

MSCS



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

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This Week's Colloquium

Title: **Topics on the Analysis of High-Dimensional Data**

Presenter: Gary Gadbury

Date: Tuesday, April 7th

Time: 1:30 pm

Location: SC 188

About the talk: The present genomic era has ushered in new challenges involving the design, data analysis, and interpretation of results from high-dimensional experiments. Draft sequences of several genomes coupled with new technologies allow study of entire genomes rather than isolated single genes. This presents a new realm of high-dimensional biology (HDB) where questions involve multiplicity at unprecedented scales. HDB can involve thousands of genetic polymorphisms, gene expression levels, protein measurements, genetic sequences, or any combination of these and their interactions. Such situations demand creative approaches to the inferential process of research. I will review the problem of simultaneous testing in the context of HDB and will provide some background on microarray experiments. A mixture model approach will be presented as one method for analyzing high-dimensional data, and the uses of this model will be discussed, such as extrapolating sample size requirements for future similar

experiments. Time permitting, a simulation procedure based on data from actual experiments will be described that allows for comparing the performance of statistical methods that analyze high-dimensional data.

About the speaker: Gary Gadbury comes to St. Olaf from the Department of Statistics at Kansas State University.

MSCS Recital

It is a long standing tradition in the MSCS Department to hold true to the musical traditions of St. Olaf College and present a recital in the spring. But this is no normal recital. Instead of grand arias or major concertos, the MSCS Recital is a chance to see your professors and classmates juggle, tell jokes, sing songs and play the tin whistle. In addition to these stupendous acts of talent (or no-talent), there will be food straight from the kitchens of faculty members before the performances and during intermission.

What are you waiting for? Contact Prof. McKelvey (mckelvey@stolaf.edu) if you are interested in performing. Any and all kinds of performances are welcome (but be in moderately good taste). And even if you don't perform, please join us for this fun evening of good food, good performances and, most importantly, good friends.

In short: MSCS Recital

Who: All friends of the MSCS Department
What: The n-th Annual MSCS Recital, an evening of performances and talent of all types presented by the students, faculty and staff of the MSCS department.
Where: Ytterboe Lounge
When: Wednesday, April 8th at 7:00pm

Putnam Results

The Putnam results are in! St. Olaf's team of **Nathan Clement**, **Thomas McConville** and **Vladimir Sotirov** scored a 73 to rank 35th out of 405 participating schools. Congratulations to them and to all who participated!

CS Course Descriptions for Fall 09

For those interested in computer science, consider the following two courses that will be offered next fall.

Hardware Design (CS 241) is a class that attempts to answer the question: how can some wires and transistors (like primitive switches) be connected together to create a "thinking" machine? We start just above the transistors, and move all the way up to CPU's and the languages "understood" (carried out) by them. We also briefly discuss computer networks, define many general terms and concepts about computing, and emphasize new trends in computer design that are now beginning to change the very nature of computer software. CS 241 provides useful background in computing notions that come up every day, and serves as a prerequisite for other CS courses as well as being a fine standalone course on its own for people interested in knowing about the design of computer hardware.

(Prerequisite: CS 121, or permission of instructor.)

Operating Systems (CS 273) delves into what an operating system really is, behind the windowing system or command prompt (shell) that you use to start up programs. In CS 273, we will study the algorithms and data structures used to control processes, input/output, memory management and file systems in modern computer operating systems as well as topics like interprocess communication, process scheduling, swapping and security. Concepts will be illustrated by referring to actual examples, including Unix, Windows and other systems, including detailed study of the Linux operating system.

(Prerequisite: CS 251 and prior or concurrent enrollment in CS 241, (CS 274), or permission of instructor.)

Problem of the Week

Show that if x, y, z are positive real numbers such that $x + y + z = 1$, then

$$\left(\frac{1}{x} - 1\right)\left(\frac{1}{y} - 1\right)\left(\frac{1}{z} - 1\right) \geq 8.$$

Solutions to last week's problem are posted at SC 222. Send your solution to this week's problem to Prof. Gower (SC 222, gower@stolaf.edu) by Friday, April 10, 2009.

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