ALEX HEYMAN (they/them)

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PhD candidate researcher at York University

Education

York University (York U)
2023-present
Lassonde School of Engineering
PhD in Electrical Engineering & Computer Science

York U
2021-2023
Lassonde School of Engineering
Master of Sciences in Computer Science

University of Toronto (U of T)
2017-2021
Faculty of Arts & Science
Honours Bachelor of Science with Specialist in Computer Science with Focus in AI, Major in Cognitive Science, Minor in Philosophy
Innis College

Publications

Reasoning Large Language Model Errors Arise from Hallucinating Critical Problem Features
Published on arXiv on 2025-05-19; under review at NeurIPS 2025
https://arxiv.org/abs/2505.12151

Evaluating the Systematic Reasoning Abilities of Large Language Models through Graph Coloring
Published on arXiv on 2025-02-11
https://arxiv.org/abs/2502.07087

Fine Granularity Is Critical for Intelligent Neural Network Pruning
Published in *Neural Computation* Volume 36, Issue 12 (December 2024)
https://direct.mit.edu/neco/article/36/12/2677/124823/Fine-Granularity-Is-Critical-for-Intelligent

Information Utilitarianism
Published in *Perspectives on Ethics* (Journal of the University of Toronto Centre for Ethics)

Presented at “Ethics, Intersections, Reflections: C4E Undergraduate Research Conference” on 2021-07-17
Conference description, link to paper, and link to 15-minute talk:
https://c4ejournal.net/2021/07/23/ethics-intersections-reflections-c4e-undergraduate-research-conference-2021-c4ej-33/

Honours and Awards

York U (MSc)
Vector Scholarship in Artificial Intelligence (2021-22)
Lassonde Graduate Entrance Scholarship (2021)
AI-EGS (AI Systems: Engineering, Governance, and Society) Trainee Funding Award (2022)

U of T
President’s Scholar of Excellence
Innis College Exceptional Achievement Award (2019)
Innis College Alumni Association Scholarship (2020)

Skills

Machine learning

- Experience with TensorFlow, PyTorch, and scikit-learn
- York U EECS 6322 – Neural Networks and Deep Learning
- York U EECS 6127 – Machine Learning Theory
- York U EECS 6327 – Probabilistic Models and Machine Learning
- York U EECS 6415 – Big Data Systems
- U of T CSC413 – Neural Networks and Deep Learning
- U of T CSC412 – Probabilistic Machine Learning
- U of T CSC311 – Introduction to Machine Learning

General computer programming

- High familiarity with Java, Python
- Moderate familiarity with C, Lua, JavaScript
- Some familiarity with C++

Video game design and programming

- 10+ years of amateur experience

Web design, including use of HTML, CSS, and JavaScript

Mathematics up through linear algebra (U of T MAT223 & MAT224)
and multivariable calculus (U of T MAT237)

Symbolic logic (University of Chicago PHIL20100, U of T CSC240)

Selected projects

Research with Prof. Jimmy Ba: Population-based training of neural networks for TensorFlow
Code link: https://github.com/AlexHeyman/PopulationBasedTraining
Undergraduate 2nd year

Cell2D – Java 2D game development library
Website: http://www.cell2d.org/
Development began 12th grade; ongoing/intermittent

Echo – short puzzle-platforming video game made in 38 hours
Website: http://alexheyman.itch.io/echo
Undergraduate 1st year