# 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

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## 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

## Experience

**Tufts University**, Medford, MA                                                           *September 2021 – Present*
*A private R1 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, Image Guided Therapy Devices R&D**
- Used semi-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

**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)