




Sam Layton

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TECHNICAL SKILLS

Languages & Tools: Python | C++ | SQL | Git | Unix Shell | HTML | Mathematica | Stata | Tableau | Virtual Machines/GPU

Libraries: PyTorch | TensorFlow | Keras | Pandas | NumPy | SciPy | Scikit-learn | NetworkX | SymPy | Jax

Relevant Expertise: Deep Learning | Statistical Modeling/Estimation | Optimization | Bayesian Statistics | Causal Inference
Econometrics | Numerical Methods | Networks | Control Theory | PDE | Fourier Analysis | Complex Analysis | Transformers

EDUCATION

B.S. in Applied Mathematics | Economics

Sep 2020 – Dec 2024

Brigham Young University – Double Major

Provo, UT

- **4.00/4.00** Applied Mathematics GPA – First in class
- **3.99/4.00** Economics GPA
- Hyrum Smith Scholarship – Full academic scholarship
- Vice President of BYU Economics Student Association

EXPERIENCE

Machine Learning Researcher | *Brigham Young University – Provo, UT*

Apr 2024 – Present

- Pioneered novel ML framework to upgrade deep learning methods based on Monte Carlo sampling of causal mechanisms
- Outperformed Random Forest, XGBoost, KNN, and CNN by 5%-20% accuracy using new algorithm and framework
- Benchmarked performance against 12 standard ML datasets (MNIST, Fashion, MIMIC, etc.) maintaining advantage
- Engineered innovative algorithm speedups, reducing prediction complexity from $O(N^2)$ to $O(N \log N)$

Quantum Computing Researcher | *Center for Quantum Networks – Tucson, AZ*

May 2023 – Mar 2024

- Developed Python library to approximate quantum PDE simulations, reducing runtime from 12 hours to 0.015 seconds
- Optimized spin-photon interface designs using our library, discovering 13% efficiency gains beyond current literature
- Collaborated with MIT faculty as 2nd author, publishing in [Optics Express](#), [NSF-PAR](#), [Europe PMC](#), [National Library of Medicine](#), and [Astrophysics Data System](#)

Quantitative Finance Researcher | *BYU Silver Fund – Provo, UT*

Apr 2023 – Mar 2024

- Improved Sharpe ratio by 44% for standard momentum strategy using a novel approach for risk through Fourier analysis
- Verified original strategy as statistically significant through back-testing with CRSP dataset on Linux supercomputer
- Replicated results of “Expected Idiosyncratic Skewness” (Boyer 2009) trading strategy for \$1.1M student-led fund

Machine Learning Engineer | *Secuvant – SLC, UT*

Jan 2021 – Mar 2023

- Predicted monthly sales within 9% margin of error by modeling sales pipeline as a learnable Poisson Markov process
- Forecasted monthly, quarterly, and annual cashflows, enabling the CEO to raise over \$1.45M in investment capital
- Optimized company-wide pricing structure, increasing product line revenue by 78% through personal initiative

Founder and CEO | *Sam’s Auto Detailing – SLC, UT*

Jan 2015 – Jul 2018

- Founded a car detailing company at age of 16, growing company to 7 employees and \$25K+ in revenue

PUBLICATIONS & PROJECTS

Journal Publications

- [Alignment-Free Coupling to Arrays of Diamond Microdisk Cavities for Spin-Photon Interface](#) *Dec 2023*
- [A Causal Framework for Deep Learning via Monte Carlo Methods](#) *Forthcoming 2024*
- [Momentum Portfolio Strategies under Fourier Calculated Risk](#) *Forthcoming 2024*

Personal and Open-Source Projects

- Invented a new, trainable algorithm to improve [speaker diarization](#) using a [conditional hidden Markov model](#)
- Contributed [echolocation algorithms](#) to open-source project developing AR glasses with subtitles for deaf individuals
- Lead research team developing [drone fleet “hive-intelligence”](#) for optimal search and rescue via control theory and reinforcement learning

ACHIEVEMENTS & LEADERSHIP

- Handpicked by OpenAI preparedness team to assess model safety and identify limitations in LLM prompt engineering
- Successfully completed all 5 levels of Google Foobar Challenge, an invite-only competitive coding challenge
- Co-founded 6-month mentorship/tutoring program, assisting 17 troubled teens to prepare for college
- Math Sterling Scholar State Finalist
- Humanitarian volunteer in Bangkok, Thailand; taught English & financial literacy (2018 – 2020)
- Fluent in Thai, CEFR Level: C1