KATHLEEN LEWIS

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RESEARCH EXPERIENCE

Research Intern

June 2020 - August 2021 Google

- Two internships with Ira Kemelmacher-Shlizerman's team
- Developed photorealistic virtual try-on method, TryOnGAN, and published SIGGRAPH 2021 paper
- Led research project for generating images of garments in unseen sizes to increase size diversity. Google funded my PhD for the 2021-2022 academic year to continue this research.

Research Assistant

September 2017 – Present MIT CSAIL

- **Multimodal Machine Learning**
  - Leverage prior knowledge of LLMs and contrastive learning to improve fine-grained few-shot image classification. Paper will be out early July.
- **Machine Learning for Art**
  - Collaborated with artist, Agnieszka Kurant, on commissioned art piece for MIT
  - Designed user studies for machine learning method that automatically creates watercolor and digital painting timelapses
- **Machine Learning for Medical Imaging**
  - Developed learning-based method to align sparse, clinical MRI brain scans with higher accuracy on 92% of subjects and 100x faster on the CPU than the most accurate baseline

Research Assistant

College of Engineering Senior Design Project

August 2016 - May 2017 Boston University

- Designed and developed automated door-opening robotic system for wheelchair users
- Implemented computer vision system to automatically detect door handle type and location

Research Assistant

Computer Architecture and Automated Design Lab

January 2016 - May 2017 Boston University

- Improved runtime of existing Molecular Dynamics code by:
  - Multithreading and implementing existing code on the GPU
  - Designing algorithms to improve locality and cache hit rates

Software Engineer Intern

MITRE Corporation

May 2015 - August 2015 Boston, MA

- Developed web app for Air Force to view and edit map routes from database

EDUCATION

PhD in Computer Science

Massachusetts Institute of Technology, Expected: August 2023

M.S. in Computer Science

Massachusetts Institute of Technology, 2019

B.S. in Computer Engineering

Boston University, 2017

PUBLICATIONS

- **Lewis, K.M.***, Mu, E.*, & Guttag, J., Using LLMs and Contrastive Learning to Improve Fine-grained Few-shot Image Classification. WiCV Workshop @ CVPR 2023.
- **Lewis, K.M.***, Shanmugam, D.* M., Ortiz, J. J. G.*, Kurant, A., & Guttag, J. At the Intersection of Conceptual Art and Deep Learning: The End of Signature. Workshop on Broadening Research Collaborations @ NeurIPS 2022
- **Lewis, K. M.**, & Guttag, J. (2022). SizeGAN: Improving Size Representation in Clothing Catalogs. arXiv preprint arXiv:2211.02892.
- **Lewis, K.M.**, Varadharajan, S., & Kemelmacher-Shlizerman, I. TryOnGAN: Body-Aware Try-On via Layered Interpolation. ACM Transactions on Graphics (Proceedings of ACM SIGGRAPH 2021)
- Zhao, A., Balakrishnan, G., **Lewis, K.M.**, Durand, F., Guttag, J., & Dalca, A.V.. Painting Many Pasts: Synthesizing Time Lapse Videos of Paintings.(arXiv:2001.01026). CVPR 2020
- **Lewis, K.M.**, Rost, N. S., Guttag, J., & Dalca, A. V. (2020, April). Fast learning-based registration of sparse 3D clinical images. In Proceedings of the ACM Conference on Health, Inference, and Learning (pp. 90-98).
- Suresh, H., **Lewis, K. M.**, Guttag, J., & Satyanarayan, A. (2022, March). Intuitively assessing ml model reliability through example-based explanations and editing model inputs. In 27th International Conference on Intelligent User Interfaces (pp. 767-781).
- Spotlight Presentation (**6% acceptance rate**) and Poster at Machine Learning for Healthcare (ML4H) @ NeurIPS 2018
- Poster presented at Women in Machine Learning (WiML) @ NeurIPS 2018
- Poster presented at Women in Computer Vision (WiCV) @ CVPR 2019
- Ahmed Sanaullah, **Kathleen Lewis**, Martin Herbordt, GPU-Accelerated Charge Mapping. IEEE High Performance Extreme Computing Conference, HPEC 2016.
- Poster presented at Performance-Aware Programming with Application Accelerators, University of Hong Kong

Research Assistant

Cross-Disciplinary Integration of Design Automation Research

August 2014 - Dec. 2015 Boston University

- Developed web app, Phagebook, for Synthetic Biology project design
- Poster presented at Synberc, MIT
- Poster presented at International Workshop on Bio-Design Automation, University of Washington

HONORS & AWARDS

- Frederic and Barbara Cronin Fellowship
- Women in ML (WiML) Travel Scholarship
- Machine Learning for Healthcare (ML4H) Travel Scholarship
- Boston University Trustee Scholarship (Four years full tuition)
- Joseph Healey Distinguished Fellowship
- Clare Booth Luce (Research Award)
- Honor Societies: Tau Beta Pi, IEEE-HKN

ACADEMIC SERVICE

- SIGGRAPH 2022 Reviewer
- NeurIPS 2021 Reviewer
- MIT AI+D PhD Application Reviewer 2021
- NeurIPS 2020 Reviewer
- ACM CHIL 2020 Reviewer

LEADERSHIP

- Writer and Editor for MIT Graduate Student Blog (MIT, 2020)
- Machine Learning across MIT Committee (MIT, 2019)
- Student Governor, IEEE-HKN Board of Governors (Nationwide position, Jan - Dec 2018)
- Teaching Assistant, 6.00 Intro: Comp Sci & Programming (MIT, Fall 2018)
- President, IEEE Student Chapter/IEEE-HKN (Boston University, April 2016 - May 2017)
- Teaching Assistant, Performance-Aware Programming with Application Accelerators (University of Hong Kong, July 2016)
- Tour Guide, College of Engineering (Boston University, January 2014 - May 2017)
- Teaching Assistant, EK127 Introduction to Computation (Boston University, January - December 2014)

SKILLS

Python, Keras, Tensorflow, PyTorch, C, C++, MATLAB, CUDA, Javascript, HTML