Ziyu Jiang

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Research Interests

Simulation, World Model, Embodied AI, Diffusion Model, 3D reconstruction

Education

Texas A&M University, TX, USA

Ph.D. in Computer Science, Jan 2019 - Dec 2022
- Advisor: Zhangyang Wang

M.S. in Computer Science, Aug 2017 - Dec 2018
- Advisor: Zhangyang Wang

Harbin Institute of Technology, Harbin, China

B.E. in Electronic and Communication Engineering, Sep 2013 - July 2017
- Thesis: Automatic License Plate Recognition System

Publications

** indicates equal contribution, † indicates project lead.*

Yifan Wang, Francesco Pittaluga, Zaid Tasneem, Chenyu You, Manmohan Chandraker, **Ziyu Jiang**. HorizonForge: Driving Scene Editing with Any Trajectories and Any Vehicles. Conference on Computer Vision and Pattern Recognition (CVPR). 2026. Acceptance ratio: 25.42%.

Sriram Narayanan, **Ziyu Jiang**, Srinivasa Narasimhan, Manmohan Chandraker. PhyCo: Learning Controllable Physical Priors for Generative Motion. Conference on Computer Vision and Pattern Recognition (CVPR). 2026. Acceptance ratio: 25.42%.

Jiacheng Chen*, **Ziyu Jiang***†, Mingfu Liang, Bingbing Zhuang, Jong-Chyi Su, Sparsh Garg, Ying Wu, Manmohan Chandraker. AutoScape: Geometry-Consistent Long-Horizon Scene Generation. International Conference on Computer Vision (ICCV). 2025. Acceptance ratio: 24%.

Shanlin Sun, Bingbing Zhuang, **Ziyu Jiang**, Buyu Liu, Xiaohui Xie, Manmohan Chandraker. LidaRF: Delving into Lidar for Neural Radiance Field on Street Scenes. Conference on Computer Vision and Pattern Recognition (CVPR). 2024. Acceptance ratio: 23.6%.

Ziyu Jiang, Yinpeng Chen, Mengchen Liu, Dongdong Chen, Xiyang Dai, Lu Yuan, Zicheng Liu, Zhangyang Wang. Layer Grafted Pre-training: Bridging Contrastive Learning And Masked Image Modeling For Better Representations. International Conference on Learning Representations 2023. Acceptance ratio: 31%.

Ziyu Jiang*, Xuxi Chen*, Xueqin Huang, Xianzhi Du, Denny Zhou, Zhangyang Wang. Back Razor: Memory-Efficient Transfer Learning by Self-Sparsified Backpropagation. Advances in Neural Information Processing Systems (Neurips). 2022. Acceptance ratio: 25.6%.

Hanxue Liang*, Zhiwen Fan*, Rishov Sarkar, **Ziyu Jiang**, Tianlong Chen, Kai Zou, Yu Cheng, Cong Hao, Zhangyang Wang. M^{3}ViT: Mixture-of-Experts Vision Transformer for Efficient Multi-task Learning with Model-Accelerator Co-design. Advances in Neural Information Processing Systems (Neurips). 2022. Acceptance ratio: 25.6%.

Ziyu Jiang, Tianlong Chen, Xuxi Chen, Luowei Zhou, Lu Yuan, Ahmed Awadallah, Zhangyang Wang. DnA: Improve Few-Shot Transfer Learning with Low-Rank Decompose and Align. European Conference on Computer Vision (ECCV). 2022. Acceptance ratio: 19.8%.

Ziyu Jiang, Tianlong Chen, Ting Chen, Zhangyang Wang. Improving Contrastive Learning on Imbalanced Data via Open-World Sampling. Advances in Neural Information Processing Systems (Neurips). 2021. Acceptance ratio: 26%.

Ziyu Jiang, Tianlong Chen, Bobak Mortazavi, Zhangyang Wang. Self-Damaging Contrastive Learning. International conference on Machine Learning (ICML). 2021. Acceptance ratio: 21%.

Ziyu Jiang, Zhenhua He, Xueqin Huang, Zibin Yang, Pearl Tan. CE-PeopleSeg: Real-time people segmentation with 10% CPU usage for video conference. 2021 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW). IEEE, 2021.

Ziyu Jiang, Tianlong Chen, Ting Chen, Zhangyang Wang. Robust Pre-Training by Adversarial

Contrastive Learning. Advances in Neural Information Processing Systems (Neurips). 2020. Acceptance ratio: 20.1%.

