Since the CDRH evaluates submissions from the FDA for this dissertation-related work. In addition, they are receiving support from labs and interacted with the researchers there. The projects relate in some way to this regulatory responsibility. Some projects, and students involved are:

- Custom QSAR models for the evaluation of potential toxicity of compounds shed from medical devices (Prachi Pradap)
- Smart physiological monitoring Mohammad Adibuzzaman
- Effect of UV light in the development of HPV-associated cancers
- Quantifying uncertainty in mathematical models used for regulation.

The experience, although involving a lot of travel, has again made clear the importance of models and computation in the world today.

Center for Devices and Radiological Health

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

SPRING 2013 NEWSLETTER

FROM THE CHAIR

It is hard to believe that we are already at the end of another academic year and that it is time for the spring MSCS newsletter! Be sure to explore the articles that introduce our new MSCS colleague and that highlight ongoing MSCS efforts at the US Food and Drug Administration, faculty grant awards, and details of several educational outreach efforts. It is interesting how, every once in awhile, MSCS faculty are called by the media to contribute to their stories. Before the Marquette men’s basketball team’s run to the NCAA Basketball Elite Eight, MSCS faculty member Dr. Daniel Rowe was interviewed by the local CBS affiliate for a NCAA March Madness, 2013 story entitled “What are your chances of filling out a perfect bracket?” While Dr. Rowe mentions “It’s March, anything can happen,” he notes that without employing prior knowledge, the number of possible brackets is huge - around 147 quintillion different combinations! Clearly, bracketologists need to employ prior knowledge, as a Bayesian statistician would say, in making predictions. The full story may be read or viewed at http://www.cbs58.com/, search for “perfect bracket.”

Another MSCS faculty member, Dr. Dennis Bylow, was asked to comment on the remarkable, credit card-sized Raspberry Pi computer for a story entitled “Raspberry Pi Could Open Doors to Computer Science” that was run by a local NPR radio station. The full story may be read or viewed at http://www.wwsm.com, search for “Raspberry Pi.”

The Raspberry Pi is not an abstract concept. Marquette’s MSCS Department is again hosting its “Computation Across the Disciplines” National Science Foundation-funded Research Experiences for Undergraduates (REU). Cudahy Hall is the summer destination of an elite group of undergraduate students from around the United States who work on a variety of research projects under the direction of volunteer faculty mentors. We expect some undergraduate students to research various challenges of running the Embedded Xinu Operating System on the Raspberry Pi. A list of potential summer, 2013 projects and past summer REU efforts is found at http://acm.mscs.mu.edu/wiki-reu.

Take a moment to look inside to meet this year’s Outstanding Undergraduate Award winners and browse brief descriptions of a few of our many ongoing department efforts. Please feel free to stop by for a visit if you are in the area. We are proud of the work we have accomplished this year and look forward to an exciting summer.

Wishing you a safe and fun summer season,

Gary Kienz
Chair
FACULTY ACTIVITIES AND AWARDS

Paul Bankston
Paper: Road systems and betweenness, Bulletin of Mathematical Sciences (in press).

Serdar Bozdag


Bozdag, Serdar, T. J. Close, and S. Lonardi. “A Graph-Theoretical Approach to the Selection of the Minimum Tiling Path from a Physical Map.”


Rong Ge
Publications:
- Rong Ge and Kirk W. Cameron. Power-Aware High Performance Computing. Book chapter in Energy Efficient Distributed Computing Systems. We created a boot camp experience to answer these issues. We also defined a two-year curriculum plan for these students leading to receiving the MS in Computing degree. We call this initiative “Start IT,” because it is starting the students in a new career in IT.

This spring we offered the boot camp as a zero credit, zero cost course to five students. The boot camp met daily for two hours throughout the semester. The material covered included an introduction to programming using, first, Python and then, Java. Exercise included developing a graphical user interface, and a simple MapReduce program based on a multi-core computing platform. We added the study of data structures and algorithms to complete the minimum prerequisites for the MS in computing program. A curriculum created by the Office of the National Coordinator (ONC) for Healthcare IT provides background on the Healthcare industry and HIT. Two of the students took an examination sponsored by the ONC and received HIT Pro certification in Electronic Medical Records implementation. All five students are ready to take classes beginning this summer. MAWIB will support them for tuition expense and the hospital IT organizations at Aurora and Froedtert have pledged to offer part-time internships in their IT departments for the duration of their studies.


