Ethan Harvey

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Highlights

- Fifth year Ph.D. candidate in the Machine Learning Research Group at Tufts University
- Presented papers at NeurIPS (Journal-to-Conference Track and Workshop) and published papers in Transactions on Machine Learning Research (TMLR) and Machine Learning for Health (ML4H)
- 5+ years of academic experience with implementation details of deep neural networks using machine learning frameworks including PyTorch, TensorFlow, and JAX
- 2+ years of teaching assistant experience for the graduate level machine learning course (Python) and data structures (C/C++) at Tufts University

Education

Tufts University, Medford, MA *Fall 2021 – Expected May 2026*
Ph.D. in Computer Science, Cumulative GPA: 4.0

Advisor: Michael C. Hughes
Thesis Title: *Bayesian Deep Learning for Limited Labeled Data: New Methods and Neuroimaging Applications*
Relevant Coursework: Convex Optimization, Bayesian Deep Learning (Spring 2026), Learning from Limited Labeled Data, Generative Models (Fall 2025), Deep Neural Networks, Statistical Pattern Recognition, Machine Learning, Mathematical Aspects of Data Analysis

Tufts University, Medford, MA *Fall 2021 – Spring 2023*
M.S. in Computer Science, Cumulative GPA: 4.0

Grove City College, Grove City, PA *Fall 2017 – Spring 2021*
B.S. in Computer Science, Mathematics minor

Research Experience

Tufts University, Medford, MA *September 2021 – Present*
A private R1 research university.
Research Assistant, Advisor: Michael C. Hughes

- Collaborating with Tufts Medical Center and Kaiser Permanente Southern California to develop deep neural networks to classify covert cerebrovascular disease and predict time-to-event outcomes for stroke and dementia using CT and MRI brain scans.
- Developed a probabilistic method to extrapolate classifier accuracy to larger datasets that led to key figure on data adequacy in NIH grant R01-NS134859 (funded $3 million).
- Priority user of Tufts University High Performance Computing (HPC) system including 40 NVIDIA A100 GPUs.

Philips, Cambridge, MA *June 2025 – August 2025*
Medical Imaging Intern, R&D Structural Heart

- Used self-supervised learning to develop a deep neural network for mitral valve detection and segmentation in echocardiogram videos.

Philips, Cambridge, MA *May 2022 – August 2022*
Machine Learning Intern, Philips Research North America
- Developed an ensemble tree model from millions of patient records for early detection of hospital-acquired infections.
- Compared general and infection-specific machine learning models.

UnitedHealth Group, Minnetonka, MN *June 2021 – August 2021*
Data Science Intern, UnitedHealth Group R&D
- Developed a deep neural network to predict blood glucose values using sleep metrics from wearable fitness data and blood glucose monitoring data.
- Worked with internal data scientists on reinforcement learning project using multi-armed bandit algorithms.

Grove City College, Grove City, PA *January 2021 – May 2021*
An ABET accredited college.
Research Assistant, Advisor: Jonathan O. Hutchins
- Collaborated with Highmark Health to research the application of unsupervised learning on acoustic signals as a surrogate for quantitative measurements of human foot pressures during walking and running.

Papers

[4] **Ethan Harvey**, Mikhail Petrov, and Michael C. Hughes. Learning Hyperparameters via a Data-Emphasized Variational Objective. *Preprint*, 2025.

[3] **Ethan Harvey**, Mikhail Petrov, and Michael C. Hughes. Learning the Regularization Strength for Deep Fine-Tuning via a Data-Emphasized Variational Objective. In *NeurIPS 2024 Workshop on Fine-Tuning in Modern Machine Learning: Principles and Scalability*, 2024.

[2] **Ethan Harvey***, Mikhail Petrov*, and Michael C. Hughes. Transfer Learning with Informative Priors: Simple Baselines Better than Previously Reported. *Transactions on Machine Learning Research (TMLR)*, 2024. (Presented at NeurIPS 2024 poster session in Journal-to-Conference Track).

[1] **Ethan Harvey**, Wansu Chen, David M. Kent, and Michael C. Hughes. A Probabilistic Method to Predict Classifier Accuracy on Larger Datasets given Small Pilot Data. In *Machine Learning for Health (ML4H)*, 2023. (28.7% acceptance rate).

Technical Skills

Programming Languages: Python, C/C++, Java, MATLAB
Machine Learning Frameworks: PyTorch, TensorFlow, JAX, scikit-learn
Data Analysis Tools: NumPy, Pandas, SciPy, Matplotlib, Spark, SQL, NoSQL
Cloud Computing Services: Amazon Web Services, Google Cloud Platform, Microsoft Azure

Teaching Experience

CS 135 Machine Learning Teaching Assistant, Tufts University, Medford, MA *Spring 2022, Fall 2022, Spring 2023*
- Developed Python unit testing framework that automatically grades student assignments.
- Led team of eight graduate and undergraduate teaching assistants to hold office hours and grade assignments.
- Taught weekly recitations on topics including linear and polynomial regression, perceptron learning, evaluating model performance, logistic regression, kernels, support vector machines, neural networks, convergence and non-convergence, parameter tuning, decision trees, dynamic programming, reinforcement learning, and k-means clustering.

CS 15 Data Structures Teaching Assistant, Tufts University, Medford, MA *Fall 2021*

- Lectured on topics including lists, complexity, queues, stacks, recursion, binary search, sets, and trees.
- Worked with infrastructure team to design, maintain, and test programs that automatically grade student assignments.

Honors & Scholarships

Tufts University Full Tuition Scholarship 2021, 2022, 2023, 2024, 2025
Approximately $10,000 yearly scholarship based on academic merit.
Dean's List with High Distinction, Grove City College, Spring 2021
Honor based on academic merit.
Grove City College General College Scholarship 2020
$4,000 scholarship based on academic merit.
Grove City College Arlene and James Adams Scholarship 2019
$3,400 scholarship based on academic merit.
Grove City College Timson-Eaton Student Aid Fund 2018
$4,100 scholarship based on academic merit.

Academic Services

Reviewer:

- 2025 – Conference on Health, Inference, and Learning (CHIL); Machine Learning for Healthcare (MLHC)
- 2024 – Conference on Health, Inference, and Learning (CHIL); Machine Learning for Healthcare (MLHC); Machine Learning for Health (ML4H@NeurIPS); NeurIPS Workshop on Fine-Tuning in Modern Machine Learning (FITML@NeurIPS)