MSCS Mess

MSCS Research Seminar

Title:	Comparing Songs without Listening: From MSCS to Music and Back Again
Speaker:	Katherine Kinnaird
Date:	Monday, April 4
Time:	3:30- 4:30 pm
Location:	RNS 310

About the talk: Music is deeply entrenched in our daily lives, from playing as we work and study to enhancing our favorite television shows. The multidisciplinary field of Music Information Retrieval (MIR) is motivated by the comparisons that we, as humans, make about music and the various contexts of these comparisons. By defining tasks such as building better song recommendation systems or finding structural information in a given recording, MIR seeks to algorithmically make these musical comparisons in the same way a single human being would, but on a much larger scale. In this talk, we will 1) introduce the field of MIR, including popular tasks and cutting edge techniques, 2) present our method for comparing songs, and 3) discuss further applications of this method beyond MIR tasks.

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Application for SI Leadership for Fall 2016

The Academic Support Center is looking for MATH 119, MATH 120, and MATH 126 SI Leaders for Fall 2016. SI is an academic support program that helps students meet their academic goals in a specific course, in this case MATH 119, Math 120, and Math 126. It differs from a TA and a tutor in a number of ways. SI Leaders attend class with their students, plan and execute well facilitated sessions each week, build close relationships with students and faculty, and receive thorough training. The full job description is available at http://www.stolaf.edu/apps/stuwork/index.cfm?fuseaction=Details&jobID=450

In addition to the qualifications listed on the job description, SI leaders should have a grade of A or A- in the math course (or a comparable one) for which they are applying and in at least one subsequent math course. SI Leaders for Math 126 need to have taken Math 226. Students who did not take Calculus at St. Olaf may apply if they received an A or A- in Linear Algebra or higher level math courses at St. Olaf.

Apply here: http://goo.gl/forms/FeHPsWZil2
Contact Antonia Grant (grant3@stolaf.edu) in the Academic Support Center if you have questions about the position.

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Senior Salute

The MSCS Mess has traditionally dediated the last issue of the year to the graduating seniors of the MSCS Department. As a continuation of this tradition, we ask all senior math, CS and statistics majors to send the following information to Patricia Martinez (martinep@stolaf.edu) no later than May 5:

- Name
- Major(s)/Concentration(s)
- Your plans after graduation

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Some MSCS Courses for Next Fall/ Spring

Math 330: Differential Equations II
Fall 2016
Instuctor: Joseph Benson

This course covers partial differential equations from an applied perspective and emphasizes simple models involving phenomena such as wave motion and diffusion. Topics and techniques such as separation of variables, boundary value problems, Fourier series, and orthogonal functions are developed carefully. Mathematical computing is used freely. Offered alternate years. Counts toward neuroscience and mathematical biology concentrations. Prerequisite: MATH 230.

Math 348: Topology
Fall 2016
Instructor: Paul Zorn

This course is an introduction to topological spaces and their structures mainly from the point-set perspective. Standard topics include separation axioms, compactness, and connectedness. Other topics from geometric and algebraic viewpoints may be included. Offered alternate years. Prerequisite: MATH 244.

Math 382: Advanced Linear Algebra
Fall 2016
Instructor: Jill Dietz

Linear algebra is as fundamental to STEM disciplines as calculus and in this second course you'll learn some advanced tools that play significant roles in mathematics, statistics, physics, computer science/machine learning, and data science. Basically, anytime you have a mechanism for dealing with data (manipulating it, storing it, analyzing it), there's probably theoretical linear algebra lurking somewhere.

We'll study some (slightly) familiar topics of vector spaces and subspaces, linear transformations, determinants, and eigenvalues from a more general point of view before getting into new topics that will include inner product spaces (good for physics and applied mathematics), the spectacular Singular Value Decomposition theorem (good for everyone), Jordan Canonical Form (good for mathematicians, and hence for everyone), and more as time permits.

Prerequisites: Math 220 and one of Math 244 or Math 252. This course will count as a "sequence" with Math 220 in the mathematics major.

Math 382: Graph Theory
Spring 2017
Instructor: Adam Berliner

What's the shortest way from point A to point B on a given set of roads? How many colors does it take to make a map of the United States so that no adjacent states get the same color? These questions and more can be stated (and sometimes proved) using graph theory. Simply put, graph theory is a mathematical game of "connect the dots." The study of graph theory dates all the way back to Euler in 1736 when he wrote a paper about the Seven Bridges of Königsburg. Since then, graph theory has become an incredibly interesting major area of mathematics with important applications in other areas of mathematics as well as computer science, engineering, physics, biology, and sociology. In this course we'll study properties of certain classes of graphs (such as complete graphs, bipartite graphs, and trees) and algorithms used to find graphs with certain properties or check if a graph has a desired property. Time permitting, we will investigate how linear algebra and matrices are used to understand graphs even though the two concepts are seemingly unrelated. Prerequisite: Students enrolling must have successfully completed either Math 244 or Math 252. This course satisfies the "Discrete" (D) perspective for the IMaP.

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