

MAX TOROP

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EDUCATION

Northeastern University

PhD Candidate in Electrical Engineering, GPA: 4.00/4.00

- **Advisor:** Professor Jennifer Dy

Boston, MA

Sep 2020 — Current

Washington University in St. Louis

MS in Computer Science, GPA: 3.97/4.00

- **Advisor:** Professor Ulugbek Kamilov

St. Louis, MO

Sep 2018 — Dec 2019

The University of Rochester

BS in Data Science, GPA: 3.40/4.00

Rochester, NY

Sep 2014 — May 2018

ACADEMIC EXPERIENCE

Machine Learning Lab

Northeastern University

Boston, MA

Sep 2020 — Current

- Created SmoothHess, a geometrically intuitive method for interpreting neural network predictions through quantifying input feature interactions. SmoothHess was effectively applied to networks trained on real-world spirometry data as well as image benchmarks (**NeurIPS 2023**).
- Developed a method to quantify model explanation uncertainty using geodesics (**AISTATS 2024**).
- Collaborating with doctors at **Memorial Sloan Kettering Cancer Center** on deep learning methods for dermatology spanning multi-modal LLMs, self-supervised learning and anomaly detection.

Computational Imaging Group

Washington University in St. Louis

St. Louis, MO

May 2019 — Dec 2019

- Collaborated with radiologists to develop a self-supervised deep learning model which jointly transforms and denoises MRI data into brain iron maps (**Magnetic Resonance in Medicine**).
- Mentored an undergraduate student in the lab for her senior thesis project.

WORK EXPERIENCE

Apple

ML Research Intern

Seattle, WA

May 2024 — Aug 2024

- Worked in the Data and Machine Learning Innovation team.
- Developed a dynamic LLM-in-the loop knowledge graph generation application.
- Created data valuation methods for selecting LLM training data.

iD Tech Camps

Instructor

New York, NY

July 2018 — Aug 2018

- Taught teenagers to create neural networks and familiarized them with basic machine learning practices.

PUBLICATIONS AND TALKS

Published

- Davin Hill*, Joshua Bone*, Aria Masoomi, **Max Torop**, Jennifer Dy. “Axiomatic Explainer Globalness via Optimal Transport.” **AISTATS 2025**.
- Davin Hill, Aria Masoomi, **Max Torop**, Sandesh Ghimire, Jennifer Dy. “Boundary-Aware Uncertainty for Feature Attribution Explainers.” **AISTATS 2024**.
- **Max Torop***, Aria Masoomi*, Davin Hill, Kivanc Kose, Stratis Ioannidis, Jennifer Dy. “SmoothHess: ReLU Network Feature Interactions via Stein’s Lemma.” **NeurIPS 2023**.
- Davin Hill, **Max Torop**, Aria Masoomi, Peter J. Castaldi, Jennifer Dy, Michael H. Cho, Brian D. Hobbs. “Deep Learning Utilizing Discarded Spirometry Data to Improve Lung Function and Mortality Prediction in the UK Biobank.” **ATS 2022 (Oral)**.
- **Max Torop**, Sandesh Ghimire, Wenqian Liu, Dana H. Brooks, Octavia Camps, Milind Rajadhyaksha, Jennifer Dy, Kivanc Kose. “Unsupervised Approaches for Out-Of-Distribution Dermoscopic Lesion Detection.” **NeurIPS 2021: Medical Imaging Meets NeurIPS Workshop**.

- **Max Torop**, Satya V.V.N. Kothapalli, Yu Sun, Jiaming Liu, Sayan Kahali, Dmitriy A. Yablonskiy, Ulugbek S. Kamilov. “Deep learning using a biophysical model for robust and accelerated reconstruction of quantitative, artifact-free and denoised images.” **Magnetic Resonance in Medicine**, vol. 84, no. 6, pp. 2932–2942, 2020.

Preprints

- Runze Li, Wenqian Liu, Meng Zheng, **Max Torop**, Milind Rajadhyaksha, Jennifer Dy, Kivanc Kose, Srikrishna Karanam, Ziyang Wu, Bir Bhanu, Richard Radke, Octavia Camps. “Towards Visually Interpreting Variational Autoencoders.” Research Square 2024. In submission.
- Davin Hill, **Max Torop**, Aria Masoomi, Peter J. Castaldi, Edwin K. Silverman, Sandeep Bodduluri, Surya P. Bhatt, Taedong Yun, Cory Y. McLean, Farhad Hormozdiari, Jennifer Dy, Michael H. Cho, Brian D. Hobbs. “Deep learning utilizing suboptimal spirometry data to improve lung function and mortality prediction in the UK Biobank.” medRxiv 2023. In submission.

Talks

- “Self-Supervised Learning: an Overview,” ML Reading Group at Northeastern, Boston, MA, 01/2025.
- “SmoothHess: ReLU Network Feature Interactions via Stein’s Lemma,” Prof. Finale Doshi-Velez’s Data to Actionable Knowledge (DtAK) lab at Harvard, Boston, MA, 10/2024.
- “Unsupervised representation learning for detecting out of distribution samples in dermoscopy images of eight types of skin lesions,” SPIE BiOS, San Francisco, CA, 03/2022.

TEACHING AND LEADERSHIP

- Teaching assistant for the Advanced Machine Learning course at Northeastern University (Spring 2022).
- Organized the purchase and setup of a server for our group. Developed usage guidelines documentation.
- Co-organized a bi-weekly seminar for the SPIRAL group at Northeastern University. Selected speakers: Brian Kulis (BU), Amin Karbasi (Yale), Michael Hughes (Tufts) and David Rosen (NEU).

SKILLS AND SERVICE

- **Research:** Interpretable ML, Large-Language Models, Self-Supervised Learning.
- **Languages/Tools:** Python, PyTorch, pandas, NumPy, scikit-learn, L^AT_EX, SLURM.
- **Familiar:** MATLAB, Java.
- **Service:** Reviewer for AISTATS, AAAI and SIVP.

AWARDS

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| • Dean’s Fellowship (Northeastern) | <i>Sep 2020 — May 2024</i> |
| • Dean’s List, 5 Terms (Rochester) | <i>Sep 2014 — May 2018</i> |
| • Research and Innovation Grant (Rochester) | <i>Sep 2014</i> |