Dawson Kinsman

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Research Interests: applied statistics, machine learning, data science, topological data analysis

EDUCATION

PhD in Computational Mathematics, Science, and Engineering 2024-Present
Michigan State University, College of Engineering
Awards: College of Engineering Fellow, AIDMM NSF Research Trainee Fellow
Advisors: Danny Caballero, Mengsen Zhang

Master of Science in Applied and Computational Mathematics GPA: 4.00/4.00
University of Michigan-Dearborn, College of Arts, Sciences, and Letters
Project: Classification of Random Walks Using Topological Data Analysis *Advisor:* Thomas Fiore

Bachelor of Arts in Mathematics, Applied Statistics GPA: 3.99/4.00
Minor: Computer and Information Science *Certificate*: Practical Aspects of Computer Security
University of Michigan-Dearborn, College of Arts, Sciences, and Letters
Awards: Carl Rasmussen Award for Excellence: Applied Mathematics (2021, 2023), Dean's List (8 semesters)

REASEARCH EXPERIENCE

Student Research Assistant January 2022-Present
Blue Data Lab | University of Michigan-Dearborn | Dearborn, Michigan

- Researched innovative topological data analysis (TDA) methods to analyze police shooting data.
- Conduct statistical analysis on open-source Detroit Police Department 911 calls data to examine the effect of a gunshot audio-detection system (ShotSpotter) on occurrence of gun shots in Detroit.
- Contributed to a dashboard containing general ShotSpotter findings for the broader Detroit community.
- Prepared and revised TDA findings in a co-authored report submitted to PLOS One.

Student Research Assistant May 2023-January 2023
University of Michigan-Dearborn | Dearborn, Michigan

- Analyzed literature and studies on RNA sequencing and metabolomics analysis.
- Implemented several statistical methods in R for a binary classification problem with a small sample size and high dimensional data. Prepared and revised manuscripts for submission.

Undergraduate Student Researcher June 2022-July 2022
Big Data Summer Institute | University of Michigan | Ann Arbor, Michigan

- Researched topics in data mining, statistics, data science, and machine learning with a focus on developing analysis and R and Python skills.
- Investigated media claims of correlation between the rise of STIs, COVID-19, and other covariates using public data. Found that symptomatic STI rates increased and asymptomatic STI rates decreased.
- Presented findings to a general audience and co-authored a report of results.

LEADERSHIP/TEAMWORK EXPERIENCE

Data Science Intern January 2024 - Present
Traxen | Plymouth, Michigan

- Lead development and implementation of internal diagnostics and other metrics used in data processing.
- Create internal Power BI dashboard connected to MySQL databases for daily performance updates.
- Analyze data to investigate correlations between fuel efficiency, driving conditions, and habits, and design features to best capture and utilize these relationships in machine learning algorithms.

Strength in Numbers Mentee October 2023-January 2023
Detroit Lions Analytics Mentorship Program | Detroit Lions | Detroit, Michigan

- Explored the field of sports analytics. Collaborated on a confidential analytics project for the Detroit Lions.

Writing Center Consultant September 2020-May 2023
University of Michigan-Dearborn, Dearborn, Michigan

- Tutored students across multiple disciplines to improve writing and communication skills.
- Collaborated with other consultants to learn and teach current pedagogy and interdisciplinary writing.

WORKSHOPS

Graduate Research Opportunities Workshop (GROW) | Duke University. October 20, 2023 - October 22, 2023

- Discussed research opportunities for women and non-binary students in mathematical sciences, graduate programs, and admissions to graduate programs.

Dartmouth Scholar's Program | Dartmouth University October 12 - October 15, 2023

- Participated in a poster presentation to general STEM audience and mock graduate admissions interviews.
- Learned about ongoing research at Dartmouth and admissions to graduate programs at Dartmouth.

Third Workshop on Topological Methods in Data Analysis | Heidelberg University (online)
September 28, 2022 - September 30, 2023

- Learned about current research being conducted at the intersection of TDA and Machine Learning.

VOLUNTEER/ASSOCIATIONS

Member, Computational Epidemiology Dispersed Volunteer Research Network September 2023 - Present

- Collaborate with other researchers to analyze public sentiment trends on policing post-BLM movement.

Member, Association of Women in Mathematics 2021 - 2023

- Tutored at events for students during midterms and finals.
- Participate in outreach events to encourage girls and women in mathematics.

SKILLS

Technical: Experienced in Python and R and relevant data analysis and machine learning packages; Basic skills in SQL and C++.

PAPERS

Published

- **Dawson Kinsman**, Zhi Zhang, Jian Hu, Gengxin Li. "New empirical Bayes models to analyze RNA-seq data from two different regions in hypophosphastasia disease study," *MDPI Genes,* 2024. https://doi.org/10.3390/genes15040407
- **Dawson Kinsman** and Tian An Wong. "Proactive Policing as Reinforcement Learning," *International Conference on Learning Representations (ICLR) Tiny Papers,* 2023. Open Review

In Revision

- **Dawson Kinsman** and Tian An Wong. "The Homological Persistence of Police Violence: Analysis and Limitations," *PLOS ONE,* 2022.

Submitted

- **Dawson Kinsman**, Jennifer Zhao, Gengxin Li. "An enrollment data analysis to examine predictors for student success," Journal of Student Affairs Research and Practice, 2023.
- **Dawson Kinsman,** Hadi Chaaban, Divya Ramjee, Maimuna Majumder, Antonios Koumpias, Tian An Wong. "Causal analysis of automated acoustic gunshot detection technology: Evidence from Detroit," *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization*, 2024.