

Aditya Khan

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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 Conostas*, Vikram Rawal*, Matthew Honorio Oliveira*, Andreas Conostas*, 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 (conditional) exact 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).

Crowds, Chaos, and Commutes: Making Inference on the Impact of Special Events on Travel Times

Joint with Katrina S. Sha (University of Toronto)

- We fit a GAM with an AR(1) covariance structure and inverse-variance weighting to spatiotemporal vehicle travel time data around Rogers Centre and Scotiabank Arena to analyse impact of events on traffic congestion.
- Work presented at CSSC 2025.

WORK EXPERIENCE

Transportation Data Analyst

Sept. 2024 – Present

City of Toronto

- Statistical consulting, building spatiotemporal models, and developing imputation strategies for data on networks.

RESEARCH EXPERIENCE

Research Assistant (SMC and Posterior Inference on LLMs)

May 2024 – Dec. 2024

Vector Institute and University of Toronto – Roger Grosse’s Group

- Developing connections between sequential Monte Carlo algorithms for LLMs, and speculative decoding.

Research Assistant (NLP and CS Education)

May 2024 – Aug. 2024

University of Toronto and Ontario Tech University – Lee Language Lab

- Led two teams of undergraduate students towards publishing research papers on CS education and NLP.

Research Assistant (Mathematical Biology)

May 2023 – Aug. 2024

University of Saskatchewan – Department of Mathematics and Statistics

- Proving theoretical results about a novel disease-transmission model and verifying with simulations in Python.

Research Assistant (Reinforcement Learning)

July 2023 – Sept. 2023

University of Toronto – Michael Guerzhoy’s Reinforcement Learning Summer Research Group

- 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

University of Toronto – Carolina Nobre’s Group

- Worked on developing data visualisation techniques for time-evolving networks, using flight data as a case study.

TEACHING EXPERIENCE

Teaching Assistant (MAT223H1: Linear Algebra I)

Sept. 2024 – Apr. 2025

University of Toronto – Department of Mathematics

- Taught tutorials (about 40 students each), graded tests for about 400 students and hosted office hours.

Teaching Assistant (MAT246H1: Concepts in Abstract Mathematics)

Sept. 2023 – Apr. 2024

University of Toronto – Department of Mathematics

- Prepared and taught multiple tutorials (about 60 students each), and graded tests and assignments for 350+ students.

AWARDS & ACHIEVEMENTS

- **Computer Science Engagement Award (2025)**

Awarded by the Department of Computer Science (University of Toronto). Recognises students who connect and apply their CS knowledge or skills in creative and innovative ways. Awarded for my 2024 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 2021-2022 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 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.