Noah Marshall

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linkedin | github | webpage

Education

McGill University *Sept. 2023 - present*

Doctor of Philosophy in Mathematics and Statistics

- Cosupervisors: Dr. Elliot Paquette and Dr. Adam Oberman
- Research Topics: random matrix theory, stochastic processes, generative models, self-supervised learning

McGill University *2020-2023*

Master of Science in Mathematics and Statistics

- Supervisor: Dr. Adam Oberman
- Cumulative GPA: 4.0/4.0
- Associated with Mila – Quebec Artificial Intelligence Institute

The University of British Columbia *2015-2019*

Bachelor of Science - Honours in Mathematics and Minor in Data Science

- Cumulative GPA: 4.33/4.33

Research Experience

Microsoft + Nuance *2023 Summer*

NLP Research Intern

- Implemented generative AI tools for customer service
- Augmented large language models using a knowledge base retriever
- Improve response quality with prompt engineering

Phyla *2021 Summer*

Machine Learning Research Intern

- Developed a graph neural network for classification of irritable bowel diseases (IBD)
- Implemented a pipeline in PyTorch to run, test, and log experimental results
- Developed a custom cross validation method to reduce the impact of batch effects

The University of British Columbia *2020-2021*

Research Assistant 2

- Analyzed and developed a differential equation model coupling the dynamics of opinion and disease
- Find that more reactive populations can experience smaller peak epidemic size, but more epidemic waves and more cases

Mathematics and Climate Research Network *2019-2021*

Student Researcher

- Collaborated with an international group of students and professors to develop a novel data assimilation method
- Investigated the use of model and data dimension reduction methods to improve the effectiveness of particle filters

Publications

- **Noah Marshall**, Ke Liang Xiao, Atish Agarwala, and Elliot Paquette. 2024. A Clipped Trip: the Dynamics of SGD with Gradient Clipping in High-Dimensions. *Preprint*
- Salvador T, Cairns S, Voleti V, **Marshall N**, Oberman A. 2021. FairCal: Fairness Calibration for Face Verification. *Ninth International Conference on Learning Representations*
- Tyson R, **Marshall N**, Baumgaertner B. 2022. Transient prophylaxis and multiple epidemic waves. *AIMS Mathematics*
- *(equal contribution, sorted by last name)** Albarakati A, Budišić M, Crocker R, Glass-Klaiber J, Iams S, Maclean J, **Marshall N**, Roberts C, Van Vleck E. 2021. Model and Data Reduction for Data Assimilation: Particle Filters Employing Projected Forecasts and Data with Application to a Shallow Water Model. *Computers & Mathematics with Applications*

Skills

Programming Languages Python | Java | R | MATLAB | SQL | Bash

Frameworks & Libraries PyTorch | Tensorflow | Numpy | Matplotplib | Pandas | Scikit-learn

Teaching and Mentorship

Directed Reading Program *2021-present*

McGill University

- Lead a mentored reading program for undergraduate students
- Studied generative diffusion models and probabilistic graphical models
- Currently directing reading on tree indexed stochastic processes and percolations on neural networks

Graduate Teaching Assistant *2022-present*

McGill University

- 2024: Introduction to stochastic processes
- 2023: Calculus 1
- 2022: Calculus 1

Undergraduate Teaching Assistant *2016-2019*

The University of British Columbia

- Calculus 1
- Calculus 2
- Introduction to Probability

Supplemental Learning Instructor *2016-2019*

The University of British Columbia

- Provide supplemental lectures for difficult first year math courses
- Prepare practice final exams and midterms
- Lead final exam and midterm review sessions

Awards

Canadian Graduate Scholarship *present*

- Program provides financial support to high-calibre students

Institut des sciences mathématiques Graduate Scholarship *present*

- Awarded to outstanding PhD students in mathematics

Graduate Excellence Award *2020-2021*

- Offered to newly recruited students whose application dossier is of an exceptional caliber at McGill University

NSERC Undergraduate Student Research Award *2018*

- Funding awarded to undergraduate students pursuing summer research in natural sciences or engineering

Deputy Vice-Chancellor Scholarship *2017-2019*

- Annually renewable entrance scholarship for continuing students at The University of British Columbia