HENRY LI

hnry.li

EDUCATION

Yale University MS 2021, PhD (est.) 2025
Advisors: Ronald Coifman and Yuval Kluger
Department of Applied Mathematics, Specialization: generative models (w/ focus on denoising diffusion models).

Yale University
Departments of Computer Science and Mathematics

EXPERIENCE

Yale University 2020-Present
PhD Student

· Conducting research on various topics in generative modeling including:

- · A novel large-scale multimodal diffusion model capable of image-to-text and text-to-image multimodal generation (*in submission*).
- · A control-based perspective to solving inverse problems with diffusion models (*NeurIPS 2024*).
- · A meta-learning approach to *model unlearning* (i.e., removing sensitive data points from a pretrained model) in classification and text-to-image foundation models via a provably optimal gradient surgery framework (*NeurIPS 2024*).
- · A simple way to retain exact likelihood evaluation in hierarchical generative models that achieves state-of-the-art density estimation performance (**ICLR 2024 Spotlight — 5% of submissions**).
- · A generalization of diffusion probabilistic models with non-Gaussian timesteps (*ICML 2023 Structured Probabilistic Inference and Generative Modeling*).
- · Improved autoregressive sampling via noise-conditional autoregressive modeling with score-based refinement (NeurIPS 2023 Score Based Models).
- · A flexible density estimator method for tabular data with universal approximation guarantees. Achieves state-of-the-art results on density estimation (*ICML 2022*).

TikTok 2024
Machine Learning Research Intern

· Built multimodal image / language models on the AI Seed-Vision Team, with a focus on diffusion-based frameworks. Acquired large-scale datasets (100M+ images / text) and trained diffusion models for simultaneous text-to-image, image-to-text, and visual understanding. Results submitted to CVPR 2025. Mentors: Heng Wang, Peng Wang, and Linjie Yang.

Elucid 2024
Machine Learning Research Intern

· Fine-tuned multimodal foundation models to aid in the diagnosis of arterial atherosclerosis. Trained large diffusion models to fine-tune LLMs to improve visual language modeling with CT arterial models.

Bosch Center for Artificial Intelligence 2023
Machine Learning Research Intern

· Developed a control-theoretic approach to solving inverse problems with score-based diffusion models. Presented results at NeurIPS 2024. Mentor: Marcus Pereira.

Center for Computational Mathematics at the Flatiron Institute 2020
Machine Learning Research Intern

· Investigated deep image prior-based techniques for enhancing phase retrieval in low-photon settings at the Center for Computational Mathematics (CCM) at Flatiron Institute. Published results at MSML 2021.

Amazon Lab126 2016
Software Engineering Intern

· Developed an experimental app prediction algorithm for pre-emptively loading apps to reduce user-perceived latency on Amazon FireOS (their tablet and smartphone operating system) that halved memory usage and run-time compared to the pre-existing implementation.

PUBLICATIONS

Dual Diffusion for Unified Image Generation and Understanding Zijie Li*, Henry Li*, Amir Barati Farimani, Yuval Kluger, Linjie Yang, Peng Wang, *In Submission* 2024.

Fast and Noise-Robust Diffusion Solvers for Inverse Problems: A Frequentist Approach Henry Li*, Jonathan Patsenker*, Myeongseob Ko, Ruoxi Jia, Yuval Kluger, *In Submission* 2024.

Solving Inverse Problems via Diffusion Optimal Control Henry Li, Marcus Pereira, *Neural Information Processing Systems (NeurIPS)* 2024.

Boosting Alignment for Post-Unlearning Text-to-Image Generative Models Myeongseob Ko*, Henry Li*, Zhun Wang, Jonathan Patsenker, Jiachen T. Wang, Qinbin Li, Ming Jin, Dawn Song, Ruoxi Jia, *Neural Information Processing Systems (NeurIPS)* 2024.

Likelihood Training of Cascaded Diffusion Models via Hierarchical Volume-preserving Maps Henry Li, Ronen Basri, Yuval Kluger, *International Conference on Learning Representations (ICLR)* 2024 **(Spotlight – 5%)**.

Exponential weight averaging as damped harmonic motion Jon Patsenker*, Henry Li*, Yuval Kluger, *ICML Workshop on New Frontiers in Learning, Control, and Dynamical Systems* 2023.

Non-normal Diffusion Models Henry Li, *ICML Workshop on Structured Probabilistic Inference & Generative Modeling* 2023.

Support recovery with stochastic gates: Theory and application for linear models Soham Jana, Henry Li, Yutaro Yamada, Ofir Lindenbaum, *IEEE Letters in Signal Processing* 2023.

Noise-conditional Maximum Likelihood Estimation with Score-based Sampling Henry Li, Yuval Kluger, *NeurIPS Workshop on Score-Based Methods* 2022.

Neural Inverse Transform Sampler Henry Li, Yuval Kluger, *International Conference on Machine Learning (ICML)* 2022.

Phase retrieval with holography and untrained priors: Tackling the challenges of low-photon nanoscale imaging Hannah Lawrence, David Barmherzig, Henry Li, Michael Eickenberg, Marylou Gabrie, *Mathematical and Scientific Machine Learning (MSML)* 2021.

Detection of differentially abundant cell subpopulations in scRNA-seq data Jun Zhao, Ariel Jaffe, Henry Li, Ofir Lindenbaum, Xiuyuan Cheng, Richard Flavell, Yuval Kluger, *Proceedings of the National Academy of Sciences (PNAS)* 2020.

Variational Diffusion Autoencoders with Random Walk Sampling
Henry Li*, Ofir Lindenbaum*, Xiuyuan Cheng, Alexander Cloninger, *European Conference on Computer Vision (ECCV)* 2020.

SpectralNet: Spectral Clustering Using Deep Neural Networks
Uri Shaham*, Kelly Stanton*, Henry Li*, Boaz Nadler, Ronen Basri, and Yuval Kluger, *International Conference on Learning Representations (ICLR)* 2018.

SERVICE

Reviewing
ICML [2024, 2023, **2022 Outstanding Reviewer (top ∼10%)**], NeurIPS [2024, 2023, 2022, 2021], ICLR [2025, 2024, 2023, 2022], Nature (Biotechnology, Methods), TMLR [2024, 2023]