Mark Bedaywi

mark_bedaywi@berkeley.edu · github.com/supermac30 · markbedaywi.ca

Education

University of California, Berkeley — Berkeley, CA
PhD in Computer Science — Aug 2024 – May 2029 (Expected)
Advised by Nika Haghtalab and Stuart Russell

University of Toronto — Toronto, ON
Honors Bachelors of Science *GPA: 3.97* — Sep 2020 – Jun 2024
Specialist in Computer Science and Major in Mathematics
Focus in Artificial Intelligence and the Theory of Computing
Recipient of $25,000 in scholarships and $8,000 in grants

Publications and Manuscripts

Will an AI with Private Information Allow Itself to Be Switched Off?
Andrew Garber, Rohan Subramani, Linus Luu, Mark Bedaywi, Stuart Russell, Scott Emmons
Link to Paper

PID Accelerated Temporal Difference Algorithms
Mark Bedaywi, Amin Rakhsha, Amir-massoud Farahmand
Link to Paper

The Distortion of Public-Spirited Participatory Budgeting
Mark Bedaywi, Bailey Flanigan, Mohamad Latifian, Nisarg Shah
Link to Paper

Research Experience

Center for Human-Compatible Artificial Intelligence (CHAI) — Berkeley, CA
Research Intern — June 2024 – Present

- Collaborating with Scott Emmons to build a theory of AI assistants. Wrote a manuscript identifying new safety failure modes of AI assistants.
- Designing algorithms for AI assistants to cooperate with humans in typical settings.

University of Toronto, Department of Computer Science — Toronto, ON
Undergraduate Student Researcher — May 2023 – June 2024

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

Vector Institute — Toronto, ON
NSERC USRA — February 2023 – August 2023

- Collaborated with Amir-massoud Farahmand to accelerate reinforcement learning algorithms using ideas from control theory.
- Built and managed a substantial code base, overseeing all aspects of its development and maintenance.

Scholarships, Awards, and Honours

Finalist, Outstanding Undergraduate Researcher Award — 2023
Awarded by the Computing Research Association to the top undergraduate computer science researchers in North America. Finalist is awarded to the top 20.

NSERC Undergraduate Student Research Award — 2023
Awarded by the National Science and Engineering Research Council of Canada to support undergraduate research.

Four Time Dean's List Scholar — 2021 – 2024
Awarded on the basis of GPA.

University of Toronto Computer Science Scholarships — 2024
Awarded the Kay Baxter Memorial Award and the Daniel Berlin Scholarship for top performing computer science students on the basis of GPA.

Victoria College In-Course Scholarships — 2021 – 2023
Awarded the Friends Of Victoria University Library Scholarship, the Louis R Charpentier Scholarship, and the Katherine St John Scholarship on the basis of GPA.

University of Toronto Scholar – Beatty 2022
Given to the top performing students in the University of Toronto's Faculty of Arts and Science.

University of Toronto Scholar – Entrance Scholarship 2020
Given to the top 10% of students entering the University of Toronto's Faculty of Arts and Science.

Community Service

President of the CS Undergraduate Theory Society at the University of Toronto. Fall 2023 – Fall 2024

Teaching

Course Content Editor and Developer Toronto, ON
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, ON
St. Marcellinus 2019 – 2020

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

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, performing 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 Verifier (Racket), 2021
Lispy metaprogramming used 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

Programming Languages	Python, C, Java, 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