Aditya Khan

adityakhan@cs.toronto.edu ❖ Toronto, ON ❖ (306) 290 0723 ❖ https://adk0101.github.io/

EDUCATION

University of Toronto – St. George Campus   **Sept. 2021 – Present**
Final-Year Student (Expected Graduation Date: 04/26)   *Toronto, ON*
- Hons. BSc – Data Science, Statistics, Computer Science.
- Cumulative GPA: 3.94/4.00; Enrolled in Arts and Science Internship Program (Co-op).
- Relevant Coursework: Intro to AI, Stochastic Processes, Sampling and Surveys, Statistical Inference, Methods for Multivariate Data, Data Science, Real Analysis, Linear Algebra, Multivariable Calculus, Ordinary Differential Equations, Algorithm Design and Analysis, Software Tools and Systems Programming, Intro to Databases.

PUBLICATIONS & PREPRINTS

Conference Papers

- **URIEL+: Enhancing Linguistic Inclusion and Usability in a Typological and Multilingual Knowledge Base**
  Aditya Khan[*], Mason Shipton[*], David Anugraha, Kaiyao Duan, Phuong Hanh Hoang, Eric Khiu, A. Seza Doğruöz, En-Shiun Annie Lee.
  International Conference on Computational Linguistics (COLING) 2025.

- **A Faculty Initiative Addressing Gender Disparity at a Small STEM-Focused University: A Case Study**
  Amane Takeuchi[*], **Aditya Khan**[*], Phuong Hanh Hoang[*], Jian Yun Zhuang, Randy J. Fortier, Mariana Shimabukuro, Michael Miljanovic, En-Shiun Annie Lee.
  ACM Virtual Global Computing Education Conference (SIGSCE Virtual) 2024.

Workshop Papers

- **Toward A Reinforcement-Learning-Based System for Adjusting Medication to Minimize Speech Disfluency**
  Pavlos Constas[*], Vikram Rawal[*], Matthew Honorio Oliveira[*], Andreas Constas[*], **Aditya Khan**[*], Kaison Cheung[*], Najma Sultani[*], Carrie Chen[*], Micol Altomare[*], Michael Akzam[*], Jiacheng Chen[*], Vhea He[*], Lauren Altomare[*], Heraa Muqri[*], Asad Khan[*], Nimit Amikumar Bhanshali[*], Youssef Rachad[*], Michael Guerzhoy.
  Machine Learning for Cognitive and Mental Health Workshop (ML4CMH) at AAAI 2024.

[*] Indicates equal contribution.

CONTRIBUTED TALKS

The Third Joint SIAM/CAIMS Annual Meetings (AN25)   **Jul. 2025**
- Endemicity and Eradication of Diseases in the Presence of Vaccination and Reinfection in a SEIRV Model

SSC Annual Meeting 2025   **May 2025**
- Comparing Exact and Approximate Inference for Spatial Autocorrelation Tests: A Power Analysis

Canadian Statistics Student Conference (CSSC) 2025   **May 2025**
- Crowds, Chaos, and Commutes: Making Inference on the Spatiotemporal Impact of Special Events on Travel Times

Trinity College Undergraduate Research Conference (TCURC) 2025   **Mar. 2025**
- Endemicity and Eradication of Diseases in the Presence of Vaccination and Reinfection in a SEIRV Model

International Conference on Computational Linguistics (COLING) 2025   **Jan. 2025**
- URIEL+: Enhancing Linguistic Inclusion and Usability in a Typological and Multilingual Knowledge Base

ACM Virtual Global Computing Education Conference (SIGSCE Virtual) 2024   **Dec. 2024**
- A Faculty Initiative Addressing Gender Disparity at a Small STEM-Focused University: A Case Study

PAPERS IN PROGRESS

Parametric Hotspot Analysis with the Getis-Ord Statistic
Joint with Ian Zhang (University of Toronto)
- We develop principled parametric tests for hotspot detection on areal datasets with the Getis-Ord statistic.
- Work based on material presented at the 2025 SSC Annual Meeting.

Analysing the Impact of Reinfection in an SEIRV Disease Transmission Model
Joint with Lin Wang (University of New Brunswick) and Juxin Liu (University of Saskatchewan)
- We propose a novel disease transmission model building upon the SEIR model, including vaccination and reinfection.
- Work presented at the 2025 SIAM/CAIMS Annual Meeting (AN25).

WORK EXPERIENCE

Transportation Data Analyst   **Sept. 2024 – Aug. 2025**
City of Toronto
- Statistical consulting, building spatiotemporal models, and developing imputation strategies for data on networks.

RESEARCH EXPERIENCE

Research Student (Spatial Statistics)   **Sept. 2025 – Present**
Advisor: Meredith Franklin (University of Toronto)
- Making spatial autocorrelation indices such as Moran's I more robust and studying their invariance properties.

Research Student (ICU Patient Forecasting)   **Sept. 2025 – Present**
Advisor: Anna Goldenberg (University of Toronto, Vector Institute)
- Comparing forecasting methods for ordering lab tests for ICU patients, in the presence of distribution shifts.

Research Assistant (SMC and Posterior Inference on LLMs)   **May 2024 – Dec. 2024**
Advisor: Roger Grosse (University of Toronto, Vector Institute)
- Developing connections between sequential Monte Carlo algorithms for LLMs, and speculative decoding.