Invited talks:
Conference participation:
The International ACM/IEEE Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing2012), Nov. 2012. (Salt Lake City, UT).

MSCS UPDATES

CU 412 Update
Last summer we added a new instructor podium, microphones, and cameras to Cudahy 412. This technology along with online collaboration software enabled MSCS to offer eight classes this past year to students via distance learning.

The online collaboration technology was tested most severely when an instructor was visiting Italy and he had a student in China attending the class. The utility of the initiative was also demonstrated when the class size of a course exceeded the number of seats in the classroom. All of the students were accommodated after several students agreed to volunteer to use the remote access instead of attending face-to-face.

While the modality of the room and remote students offer an adjustment in teaching style, the overall reaction of students and instructors has been positive.

Since the room was designed with student microphones in only the first two rows (no this was not a plot to get them to sit in the front of the room) and we have seen the need to have the room fully covered, we will install additional microphones during the break between the spring semester and summer sessions.

MS in Computing Program
Over the past several years, we have been looking at the needs of the community and the nation in Healthcare Information Technology (HIT). This is an area of recognized need and growth. Evidence of the need is federal and state programs encouraging HIT workforce development. Recent study on the growth of the IT industry reported that HIT is the leading growth area.

Recognizing the need for a well-qualified professional HIT workforce, MSCS worked with the Milwaukee Area Workforce Investment Board (MAWIB) and two HIT organization to create an innovative plan that helps displaced workers with an undergraduate degree make a career transition into HIT.

The MS in Computing program has always enabled career change, but displaced workers could have minimal knowledge of computing. Their knowledge of healthcare systems and HIT could be minimal as well. We created a boot camp experience to answer these issues. We also defined a two-year curriculum plan for these students leading to receiving the MS in Computing degree. We call this initiative “Start IT,” because it is starting the students in a new career in IT.

This spring we offered the boot camp as a zero credit, zero cost course to five students. The boot camp met daily for two hours throughout the semester. The material covered included an introduction to programming using, first, Python and then, Java. Exercise included developing a graphical user interface, and a simple MapReduce program based on a multi-core computing platform. We added the study of data structures and algorithms to complete the minimum prerequisites for the MS in computing program. A curriculum created by the Office of the National Coordinator (ONC) for Healthcare IT provides background on the Healthcare industry and HIT. Two of the students took an examination sponsored by the ONC and received HIT Pro certification in Electronic Medical Records implementation. All five students are ready to take classes beginning this summer. MAWIB will support them for tuition expense and the hospital IT organizations at Aurora and Froedtert have pledged to offer part-time internships in their IT departments for the duration of their studies.

Raspberry Pi
The MSCS Systems Laboratory strives to provide cutting-edge tools for hands-on research and education in embedded computer systems. Our Embedded Xinus project, with the assistance of extramural grant funding from National Science Foundation, Intel Corporation, and Cisco Corporation, has had a significant impact on half a dozen courses in the undergraduate COSC major at Marquette, and at many other institutions in the country. However, the inherent difficulty in modifying inexpensive consumer-grade hardware to be more amenable for experimental systems work has proven to be a significant barrier to many others.

