Karan Srivastava

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EDUCATION

MA, PhD in Mathematics | *University of Wisconsin-Madison*   Expected 2025
PhD Minor in Computer Science   GPA: 3.57/4
BSc. Mathematics | *University of Illinois at Urbana-Champaign*   May 2020
Magna Cum Laude with Highest Distinction in Mathematics   GPA: 3.97/4
Study Abroad   Spring 2019
Independent University of Moscow   GPA: 3.87/4

RESEARCH EXPERIENCE

PhD Work, University of Wisconsin-Madison and Wisconsin Institute for Discovery   Aug 2020 – present
- Working on developing ***reinforcement learning*** agents that generate data for problems in pure mathematics.
- Developing ***graph convolutional network architecture*** for detecting hidden cliques in graph networks.
- Developed a novel method of ***reconstructing linear data*** **robust to noise** and published findings at the IEEE ISIT 2022. Slides, code, and paper can be found here.

SELECTED PROJECTS

Learning Tic Tac Toe with Reinforcement Learning   July 2023 - August 2023
- Implemented a ***reinforcement learning*** model that learns how to play tic tac toe with **100% accuracy** starting from just the rules. *Github link*

Erdös Institute | Data Science Bootcamp   May 2022 – July 2022, Nov 2022 - Jan 2022
CoverMyMed Copayment Prediction
- Developed and tested various ***machine learning models*** that reduce bias to predict copayment information based on patient history and drug formulary information with **~90% accuracy**. *Github link*

What's Cooking? Cuisine Analysis
- Studied a Kaggle dataset on cuisines, used various clustering techniques to find similarities between cuisines based on ingredients, and developed ***random forest, linear SVC, and other machine learning models*** to achieve **classification accuracies of ~ 85%**. Github link

University of Wisconsin   Aug 2022 - Dec 2022
Causal Inference through Machine Learning
- Synthesized and implemented advancements in causal learning to experimentally demonstrate how ***machine learning*** methods can uncover causal relationships in synthetic and real-world datasets with **~90% confidence**. *Write-up link*. *Github Link*.

SKILLS

- **Languages:** Python, Julia, Mathematica, C++, Java, Latex, R (basic), SQL (basic)
- **Python Libraries:** Pandas, Scikit-Learn, Matplotlib, BeautifulSoup, Numpy
- **Machine Learning:** Pytorch, Tensorflow, Keras, Reinforcement Learning, Graph Convolutional Networks
- **OS and Platforms**: Bash, GitHub(ksrivastava1), MacOS, Jupyterlab, VSCode, Linux computing clusters.

LEADERSHIP AND SERVICE

Undergraduate Mentor Program, University of Wisconsin-Madison   2022 – present
- Founded and organized a mentorship program that paired ~30 PhD mentors with undergraduates.

Directed Reading Program, University of Wisconsin-Madison   2021 – present
- Organizes a reading program that groups ~300 undergraduate students with PhD mentors over many semesters.
- Designed 3 projects in **machine learning**, **graph neural networks**, and algebraic geometry.

Math Circle, University of Wisconsin-Madison   2021 – 2022
- Organized ~30 mathematical talks by faculty and PhD students for local middle and high schools.
- Designed a workshop in mathematical reasoning for 40 local middle and high school students.

Madison Experimental Math Lab, University of Wisconsin-Madison   2022 – present
- Helped organize ~45 undergraduate research projects with faculty and PhD mentors over many semesters.

Teaching Assistant, University of Wisconsin-Madison   2020 – present

CERTIFICATES AND AWARDS

Institute for Foundations of Data Science Research Assistantship: $10,000 Research Grant	Aug 2023 - Jan 2023
Erdos Institute Data-Science Bootcamp	May 2022 - July 2022
Campus-wide Exceptional Service Award: Awarded to 3/2300 Teaching Assistants	2022-2023
Departmental Exceptional Service Award: Awarded to 2/120 Math Dept. Teaching Assistants	2022-2023
Exceptional Teaching Award: Demonstrated excellence in teaching for 4 or more semesters	2020-2022
Edmund J. James Scholar: Awarded to top 15% of undergraduates campus-wide	2017-2020
Dean's List, University of Illinois at Urbana-Champaign	All semesters