

# Mathematics, Statistics and Computer Science

Helen Way Klingler College of Arts and Sciences



MARQUETTE  
UNIVERSITY

2014 NEWSLETTER

## Karl Byleen and Doug Harris

### Introduction by G. G. Hamedani

It is indeed a great pleasure to prepare this column for our colleagues Karl Byleen and Doug Harris, who retired last spring. The idea of this front page article of our newsletter came from Gary Krenz. I asked faculty and staff if they had questions that they would like to ask Karl and Doug. I received several questions, some of which will be answered below. I presented the questions to Karl and Doug and decided to have them answer the questions in their own words by writing up whatever they felt. What follows consists first of some introductory comments from Joe Hughes (who predates everyone in our department), and then questions interspersed with Karl and Doug's comments in their own words.



Doug Harris (left) and Karl Byleen (right) at their retirement party, June 2014.

*(J. Hughes:) Dr. Byleen, you came to Marquette after receiving your PhD in semigroups from Nebraska in 1977 and remained for 37 years. You wrote your first paper in semigroups as a PhD candidate while at Nebraska with our own Dr. Pastijn (then a visiting professor), and you subsequently wrote several more papers during your early years at Marquette. These efforts eventually lead to a PhD program in the 1990s in semigroups led by Drs. Pastijn, Jones and yourself. Also, your celebrated combined finite mathematics and calculus textbooks have been widely used for years in many institutions, and a separate finite mathematics textbook has even been used in various graduate courses (i.e., MBA programs). This heralded you, most especially, as an advisor to the Business School, but your teaching prowess in mathematics across variegated disciplines contributed immeasurably in cultivating students' mathematical abilities. These achievements, in addition to*

*your involvement in mathematics education and the Teacher Education Committee (TEC), and your time as an advisor to the Major in Mathematics for Elementary School Teachers (MELT), place you among Marquette's master teachers.*

### Karl Byleen's Comments:

**What brought you to Marquette?** I taught a second-shift calculus class at Nebraska in the spring of 1977. One Monday evening, I announced that I would be going over to the student union after class to watch the NCAA championship basketball game. I explained that Marquette had sent me a contract, and if Marquette won the game, I would sign the contract and go to Marquette as an assistant professor. Marquette beat North Carolina in Al McGuire's last game as coach. I signed the contract and came to Marquette.

**What do you believe is your most significant contribution to the department?** One of my chairmen told me that he had described my role to the Dean as "utility infielder". I like that description. So I wouldn't talk of significant contributions, but would say that when there was a need, I tried to fill in. I've enjoyed belonging to a team with many stars, and have taken pride in the team's successes. As a kid, I dreamed of a dual career: baseball in the summer, teaching in the off-season. So perhaps that dream has been realized, as a utility infielder for a math department.

**If you had to do it all over again, would you teach?** Yes, teaching is my vocation, and I expect that my vocation will continue for some years to come in volunteer positions.

**Having been teaching for a long time, have students changed over this period, and if yes, how?** Students seem to be getting younger, but at a slower rate than their parents seem to be getting younger.

**What was your favorite class to teach over all the years?** I have two favorites, Theory of Numbers and Foundations of Geometry. Both are beautiful subjects, well suited for helping students to strengthen their reasoning and communication skills. Many future teachers take those courses, so you hope to generate an interest and understanding that will be passed on to the students in our schools.

**Did you like the administrative part of your position as Assistant Chair?** There are aspects of the job – solving problems, creating opportunities, seeing that things run smoothly – that can (Continued, pg. 2)

### IN THIS ISSUE

From the Chair .....	1
Faculty News/Publications.....	3
Undergraduate Student News.....	3
Graduate Student News.....	3
Graduations.....	4
Faculty Focus.....	4
Alumni News .....	4
MSCS Updates.....	4

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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

### FROM THE CHAIR



2014 was a tremendously busy year for the MSCS Department. (So much so, that its Newsletter has spilled over into 2015!) It was a year full of exciting new research activity, funding awards and extensive community outreach. I am pleased to report that

our total external grant funding to the department was 1.6 million dollars, and our Computing Program was ranked 28th nationally! Furthermore, the research done by our faculty and students is touching the lives of people outside of the University not only through their work within the sub-disciplines of the department, but also through their collaborations with people in fields like medicine, engineering, and education.