Ziyu Jiang, Buyu Liu, Samuel Schulter, Zhangyang Wang, Manmohan Chandraker. Peek-a-Boo: Occlusion Reasoning in Indoor Scenes With Plane Representations. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020 (**ORAL**). Acceptance ratio: 22%.

Yue Wang*, **Ziyu Jiang***, Xiaohan Chen*, Pengfei Xu, Yang Zhao, Yingyan Lin, Zhangyang Wang. E^2-Train: Training State-of-the-art CNNs with Over 80% Less Energy. Advances in Neural Information Processing Systems (Neurips) 2019. Acceptance ratio: 21.2%.

Wuyang Chen*, **Ziyu Jiang***, Zhangyang Wang, Kexin Cui, Xiaoning Qian. Collaborative Global-Local Networks for Memory-Efficient Segmentation of Ultra-High Resolution Images. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019 (**ORAL**). Acceptance ratio: 25%.

Ziyu Jiang, Kate Von Ness, Julie Loisel, Zhangyang Wang. ArcticNet: A Deep Learning Solution to Classify Arctic Wetlands. 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW). IEEE, 2019.

Ziyu Jiang*, Randy Ardywibowo*, Aven Samereh, Heather Evans, Bill Lober, Xiangyu Chang, Xiaoning Qian, Zhangyang Wang, Shuai Huang. A Roadmap for Automatic Surgical Site Infection (SSI) Detection and Evaluation using User-Generated Wound Images. Surgical infections (2019).

Experience

Researcher, NEC Laboratories America, Inc., San Jose, CA Feb 2023 – Present

Supervised by Manmohan Chandraker

Project: Simulation system for training and verifying autonomous driving algorithms.

Autonomous Driving Simulation:

- Developed a language-guided driving scene editing product supporting ego/agent trajectory manipulation, vehicle removal, text-guided vehicle insertion, and environmental condition changes such as weather, season, and time of day.
- Led appearance simulation research combining 3D scene reconstruction with diffusion-based generative models to produce controllable, photorealistic, and 3D-consistent scene editing.
- Mentored multiple research interns and published 3 papers in top-tier venues.

World Model:

- Developed physically-aware world models with improved understanding of physical properties such as friction, elasticity, applied forces, and material deformability.
- Mentored one research intern and published 1 paper in top-tier venues.

Research Intern Microsoft, Seattle, WA May 2022 - Aug 2022

Position: Research Intern with Yinpeng Chen.

Co-supervised by Dongdong Chen, Mengchen Liu, Xiyang Dai and Zhangyang Wang

Improving self-supervised training in dense prediction downstream tasks

- Our aim is to combine the benefits of both Mask Image Modeling and Contrastive Learning for further boosting the performance of downstream dense prediction tasks.

Research Intern Microsoft, Seattle, WA May 2021 - Aug 2021

Position: Research Intern with Luowei Zhou and Yu Cheng

Improving self-supervised training in terms of few-shot performance

- We propose a simple alignment method for mitigating the domain gaps between pre-training and downstream transfer, in order to enhance the few-shot transferability of self-supervised pre-trained models.
- We draw inspirations from the classical low rank and sparse decomposition algorithm and design an algorithm that can mitigate the potential catastrophic forgetting during the alignment.

Research Intern Bytedance, Mountain View, CA June 2020 - Nov 2020

Position: Research Intern with Linjie Yang

Co-supervised by Longyin Wen, Ding Liu and Zhangyang Wang
Efficient semi-supervised video object segmentation

- Explore efficient semi-supervised video object segmentation algorithm with SoTA performance

Research Assistant NEC laboratories america inc, San Jose, CA June 2019 - August 2019
Position: Research Assistant with Dr Buyu Liu
Co-supervised by Samuel Schulter, Zhangyang Wang, Manmohan Chandraker
Peek-a-boo: Occlusion Reasoning in Indoor Scenes with Plane Representations

- Extend Plane-RCNN to predict the occluded part of planes in indoor scenes with plane representation.
- Design a novel network architecture (DualRPN) and training objective (plane-warp) specifically designed for the task of occlusion reasoning.
- Generate ground truth of semantics and geometry in occluded areas automatically from the ScanNet dataset.
- Propose an evaluation metric for analyzing the prediction quality of occlusions.

Texas A&M University, College Station, TX Sep 2018 - Dec 2022
Position: Graduate Research Assistant with Dr Zhangyang Wang