

# Jiarun Liu

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## SUMMARY

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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

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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

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Outstanding Graduates at ZJU, 2022 & 2025

Tianzhou Chen Scholarship of ZJU, 2023

Yongping Scholarship of ZJU, 2020

## INTERNSHIP & WORK EXPERIENCE

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**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

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## 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 Retrieval

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 retrieval. 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 spital-temporal consistency MVS pipeline for better depth estimation. I also build the depth GT refinement pipeline for data production. 1 Paper under review [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<sup>1</sup>

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- [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.

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<sup>1</sup>\* 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: *Under Review*. 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

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English    TOEFL 108 & CET-6 certified.

Cello      Grade 10 certified. Experienced in band and orchestra.