The Raspberry Pi (www.raspberrypi.org) is an inexpensive ($35) embedded computer designed to be small (the size of a credit card), flexible, and powerful, with research and education in mind. Students in the Systems Lab are working this year to port Embedded Xinus to this exciting new platform, and expect to roll it out in our courses for the 2013-14 academic year. Our efforts recently attracted the attention of Latoya Dennis, who did a story WUWM radio on the “RasPi” and local projects using the platform here in Milwaukee.
The Computational Sciences program
The Computational Sciences program has been operating very well and demonstrating its strengths. In 2012-2013:
- There were 6 new PhD students admitted to the program (Fall 2012: Mirud Khan, Regis Rutarindwa, Spring 2013: Ivar Addo, Mohammad Arif Ul Alam, Kehinde Faronbi, William Castellano).
- In the August 2012 offering of the comprehensive exam, 5 students passed (First Attempt: Mohammad Adibuzzaman, Md. Munirul Haque, Niharika Jain, Prachi Pradeep, Rizwana Rizaa). In the January 2013 offering one student passed (Second Attempt: Samson Kiware).
- There were 2 PhD graduates (May 2013: Md. Munirul (Sunny) Haque, Farzana Rahman) and 6 MS graduates (December 2012: Rizwana Rizaa; May 2013: Yuning Chen, Chaitan Parikh, Samir Suleiman, Thomas Wirtz, Mary Kociuba). There are at least another 3 MS graduates expected in August 2013 which is considered part of the 2012-2013 AY. Regarding the PhD graduates, Sunny Haque took a postdoctoral position at the University of Alabama while Farzana Rahman has taken a tenure track position at James Madison University.
- The CMPS PhD program received 20 applications while the CMPS MS program received 10. Admissions status for CMPS PhD program is that 3 have accepted our offer of admission (Bauer, Smith, Williams), 3 have indicated that they will accept admission, and 4 have not given an indication of acceptance. For the CMPS MS program, 2 have accepted our offer of admission and 3 have given no indication of acceptance.

BiIN MS Program
The BiIN program is receiving more activity.
- New faculty member Serdar Bozdag from the NIH started Fall 2012. Hired new faculty member Medhi Maadooliat from Texas A&M.
- One student Brittany Baur is graduating with BiIN MS. She will be continuing in the CMPS PhD program.
- The BiIN MS program received 15 applications of which 3 have accepted admission, 1 has indicated that they will accept admission, 1 has not given any indications of acceptance, 3 applications are incomplete.

Awards
Iqbal Ahmed, Associate Professor, with students Syam Ahmed, A.K.M. Jahanang Majumder, Kristina Mensch, Colm Ostberg and Farzana Rahman, was awarded a $1,500 international research grant in the Marquette University Office of International Education 2012 International Research Poster Session. The winning poster presentation was entitled mHealthMTT: Bridging the Gap in Communication Using a Mobile Based Intervention for Maternal and Child Healthcare in Rural Bangladesh.

Pi Mu Epsilon Spring 2013 Induction
The Wisconsin Alpha Chapter of Pi Mu Epsilon Induction Ceremony was held this semester. Following dinner and a presentation the inductees took their pledge. The following are the new members:

- Kerri Byers
- Stephanie Carran
- Kimberly Hillmer
- Christian Huehns
- Michael Kren
- Demetrius Kutke
- Kevin Liu
- Theresa McGrevey
- Matthew Mesko
- Alex Byrd
- Emilia Picard
- Alexander Richard
- Maureen Ricken
- David Savoia
- Matthew Soldo
- Kelly Vanderhaar
- Joseph Vanderhaar
- Michael Young

A big thanks goes out to the outgoing officers of the Wisconsin Alpha Chapter. They are:
- President: Alyssa DiGilio
- Treasurer: Jack Coleman
- Vice President: Brandon Montalvo
- Secretary: Jim Cramz

Upsilon Pi Epsilon Spring 2013 Induction
The Spring 2013 Initiation. Pictured, from left to right: Kaleb Breault, Alex Hunsberger (incoming VP), Jacob Dahlen, Andrew Kirkham, Chris Lewis (honorary inductee), Warren Leland, Jake Cohen (outgoing VP, incoming president), Paul Kulander, Tyler Much, Chris Sabin (outgoing president), Jack Batzner (incoming president), Warren Leland, Jake Cohen (outgoing president).

The Wisconsin Beta chapter of Upsilon Pi Epsilon, the international honor society for the computing and information disciplines, held its sixth induction in April. Marquette’s chapter inducts computer science, computational mathematics, and computer engineering majors who have completed more than 15 credits of computing coursework, are in the top 35% of their class, and are nominated by at least two of their professors or peers.

Following the ceremony, UPE hosted the Spring 2013 Computer Science and Software Engineering Featured Speaker, UPE honoree Christopher Lewis. A Technical Support Specialist for the College of Communications at Marquette, Mr. Lewis shared his years of experiences as a Tech Artist, Game Designer, and Associate Producer for several well-known game production houses.

