Jiarun Liu

github | homepage | jiarunliu@zju.edu.cn

Summary

I'm a 3DCV researcher and algorithm engineer, mainly focusing on autonomous driving scenarios.

Before that, I got my M.S. degree in Zhejiang University, advised by Prof. Guofeng Zhang, studying on SLAM, visual localization and neural reconstruction.

I am interested in 3D vision and generative models, as well as world models and applications in autonomous driving and embodied AI.

Education

2022 - 2025 M.S. in Software Engineering at **Zhejiang University** (GPA: Top 5%)
2018 - 2022 B.S. in Digital Media at **Zhejiang University** (GPA: Top 5%)

Awards and Honor

Outstanding Graduates at ZJU, 2022 & 2025
Tianzhou Chen Scholarship of ZJU, 2023
Yongping Scholarship of ZJU, 2020

Internship & Work Experience

Senior Algorithm Engineer, NIO Inc. Jan 2026 - Now

– Research on video foundation model. My main research direction is video generation and prediction.

Algorithm Engineer, Cainiao Inc., Alibaba Group Mar 2025 - Dec 2025

– Work on world model and diffusion model. Currently, we've investigated in many directions, including DiT-based multi-view AD video generation, SVD-based synthetic video harmonization and more.
– Work on Gaussian Splatting-based sensor simulation system. I mainly focused on street scene reconstruction, editing (insertion and inpainting) and scene expansion with diffusion guidance.
– Research on multi-modal learning, mainly on text-image-3DGS feature alignment.
– Research on 3D reconstruction, mainly on visual reconstruction and depth estimation.

Research Intern, Cainiao Inc., Alibaba Group Mar 2024 - Mar 2025

– Work on SLAM & point cloud registration.
– Research on Gaussian Splatting and scene inpainting.

Research Intern, SenseTime Group Mar 2023 - May 2024

– Create a large-scale indoor localization benchmark, along with an open-source dataset.
– Research on mesh-based landmark localization.
– Maintainer of XRLocalization, an open-source visual re-localization framework.

Projects

GS-based Sensor Simulation System Work done in Cainiao

We build an industrial-grade multi-sensor simulation system for unmanned vehicle, which provides more than 210k+ frames training data for perception models. I mainly focus on Neural GS framework building, multi-camera optimization, object generation, scene editing and inpainting. 5 Papers have been accepted [1, 2, 3, 4]. 1 Papers under review [5].

3DGS Database & Multi-modal Retreival Work done in Cainiao

I build the AIGC 3D assets for our simulation system, including 200+ objects and 100+ scenes. I also worked on multi-modal alignment for text-image-3D feature alignment and retreival. 1 Paper has been accepted [6].

Visual-based 3D Reconstruction & MVS Work done in Cainiao

I joined the visual reconstruction team for 2 months and worked in sptial-temporal consistency MVS pipeline for better depth estimation. I also build the depth GT refinement pipeline for data production. 1 Paper has been accepted [7].

Mesh-based Landmark Visual Localization Work done in SenseTime

I worked on visual-based localization for outdoor landmark AR in anywhere. This is also a part of my master thesis.

Large-Scale Indoor Visual Localization Work done in SenseTime

I worked on building the large-scale indoor localization benchmark. 1 Paper has been accepted [8].

Publications[1]

[1] Xianming Zeng*, Sicong Du*, Qifeng Chen*, Lizhe Liu, Haoyu Shu, Jiaxuan Gao, **Jiarun Liu**, Jiulong Xu, Jianyun Xu, Mingxia Chen, Yiru Zhao, Peng Chen, Yapeng Xue, Chunming Zhao, Sheng Yang†, and Qiang Li. "Industrial-Grade Sensor Simulation via Gaussian Splatting: A Modular Framework for Scalable Editing and Full-Stack Validation". In: *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2025.

[2] Guo Chen*, **Jiarun Liu***, Sicong Du, Chenming Wu, Deqi Li, Shi-Sheng Huang†, Guofeng Zhang, and Sheng Yang†. "GS-RoadPatching: Inpainting Gaussians via 3D Searching and Placing for Driving Scenes". In: *ACM SIGGRAPH Asia*. 2025.

[3] Sicong Du*, **Jiarun Liu***, Qifeng Chen, Hao-Xiang Chen, Tai-Jiang Mu, and Sheng Yang†. "RGE-GS: Reward-Guided Expansive Driving Scene Reconstruction via Diffusion Priors". In: *IEEE International Conference on Computer Vision (ICCV)*. 2025.

[4] Qifeng Chen, **Jiarun Liu**, Rengan Xie, Tao Tang, Sicong Du, Yiru Zhao, Yuchi Huo, and Sheng Yang†. "LiDAR-GS++: Improving LiDAR Gaussian Reconstruction via Diffusion Priors". In: *AAAI Conference on Artificial Intelligence*. 2026.

[5] Wenxin Li*, **Jiarun Liu***, Qifeng Chen*, Yingbo Wu, and Sheng Yang†. "Syn2Real: Harmonizing Synthetic Instances in Street Gaussians". In: *Under Review*. 2026.

[6] **Jiarun Liu***, Qifeng Chen*, Yiru Zhao, Minghua Liu, Baorui Ma, and Sheng Yang†. "TIGaussian: Disentangle Gaussians for Spatial-Awared Text-Image-3D Alignment". In: *International Conference on Learning Representations (ICLR)*. 2026.

[1] * denotes equal contribution, † denotes corresponding author.

[7] Qihao Sun*, **Jiarun Liu***, Ziqian Ni*, Jianyun Xu, Tao Xie, Lijun Zhao, Ruifeng Li†, and Sheng Yang†. "LiDAR Prompted Spatio-Temporal Multi-View Stereo for Autonomous Driving". In: *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. 2026.

[8] Hailin Yu, **Jiarun Liu**, Zhichao Ye, Xinyu Chen, Ruohao Zhan, Yichun ShenTu, Zhongyun Lu, and Guofeng Zhang†. "Indoor large-scale panoramic visual localization dataset". In: *Journal of Image and Graphics*. 2025.

Skills

English TOEFL 108 & CET-6 certified.
Cello Grade 10 certified. Experienced in band and orchestra.