Dawson Kinsman

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Education

Michigan State University 2024–Present
PhD in Computational Mathematics, Science and Engineering (Advisor: Danny Caballero) *East Lansing, MI*
- **Fellowships:** College of Engineering Distinguished Scholar Fellow, AI and Data enabled predictive Multiscale Modeling across STEM NSF Research Traineeship (AIDMM-NRT) Fellow

University of Michigan-Dearborn GPA: 4.00/4.00
Master of Science in Applied and Computational Mathematics (Advisor: Thomas Fiore) *Dearborn, MI*
- **Awards:** Departmental Award for Excellence: Applied and Computational Mathematics

University of Michigan-Dearborn GPA: 3.99/4.00
Bachelor of Art in Mathematics, Applied Statistics *Dearborn, MI*
- **Awards:** Carl Rasmussen Award for Excellence: Applied Mathematics (2 years), Dean's List (8 semesters)

Research

Graduate Research Assistant Aug 2024 – Present
Michigan State University *East Lansing, MI*
- Trained and tested Latent Dirichlet Allocation (LDA) models for cluster analysis of education research abstracts. Contributed to construction of data cleaning and clustering pipeline for abstracts and new test abstracts.

Volunteer Researcher Jan 2023 – Present
Computational Epidemiology Dispersed Volunteer Research Network *Remote*
- Created web-scraping tools in Python to systematically obtain Google search trends data related to ShotSpotter and policing.
- Collaborate with external researchers on ShotSpotter analysis in Detroit (discussed further below).

Student Research Assistant Jan 2022 – Present
University of Michigan – Dearborn *Dearborn, MI*
- Implemented topological data analysis (TDA) methods to analyze police shooting data. Prepared and revised TDA findings in a co-authored report submitted to PLOS One.
- Led statistical analysis of Detroit Police Department 911 calls open data to examine the effect of a gunshot acoustic-detection system (ShotSpotter) on policing and crime metrics for future policy considerations. Contributed to a public dashboard containing general ShotSpotter findings for the broader Detroit community.
- Implemented a new empirical Bayes method in R for a binary classification problem with a small sample size and high dimensional data. Prepared and revised manuscripts for submission to MDPI Genes.

Undergraduate Research Assistant Jun 2022 – Jul 2022
Big Data Summer Institute—University of Michigan *Ann Arbor, MI*
- Researched topics in statistics, data science, and machine learning topics with a focus on developing analysis and R and Python skills.
- Coded in Python to data mine and investigate correlation between the rise of STIs, COVID-19, and other covariates.
- Collaborated on presentation to communicate statistical findings to a general audience.

Publications

† equal contribution, * undergraduate author

- **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, 2024.

In Preparation
- **Dawson Kinsman**, Hadi Chaaban*, Divya Ramjee, Maimuna Majumder, Antonios Koumpias, and Tian An Wong. "Causal analysis of automated acoustic gunshot detection technology: Evidence from Detroit." Draft.

Workshops

Graduate Research Opportunities Workshop (GROW) Oct 20, 2023 – Oct 22, 2023
Duke University *Durham, NC*

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

Dartmouth Scholar's Program Oct 12, 2023 – Oct 15, 2023
Dartmouth College *Hanover, NH*

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

Leadership/Teamwork Experience

Secretary Nov 2024 – Present
Computational Mathematics, Science, and Engineering Graduate Student Organization (GSO) *East Lansing, MI*

- Document events and take minutes from all GSO meetings.
- Maintain all important documents in a shared drive between CMSE GSO leadership.
- Edit and send out the bi-weekly newsletter. Maintain and run the publicly available, view-only Outlook calendar for departmental events.

Data Science Intern Jan 2024 – Aug 2024
Traxen *Plymouth, MI*

- Led development and implementation of internal diagnostics to identify failing units and track their repairs. Automated the generation and dissemination of Excel reports to relevant teams.
- Contributed to constructing a new data processing pipeline reducing processing time by 30% while increasing the number of features generated.
- Create internal Streamlit dashboard connected to MongoDB database for daily diagnostics and pilot performance updates. Optimized NoSQL queries to reduce page load times and improve overall performance.
- Analyzed data to investigate correlations between fuel efficiency, driving conditions, and habits, and design features to best utilize these relationships in machine learning algorithms.

Strength in Numbers Mentee Oct 2023 – Jan 2024
Detroit Lions Analytics Mentorship Program — Detroit Lions *Detroit, MI*

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

Writing Center Consultant Sept 2020 – May 2023
University of Michigan–Dearborn *Dearborn, MI*

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

Relevant Courses

Mathematical Foundations of Data Science Spring 2025
Michigan State University *East Lansing, MI*

Studied the fundamental mathematical principles of data science that underlie the algorithms, processes, methods, and data-centric thinking. Major topics include: unsupervised and supervised learning methods, optimization , kernel learning, manifold learning and basic probability and statistical inference.

Numerical Linear Algebra Fall 2024
Michigan State University *East Lansing, MI*

Studied fundamental numerical concepts and methods for efficiently solving linear equations and eigenvalue problems with emphasis on the design and analysis of efficient and stable numerical schemes. Major topics include: fundamental matrix factorizations, solving linear systems, and algorithmic analysis.

Multivariate Statistical Analysis Winter 2023
University of Michigan-Dearborn *Dearborn, Mi*

An introduction to commonly encountered statistical and multivariate techniques with a focus on computation and interpretation of estimated parameters. Topics include: multivariate regression, PCA, factor analysis, canonical correlation, and LDA.

Technical Skills

Languages: Python (Advanced), R (Advanced), C++ (Intermediate)
Technologies: PySpark, Pandas, NumPy, TensorFlow, LaTeX, MongoDB.
Productivity: Notion, Jira, Microsoft 365, Google Workspace.
Certifications: The Erdős Institude Data Science Boot Camp.