One of many exciting pieces of recent news involves two very prestigious awards. I am very pleased to announce that two members of our faculty, Dr. Rong Ge and Dr. Marta Magiera, have each received the National Science Foundation Early Career Development (CAREER) award. My hearty congratulations go to both recipients! Both awards fund five-year projects—Dr. Magiera's for improving teacher development in math, and Dr. Ge's for improving performance and efficiency in computing systems. Please read more about their projects on page 3. In other research news, the Research Experiences for Undergraduates (REU) continued through Summer of 2014 and has just received a three year renewal from the National Science Foundation, starting in the Summer of 2015. Congratulations to Dr. Dennis Brylow and Dr. Kim Factor on their continued work! Dr. Brylow has also hosted several groups of high school teachers as part of his ongoing NSF project focused on improving the state of computer science education in Wisconsin's secondary schools. (Stay tuned for more details on these teacher workshops in our next newsletter.)

Last year was also the jumping off point for several exciting new program additions. In the fall, the professional Master's degree program in Computing introduced a new Integrated Practicum curriculum path (described on p. 4). Much work was also done in 2014 to develop upcoming program changes. For example, effective Fall 2015, MSCS will be offering three new 5-year Bachelors/Masters programs—STEM-MBA programs in both Math and Computer Science, and a combined Computer Science and Computing Program—as well as new specializations for Computing. (Watch for more information on these new additions in the next issue as well.)

Finally, 2014 was a year with some changes to our faculty and staff. As you will read in our front page story, in the spring, we celebrated with Dr. Karl Byleen and Dr. Doug Harris as they entered into retirement. We congratulate them both and wish them all the best! Then, in the fall, we welcomed Dr. Sarah Hamilton to the MSCS faculty. Dr. Hamilton comes to us most recently from a postdoctoral position in Helsinki, Finland. Be sure to read about the rest of her background and interests on page 3. Finally, in October, we welcomed Petra Eccarius Brylow to the position of Office Associate.

The snow is finally gone, which means that spring is almost here in the Midwest. I wish you all a wonderful summer!

Gary Krenz  
Chair

## KARL BYLEEN AND DOUG HARRIS (CONTINUED)

be very satisfying. I am pleased that in the past two years we were able to hire 7 new members of our participating faculty. I hope that they will continue to teach for us. Of course there are also frustrations. The frustrations make me grateful to my chairmen-especially Doug Harris, Peter Jones, and Gary Krenz, who have served the longest as chair while I've been in the department-for taking on a job that seems Herculean to me.

**What else (if anything) will you remember?** I'll remember my collaboration with other researchers and authors with fondness and appreciation: a paper on combinatorial designs with Don Crowe (UW-Madison), who introduced me to the thrill of discovering and publishing a new result; a joint paper with John Peter Komjath, who wrote a joint paper with Paul Erdos; several papers with John Meakin (Nebraska) and Francis Pastijn on semigroup theory; and work with Ray Barnett and Mike Ziegler on math textbooks.

**What are your plans for retirement?** First, I'm going to ride my bike to Nebraska. My wife's grandfather's grandmother left Berlin, Wisconsin on August 24, 1864, and travelled by covered wagon to Nebraska. The dairy she kept has survived. It tells where the party camped each night. We plan to recreate the journey on its 150 anniversary, substituting bicycles for oxen.

