

# Andrew Lizarraga

---

Email: andrewlizarraga@ucla.edu

Homepage: <https://drewrl3v.github.io/>

LinkedIn: <https://www.linkedin.com/in/andrew-lizarraga/>

Google Scholar: <https://scholar.google.com/citations?user=KUDS8uwAAAAJ&hl=en>

ACADEMIC BACKGROUND	<b>University of California, Los Angeles (UCLA)</b> Ph.D. Statistics GPA: 4.0 / 4.0; Co-advised by Prof. Ying Nian Wu and Prof. Shantanu H. Joshi	Sep 2022 – Jun 2026 (Expected)
	<b>University of California, Santa Barbara (UCSB)</b> B.S. Mathematics GPA: 3.5 / 4.0	Sep 2014 – Jun 2018
LANGUAGES /LIBRARIES	Python, C, C++, CUDA, Pytorch, Huggingface	
DOMAIN KNOWLEDGE	AI 4 Science: Medical Imaging, Astrophysics, Robotics	
AWARDS	National Science Foundation - Graduate Research Fellowship UCLA Gene Block Merit Award UCLA Graduate Summer Research Fellowship	Sep 2023 – Jun 2026 Sep 2022 – Jun 2023 Jun 2022 – Sep 2022
TEACHING EXPERIENCE	UCLA STATS 100A: Introduction to Probability UCLA STATS 100A: Introduction to Probability	Jun 2025 – Sep 2025 Jun 2024 – Sep 2024
WORK EXPERIENCE	<b>UCLA, Department of Statistics and Data Science</b> <i>Research Assistant, Advisors: Prof. Ying Nian Wu and Prof. Shantanu H. Joshi</i>	Sep 2022 – present
	<b>Diffusion Models:</b> <ul style="list-style-type: none"><li>Collaborated with UCLA Physics and Astronomy to develop diffusion models linking galaxy morphology, age, and redshift; established the first strong correlation between redshift and morphological structure.</li><li>Developed generic inverse-problem solver using diffusion priors with posterior updates via short-run MCMC, achieving state-of-the-art results with reduced computational cost.</li></ul>	
	<b>• Representation Learning:</b> <ul style="list-style-type: none"><li>Demonstrated that standard deep networks (AE, VAE, VQ-VAE, WAE) fail to capture anatomical structure in high-dimensional medical scans. Proposed <i>Diff-VQ-VAE</i>, introducing latent space constraints to improve medical robustness.</li></ul>	
	<b>• Decision Making and Planning:</b> <ul style="list-style-type: none"><li>Developed the <i>Latent Plan Transformer</i>, an unsupervised sequence model that performs decision-making by inferring a latent variable conditioned on target returns to guide policy execution.</li><li>Created the <i>Latent Adaptive Planner</i>, integrating reinforcement learning and dynamic programming while maintaining Transformer scalability for dynamic manipulation and robotics tasks.</li></ul>	

## SELECTED PUBLICATIONS Diffusion

- Andrew Lizarraga, Eric Hanchen Jiang Jacob Nowack, Morgan Himes, Jonathan Soriano, Yun Qi Li, Ying Nian Wu, Bernie Boscoe, Tuan Do. *Modeling Galaxy Morphology Evolution Through Cosmic Time via Redshift Conditioned Diffusion Models | (In Review) - Astrophysical Journal*
- Andrew Lizarraga, Eric Hanchen Jiang, Jacob Nowack, Yun Qi Li, Ying Nian Wu, Bernie Boscoe, Tuan Do. *Learning the Evolution of Physical Structure of Galaxies via Diffusion Models | Neurips-MLP4S 2024*
- Eric Hanchen Jiang, Yasi Zhang, Zhi Zhang, Yixin Wan, Andrew Lizarraga, Shufan Li, Ying Nian Wu *Unlocking the Potential of Text-to-Image Diffusion with PAC-Bayesian Theory | (In Review) ICLR 2026*

## LLM/Transformer

- Donghun Noh, Deqian Kong, Minglu Zhao, Andrew Lizarraga, Jianwen Xie, Ying Nian Wu, Dennis Hong. *Latent Adaptive Planner for Dynamic Manipulation | CoRL 2025*
- Morgan Himes, Samiksha Krishnamurthy, Andrew Lizarraga, Srinath Saikrishnan, Vikram Seenivasan, Jonathan Soriano, Ying Nian Wu, Tuan Do *Multi-Modal Masked Autoencoders for Learning Image-Spectrum Associations for Galaxy Evolution and Cosmology | Neurips-MLP4S 2025*
- Jinxing Li, Jacob Bortnik, Qiushuo Wang, Yingnian Wu, Andrew Lizarraga, Mirana Angel, Beibei Wang, Qianzhuang Wen, Jeffrey Jiang *Modeling ring current proton distribution using MLP, CNN, LSTM, and transformer networks | Frontiers in Astronomy and Space Sciences*
- Andrew Lizarraga, Edouardo Honig, Ying Nian Wu. *From Stochastic Parrots to Digital Intelligence | WIRES Computational Statistics 2025*
- Edouardo Honig, Andrew Lizarraga, Zijun Frank Zhang, Ying Nian Wu. *Better Prompt Compression Without Multi-Layer Perceptrons | Neurips-AFM 2025*
- Deqian Kong, Dehong Xu, Minglu Zhao, Bo Pang, Jianwen Xie, Andrew Lizarraga, Yuhao Huang, Sirui Xie, Ying Nian Wu. *Latent Plan Transformer: Planning as Latent Variable Inference | NeurIPS 2024*

## Representation Learning

- Andrew Lizarraga, David Lee, Antoni Kubicki, Ashish Sahib, Elvis Nunez, Katherine Narr, Shantanu H. Joshi. *Alignment of Tractography Streamlines Using Deformation Transfer via Parallel Transport* | MICCAI - CDMRI 2021
- Vikram Seenivasan, Srinath Saikrishnan, **Andrew Lizarraga**, Jonathan Soriano, Bernie Boscoe, Tuan Do *Combining datasets with different ground truths using Low-Rank Adaptation to generalize image-based CNN models for photometric redshift prediction* | Neurips-MLP4S 2025
- Elvis Nunez, **Andrew Lizarraga**, Shantanu H. Joshi. *SrvfNet: A Generative Network for Unsupervised Multiple Diffeomorphic Functional Alignment* | CVPR - DiffCVML 2021
- Jie Ren, Xinhao Zheng, Jiyu Liu, **Andrew Lizarraga**, Ying Nian Wu, Liang Lin, Quanshi Zhang. *Monitoring Primitive Interactions During the Training of DNNs* | AAAI 2025
- **Andrew Lizarraga**, Brandon Taraku, Edouardo Honig, Ying Nian Wu, Shantanu H. Joshi. *Differentiable VQ-VAE's for Robust White Matter Streamline Encodings* | IEEE - ISBI 2024
- **Andrew Lizarraga**, Katherine L. Narr, Kirsten A. Donald, Shantanu H. Joshi. *StreamNet: A WAE for White Matter Streamline Analysis* | PMLR - GeoMedia 2022