Laker Newhouse

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EDUCATION
Massachusetts Institute of Technology, Cambridge, MA   GPA: 5.0/5.0

B.S. in Mathematics, M.S. in Artificial Intelligence, 2021-2025

Relevant coursework:

Deep Learning (G)	Complexity Theory (G)	Inference and Information (G)
GPU Programming (G)	Theory of Probability (G)	Embodied Intelligence (G)
Performance Engineering	Quantum Mechanics III	Field and Galois Theory

CURRENT RESEARCH
Faster Optimizers via Modular Duality, advised under Jeremy Bernstein and Phillip Isola

- Inspired Muon. TL;DR: for linear layers, update by $UV^\top$ for gradient $G = U\Sigma V^\top$.

PUBLICATIONS
Modular Duality in Deep Learning, 2024 (preprint)

Old Optimizer, New Norm: An Anthology, NeurIPS 2024 (workshop)

An Assessment of Model-on-Model Deception, ICLR 2024 (workshop)

ANTN: Bridging Autoregressive Neural Networks and Tensor Networks for Quantum Many-Body Simulation, NeurIPS 2023 (poster)

An Examination of Diversity in INFORMS Journal Editorial Boards, INFORMS Journal of Service Science 2021

WORK EXPERIENCE
Khan Academy for Ukraine Co-Founder   Sep 2023 — Present

- Co-leading initiative to translate Khan Academy for every student in Ukraine.

Center for Human-Compatible AI Researcher, Berkeley, CA   Jun 2024 — Aug 2024

- Implemented 40 new environments up to 4M states, researched long effective horizon RL.

Commonwealth Fusion Systems Software Intern, Somerville, MA Jun 2023 — Aug 2023

- Designed, implemented, and tested study of quench detection in the SPARC reactor. Sped up core physics algorithm by 23x using performance engineering.

Amazon Web Services Software Intern, Arlington, VA   Jun 2022 — Aug 2022

- Designed, implemented, tested, and documented integrating AWS IAM into Apache Kafka for disconnected edge devices. Wrote 9000 lines of Java code, all going into production.

Khan Academy Content Developer, Mountain View, CA   Jul 2019 — Sep 2020

- Created comprehensive set of 600 practice problems for Khan Academy's online multivariable calculus course, now serving over 10,000 unique users per month.
- Interviewed subject matter experts, including Grant Sanderson from 3Blue1Brown.

AWARDS
TheCoderGames National Contest Winner — first place out of 300 nationwide (2018)

LANGUAGES
machine: Python, C, JavaScript, Java, Verilog, Vim, Git, CUDA

human: English, German, Spanish; beginning French and Hebrew

INTERESTS
hiking, meditation, basketball, cheese, language learning, reading, and good math problems