

Mark Bedaywi

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Github: github.com/Supermac30
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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 Prof. Nisarg Shah

May 2023 – Ongoing

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

Vector Institute

Toronto, CA

NSERC USRA with Prof. Amir-massoud Farahmand

February 2023 – Ongoing

- Collaborating with Professor 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

- **PID Accelerated Temporal Difference Algorithms**
Mark Bedaywi, Amin Rakhsha, Amir-massoud Farahmand.
Working Paper
- **The Distortion of Public-Spirited Participatory Budgeting**
Mark Bedaywi, Bailey Flanigan, Mohamad Latifian, Nisarg Shah.
Under submission

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

- 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

PROJECTS

- **Curious Transformers On Rubik's Cubes** (Python, PyTorch, 2023)
An implementation of decision transformers, as well as an exploration into novel variants of decision transformers that can take decisions and learn from feedback, 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