JIUMING LIU

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EDUCATION

Shanghai Jiao Tong University (SJTU) Sep. 2022 - Present
Master of Automation GPA: 3.63/4 Shanghai, China
Supervised by Prof.Hesheng Wang (General chair of IROS 2025, Senior member of IEEE)

Harbin Institute of Technology (HIT) Sep. 2018 - Jun. 2022
Bachelor of Automation GPA: 95.18/100 Rank: 3/163 **(TOP 1.8%)** Harbin, China
Supervised by Prof.Huijun Gao (IEEE Fellow, European Academy of Sciences Fellow)

PUBLICATIONS

Research interests: 3DV, diffusion model, NeRF/3DGS-based reconstruction, 4D understanding/generation, LiDAR SLAM, transformer, point cloud registration, and scene flow estimation.
Personal Page: https://liujiuming.netlify.app/
Google Scholar: https://scholar.google.com/citations?user=j4YXCukAAAAJhl=en

- **Liu J***, Zhuo D, Feng Z, et al. DVLO: Deep Visual-LiDAR Odometry with Local-to-Global Feature Fusion and Bi-Directional Structure Alignment. Accepted by (**ECCV2024**).
- **Liu J***, Wang G, Ye W, et al. DifFlow3D: Toward Robust Uncertainty-Aware Scene Flow Estimation with Iterative Diffusion-Based Refinement[C]//Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2024: 15109-15119. (**CVPR2024**)
- **Liu J***, Wang G, Liu Z, et al. RegFormer: an efficient projection-aware transformer network for large-scale point cloud registration[C]//Proceedings of the IEEE/CVF International Conference on Computer Vision. 2023: 8451-8460.(**ICCV2023**)
- **Liu J***, Wang G, Jiang C, et al. Translo: A window-based masked point transformer framework for large-scale lidar odometry[C]//Proceedings of the AAAI Conference on Artificial Intelligence. 2023, 37(2): 1683-1691.(**AAAI2023**)
- Jiang C, Wang G, **Liu J***, et al. 3dsflabelling: Boosting 3d scene flow estimation by pseudo auto-labelling[C]// Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2024: 15173-15183. (**CVPR2024**)
- Zhu S, Wang G, Blum H, **Liu J***, et al. Sni-slam: Semantic neural implicit slam[C]//Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2024: 21167-21177. (**CVPR2024**)

PREPRINT

- **Liu J***, Han J, Liu L, et al. MAMBA4D: Efficient Long-Sequence Point Cloud Video Understanding with Disentangled Spatial-Temporal State Space Models[J]. arXiv preprint arXiv:2405.14338, 2024.
- **Liu J***, Yu R, Wang Y, et al. Point mamba: A novel point cloud backbone based on state space model with octree-based ordering strategy[J]. arXiv preprint arXiv:2403.06467, 2024.
- Jiang C, Du D, **Liu J***, et al. NeuroGauss4D-PCI: 4D Neural Fields and Gaussian Deformation Fields for Point Cloud Interpolation[J]. arXiv preprint arXiv:2405.14241, 2024.
- Zheng Y, Wang G, **Liu J***, et al. Spherical Frustum Sparse Convolution Network for LiDAR Point Cloud Semantic Segmentation[J]. arXiv preprint arXiv:2311.17491, 2023.
- Song L, Wang G, **Liu J***, et al. SC-NeRF: Self-Correcting Neural Radiance Field with Sparse Views[J]. arXiv preprint arXiv:2309.05028, 2023.
- Zhu S, Qin R, Wang G, **Liu J***, et al. Semgauss-slam: Dense semantic gaussian splatting slam[J]. arXiv preprint arXiv:2403.07494, 2024.

RESEARCH EXPERIENCE

The Intelligent Robotics and Machine Vision (IRMV) Lab, SJTU Sep. 2022 - Present
Supervised by Prof.Hesheng Wang (the General Chair of IROS 2025, Recipient of the National Science Fund for Distinguished Young Scholars, Senior Member of IEEE) Shanghai, China

- **An Efficient Projection-Aware Transformer Network for Large-Scale Point Cloud Registration.**
  (i) **Main Contribution:** The idea was mostly proposed by me. I wrote all the related codes, conducted all the experiments, and completed the paper writing.

