MAAZ M.

mmaaz.ca ◇ m.maaz@mail.utoronto.ca ◇ github.com/mmaaz-git

EDUCATION

University of Toronto, Ph.D. in Operations Research *Sep 2022 - Aug 2025*
Interests: optimization, machine learning, formal verification
Awards: Vanier Scholarship ($150,000) – given to 55 top PhD students in Canada

EXPERIENCE

Anthropic Aug 2025 -
Research Fellow *San Francisco, CA*

- Working with Nicholas Carlini and Zac Hatfield-Dodds on LLMs, AI agents, software testing, and cybersecurity

MIT Sloan School of Management Feb 2024 - Jul 2024
Visiting Researcher *Cambridge, MA*

- Developed multimodal AI models for diagnosis of cardiac conditions in collaboration with Hartford Health, the largest hospital in Connecticut
- Leveraged state-of-the-art transformers, large language models, & time series models to achieve >90% accuracy

Amazon Jun 2022 - Sep 2022
Applied Scientist (intern) *Toronto, ON*

- Developed outlier detection system for Amazon Alexa, using a CNN developed in Keras/Tensorflow
- Devised a novel unsupervised performance estimation technique, which yielded a 75% reduction in error compared to state-of-the-art methods in experiments – paper featured on the Amazon Science website

SELECTED PUBLICATIONS

- *Formal verification of Markov chains with learned parameters.* NeurIPS 2025.
- *Siamese graph neural networks for drug discovery.* Poster at MoML 2023, Mila - Quebec AI Institute.
- *On orderings of probability vectors and unsupervised performance estimation.* IJCAI 2023, GLOW Workshop. arxiv:2306.10160

SELECTED SOFTWARE

markovml

- Python package for constructing Markov processes with embedded machine learning models and verifying their properties
- Supports Sklearn and Pytorch (Github link)

Citizen Gemini

- Developed an AI chatbot for citizens to ask questions about Ontario legislature (meetings, bills, etc.)
- Uses Google's Gemini LLMs with long-context, multiple models for retrieval and answer generation, and a dynamic caching approach to reduce latency (Github link)

Misc. open-source contributions

- Fixed bug in NumPy: developed a more numerically stable algorithm for generating Wald samples, thus ensuring samples are non-negative
- Contributed to SymPy: first solver for polynomials with algebraic coefficients
- First implementation of cylindrical algebraic decomposition (CAD) in Python
- Utility that converts SymPy systems to Z3 in order to check feasibility

SKILLS

Python (pandas, scikt-learn, SymPy, PyTorch, Tensorflow, Keras) • R (tidyverse, ggplot2) • Javascript (React) • Z3 • Lean • Gurobi