlights our recent semi-group mini-symposium and Dr. Rowe's experience leading a summer workshop at SAMSI.

Summer, 2013 was very busy! Dr. Marta Magiera and College of Education colleague, Dr. Leigh van den Kieboom, conducted a summer institute for 30 West Allis/West Milwaukee School district teachers on the study of learning and teaching algebra, and algebraic thinking as part of their Raising Achievement in Mathematics through Fostering Algebraic Thinking (RAM t-FAT) grant. Dr. Dennis Brylow held a Google-funded Computer Science for High School (CS4HS) summer workshop for 25 Wisconsin high school teachers that promotes Computer Science and Computational Thinking in high school and middle school curriculums. We also hosted a very successful NSF-funded summer Research Experience for Undergraduates (REU). MSCS, along with Marquette's Department of Biological Sciences and the McNair Scholars Program, held a joint poster session on July 30. More than 50 undergraduate students presented their summer research project results using posters attached to the walls of the second, third, and fourth floors of Cudahy Hall's atrium. The hallways were abuzz with the conversation of around hundred people! Also in attendance were Diana Robertson, Regional Director, Office of U.S. Senator Ron Johnson and Marquette Baylor, Deputy State Director, Office of U.S. Senator Tammy Baldwin. These are just a few MSCS student and faculty highlights. Please take a moment to look inside for more details.

Wishing you a healthy and fulfilling new year,
Gary Krenz
Djedid Mohammed Nadijr, a Ph.D. candidate at the University of Sciences and Technology of Oran in Algeria was a visitor in Iqbal’s Ubicomp Lab. Mr. Nadijr is a member of a networking and distributed system laboratory at his home institution. He received a university visiting appointment, and stayed with us through the end of December 2013.

Alumni News
Sarah Sobeck (formerly Schmidtke), 2000, has earned her Ph.D. in Chemistry (2005, University of Minnesota) and is a professor of chemistry at the College of Wooster since 2008.

Iqbal Ahamed, Professor, received a $33,135 award sponsored by the Medical College of Wisconsin for the project mPeer: Mobile Detection of High Risk Behavior in Veterans- A Sociotechnical Systems Approach in 2013.

Elaine Spiller, Assistant Professor, received a $300,000 3-year grant sponsored by National Science Foundation entitled Marcher- A Heterogeneous High Performance Computing Infrastructure for Research and Education in Green Computing from September 2013- August 2016.

Dennis Brylow, Associate Professor, and Marta Magiera, Assistant Professor, were awarded an NSF CE21 entitled Collaborative Research: Priming the PUMP- Preparing the Upper Midwest for Principles of Computer Science.

This 3-year grant is a collaboration between Marquette and UW-La Crosse, with the assistance of Wisconsin Department of Public Instruction and the Wisconsin-Dairyland chapter of the Computer Science Teacher Association. As the leader of the state-wide project, Marquette is to receive $844,254 of the $997,508 overall project total.

Rong Ge, Assistant Professor, received a $300,000 3-year grant sponsored by National Science Foundation entitled Marcher- A Heterogeneous High Performance Computing Infrastructure for Research and Education in Green Computing from September 2013- August 2016.

Anne Clough, Professor, received a $61,847 4-year grant sponsored by NIH Heart, Lung, and Blood Institute entitled Novel Imaging to Identify Lung Mitochondrial Injury and Predict Recovery from July 2013 - June 2017.

Serdar Bozdag, Assistant Professor, received a $5,500 grant from Marquette University to support his project entitled Reverse engineering of gene regulatory networks from high-throughput genomics data in June 2013- July 2013.

Dr. Elaine Spiller, upon completion of 5 years of service.

Dr. Sheikh Iqbal Ahamed, upon completion of 10 years of service.

Dr. Marta Magiera, upon completion of 5 years of service.

Department News
Dr. Elaine Spiller, upon completion of 5 years of service.

