

# MSCS Mess

Access the MSCS Mess online at <http://wp.stolaf.edu/mscs/mscs-mess/>. E-mail the editor (greimann@stolaf.edu) if you wish to receive a digital copy every Friday.

Department of Mathematics, Statistics, and Computer Science  
St. Olaf College, Northfield, MN 55057

17 October 2014  
Vol. 43, No. 5

## This Week's Colloquium

<b>Title:</b>	Consulting Vignettes
<b>Speaker:</b>	Terry Therneau
<b>Date:</b>	Monday, October 20
<b>Time:</b>	3:30 - 4:30 pm
<b>Location:</b>	RNS 310

**About the talk:** "Research at Mayo is like standing in front of a fire hydrant with your mouth open." -John Blinks, Department of Pharmacology

The primary goal of this talk will be to give an idea of the breadth and variety of work encountered as a consulting biostatistician within medical research. I'll give a short introduction to the medical and statistical question of several projects, covering one of them in more depth. Topics include the summarization of fluorescent in-situ hybridization (FISH) data from a set of 138 prostate cancer patients, modeling the long term impact of non-randomized hormonal therapy in prostate cancer, computation of incidence/prevalence in the presence of in-and-out migration from the Olmsted county population, normalization of Nanostring assay data (806 RNA probes on 1488 samples), comparing different endpoint measures in patients with chemotherapy induced peripheral neurotoxicity, summarization and use of shotgun proteomics data to understand the possibly multiple mechanisms of amyloidosis, cataloging immune function and potential using RNASeq, and three statistical research topics.

Lifelong learning is the greatest prerequisite for success in this area, but also what makes biomedical consulting exciting and just plain fun.

**All are welcome, but Statistics concentrators and anyone interested in biomedical research are especially encouraged to attend!**

Terry Therneau, PhD, works in the Division of Biomedical Statistics and Informatics at the Mayo Clinic

## This Week's Seminar

<b>Title:</b>	Epidemiology: 99 problems and confounding's just one
<b>Speaker:</b>	Jess Musselman
<b>Date:</b>	Friday, October 24
<b>Time:</b>	3:30 - 4:30 pm
<b>Location:</b>	RNS 310

**About the talk:** Most epidemiologic research occurs within the context of an observational study, that is, a study in which exposures are chosen by participants rather than randomly assigned. This requires that we make large assumptions regarding a number of elements including measurement error, study bias, and confounding. Our ability to make causal inferences rests squarely on our willingness and ability to comfortably make those assumptions. Genetic and molecular epidemiology has recently emerged as a means by which we can study disease etiology without requiring an excessive number of assumptions. However, technologies for measuring biological data such as epigenome-wide methylation have developed prior to the emergence of proper analytic techniques. We will discuss the ups and downs of observational research and end with an example of a new method for analyzing these increasingly rich biological data sets using semi-structured recursively partitioned mixture modeling.

Jessica, a Visiting Assistant Professor in the MSCS department, comes to St. Olaf after spending a year as a research associate in the School of Public Health at the University of Minnesota. Her research has covered a wide range of public health issues ranging from the impacts of alcohol control policies to

clinical trials to the genetics of childhood cancer. In her spare time, Jessica enjoys spending as much time as possible outside running, swimming, and cycling. When forced indoors, Jessica enjoys playing hockey, practicing her viola, improving her French and Russian, hanging out with her Welsh corgi, and cheering for her favorite teams.

## Math Practicum: Real Math in the Real World.

The Mathematics Practicum (Math 390) is an interim course that gives you the chance to work on real life math problems in cooperation with local (Twin Cities and Rochester) companies and nonprofit organizations. The course typically begins with a visit to the offices of the sponsoring organization, a chance to meet the people with a serious interest in the problem. Three weeks of hard on-campus work on the problem follow. The course ends with group presentations given to executives at the company offices.

