

Qingyao Liu

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EDUCATION

- Zhejiang University (ZJU)** Hangzhou, China
Master of Engineering - Electronic Information; Supervisor: Prof. Yong Liu
Sep 2020 - Mar 2023
- Wuhan University (WHU)** Wuhan, China
Bachelor of Engineering - Automation; GPA: 87.7/100
Sep 2016 - Jun 2020

RESERACH INTERESTS

Computer vision, Scene Understanding, 3D Reconstruction, Robotics

PUBLICATIONS

*: equal contribution

- Wang H*, **Liu Q***, et al. CSR: A Lightweight Crowdsourced Road Structure Reconstruction System for Autonomous Driving[C]//2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2024.
- Huang T, **Liu Q**, et al. Learnable Chamfer Distance for point cloud reconstruction[J]. Pattern Recognition Letters, 2024, 178: 43-48.

RESEARCH & PROJECTS

- Research on Deep Learning Based Monocular Mapping - Master thesis** Sep 2022 - Jan 2023
Developed depth estimation methods for monocular mapping in autonomous driving scenes.
 - Improved depth estimation by focusing on reliable regions and augmenting spatiotemporal fusion.
 - Tackled scale-inconsistency in self-supervised depth estimation, ensuring inter- and intra-frame consistency.
 - Assembled a monocular vision and SLAM-based map construction system.
- Self-Supervised Dense Reconstruction from a High-Resolution Monocular Camera** Jul 2021 - May 2022
Manuscript submitted to Pattern Recognition *First Author*
To address limitations in high-resolution self-supervised monocular depth estimation for dense mapping.
 - Redesigned the skip-connection architecture and integrated a feature fusion squeeze-and-excitation module.
 - Implemented a scale consistency constraint across adjacent frames for scale-consistent depth estimation.
 - Constructed a pseudo-RGBD camera model for dense reconstruction in outdoor scenes.
- Depth Estimation Research Project - Huawei Noah's Ark Lab** Sep 2021 - Nov 2022
Reconstructed autonomous driving scenes through advanced depth estimation techniques.
 - Introduced confidence estimation to identify and filter unreliable depth predictions, enhancing robustness.
 - Optimized spatiotemporal fusion by enhancing multi-scale feature aggregation via cross-view transformers.
 - Built a lightweight model to reduce complexity, enabling 3× faster inference with comparable accuracy.
- Autonomous Driving Research Project - Huawei Noah's Ark Lab** Dec 2020 - Jun 2021
Constructed an online SLAM system using surround-view cameras, IMU and wheel odometry.
 - Developed multi-camera corner tracking, proposed fast pose estimation integrating IMU and wheel odometry.
 - Achieved sub-0.05% error (<0.5m/1000m) on Huawei's large-scale outdoor dataset.

WORK EXPERIENCE

- Autonomous Driving Algorithm Engineer - Li Auto** Jun 2023 - Jun 2024
 - Contributed to develop a robust two-stage coarse-to-fine multi-trip alignment algorithm, achieving 98% alignment success rate and centimeter-level accuracy for vehicle-sourced BEV perception data.
 - Assisted in designing an incremental mapping algorithm for highways, improving robustness in diverse scenarios.
- AI Algorithms Intern - Zhijia Technology** Jun 2022 - Sep 2022
 - Explored the feasibility of surround-view depth estimation in highway scenes.

HONORS & AWARDS

- Academic Scholarship - Graduate School of Zhejiang University 2021
- Outstanding Graduate Award from Wuhan University - **Top 10%** 2020
- The 14th National Smart Car Competition for College Students - **Champion** 2019
 - Four-Wheel Group, 53 teams in the finals, 3-member team
- Outstanding Student Leader Award from Wuhan University 2017 - 2018
- Outstanding Student Award & Scholarship from Wuhan University 2016 - 2018

SKILLS & OTHERS

- Skills:** C++ / Python, PyTorch, ROS, Linux, OpenCV / PCL, Solidworks, AutoCAD
- Languages:** Chinese (Native Speaker), English (IELTS: 6.5)