Noah Ripstein

noah.h.ripstein@gmail.com | noahripstein.com

EDUCATION

McMaster University **Hamilton, Canada**
Non-degree student, additional advanced coursework in Statistics and Mathematics Sept. 2024 – Apr. 2025

McMaster University **Hamilton, Canada**
B. Arts Sc. (Hons.) Arts and Science, & Psychology, Neuroscience and Behaviour (Math Minor) Sept. 2020 – Apr. 2024

- cGPA: 3.94/4.0 | Laura Dodson Prize (top graduation award)
- **Honours Thesis:** Bayesian Modelling of a Haptic Categorization Task, and Temporal Video Segmentation

AWARDS AND SCHOLARSHIPS

Industry Disruptor Award ($5,000), RBC Amplify **2024**
Awarded by chief executives for developing most innovative solution in summer-long competition.

Laura Dodson Prize ($200), McMaster University Faculty of Arts and Science **2024**
Top academic achievement graduation award in Arts and Science program (awarded to 1-2 students in cohort).

Barbara Francis Scholarship ($400), McMaster University Faculty of Arts and Science **2022**
Top academic achievement award in Arts and Science program (awarded to one student in program annually).

Undergraduate Student Research Award ($7,500), McMaster University Faculty of Arts and Science **2022**
Awarded funding for summer 2022 research through competitive USRA program.

McMaster President's Award ($2,500), McMaster University Faculty of Arts and Science **2020**
Entrance scholarship for 95%+ high school GPA

RESEARCH EXPERIENCE

University of Toronto **Toronto, Canada**
Research Collaborator (Statistical Sciences) Aug. 2024 – present
Supervisors: Professor Jamie Stafford and Professor Patrick Brown

- Research in Extended Latent Gaussian Models (ELGMs), a broad class of Bayesian hierarchical model, focused on efficient model fitting and applications to spatio-temporal statistics.
- Developing novel method to infer high resolution disease risk from spatially aggregated point process data for which the boundaries of the aggregating regions change over time.
- Investigating computational advancements to fit ELGMs more accurately with Variational Inference.

McMaster University **Hamilton, Canada**
Research Assistant II (Statistics) Sept. 2024 – present
Supervisor: Professor Pratheepa Jeganathan

- Developing a Bayesian approach to spatial clustering, with applications to spatial omics and tumour identification.
- Designing novel approach to regionalization which leverages Gaussian Mixture Models to quantify uncertainty.

McMaster University **Hamilton, Canada**
Research Student (Computational Neuroscience & Computer Vision) Sept. 2022 – Apr. 2024
Supervisor: Professor Daniel Goldreich

- Built Bayesian models of human sensory perception and learning; found that human performance in a learning task is similar to optimal Bayesian models.
- Independently identified opportunities to design and implement novel computer vision method to automate parts of tedious manual video inspection process.
- Developed method to temporally segment videos, facilitating 250+ hours of automatic video labelling.
- Synthesized and combined research in historically separate areas of Statistics and computer vision (time series changepoint detection, human-object interaction, and temporal action segmentation).

McMaster University **Hamilton, Canada**
Research Student (Bioethics) May 2022 – Aug. 2022
Supervisor: Professor Daniel Coren

- Independent research project funded by USRA award which involved synthesizing cognitive and neurological dementia research in conjunction with philosophical notions of responsibility.

INDUSTRY EXPERIENCE

Royal Bank of Canada (RBC) **Toronto, Canada**
Software Developer, *RBC Amplify* May 2024 – Aug. 2024

- Part of RBC's flagship technology and innovation early talent program.
- Developed a multimodal machine learning product which improves call centre client intent identification and provides advisors with personalized client insights, saving time for clients and advisors.
- Projected to save $2M+ annually through advisor time savings in first year of deployment.
- Named inventor in RBC provisional patent.
- Won prestigious "Industry Disruptor Award" in final competition with 18 teams for best presentation to audience of 400+ (see Awards and Scholarships).

SKILLS

Programming Languages: R, Stan, Python, MATLAB, SAS, SQL
Frameworks: INLA, RStan, Various R Spatial Statistics packages, Numpy, Scipy, Sklearn, Matplotlib, Tensorflow

INDEPENDENT PROJECTS

2048 Game Artificial Intelligence (2023)

- Developed probabilistic methods to algorithmically beat 2048, the viral online game from 2014 which can be formalized as a Markov Decision Process.
- Independently discovered strategies including Expectimax and Monte Carlo Tree Search without reference to existing theory. Later found literature about the techniques and used my findings to improve performance.
- Tuned parameters with multi-objective Bayesian optimization to identify pareto-efficient parameters which strike balance of score and computing time, achieving 97% win-rate.

LEADERSHIP & EXTRACURRICULARS

Hospital Volunteer – St. Michael's Hospital May 2023 – Aug. 2023
Peer Mentor – McMaster Arts and Science Program Sept. 2022 – Apr. 2024
Peer Mentor – McMaster Psychology, Neuroscience and Behaviour Program Sept. 2022 – Apr. 2024
Occasional Writer - The Melange, a magazine about life in the Arts and Science Program Sept. 2021 – Apr. 2024
Overnight Canoe Trip Guide – Camp Northway Lodge, Algonquin Park Jun. 2019 – Jul. 2019