*(J. Hughes:) Dr. Harris, you arrived at Marquette in 1969 and remained for 45 years, as well as served as Chair for an unprecedented 21 years (1979-2000). In 1971, as a young topologist you published a well-known monograph AMS Memoirs 115. (Memoirs of the AMS is devoted to the publication of research in all areas of pure and applied mathematics between 80 and 200 pages.) In this memoir, you developed new techniques to solve seemingly different problems, which was a significant contribution to general topology. Your influence on students and faculty has been monumental. (Your daughter Ondine even obtained a PhD in biomathematics from Marquette, and your first master's student Commander Hughes to this day recalls the definition of a regular open set from general topology.)*



Party attendees, (left to right): Sebastian Luft, Steve Merrill, Stephanie Luft, Marta Magiera, Ruth Engbers, John Engbers, Joel Engbers.

### Doug Harris' Comments:

**What brought you to Marquette?** I arrived at MU in June, 1969, after just receiving my Ph. D. in Mathematics from the University of Kansas, hired for the summer to write some instructional programs for beginning statistics courses, before starting a regular appointment as a faculty member in the Fall.

**What was the state of data processing at Marquette in 1969?** The computer system at the time was just an IBM 7040 in a corner of the Engineering building and the programs were the usual punch card/printout batch oriented sort. There was a small group of individuals mostly in engineering interested in using computers in significant ways for instruction, and a few folks in the math department besides myself also wanting to become involved. The University did not have a Computer Center at the time, and some business operations were done on an IBM 360/30. Several of us began to realize that we needed a more modern computing system, and that a unified system could offer advantages both for university-wide data processing and also for instruction, as well as opening opportunities for research in many areas. We began exploring the possibility of adding terminals to the 360 system, using what IBM at the time called RAX (for Remote Access) and which I called "clumsy remote batch from a typewriter". After quite a political struggle involving vendors competing for this new campus a coalition developed involving Bob Lade (the chairman of Electrical Engineering), Bobby Richardson (in Mechanical Engineering) and myself, and we determined that Xerox/Sigma 9 would be the best solution for all parties involved, and offer very modern real interactive computing and very solid database facilities.

**How did your championing of computer science influence the Department?** The point of all of this is that I got involved very early at the University level in an area that the mathematics department had not previously been much involved with and began to realize that the department could and should play a leadership role in the situation of computing on the Marquette campus. I also began to realize that there were legions of students who were interested in learning more about this emerging field and that it was an exciting possibility to consider how we could meet their needs.

**How were you a pathfinder in mathematical pedagogy?** My own development in teaching involved creating all sorts of new courses, especially including a course in Mathematical History (which I conceived as a study of the development of mathematical ideas, very much including computing as something integral) and which involved a process which I continued in all courses of using lecture notes which I developed rather than a textbook.

**Tell us more about your approach to algorithmic thinking.** In Summer 1972, I participated in an MAA Summer Seminar series which involved 6 weeks of lectures by Chung Liu, a very distinguished combinatorialist who became a very distinguished professor of Computer Science at Urbana, and Alston Householder, a very distinguished numerical analyst at the University of Tennessee. The series of lectures by Liu had a profound effect upon my interests, and led me first to develop a course in combinatorics and then, coupled with the things I had seen from Householder, to realize the importance of algorithmic thinking in mathematics.

**How did you come to meld mathematical sciences with computing?** I began developing undergraduate courses, which were quite popular, and these included database systems, operating systems, data structures, programming languages, and individual programming courses in a wide variety of languages. At the same time I began to see how some of my topological work could mesh with the new thinking and give new insights into problems such as the prime ideal spaces of rings that had long puzzled topologists.

**Give us some background on the fledgling doctoral program.** In 1979 I decided to try to build a research community integrated with our teaching community that would encompass some of these new ideas. When I came in 1969 the department had hoped it was building a doctoral program, and in my entrance interview with the Graduate Dean at the time I learned, and broke the news to the department, that there would be no such doctoral program. Ten years later it seemed that an appropriate step might be to combine these emerging notions of algorithmic approaches to mathematics with the rapidly emerging importance of mathematics as a tool for modelling real problems in many fields, and in a document called "Why Not Us?" argued that an integrated program involving teaching and research centered on these ideas might be especially appropriate at Marquette, especially given the ties that some were developing with local medical institutions. So as chair, along with others in the department, we began to build such a program and eventually were approved for doctoral work in this direction. One of my fond memories when our doctoral program was approved was sending a note to the executive vice president at the time, who had been the graduate dean who notified me fifteen years earlier that we would have no doctoral program, saying "never tell me I am not patient".

