

Zhixuan LIU

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5000 Forbes Ave, Pittsburgh, PA 15213

Education

Carnegie Mellon University, School of Computer Science

2022.8 – present

Robotics Institute, Master of Science in Robotics

Advisor: Dr. Jean Oh, Dr. Ji Zhang

- GPA: 4.25/4.0
- Relevant Coursework: Machine Learning, Computer Vision, Learning-based Image Synthesis, Visual Learning and Recognition.

The Chinese University of Hong Kong, Shenzhen

2018.9 – 2022.6

Bachelor of Engineering in Computer Science and Engineering

- Cumulative GPA: 3.74/4.0, major GPA: 3.87/4.0
- Awards and Honors: 2022 Presidential Award for Outstanding Student (Top 1%), University Entrance Half Scholarship, Dean's List of School of Data Science (2019 - 2022), School Academic Scholarship (2019-2022 for Top 2% students).
- Undergraduate Teaching Assistant for Mechanics in 2019 spring, for C++ in 2021 fall, for Data Mining in 2022 spring.
- Relevant Coursework: Data Mining, Computer Graphics, Convex Optimization, Linear Algebra, Statistics, Parallel Computing, Operating System, Data Structure, Software Engineering, Database System.

Publications

1. **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*”, under review.
2. **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*”, 2023 AAAI workshop on Creative AI Across Modalities. <https://arxiv.org/abs/2301.12073>
3. Peter Schaldenbrand, **Zhixuan Liu**, Jean Oh, “*Towards Real-Time Text2Video via CLIP-Guided, Pixel-Level Optimization*”, 2022 NeurIPS Workshop on Machine Learning for Creativity and Design. <https://arxiv.org/pdf/2210.12826.pdf>
4. Peter Schaldenbrand, **Zhixuan Liu**, Jean Oh, “*StyleCLIPDraw: Coupling Content and Style in Text-to-Drawing Translation*”, 2022 IJCAI. <https://www.ijcai.org/proceedings/2022/688>
5. Peter Schaldenbrand, **Zhixuan Liu**, Jean Oh, “*StyleCLIPDraw: Coupling Content and Style in Text-to-Drawing Synthesis*”, 2021 NeurIPS Workshop on Machine Learning for Creativity and Design. <https://arxiv.org/abs/2111.03133>
6. **Zhixuan Liu**, Peter Schaldenbrand, Jean Oh, “*Gander: A Comprehensive Machine Learning Media Synthesis Platform & Style-CLIPDraw: A Style-Transferred Text-to-Drawing Synthesis Method*,” 2021 CMU RISS Working Papers Journal, pp. 189-195. https://riss.ri.cmu.edu/research_showcase/working-papers-journals/
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*,” IEEE International Conference on Real-time Computing and Robotics (RCAR), 2021. <https://ieeexplore.ieee.org/document/9517454>

Research Experiences

Bot Intelligence Group (BIG) at Carnegie Mellon University

2022.6 – present

Research Intern supervised by Dr. Jean Oh, Dr. Ji Zhang, and Dr. Soonmin Hwang

Pittsburgh, USA

- Working on culturalize foundation text-to-image generation model and propose the first culturally accurate text-image dataset. The research paper is accepted by AAAI 2023 workshop on Creative AI Across Modalities and the full version is under review for CVPR-24.
- Leveraging the knowledge of foundation image generation models to create indoor simulation environments based on 3D prior (lidar point clouds), enabling simulated robots to navigate and interact seamlessly within these digital environments.

Undergraduate Intern at Bot Intelligence Group (BIG) at Carnegie Mellon University

2021.8 – 2022.6

Research Intern supervised by Dr. Jean Oh and PhD student Peter Schaldenbrand

Virtual

- Added artistic control to image synthesis ML models using CLIP guidance and style transfer network.
- Designed a text-to-drawing synthesis model StyleCLIPDraw, which is accepted by NeurIPS 2021 workshop and IJCAI 2022 with more than 200 stars on GitHub (<https://github.com/pschaldenbrand/StyleCLIPDraw>) and many shares on Twitter.
- Conduct research focused on natural language to video generation.

Carnegie Mellon’s Robotics Institute Summer Scholars (RISS) Program

2021.6 – 2021.8

Summer Research Intern supervised by Dr. Jean Oh and PhD student Peter Schaldenbrand

Virtual

- Designed the user interface of “Gander” – a machine learning competition website for generated media outputs, by interviewing potential users; and implemented some of the web pages.
- Implemented state-of-the-art code metrics such as FID score that measure the performance of media outputs generated by Generative Adversarial Networks (GAN) for Gander website.
- Designed “Style-CLIPDraw”, an algorithm that generates a drawing based on natural language input and a style image.

Shenzhen Research Institute of Big Data (SRIBD)

2021.1 – 2021.6

Research Assistant under Prof. Baoyuan Wu

Shenzhen, China

- Participated in building federated learning (e.g. a distributed training model) based machine learning training platform and create various script to process medical datasets by leveraging machine learning algorithms such as fedavg.
- Conducted a backdoor defense research in Artificial Intelligence security area using GANs.

Shenzhen Institute for Artificial Intelligence and Robotics for Society (AIRS)

2020.4 – 2020.12

Research assistant under Prof. Huihuan (Alex) Qian

Shenzhen, China

- Leveraged Probabilistic Graphical Model and Markov Chain Model to realize an automatic music composition robot.
- Implemented the controlling modules and optimized hyperparameters by using crowdsourcing algorithm.
- Published the paper “*SongBot: An Interactive Music Generation Robotic System for Non-musicians Learning from A Song*” as the second author in IEEE RCAR 2021.

Skills and Interests

Languages: TOEFL: 111 (MyBest Score), Chinese (Mandarin)

Programming Language: python, C/C++, Java

Other Interests: machine learning and generative models in music and art