Dr. Michael Slattery, upon completion of 30 years of service.

Dr. Rong Ge, upon completion of 5 years of service.

John Engbers, Assistant Professor, was one of five mathematicians selected nationwide as an AMS fellow for Project NExT (New Experiences in Teaching) for the 2013-2014 academic year. Project NExT is a professional development program of the Mathematical Association of America for new and recent Ph.D.’s in the mathematical sciences.

It addresses all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, participating in professional activities, and also provides a network of peers and mentors.

John attended his first workshop/conference at MathFest in Hartford August 2013. “I’ve really enjoyed getting to know the other fellows as they are going through the same transitions as I am and I continually benefit from being part of this network. I find the program itself to be very helpful in exposing me to new ideas, and I plan to incorporate several of these in my work here at Marquette.”

John will be participating in more conferences in the upcoming year. “I’m very much looking forward to our next ‘in-person’ meeting at the Joint Mathematics Meetings in Baltimore in January.”

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A.K.M. Jahangir Alam Majumder, a computational sciences doctoral student, was recently notified he is one of fifteen students invited to participate in the Association for Computing Machinery (ACM) Student Research Competition sponsored by Microsoft Research.

The Student Research Competition will take place during the Symposium on Applied Computing (SAC) to be held in Gyeongju, Korea in March 2014. The Student Research Competition program provides an elite group of graduate students the opportunity to meet and exchange ideas with researchers and practitioners in their area of interest.

Jahangir is currently exploring the feasibility of a smartphone- and ‘smart shoe’- based fall prevention system. The eventual goal of Jahangir’s research is the creation of a fully functional system to identify abnormalities in a subject’s walking pattern that will be useful in preventing falls in the elderly population. The system would also aid in identifying gait disorders in children, physical rehabilitation patients, and individuals with autism.

Jahangir will receive $500 from ACM’s Student Research Competition Program to partially defray his conference travel expenses. As a Student Research Competition invitee, he has been encouraged to apply for additional funding from the conference Student Travel Award Program (STAP).

Mohammad Adibuzzaman, a computational sciences doctoral student, received a best paper award at the Association for Computing Machinery (ACM) conference Research in Adaptive and Convergent Systems (RACS 2013) that was held in Montreal, Canada October 2013. The paper, Towards In Situ Affect Detection in Mobile Devices: A Multimodal Approach, investigates affect detection in everyday environments using smartphone sensors. He has found an important correlation between facial image and energy, validating Russell’s two dimensional theory of emotion using arousal and valence space.

In summer 2013, Adib worked for the Medical Counter Measure Initiative at the US Food and Drug Administration by an appointment to the Research Participation Programs at the Center for Devices and Radiological Health administered by the Oak Ridge Institute for Science and Education.

Heather Bort, a computational sciences graduate student, received an NSF scholarship to attend the 2013 Grace Hopper Celebration of Women in Computing. Heather was selected from a competitive pool of over 500 applicants. The NSF scholarship award is granted by the Anita Borg Institute and includes conference registration, a prepay meal card and hotel accommodations. In addition, the award includes partial travel support up to $175.

Heather was also extended a Supercomputing 2013 (SC13) Conference Broader Engagement Program Participation grant. This is a competitive grant which provides financial support for registration, lodging at, travel to, and incidentals for participation in the SC13 Technical Program. The Broader Engagement Program is an effort to increase the participation of individuals traditionally under-represented in High Performance Computing (HPC). The program provides special activities to introduce, and support, a diverse community in HPC.

Pi Mu Epsilon

Pi Mu Epsilon officers, Demetrious Kutzke (President) and Matthew Solfest (Vice President), began their first year as officers facing the loss of all PME records. During the summer, the hard drive of the organization’s computer had fried and destroyed all records, which were unable to be recovered.

Demetri and Matt spent weeks contacting people who had pieces of the information and started building the database back. Fortunately, they were able to rebuild it and get it ready to invite the new inductees to join by later in the semester.