**Please share some valedictory comments about your Departmental philosophy.** In this note I do not want to comment on specific individuals or parts of our program, but only to note that I am proud that the department has remained mostly unified around the idea of being an academic community with a variety of individual interests who share mutual respect and communication. Marquette will never be large enough to support groups dedicated to a single purpose, but it is enormously fitting with our overall mission of teaching and learning and also allows us to share the learning process with our students and our colleagues within the university.



Party attendees, (left to right): Ondine (Harris) Callan, Olivia Callan, Doug Harris, Mei-Lie Harris, Ethen Harris, Devin Callan, Xiaomei Huang, Tao Huang.



Party attendees, (left to right): Rong Ge, Katherine Feng, James Factor, Rebecca Sanders, Bill Sanders, Xizhou Feng.



Karl Byleen at the center of the Northern half of the western hemisphere.



Party attendees, (left to right): Tyler Gillen, Wim Ruitenburg, Mike Slattery, Clem Hanneken, Mary Hanneken, June Hanneken.

## FACULTY AWARDS AND ACTIVITIES

### Marta Magiera and Rong Ge

Congratulations to Dr. Marta Magiera and Dr. Rong Ge, both of whom have recently received the very prestigious National Science Foundation Early Career Development (CAREER) award!

Dr. Magiera received a CAREER award for her project entitled "CAREER: L-MAP: Pre-service Middle School Teachers' Knowledge of Mathematical Argumentation and Proving." This five-year, \$791,854 project will examine how middle school pre-service teachers' knowledge of mathematical argumentation and proving develops in teacher preparation programs.



Dr. Ge received a CAREER award for her project entitled "CAREER: Cross-Layer Power-Bounded High Performance Computing on Emerging and Future Heterogeneous Computer Clusters." Her five-year, \$453,486 project will work to maximize performance and power efficiency of computing systems, while engaging graduate and undergraduate students in the research and broadening participation of underrepresented and K-12 students.

### John Engbers

In March 2014, John Engbers attended the first Lake Michigan Area Workshop on Combinatorics and Graph Theory at Western Michigan University. Additionally, he presented "Graph Theory- to the Extreme" at a Colloquium at Calvin College in April 2014. Aside from the conferences and presentations, John Engbers was awarded a 2014 Marquette Summer Faculty Fellowship for his project entitled "External Colorings of Graphs" and published "Counting independent sets of a fixed size in graphs with a given minimum degree", *Journal of Graph Theory*, 76 (2014) pp.149-168, with D. Galvin.



### Wim Ruitenburg

The MSCS Department gave a warm welcome to special Colloquium Speaker Melanie Wood on March 27, 2014, (organized by Wim Ruitenburg). Wood was the first American woman to make the U.S. International Mathematical Olympiad Team, as well as the first American woman (and second woman ever) to be named a Putnam Fellow. (See more at [http://en.wikipedia.org/wiki/Melanie\\_Wood](http://en.wikipedia.org/wiki/Melanie_Wood).)



Colloquium attendees. Back: Marta Magiera, Sarah Huber, Kaitlyn Monteer, Erhard Menker, Brian Bergner, Melanie Wood, Tony Siever. Front: Carolyn Wilson, Stephanie Luft, Wim Ruitenburg, Rebecca Sanders, John Engbers.

## SELECT PUBLICATIONS

### Serdar Bozdag

Publication:

Bayson, M., Woolard K, Bozdag S, Riddick G, Kotliarova S., Cam, M., Belova, G., Ahn, S., Zhang, W., Song, H., Walling, J., Stevenson, H., Meltzer, P., Fine, H. "Micro-Environment Causes Reversible Changes in DNA Methylation and mRNA Expression Profiles in Patient-Derived Glioma Stem Cells", *PLoS ONE*, vol. 9, iss. 4, p. e94045, 2014.