Research Assistant (NLP and CS Education)   **May 2024 – Aug. 2024**
Advisor: En-Shiun Annie Lee (University of Toronto)
- Led two teams of undergraduate students towards publishing research papers on CS education and NLP.

Research Assistant (Mathematical Biology)   **May 2023 – Aug. 2024**
Advisors: Juxin Liu and Lin Wang (work done at University of Saskatchewan)
- Proving theoretical results about a novel disease-transmission model and verifying with simulations in Python.

Research Assistant (Reinforcement Learning)   **July 2023 – Sept. 2023**
Advisor: Michael Guerzhoy (University of Toronto)
- Designed an experiment for gathering disfluency ratings and feeding data into an RL system to learn optimal strategies to minimise speech disfluencies.

Research Assistant (Data Visualisation)   **May 2023 – Aug. 2023**
Advisor: Carolina Nobre (University of Toronto)
- Worked on developing data visualisation techniques for time-evolving networks, using flight data as a case study.

TEACHING EXPERIENCE

Teaching Assistant   **Sept. 2023 – Present**
University of Toronto – Department of Mathematics
- TA for MAT246H1: Concepts in Abstract Mathematics (Fall 2023, Winter 2024, Fall 2025)
- TA for MAT223H1: Linear Algebra I (Fall 2024, Winter 2025)
- TA for STA130H1: An Introduction to Statistical Reasoning and Data Science (Winter 2026)
- Combination of preparing and teaching tutorials, grading assignments and tests, and holding office hours.

AWARDS & ACHIEVEMENTS

- **Computer Science Engagement Award (2025)**
  Awarded by the Department of Computer Science. Recognises students who connect and apply their CS knowledge or skills in creative and innovative ways. Awarded for my paper presented at SIGSCE Virtual.
- **NSERC Undergraduate Student Research Award (2024)**
  Awarded by the University of Saskatchewan for a project on mathematical modelling of disease spread with differential equation models.
- **Dean's List Scholar (2022, 2023, 2024)**
  Awarded to students under the Faculty of Arts and Science at the University of Toronto who have a cumulative GPA of at least 3.50, after completing five credits.
- **Samuel Beatty Scholarship (2023)**
  Awarded to students studying Computer Science, Mathematics, Statistics, or Physics at the University of Toronto based on academic performance during the previous year or financial need.
- **Chancellor's Scholarship (2022)**
  Awarded for high academic achievement in the 2021-2021 academic year by Trinity College, University of Toronto.
- **University of Toronto Scholars Award (2021)**
  Awarded to outstanding secondary school applicants to the University of Toronto, on the basis of their mark average at the time of admission.
- **Competitive Debate Achievements**
  2-time provincial representative at national tournaments; 7-time medallist in civic/provincial tournaments.

GRANTS

- **CSSC Travel Award (2025)**
  Awarded to select participants at CSSC 2025 to travel to Saskatoon, SK to present their work.
- **Trinity College Experiential Fund (2025)**
  Awarded to students at Trinity College, University of Toronto to support experiential learning opportunities.
- **Department of Computer Science Academic Travel Grant (2025)**
  Awarded to students under the Department of Computer Science to attend a conference, prioritising students whose research projects contribute to equity, diversity, inclusion, and belonging in computer science.
- **Arts and Sciences Student Union Travel Grant (2025)**
  Awarded to full-time students at the University of Toronto who are presenting their work at a conference.

OTHER PROJECTS

Predicting Polarising Tweets with Random Forests   **Mar. 2023 – Apr. 2023**
Python
- Trained a random forest classifier to predict how polarising a tweet would be based on the assigned sentiment score.
- Used an extensive validation regime to fine-tune the model hyperparameters to maximise prediction accuracy.

Tournament Bracket Manager   **Sept. 2022 – Dec. 2022**
Java
- Designed a long-term group course project wherein multiple different users can simulate and manage a tournament.
- Ensured code efficiency by implementing effective tree algorithms and followed industry-standard design principles.

Modelling the Change of Employed Persons in Canada (Jan. 2018 - Jan. 2021)   **Mar. 2021 – Apr. 2021**
R – Microsoft Excel
- Fitted a logistic regression with R to draw conclusions on the pandemic's effect on changes in employment.
- Drew novel conclusions about significant differences in pandemic employment changes across regions in Canada.

ACADEMIC SERVICE

Peer Reviewer (ML4H 2025)   **Sept. 2025**
Machine Learning for Health Symposium (ML4H) 2025
- Peer reviewer for four papers submitted to ML4H on the topic of ML/AI in healthcare.

ACADEMIC COMMUNITY INVOLVEMENT

Birds of a Feather Event on Multilinguality and Language Diversity   **Jun. 2024**
North American Chapter of the Association for Computational Linguistics (NAACL) 24
- Co-hosted an event at a top CS conference, leading discussion on representation of low-resource languages in NLP.
- Involved 40+ conference attendees, including leading researchers in NLP and computational linguistics.

MEDIA COVERAGE

U of T undergraduate students explore the use of AI to treat speech disfluency   **Feb. 2024**
By Selah Katona – UofT News

TECHNICAL SKILLS

- Languages: Python (Jax, Pytorch, Pandas, Scikit-Learn, psycopg), R (tidyverse, ggplot2), Java, C, SQL, JavaScript.
- Technologies: QGIS, Jupyter, Tableau, GitHub, Anaconda, SLURM, Microsoft Excel, Wolfram Mathematica, Latex.