The entire course is an intense group project. Groups of between four and six students work on one problem that is separate from the problems being tackled by other groups. The course faculty will be helpful, meeting with each group daily, but will not be actively engaged in the research. Faculty will be present at, but will not participate in, the final presentation to corporate personnel. The course involves hard work, but is unusually satisfying.

The course is primarily intended for junior and senior mathematics majors. Enrollment is limited to approximately 15 students. Admission to the course is by permission of the course faculty (Professors Vandiver and McKelvey). Watch your email and the Mess for details on the application process, which will begin shortly.

If you want to learn more about the course, or the interview process, please contact either Prof. Vandiver or McKelvey. They would enjoy chatting with you about the experience.

## Interim Opportunity in Education

Here's an Interim course that you might consider. In **EDUC 170: Urban Schools and Communities**, you'll spend time in the Twin Cities being part of a middle or high school mathematics classroom. You'll participate as tutors and classroom assistants during the school day and then assist in various after-school and community programs. This course is appropriate for anyone with a curiosity or interest in teaching, especially in the urban setting. (Many former students have told me that this is the class where they really fell in love with teaching.)

The course is open to first-years and sophomores only, with no prerequisite. It satisfies the MCD requirement. For those pursuing a teaching license, it counts towards your Interim field-experience requirement. There is a pre-registration process, so if you're interested in taking the course, please contact Prof. Matsuura ([matsuura@stolaf.edu](mailto:matsuura@stolaf.edu)) as soon as possible.

**Look for a more complete list of upcoming MSCS courses in the Mess soon!**

## Math Grad School Night!

Recent St. Olaf alumni and current graduate students will be here on Thurs. Oct. 23 to talk about what grad school is, how to prepare for it, apply for it, get in to it, and pay for it. There will be plenty of time for questions, too!!

If you are even considering math graduate school as an option or just want to hear about it, this event is for you!

Come hear these students talk about their experiences and answer questions such as:

1. What should I think about when deciding whether or not to go to graduate school?
2. What do I need to do to get into graduate school? What courses should I take?
3. What IS graduate school like? How awesome is it?
4. What can I do with a Masters or a Ph.D. in mathematics? Will anyone want me?
5. Are you kidding? Can I really get paid for going to school!?!?

Date: Thursday, October 23

Location: RMS 6th Floor

Time: Pizza will arrive at 7:15 pm, the Panel Discussion will begin at 7:30 pm, and the extended Q&A will follow.

## Math vs. Bio Capture the Flag

The **Third Annual Math vs. Biology Capture the Flag** event will be taking place on the quad next Friday, October 24th. Team Math will wear red and Team Bio will wear green. Meet on the front lawn of Regents at 7pm to help the math department continue its winning streak!

## Fall Speaker Colloquium presented by Pi Mu Epsilon

There is going to be a Colloquium on Monday, November 17th, organized by Pi Mu Epsilon. The speaker is one of our very own MSCS professors! A clue about the identity of the professor will be released in each week's Mess. Here is this week's clue!

This MSCS professor prefers blackboards over chalkboards.

There will be a sheet on the 3rd floor of RMS if you would like to make a guess about who this speaker could be!

### and for Your Reading Pleasure...

**a Math Joke**

A physicist, a biologist, and a mathematician are sitting on a bench across from a house. They watch as two people go into the house, and then a little later, three people walk out.

The physicist says, "The initial measurement was incorrect."

The biologist says, "They must have reproduced."

And the mathematician says, "If exactly one person enters that house, it will be empty."

**a Quote**

"In mathematics the art of proposing a question must be held of higher value than solving it." -Georg Cantor

**and a Riddle**

I have holes in my top and bottom, my left and right, and in the middle. But I still hold water. What am I?

*(The answer can be found in the next Mess!)*

*(Last week's answer: "Short")*

Editor-in-Chief:	Zach Greimann
Faculty:	Joe Benson
Mess Czar:	Patty Martinez

*If you would like to submit an article or event to be published in the Math Mess, e-mail greimann@stolaf.edu*