

MSCS



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Department of Mathematics, Statistics, and Computer Science
St. Olaf College, Northfield, MN 55057
March 10, 2023 | Volume 51, No. 16

Colloquium

Title: **Voting and Linear Algebra:
Connections and Questions**
Speaker: Prof. Michael Orrison
Date: 3/13/23, 3:30pm
Place: RNS 310

Voting is something we do in a variety of settings and in a variety of ways, but it can often be difficult to see nontrivial relationships between the different voting procedures we use. In this talk, I will discuss how simple ideas from linear algebra and discrete mathematics can sometimes be used to unify different voting procedures, and how doing so leads to new insights and new questions in voting theory.



Michael Orrison is a Professor of Mathematics at Harvey Mudd College. He received his A.B. from Wabash College in 1995, and his Ph.D. from Dartmouth College in 2001. His teaching interests include linear algebra, abstract algebra, discrete mathematics, and representation theory. His research interests include voting theory and harmonic analysis on

finite groups. He particularly enjoys finding, exploring, and describing novel applications of the representation theory of finite groups with the help of his talented and energetic undergraduate research students.

Colloquium

Title: **Advances in Spatial Point
Process Models for Urban Policing**
Speaker: Prof. Clarie Kelling
Date: 3/20/23 , pm
Place: RNS 310

Recent advances in police open data initiatives across the United States allow for analyses of datasets in criminology and policing across a variety of spatial scales. However, existing statistical methods often do not allow for the utilization of the original spatial granularity or event-level information present in these complex datasets. I will present an overview of some of the gaps in spatial statistical methodology for analyzing crime and policing data. In particular I will discuss my work to (1) develop a two-stage approach to study police use of force incident outcomes across space, (2) adapt a new shared component model for point process data that allows for flexible characterization of shared spatial patterns between point

processes, and unique drivers of each point process, and (3) explore a method for privatizing data that preserves its statistical utility. If time allows, I will also discuss some other exciting areas of interest in point processes.

Annual MSCS Recital *MSCS Talent Show!*

The MSCS Department is hosting a talent show on April 5th, the Wednesday after break, at 7:00pm in Ytterboe Lounge.

The recital is an annual recognition of the talent, broadly defined, of the members of the MSCS community. Faculty and students will perform, in ensembles or solo, for a couple of hours in the evening. Anyone associated with MSCS is welcome to participate, as a performer or an observer. This is a fun, relaxed gathering of students and faculty on equal footing. We sincerely hope you will join us.

There will be food and drink, but this event also features home cooking, not just Bon Appetit fare. If you are interested in performing or have questions, please contact Steve McKelvey (mckelvey@stolaf.edu).

Curling Club - We Deliver!

There is an opportunity for learning and trying a bit of the curling sport! This sport is all about throwing chunks of granite down lanes of ice while your teammates sweep in front of the rock. This Sunday (March 12th) the St. Olaf Student Curling Club is meeting at 2:30pm in the Skoglund Ice Arena! You are invited to join them and learn about the sport and give it a whirl. If you can't make it this Sunday, the club will continue to meet regularly on Sundays at 2:30pm after the break. Hope to see you there!

CIR Application Open!

[Applications](#) are now being accepted for the Center for Interdisciplinary Research (CIR)

for the 2023-24 academic year, and will continue until **Friday, March 24**. St. Olaf College's MSCS Department, with support from the National Science Foundation (NSF), had the unique opportunity to establish the Center for Interdisciplinary Research (CIR) in 2004, and over 300 students have participated since that inaugural year. The goal of the CIR is to provide interested undergraduate students with a background in statistics and data science with training and experiences in the modern practice of the discipline while engaging in applied, collaborative, interdisciplinary research.

Many details about the CIR can be found at [the St. Olaf CIR webpage](#), including lists of the cool and diverse past projects that have been completed. **In short, CIR Fellows participate on interdisciplinary research teams whose goals are to use statistics and data science to support the quantitative research of faculty or staff from a variety of disciplines around the college.** The research teams meet weekly with their MSCS mentors and domain experts, and many teams ultimately present their work at regional and national conferences.

