Shobhita Sundaram

Website: shobhitasundaram.com
Email: shobhita@mit.edu
LinkedIn: linkedin.com/in/shobsund
GitHub: github.com/ssundaram21

Education

Massachusetts Institute of Technology (MIT) — Cambridge, MA
Ph.D. Computer Science — 2022–2027
Advisor: Phillip Isola

Massachusetts Institute of Technology (MIT) — Cambridge, MA
S.B. Computer Science, S.B. Mathematics — 2018–2022
Advisors: Pawan Sinha, Xavier Boix, Tomaso Poggio

Publications

** indicates equal contribution*

1. When Does Perceptual Alignment Benefit Vision Represenations?
   S. Sundaram*, S. Fu*, L. Muttenthaler, N. Tamir, L. Chai, S. Kornblith, T. Darrell, P. Isola.
   Advances in Neural Information Processing Systems (NeurIPS), 2024

2. DreamSim: Learning New Dimensions of Human Visual Similarity using Synthetic Data.
   S. Fu*, N. Tamir*, **S. Sundaram***, L. Chai, R. Zhang, T. Dekel, P. Isola.
   Advances in Neural Information Processing Systems (NeurIPS), 2023 **(spotlight)**

3. Recurrent Connections Facilitate Symmetry Perception in Deep Networks.
   S. Sundaram*, D. Sinha*, M. Groth, T. Sasaki, X. Boix.
   Scientific Reports, vol. 12, no. 1, 2022
   Workshop on Generalization Beyond the Training Distribution in Brains and Machines, ICLR 2021

4. GAN-Based Data Augmentation for Chest X-ray Classification.
   S. Sundaram* and N. Hulkund*.
   Workshop on Applied Data Science for Healthcare, KDD 2021

5. Do Neural Networks for Segmentation Understand Insideness?
   K. Villalobos*, V. Štih*, A. Ahmadinejad*, **S. Sundaram**, J. Dozier, A. Francl, F. Azevdo, T. Sasaki, X. Boix.
   Neural Computation, vol. 33, no. 9, 2021

Experience

Google Research — Cambridge, MA
Student Researcher — December 2023 - March 2024

- Researched synthetic data generation with diffusion models for personalizing vision backbones.
- *Mentors:* Yonglong Tian, Dilip Krishnan

Google DeepMind — London, UK
Research Engineering Intern — June - August 2022

- Researched novel data selection strategies for pre-training large language models.
- *Mentors:* Sebastian Borgeaud, Laurent Sifre, Jordan Hoffman, Arthur Mensch

Center for Brains, Minds, and Machines, MIT — Cambridge, MA
Undergraduate Researcher — September 2019 - May 2022

- Investigated recurrent vision models for learning generalizable representations of visual features with long-range spatial dependencies.

– Studied applications in segmenting closed curves and symmetry detection.
– *Mentors:* Xavier Boix, Pawan Sinha, Tomaso Poggio

The D. E. Shaw Group New York, NY
Quantitative Research Intern June - August 2021

– Developed RL tools for portfolio management, outperforming baselines derived from optimal control theory.
– *Mentor:* Konstantin Turitsyn

Apple Cupertino, CA
Machine Learning Intern June - August 2020

– Built machine learning models to forecast battery drain from iPhone time series usage data, enabling intelligent power management.
– Deployed an end-to-end machine learning pipeline on-device for power optimization, aiming to release to consumer iPhones; selected from 15 interns to present to SVP of Software Engineering based on impact.

Two Sigma Investments Houston, TX
Software Engineering Intern May - August 2019

– Developed a RESTful Flask service and UI to create and maintain collections of instruments for trading.
– Tool is now used by 4 teams to track over 20,000 instruments with unique trading characteristics.

Digital Humanities Lab, MIT Cambridge, MA
Undergraduate Researcher September - December 2018

– Collaborated on open-source project: "Computational Reading of Gender in Novels, 1770-1992".
– Designed and released Python tools to uncover gender biases in 4,200 novels.

Awards

NSF Graduate Research Fellowship 2022 - 2025
HDTV Grand Alliance Fellowship 2022 - 2023
MIT Undergraduate Research and Innovation Scholar 2020
MIT Burchard Scholar 2020

Service & Leadership

Organizer: ECCV Tutorial on Efficient Text-to-Image Modeling 2024
Organizer: CVPR Workshop on Synthetic Data for Computer Vision 2024
Event Coordinator: MIT Graduate Women of EECS 2023
Mentor: MIT Graduate Application Assistant Program 2022 - Present
Associate Editor: MIT Science Policy Review 2020 - 2022
VP of Campus Relations: MIT Society of Women Engineers 2019 - 2021

Invited Talks

Evaluating Text-to-Image Models.
ECCV Efficient Text-to-Image Modeling Tutorial, September 2024

DreamSim: Learning New Dimensions of Human Visual Similarity using Synthetic Data.
Adobe, October 2023.

DreamSim: Learning New Dimensions of Human Visual Similarity using Synthetic Data.
Computer Vision Meetup, hosted by Voxel51, July 2023.

Skills & Interests

Skills: Python (PyTorch, Jax/Haiku, Tensorflow), Java, C/C++, CoreML, R.

Research Interests: Generative models, representation learning, synthetic data, machine learning.