Colloquium Talk:

"Discovering biological basis of age-related survival disparities in brain cancer: A bioinformatics approach." Department of Electrical Engineering and Computer Science, University of Wisconsin, Milwaukee, WI, March 2013.

## NEW FACULTY MEMBERS

### Sarah Hamilton

The MSCS Department would like to welcome Dr. Sarah Hamilton! She previously worked as a Postdoctoral Researcher with Dr. Samuli Siltanen at the Centre of Excellence in Inverse Problems Research, in the Department of Mathematics at the University of Helsinki. She received a BS in Mathematics with a minor in Spanish from Saint Michael's College and completed her Ph.D. in Mathematics at Colorado State University. Sarah's research interests include inverse problems, nonlinear inversion methods such as D-bar, Complex Geometrical Optics Solutions, and medical imaging; particularly Electrical Impedance Tomography. Aside from the mathematics and research, Sarah is an avid skier and snow boarder who also loves to spend her free time in pottery studios and traveling the world.



## UNDERGRADUATE AND GRADUATE STUDENT NEWS

### UNDERGRADUATE NEWS

#### Nebraska Conference for Undergraduate Women in Mathematics

Three young women from the 2013 Research Experience for Undergraduates hosted by the Department of Mathematics, Statistics and Computer Science, were invited to give talks on their research at the Nebraska Conference for Undergraduate Women in Mathematics. Hannah Guth (Marquette University) and Lindsey Smith (University of Wisconsin-Madison) went on a road trip with Dr. Kim Factor from the department to this national conference at the end of January. Laura Ramm (Benedictine College, Kansas) joined her professor and made her way to meet everyone in Lincoln at the University of Nebraska. All three did a great job showing the very best in undergraduate research in front of a large audience. Hannah and Laura worked with Dr. Marta Magiera on their research, and Lindsey worked with Dr. Factor.

#### Pi Mu Epsilon

This spring, Pi Mu Epsilon officers decided to have a function in addition to the induction ceremony. On April 12, 2014, members were invited to "Taco and a Movie" night in Cudahy Hall. Those who came had a grand time! Later, on April 23rd, 18 students were inducted into the honor society, bringing the total to 39 for the entire academic year. Dr. Rebecca Sanders gave a talk at the ceremony, where everyone enjoyed pizza and good company.



Pi Mu Epsilon induction ceremony participants.

#### Upsilon Pi Epsilon

Marquette University's Wisconsin Beta chapter of Upsilon Pi Epsilon, the international honor society for the computing and information disciplines, inducted 17 new members in April. Alum Nick McMillan (COSC '08) was the featured Computer Science / Software Engineering

speaker and honorary inductee, presenting "Practices of a Modern Tech Startup" to a full crowd in Cudahy 401.



Pictured, (left to right): A. Calfo, D. Savoia, S. Goodman, M. Solfest, B. Buckley, D. Saxena, R. Gries, J. Chitel, N. Hafeez, M. Friedman, J. Dahleen, A. Hunsberger (outgoing VP), C. Pivonka, J. Cohen (outgoing president), J. Anderson, J. Batzner (outgoing treasurer, holding Tux the Penguin), R. Vogt, A. Hill, D. Polfer, W. Braden, G. Merkel, R. Naugle, S. Robinson, C. Mojek, N. McMillan (honorary inductee, COSC '08).