On December 4, 2013, 21 inductees were welcomed in to the mathematical honor society with a dinner ceremony. (A photo of those attending is shown above).

Undergraduate Conference

Ryan Vogt, an undergraduate computer science major, received full travel support to attend the Experiencing HPC for Undergraduates program at the Supercomputing Conference in Denver, Colorado, November 2013. The goal of this program is to increase awareness of undergraduate high performance computing research opportunities as well as encourage undergraduates to pursue graduate study and/or a job related to HPC topics in computer science and computational science.

Putnam Competition

The William Lowell Putnam Mathematical Competition is an annual contest for college students in the U.S. and Canada. Seven fearless Marquette undergraduates, Brian Bergner, Ben Cundiff, Casey French, Austin Kopitzke, Erhard Menker, Min Roh, and Katie Sherman took the challenging six-hour exam on Saturday, December 7, 2013.

Try your hand at one of the 12 problems on the 2013 exam: On each face of a regular icosahedron is written a nonnegative integer such that the sum of all 20 integers is 39. Show that there are two faces that share a vertex and have the same integer written on them.

Undergraduate Halloween Party

On October 30, 2013, the Undergraduate Halloween Party was held in room CU 401 and was well attended with an estimated 45 students and faculty.

There was a drawing for best halloween costume, and everyone who wore a costume received a prize of Marquette University gear. The best costume was by Hannah Guth wearing a Miss Calculation ribbon, and a t-shirt with written miscalculations on it. The prize she received for best costume was a diploma holder frame.

Thanks to the Department of Mathematics, Statistics and Computer Science for supporting the undergraduates with this great party!
DEPARTMENT NEWS

Department Hosts Mini-Symposium in Semigroup Theory

Prompted by a week-long visit by the prominent algebraist Victoria Gould, of the University of York, England, a series of talks was organized on semigroup theory, historically one of the Department’s research strengths, on December 13, 2013.

Dr. Gould spoke on “Groups and idempotents”. The other speakers were Francis Pastijn, Marquette University, “Embedding theorems for bands”; Peter Jones, Marquette University, “Could a four-element semigroup be so complicated”; Nasir Sohail, University of Waterloo, Canada, “Some questions regarding epimorphisms and amalgamation of partially ordered semigroups”; and Wim Ruitenburg, Marquette University, “The hunt for Boolean algebras”.

Pictured are, from left, Victoria Gould, Peter Jones, Justin Albert, Karl Byleen, Wim Ruitenburg, Rebecca Sanders, and Francis Pastijn.

FACULTY NEWS

SAMSI Program by Dan Rowe

This past summer, I was one of twenty invited speakers, a working group co-chair, and participant in a week-long program on Neuroimaging Data Analysis (NDA) at the Statistics and Mathematical Sciences Institute (SAMSI).

SAMSI, located in Research Triangle, NC, is an NSF-funded institute with a mission to forge a synthesis of the statistical sciences and the applied mathematical sciences with disciplinary sciences to confront the very hardest and most important data and model-driven scientific challenges.

The NDA program was attended by the best and brightest statistical neuroimaging researchers in North America, most of which are professors at distinguished universities.

My research is scientifically motivated by the applications area of functional magnetic resonance imaging (fMRI). FMRI takes MRIs rapidly over time to capture and determine brain activation for basic scientific understanding of the human brain and to quantify neurological disease. FMRI is rich with problems that need quantitative statistical solutions. It was an honor that the other researchers presented my research findings in subsequent discussions.

Together, the attending researchers discussed the important issues including existing approaches and their limitations, cutting-edge research questions, important mathematical and statistical methods for solving those questions, and collaborations among group members.

This was an amazing experience to participate in rigorous academic discussions on a shared problem. It felt ‘Manhattan project’ like, at least that’s how I imagine it. While at SAMSI, I made many new connections and renewed existing ones to continue discussions on the important NDA issues in the future.