Andrew Luo

(778) 320-6660 | j92luo@uwaterloo.ca | turnip314.com

Education

University of Waterloo — Waterloo, Ontario
Master of Mathematics - Thesis Option — *Jan 2024 - Present*

- Conducting research in symbolic computational methods for Analytic Combinatorics in Several Variables under supervision of Stephen Melczer and Eric Schost
- **Courses:** Computational Complexity, Algebraic Geometry

University of Waterloo — Waterloo, Ontario
Bachelor of Mathematics — *Sept 2018 - Apr 2023*

- Triple majors in Computer Science, Pure Mathematics, and Combinatorics & Optimization
- Graduated with Dean's Honours standing and a 95% CAV
- **Courses:**
  - PMATH – Groups and Rings, Fields and Galois Theory, Real Analysis, Complex Analysis, Differential Geometry, Analytic Number Theory, Lebesgue Integration and Fourier Analysis, Algebraic Number Theory, Representation of Finite Groups, Set Theory and Model Theory
  - CS – Designing Functional Programs, Data Structures and Algorithms, Numerical Computation, The Theory of Computation, Algorithm Design and Analysis, Introduction to Machine Learning
  - CO – Intro to Optimization (Advanced Level), Combinatorial Enumeration, Applied Cryptography, The Mathematics of Public Key Cryptography, Algebraic Combinatorics, Continuous Optimization

Academic Experience

Graduate Teaching Assistant — Waterloo, ON
University of Waterloo — *Jan 2024 - Present*

- Conducting office hours, tutorials, responses to student inquiries, and grading of assignments and exams for undergraduate CS course
- Organized and presented Jupyter Notebook and Python tutorial for CS 370 - Numerical Computation

Undergraduate Teaching Assistant — Waterloo, ON
University of Waterloo — *Sept 2019 - Dec 2022*

- Conducted grading and feedback for undergraduate mathematics courses

Undergraduate Mathematics Research Assistant — Waterloo, ON
University of Waterloo — *May - Aug 2022*

- Worked under the supervision of Stephen Melczer and ACSV group B. Hackl, J. Selover, E.Wong to develop a Sage package for computing asymptotics of multivariate generating functions

Undergraduate Mathematics Research Assistant — Waterloo, ON
University of Waterloo — *May - Aug 2021*

- Studied the most recent progress made in and applications to Waring's Problem and Vinogradov's Mean Value Theorem under supervision of Professor Yu-Ru Liu

Professional Experience

Part-Time Mathematics Tutor   Missisauga, ON
Cloudtimes Education   *Feb 2023 - Present*
- Developing and giving lessons for high school students taking various math courses or programs, including Advanced Functions, Calculus, and Euclid Math Contest preparation

Full-Stack Software Developer Intern   New York City, NY
Noom   *Jan - Apr 2022*
- Developed Natural Language Processing microservice for customer service request question detection and triage

Full-Stack Microsoft Developer Intern   Mississauga, ON
BDO   *Sept - Dec 2020*
- Designed web application and backend logic for resource allocation tool

Backend Developer Intern   Boston, MA
Wayfair   *Jan - Apr 2020*
- Made architecture decisions for backend software use by the customer service team

Full Stack Software Developer Intern   San Francisco, CA
Wish   *May - Aug 2019*
- Developed Python APIs and scripts for monitoring merchant fraud activity

Publications

Rigorous Analytic Combinatorics in Several Variables in SageMath. B. Hackl, A. Luo, S. Melczer, J. [arxiv:2303.09603](https://arxiv.org/abs/2303.09603) Selover, and E. Wong. Submitted March 2023.

Presentations

A Brief Introduction to Computational Analytic Combinatorics   Québec City, QC
Canadian Undergraduate Mathematics Conference, Université Laval   *July 2022*
- Presented SageMath software package for computing the asymptotics of multivariate generating functions.

An Introduction to Vinogradov's Mean Value Theorem   London, ON
Canadian Undergraduate Mathematics Conference, Western University   *Aug 2021*
- Summarized Dr. Trevor Wooley's recent work on Vinogradov's Mean Value Theorem.

Honours and Awards

Graduate Excellence Award in Computer Science | *University of Waterloo*	2024
Mike Vangoch Memorial Scholarship | *University of Waterloo*	2023
NSERC Undergraduate Student Research Award | *NSERC*	2022
NSERC Undergraduate Student Research Award | *NSERC*	2021
Faculty of Mathematics Entrance Scholarship | *University of Waterloo*	2018
Putnam Math Competition Honour Roll | *Mathematical Association of America*	2018