(ii) **Research Influence:** This paper firstly addressed the global matching for large-scale point cloud registration with transformer. It has been accepted by **ICCV 2023**, which got wonderful feedback from Prof.Marc Pollefeys (ETH) and also Prof.Daniel Cremers (TUM).

- **Researching how to design diffusion module for robust scene flow estimation.**
  (i) **Main Contribution:** All the related codes, experiments, and paper writing were conducted by me.
  (ii) **Research Influence:** This is the first work investigating how to leverage the diffusion model for the scene flow estimation task. It has been accepted by **CVPR 2024**.

T Stone Robotics Institute, CUHK Jun. 2023 - Aug. 2023
Supervised by Prof.Yunhui Liu (IEEE Fellow) Hong Kong, China

- **Visiting the autonomous driving group and medical image processing group.**
- **Researching how to extend our former work RegFormer with RWKV structure (adding channel shift).**
  (i) **Main Contribution:** The idea was proposed by me. I wrote all the codes, conducted the experiments, and completed the paper writing.
  (ii) **Research Influence:** This paper is based on our former work RegFormer, which was reported to be a valuable attempt at the low-overlap open issue in one IJCV'24 paper. We would like to delve deeper into more flexible and potential backbone RWKV. We plan to submit this extended work to T-PAMI.

Intelligent Control and Systems Research Institute, HIT Oct. 2021 - Jun. 2022
Supervised by Prof.Huijun Gao (IEEE Fellow) Harbin, China

- **Investigating how to design a multi-modality odometry network (My bachelor thesis)**.

PROJECT EXPERIENCE

Large-scale 3D Reconstruction for Dynamic Urban Scenes Mar. 2024 - Present

- I am responsible for the multi-clip route aware reconstruction and lightning appearance encoding.

SOCIAL EXPERIENCE

Vice President of the Student Union (HIT) Oct. 2020 – Oct. 2021
Services in organizing a number of events and activities, including: Inaugural Lilac Cultural Festival on campus, University volleyball game, Space knowledge competition for high-school students, etc.
Reviewer for CVPR 2024, ECCV 2024, NeurIPS 2024, ICIAR 2023

TEACHING

Co-supervisor for the national Innovation Training Program for College Students. Sep. 2022 - Sep. 2023

- Teaching undergraduate students about the basic knowledge in SLAM.
- One of my supervised undergraduates' work about multi-modality odometry has been submitted to ECCV 2024.

Co-supervisor for PhD or master students in our lab. Nov. 2022 - Present

- Supervising Linrui Gong (the first-year PhD in SJTU) about GMM-based point cloud registration, Jun Ye (the second-year PhD in SJTU) about 3D Gaussian Splatting.
- Supervising Zehang Shen (the second-year Master in SJTU) about diffusion-based depth completion, Yichen Sha (the second-year Master in SJTU) about NeRF-based visual relocalization, Zhiheng Feng (the second-year Master in SJTU) about optimization-based scene flow estimation.

TALKS

- Giving a talk about our ICCV paper on 'the heart of autonomous driving'. Sep. 2023
- Giving a poster presentation on ICCV 2023, Paris. Oct. 2023
- Giving an online talk about my research for DAMTP group, University of Cambridge. May. 2024
- Giving a poster presentation on CVPR 2024, Seattle. Jun. 2024

HONORS AND AWARDS

- National Scholarship for Graduate Students **(<TOP 5 %)** Dec. 2023
- National Scholarship for Undergraduate Students **(TOP 1.2%)** Dec. 2020
- Outstanding Graduates of Harbin Institute of Technology **(<TOP 15 %)** Jun. 2022
- Yu Menglun Scholarship Jun. 2022
- First-class Academic Scholarship (five times) 2018-2022
- National Academic English Vocabulary Competition, Second prize Jun. 2020
- Interdisciplinary Contest in Modeling (ICM), Honorable Mention Award Nov. 2020
- National English Competition for College Students, Second prize May. 2019

SKILLS AND QUALIFICATIONS

- **Programming:** Python, C, C++, Matlab
- **English:** IELTS: 6.5, CET-6: 566
- **Soft Skills:** Self-motivated, Teamwork, Problem-solving, etc.