His 90-minute interactive session attracted a full crowd for the Cudahy 401 colloquium room, and helped highlight Marquette’s new minor in Motion Narrative within the department of Fine Arts -- an attractive option for computing majors with a career interest in computer game development.

ACM Regional Programming Contest
On Saturday, Nov 3, 2012, Marquette participated in the ACM North Central North America Regional Programming Contest sponsored by IBM. The contest involves teams writing programs to solve specified problems in the shortest time possible. The North Central competition is hosted at several sites throughout central US and Canada. The top teams in the region advance to the World Finals of the International Collegiate Programming Contest. This year those finals were in St. Petersburg, Russia.

Teams consist of three students. This year Marquette sent two teams: The Codin’ Eagles - Charles Powell, Paul Kulander, and Alex Becherer - and The Uncaught Exceptions - Seijung Kim, Benjamin Cundiff, and Alex Hunsberger.

The competition ran for five hours and the teams were given 9 problems to work on. The list of problems for this year can be found at:

http://ncna-region.unl.edu/contest2012pdf

The Uncaught Exceptions solved one problem to place in the top third of the 239 teams competing. The Codin’ Eagles solved three problems and ranked #28 in the final standings (top 11%). Congratulations to both teams for a great performance! Each Fall semester, we have weekly meetings to prepare for this competition, if it sounds intriguing, talk to current team members or contact Dr. Slattery.

Outstanding Undergraduate Awards
During the MSCS Undergraduate Spring Reception on Wednesday, April 10, 2013, three undergraduate students were honored for their achievements in their respective fields. In order of the presentations, the honorees are listed below.

- Natasha Sahr was given the Outstanding Undergraduate Mathematics Award for her excellent academic achievement as well as her service, which includes volunteering as the invited student representative on the department’s undergraduate committee and other department and university activities.

- Alex Becherer was given the Outstanding Undergraduate Computer Science Award for his excellent academic achievement, going beyond what was expected, participating in an NSF-funded Research Experience for Undergraduates at Marquette, and for volunteering for activities in the department and university.

- Erin Galvin was given the Miriam Connellan Mathematics Education Award for her demonstrated high level of achievement in her collegiate coursework generally, and in her math ematics and education courses, more specifically. In addition, she exhibits a curiosity, thoughtfulness and enthusiasm for teaching that distinguishes her among her peers as the student most likely to excel as a mathematics educator and classroom leader within her future school and district.
GRADUATIONS

Spring 2013

M.S. Bioinformatics
Brittany Baur

M.S. Computational Sciences
Yuning Chen Samir Suleiman
Mary Kociuba Thomas Wirtz
Chaithan Parikh

M.S. Mathematics for Secondary School Teachers
Elizabeth Cherry

Ph.D. MSCS
Md. Munirul Haque Farzana Rahman

B.S. Computer Science
Jahnavi Acharya Charles Powell
Brooke Borowiak Christopher Sabin**
Aracely Macias Jeffery Slavens

B.S. Computational Mathematics
David Caseria Brandon Wolff

B.S. Elementary/Middle Education and B.A. Mathematics for Elementary School Teachers
Erin Galvin Amy Sanders
Kristin Ottosen Megan Sawinski
Samantha Pecotte

B.S. Middle/Secondary Education and B.A. Mathematics for Secondary School Teachers
David Dau Allison Mahere*
Brandon Johnson* Stephanie Nagawiecki
Patrick Lewandowski*

B.S. Mathematics
Jesse Dikman Natasha Sahr*
Holly Hadden Edward Randerson*
Samuel Hokamp* Kyel White*
Joshua Pinter John Wollney

For the masters picture from left to right are Brittany Baur (BION-MS), Yuning Chen (CMPS-MS), Chaithan Parikh (CMPS-MS) and Jahangir Mumajder (CMPS-MS).