#### ACM/IBM International Collegiate Programming Contest

Here is a report of the Marquette programming teams that attended the 2013 ACM/IBM International Collegiate Programming Contest held on Saturday, November 9, 2013. There were three teams of three members each that attended the competition. They were:

- Buffered Streams: Chaonan Chen, Nadiyah Johnson, Ryan Vogt
- Codin' Eagles: Kaleb Breault, Casey French, Matthew Friedman
- Overloaders: Alex Becherer, Seijung Kim, Tyler Much

There were 254 teams that competed in the North Central North America Regional contest at 17 sites throughout the region. We competed at the EPIC campus in Madison. The contest consisted of writing Java or C++ programs to solve eight problems in five hours. (You can find the problems statements at <http://ncna-region.unl.edu/regional2013final.pdf>) The teams were ranked in terms of how many problems they solved and how long it took them to do so. The results for our three teams were as followed: Buffered Streams solved two problems and placed #169, Codin' Eagles solved three problems placing #65, and Overloaders solved two problems bringing them in at #106. The first place teams solved all eight problems and was from Iowa State University. They will be representing the North Central North America region at the World Finals this June in Ekaterinburg, Russia. Solving even one of these problems is a good accomplishment and we are quite pleased that our teams each had at least two

correct solutions. If you know any of the team members, congratulate them on their participation and a job well done.

### GRADUATE NEWS

#### Awards

Doctoral students Brittany Baur (advisor Dr. Bozdag), Prachi Pradeep (Dr. Merrill), Mary Kociuba (Dr. Rowe), and Kaitlin Ryan (Dr. Factor) were awarded Summer Fellowships for 2014 through the Computational Sciences Summer Research Fellowship Program. These awards required an in-depth grant proposal for doctoral research to be accomplished during the summer and are highly competitive.

Doctoral students Mohammad Adibuzzaman (advisors Dr. Ahamed and Dr. Merrill) and Casey O'Brien (Dr. Merrill) were named ORISE Fellows at the U.S. Food and Drug Administration's Center for Devices and Radiological Health, in Silver Spring, Maryland over the Summer of 2014. Mr. Adibuzzaman worked for a second summer on Smart Physiological Monitors in Division of Physics while Mr. O'Brien is attached to the Infection Control Lab of the Division of Biology.

#### Defended Dissertations

Four MSCS doctoral students successfully defended their dissertations in Spring and Summer, 2014.

First, Iain Bruce (advisor: Dr. Rowe) defended his dissertation entitled "Determination of correlations induced by the SENSE and GRAPPA PMRI models with an application to MRI RF coil design" in March. After graduation, he accepted a postdoctoral position at Duke University.

Next, in April, Samson Kiware (Dr. Corliss) defended his dissertation, "Bioinformatics systems and mathematical models for improved understanding of malaria transmission, control, and elimination." He is now a Research Scientist at the IFAKARA Health Institute in Tanzania.

In May, Mohammad Tanviruzzaman (Dr. Ahamed) defended his dissertation, "Towards usable end-user authentication." Tanvir has accepted a position with Microsoft.

Finally, in July, Meryem (Muge) Karaman (Dr. Rowe) defended her dissertation, "Improving fMRI analysis and MR reconstruction with the incorporation of MR relaxivities and correlation effect examination." She has accepted a postdoctoral position at the University of Illinois at Chicago.

Our congratulations go out to all of these students!

## GRADUATIONS

### Spring 2014/Summer 2014

#### Graduate Degrees

##### Ph.D., Computational Sciences

Iain Bruce  
Samson Kiware  
Meryem Karaman  
Mohammad Tanviruzzaman

##### Masters, Computational Sciences

Colin Ostberg

##### Masters, Computing

Patrick Callan  
Karl Kaluzny  
William McRae  
Brad Natelborg  
Matthew Passini  
David Polyak  
Dan Thomas  
Drew Williams  
Brittany Johnson

#### Undergraduate Degrees

##### Applied Mathematical Economics

Kameron Bass  
Kevin Liu  
Erhard Menker  
Tor Peterson  
Bryan Reed

##### Computer Science

Jacob Anderson  
Artem Azarenko  
Kaleb Breault  
Jackson Cohen  
Nadiyah Johnson  
Jason Laqua  
Peter Quint

##### Mathematics

Johannes Christian  
William Condon  
Kevin Dentino  
Marlena Eanes  
Matthew Frey  
Hannah Guth  
Paige Hermann  
Judith Ifarinde  
Daniel Kawa  
Anna Peris  
Jessica Pruess  
Alexander Richard  
Katherine Sherman  
Andrew Smistad  
Sheila Walsh  
Wei Wu  
Jeffrey Wujek