Additionally, CIR Fellows participate in a weekly Research Skills Seminar which focuses on research-oriented oral and written communication skills, from one-on-one collaboration to formal scientific presentations. Other topics such as ethics in research and opportunities for stats and data science careers and graduate school are also covered. **For the 2023-24 academic year, this seminar will be held from 2:00-2:55 MWF.** The entire group of CIR Fellows will meet Mondays, and then Wednesdays and Fridays will be used for meetings of individual research teams. Participants receive a **0.5 academic credit each semester** for this seminar. You will also receive **an ORC credit** (old GE) or **OEP credit** (new OLE Core) after successful completion of both semesters of CIR.

Applicants are expected to have:

- successfully completed (or on track to complete) Statistics 272: Statistical

Modeling and/or MSCS 264: Intro to Data Science (ideally candidates will have completed both courses, but we will consider applications where only one of the two has been completed)

- are a declared Statistics and Data Science concentrator
- are available Mondays 2:00-2:55 both Fall and Spring semesters in 2023-24. Ideally, participants would also be available Wed and Fri 2:00-2:55, but there is some flexibility here.
- love (or think they might enjoy) using statistical and data science problem solving skills to address real research questions!

Applicants must be willing to make a regular, concerted time commitment to CIR. Our collaborative domain experts are depending on us to help them form answers to real research questions. Although time commitment fluctuates based on the stage of the projects, CIR

Fellows probably average 6-8 hours per week including group meetings, preparation for meetings and the Research Skills Seminar, and individual work. Therefore, you should consider your other commitments — classes, extracurriculars, work study, etc. — before applying. But most CIR alumni have considered their commitments to the CIR to be highly worthwhile, meaningful, and even fun.

If you are interested, you should complete this [form](#). With advising and registration for next year soon underway, we encourage you to apply as soon as possible. We will start reviewing applications after the Friday, March 24, due date, and **we will notify Fellows selected by Friday, April 7.**

If you are accepted as a CIR Fellow, you should register for MSCS 389: MSCS Research for Fall semester 2023. We will then solicit your input on potential projects for 2023-24 before making team assignments over the summer.

If you have any questions about the CIR, please do not hesitate to contact any statistics and data science faculty member.

Volunteer/Experience Opportunities

REUs: Summer Research in MSCS

If you are interested in being paid to collaborate on a research project with students from around the country off campus this summer, keep reading! To look through the programs available for Research Experiences for Undergraduates (REU's), check out this [link](#)! Most of them are done over the course of 8 – 10 weeks during the summer and include stipends around \$4,000. Applications will open in November and most will be due between late January and early March.

Read the eligibility for each because many are restricted to certain years in school, certain majors, or US citizenship. The website has a

variety of tabs at the top to help you find programs that apply to you! In particular, there are lots available for international as well as domestic students!

Most applications require a personal statement about why you would like to participate in the REU as well as letters of recommendation, so start looking into these sooner rather than later.

Make sure to reach out to us (mercur1@stolaf.edu and mainell1@stolaf.edu) if you have any questions!

CS Undergraduate Research

St. Olaf CS invites applicants for undergrad-

uate research student work during Spring '23, for work on projects involving cloud computing or Raspberry Pi units, as part of the CSin-Parallel research group. Specifically, the work relates to (1) “Runestone Backend”, an automated containerized parallel/cluster computations on Google Cloud using Kubernetes, and (2) the Self-Organizing Cluster system for the Raspberry Pi, including system image development. Qualifications depend on the particular

project, as described in the application details. Both are ongoing projects with flexible expectations for hours per week, and strong applicants who may have partial qualifications are encouraged to apply for one or both projects.

Please apply [here](#), applications will be accepted and considered until further notice.

To submit an article, event, or anything else for publication in the Mess, email hilst1@stolaf.edu; to receive the Mess digitally each Friday, email habero1@stolaf.edu; visit <http://wp.stolaf.edu/mscs/mscs-mess/> for a digital archive of previous MSCS Mess issues.

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