M.S. Mathematics for Secondary School Teachers
Elizabeth Cherry

Ph.D. MSCS
Md. Munirul Haque Farzana Rahman

B.S. Computer Science
Jahnavi Acharya Charles Powell
Brooke Borowiak Christopher Sabin**
Aracely Macias Jeffery Slavens

B.S. Computational Mathematics
David Caseria Brandon Wolff

B.S. Elementary/Middle Education and B.A. Mathematics for Elementary School Teachers
Erin Galvin Amy Sanders
Kristin Ottosen Megan Sawinski
Samantha Pecotte

B.S. Middle/Secondary Education and B.A. Mathematics for Secondary School Teachers
David Dau Allison Mahere*
Brandon Johnson* Stephanie Nagawiecki
Patrick Lewandowski*

B.S. Mathematics
Jesse Dikman Natasha Sahr*
Holly Hadden Edward Randerson*
Samuel Hokamp* Kyel White*
Joshua Pinter John Wollney

MATH and COMA majors, class of 2013. From left, Jesse Dikman, Brandon Wolff, Natasha Sahr, Alyssa DiGilio, Elizabeth Haubenreiser, David Caseria, Zhisheng Zhang, John Wollney.


B.S. Interdisciplinary Major in Applied Mathematics
Alyssa DiGilio* Kiefer Hotek

*Pi Mu Epsilon Member
**Upsilon Pi Epsilon

FACULTY FOCUS

Welcome to MSCS

This semester, our department hired Mr. Steven Goodman.
Steve served as the Chief Information Officer and an Executive Vice President of Integrated Medical Partners, LLC. Mr. Goodman was responsible for the information and technology design, deployment and management for the Integrated Medical Partners companies. Previously, he was the Director of Operations for Strong Financial Corporation developing technology and management consolidation methodologies. Before Strong Financial, he served GE Medical Systems as the Chief Technology Architect, providing the technical skills and process required to support an acquisition plan of over 300 businesses. His other experience includes various management positions including Principal Engineer at Marquette Medical Systems and was previously with the Department of Mathematics, Statistics and Computer Science at Marquette University (1987-1993) during that time he provided Marquette University with its first internet connection working closely with Donna Shalala Chancellor, University of Wisconsin to make this possible. Mr. Goodman is published and a contributor to various IEEE initiatives, point-to-point protocol and RFC1386 which defines how US domains interact with the internet. Steve is married and has two children, contributes to Milwaukee’s Summerfest organization, provides free consulting services to the ICC, and is Six Sigma certified.

Steve returned to Marquette University to provide operational leadership for the Department’s “Start IT” initiative and to provide a strategic “roadmap” for the department’s technology. He hopes to facilitate the disposition of Intellectual Property developed within the department as well.

GOOD AND WELFARE

January 2013

Anne Clough, Professor, was awarded a 2013 Summer Faculty Fellowship of $5,500 and a 2013 Regular Research Grant of $8,500 to support her project entitled, Understanding Lung Injury Using Mathematical Modeling of Imaging Agents. Serdar Bozdag, Assistant Professor, was awarded a 2013 Summer Faculty Fellowship of $5,500 to support his project entitled, Reverse Engineering of Gene Regulatory Networks From High-Throughput Genomics Data.

The Milwaukee Area Workforce Investment Board’s Healthcare Training Institute has extended their Healthcare Profession Opportunity Grant to include the Marquette Computing program’s START IT initiative. The Computing program START IT initiative is a unique opportunity we are providing to help the long-term unemployed, and returning veterans, move into healthcare IT careers. Funds from the Healthcare Profession Opportunity Grant will provide up to $21,000 of tuition assistance per student who are selected by the Healthcare Training Institute program plus part-time work throughout the program.

February 2013

Sheikh Iqbal Ahamed, Associate Professor, was awarded a Clinical Translational Science Institute award to support the project entitled, mPeer: Mobile Detection of High Risk Behavior in Veterans – A sociotechnical Systems Approach. Anne Clough, Professor, is a part of a Marquette team awarded a National Institutes of Health grant entitled, Advancing energy-resolved CT systems for imaging K-edge contrast agents. The Department received a $5,000 gift from grateful parents to support the undergraduate research-intensive Embedded Systems Lab.

We would like to know where you are and what you are doing. Please send news and current address updates to:

newslet@mscs.mu.edu