##### Mathematics for Elementary School Teachers

Marie Fredrickson  
Ashley Stemmeler  
Ashley Stoltz  
Alix Wilt

## FACULTY FOCUS

### John Moyer

From April 7-9, 2014, Dr. John Moyer attended the 2014 National Council of Teachers of Mathematics Research Conference in New Orleans. At the conference, he presented a poster that was researched and written by himself, Victoria Robison, and Jinfa Cai entitled "Long-Term Effect of Middle School Mathematics Curricula on Students' Attitudes in High School". The research was a small part of their longitudinal 9-year NSF funded grant: Longitudinal Investigation of the Effect of Curriculum on Algebra Learning from the Middle Grades through High School.

Across the street from the New Orleans Morial Convention Center, where the conference was held, there was a sculpture honoring the people and remembering the events related to Hurricane Katrina. Peg Moyer and Judy Sowder, former editor of the *Journal for Research in Mathematics Education*, are featured in the picture below.



### BABY NEWS

#### Praveen Madiraju

Praveen Madiraju and his wife, Srilaxmi Malladi, welcomed Ramya, a beautiful baby girl, into their life on July 5, 2014.



#### S. Iqbal Ahamed

Similarly, Iqbal Ahamed and his wife, Sadia, gained a new addition to their family on September 26, 2014 at 11:29pm when they had Safan Iqbal.



## ALUMNI NEWS

### Tim Miller

#### BS Computer Science '03

I thought I would send an update since I'm finally in a somewhat stable position! After graduating in CS with a math minor in 2003 I went to the University of Minnesota for graduate school and finished my Ph.D. in computer science in 2010. After that I was hired as a post-doc at Boston Children's Hospital and Harvard Medical School, and was recently promoted to a faculty position at the Instructor level. My research is in clinical natural language processing, attempting to extract information from the electronic health record and other medical texts. I am very appreciative of my professors in MSCS at Marquette (and in all the other departments for that matter) for the rigorous undergraduate training I received. I really enjoy reading the newsletters to see what the faculty and current students are up to!

### Bryan Gannon

#### BS Biochemistry and Mathematics '10

I am currently in a Nutritional Sciences Ph.D. program at UW Madison, using stable isotopes to measure vitamin A status of humans and monitor interventions. I am also doing mathematical modeling work of vitamin A kinetics in human and other animal models.

## MSCS UPDATES

### Masters in Computing Program

In the fall of 2014, Marquette's professional master's degree program in Computing began an exciting new Integrated Practicum curriculum path. Through this option, financial assistance is available to the student in the form of part-time employment.

In this unique dual-path option, students build practical knowledge through significant job assignments while building fundamental knowledge through academics. The integration of the academics with work assignments enhances learning and contributes to the success of the work.

In this curriculum path, students must maintain full-time student status (7 or more credits per term) and work part-time at one or more participating employers for five consecutive terms. They will earn one graduate practicum credit per term. We anticipate about 350 hours of work experience each term and a total income that at least covers the cost of tuition.

The inspiration for the option comes from graduate assistantships, co-ops, and internships.

- Graduate Assistantships: Full-time study and part-time work
- Co-ops: Work integrated with the curriculum and thus an option for international students
- Internships: Work assignments in industry to enrich learning and build experience

The Integrated Practicum can build future IT leaders for participating employers. Companies are always seeking employees that will be their future thought-leaders. Leadership in IT requires knowledge about cutting-edge technologies and an understanding of how to manage it. Students find an emphasis on these ideas in the MS Computing program. Our students examine innovative technologies and receive the inspiration, knowledge, and skills to implement it.

We are in the process of recruiting students and employers to participate in this exciting opportunity. If you know of opportunities to recruit students or employers, please contact the Director of Graduate Studies for the MS in Computing Program, Tom Kaczmarek (thomas.kaczmarek@mu.edu or 414-288-6734.)

**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**