

Zhixuan Liu

+1 (412) 909 6279
✉ zhixuan2@andrew.cmu.edu
📁 ariannaliu.github.io
Google Scholar / Github / LinkedIn

Summary

I am a second-year Robotics Ph.D. student at Carnegie Mellon University. My research focuses on controllable generative models for image, scene, and video synthesis. I am particularly passionate about the intersection of robotics and GenAI, where generative models can provide diverse, physics-grounded environments for sim-to-real applications, and robots, in turn, can collect data, actively participate in the content generation process.

Education

- 2024-now **Ph.D. Student in Robotics, School of Computer Science, CMU.**
 - Advisor: Jean Oh and Ji Zhang
- 2022-2024 **M.S. in Robotics, School of Computer Science, CMU.**
 - Advisor: Jean Oh; Committee: Ji Zhang, Jun-Yan Zhu, Peter Schaldenbrand
- 2018-2022 **B.S. in Computer Science, Chinese University of Hong Kong, Shenzhen.**
 - Presidential Award for Outstanding Graduating Student

Research Experience

- 2025-present **Research Intern, Adobe.**
 - Mentors: Jui-hsien Wang, Yijun Li; Manager: Aseem Agarwala.
 - Leading research projects on controllable diffusion-based text-to-video generation.
- 2022-present **Research Assistant, CMU.**
 - Advisors: Jean Oh and Ji Zhang.
 - Conducting research at the intersection of generative models and robotics. Contributions include:
 1. Digital twin: MOSAIC [1] generates multi-view consistent indoor digital twins using only geometric data collected by navigation robots.
 2. Generative fairness and debiasing series [2, 4]: First to identify and address cultural bias in text-to-image generative models, proposing both dataset and algorithmic solutions.
 3. MLLM for robotics: STRIVE [3] applies VLMs for robot object navigation.
- 2024.5-8 **Research Intern, Microsoft Research Asia.**
 - Mentor: Yuhui Yuan; Manager: Baining Guo.
 - Conducted research on visual generative models, resulting in patent submission: "Training-free Techniques for Resolving Color Inconsistency in Diffusion Model Inpainting".
- 2021-2022 **Summer Intern, RISS CMU.**
 - Mentors: Peter Schaldenbrand, Jean Oh.
 - Focused on creative art content generation. StyleCLIPDraw [5] achieves stroke-based painting generation. [6] advances early steps in pixel-style video generation.
- 2020-2021 **Research Assistant, CUHK(SZ).**
 - Mentors: Huihuan Qian, Baoyuan Wu.
 - Undergraduate research on music generation. SongBot [7]: An interactive music generation robotic system that replicates style from a given song and generates new compositions.

Selected Works

- [1] Zhixuan Liu, Haokun Zhu, Rui Chen, Jonathan Francis, Soonmin Hwang, Ji Zhang, Jean Oh, **MOSAIC: Generating Consistent, Privacy-Preserving Scenes from Multiple Depth Views in Multi-Room Environments**, In ICCV 2025, Project
- [2] Zhixuan Liu, Peter Schaldenbrand, Beverley-Claire Okogwu, Wenxuan Peng, Youngsik Yun, Andrew Hundt, Jihie Kim, Jean Oh, **ScoFT: Self-Contrastive Fine-Tuning for Equitable Image Generation**, In CVPR 2024, Project
- [3] Haokun Zhu, Zongtai Li, Zhixuan Liu, Wenshan Wang, Ji Zhang, Jonathan Francis, Jean Oh, **Strive: Structured representation integrating vlm reasoning for efficient object navigation**, In 2025 RSS workshop on Semantic Reasoning and Goal Understanding in Robotic, in submission to ICRA 2026, Project
- [4] Zhixuan Liu*, Youeun Shin*, Beverley-Claire Okogwu, Youngsik Yun, Lia Coleman, Peter Schaldenbrand, Jihie Kim, Jean Oh, **Towards Equitable Representation in Text-to-Image Synthesis Models with the Cross-Cultural Understanding Benchmark (CCUB) Dataset**, In AAAI 2023 workshop on Creative AI Across Modalities
- [5] Peter Schaldenbrand, Zhixuan Liu, Jean Oh, **StyleCLIPDraw: Coupling Content and Style in Text-to-Drawing Translation**, In IJCAI 2022, and NeurIPS 2021 Workshop on Machine Learning for Creativity and Design (Oral), Project
- [6] Peter Schaldenbrand, Zhixuan Liu, Jean Oh, **Towards Real-Time Text2Video via CLIP-Guided, Pixel-Level Optimization**, In NeurIPS 2022 Workshop on Machine Learning for Creativity and Design, Project
- [7] Kaiwen Xue, Zhixuan Liu, Jiaying Li, Xiaoqian Ji, Huihuan Qian, **SongBot: An Interactive Music Generation Robotic System for Non-musicians Learning from A Song**, In IEEE RCAR 2021

Honors & Awards

- May 2022 **Presidential Award for Outstanding Graduate (top 10 in the University)**
- 2019-2022 **CUHK(SZ) School of Data Science Academic Performance Scholarship**
- 2019-2022 **CUHK(SZ) School of Data Science Dean's List**
- 2018 **CUHK(SZ) University Entrance Half Scholarship**

Teaching Assistant & Services

- Spr 2025 **16-824 Visual Learning and Recognition**, CMU
- Spr 2025 **16-726 Learning-Based Image Synthesis**, CMU
- Spr 2022 **CSC4008 Techniques for Data Mining**, CUHK(SZ)
- Fall 2021 **CSC3002 Programming Paradigms**, CUHK(SZ)
- Fall 2019 **PHY1001 Mechanics**, CUHK(SZ)
- Conference Reviewer:** CVPR, IROS, CoRL, RSS, NeurIPS, AAAI
- Journal Reviewer:** IEEE MM