

Mark Bedaywi

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EDUCATION

The University of Toronto

Toronto, CA

Bachelors of Science. Specialist in Computer Science with a focus in AI and Theoretical Computer Science, Major in Mathematics.

GPA: 3.96/4.00

Recipient of \$20,000 in scholarships and \$8,000 in grants.

2020 – 2024 (expected)

RESEARCH EXPERIENCE

University of Toronto, Department of Computer Science

Toronto, CA

Undergraduate Researcher with Dr. Nisarg Shah

May 2023 – August 2023

- Collaborated with Dr. Nisarg Shah to analyse and design new participatory budgeting voting rules with provable fairness guarantees.

Vector Institute

Toronto, CA

NSERC USRA with Dr. Amir-massoud Farahmand

February 2023 – Ongoing

- Collaborating with Dr. Amir-massoud Farahmand on accelerating reinforcement learning algorithms using ideas from control theory.
- Building and managing a substantial code base, overseeing all aspects of its development and maintenance.

PUBLICATIONS AND MANUSCRIPTS

- **The Distortion of Public-Spirited Participatory Budgeting**

Mark Bedaywi, Bailey Flanigan, Mohamad Latifian, Nisarg Shah.

Under review at AAAI 2023

[Link to paper](#)

TEACHING

Course Content Editor and Developer

Toronto, CA

Department of Computer Science, University of Toronto

Summer 2021

- Assisted in the preparation and revision of course materials for blended offerings of introductory computer science courses.
- Coordinated with faculty instructors in the creation and editing of online content.

Volunteer Mathematics and Science Tutor

Mississauga, CA

St. Marcellinus

2019 – 2020

- Assisted students with mathematics, physics, and chemistry
- Planned tutoring sessions and monitored the growth of select students

SCHOLARSHIPS, AWARDS, AND HONOURS

- CRA Outstanding Undergraduate Researcher Finalist 2023
- NSERC Undergraduate Student Research Award 2023

• Three Time Dean's List Scholar	2021 – 2023
• Friends Of Victoria University Library Scholarship III	2023
• University Of Toronto Scholar - Beatty	2022
• Louis R Charpentier Scholarship II - University of Toronto	2022
• Katherine St John Scholarship - University of Toronto	2021
• Entrance Scholarship: University of Toronto Scholar	2020
• University of Waterloo Pascal and Senior CEMC Contest Honour Roll	2018 2020

EXTRACURRICULAR ACTIVITIES

• President of the CS Undergraduate Theory Society	Fall 2023
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PROGRAMMING PROJECTS

- **Curious Transformers On Rubik's Cubes** (Python, PyTorch, 2023)
An implementation of decision transformers, as well as an exploration into various novel variants of decision transformers that can take decisions and learn from feedback, essentially doing online RL, tested on Rubik's cubes.
- **Traversing Game Trees Intelligently** (Python, Scikit-Learn, 2021)
Implementations of various algorithms to search through game trees of an assortment of games intelligently, including a minimax search with alpha-beta pruning, a MCTS with simulation, and a MCTS with a neural network that learns the value of moves through repeated self play.
- **First Order Logic Theorem Verifier** (Racket, 2021)
A utilization of lispy metaprogramming to formally specify mathematical proofs in Racket.
- **Analysis of Global Warming Sentiment on Social Media** (Python, Twitter API, Plotly, Pygame, 2020)
An application that aggregates over Twitter data and economic indicators to find relationships between public perception of global warming and government response.
- **Julia Set Viewer** (JavaScript, p5.js, 2019)
A fractal viewer that finds and plots the fixed points of any inputted equation.

All projects are available at github.com/Supermac30

TECHNICAL SKILLS

- **Languages:** Expert: Python; Proficient: C, Java; Prior Experience: Javascript, Haskell, Racket
- **Python for ML and Data Visualisation:** PyTorch, Numpy, Matplotlib, Weights and Biases, Tensorboard, Scikit-Learn, Keras, Plotly
- **Tools:** Unix, Slurm
- **Formatting:** \LaTeX , HTML, Markdown