

Zhe Liu, Associate Professor, Shanghai Jiao Tong University

Date of birth: July 1988 Nationality: P. R. China Contact: liuzhesjtu@sjtu.edu.cn



Education

2010.09-2016.12 **Ph.D.** in Control Science and Engineering, **Shanghai Jiao Tong University**

2006.09-2010.07 **Bachelor** in Automation, **Tianjin University**

Academic Experience

2022.07-present **Associate Professor** at Department of Automation, **Shanghai Jiao Tong University**

2020.02-2022.06 **Postdoc.** at Dep. Computer Science & Technology, **University of Cambridge**

Supervisor: Prof. Amanda Prorok

2017.03-2020.02 **Postdoc.** at Dep. Mechanical & Automation Engineering, **The Chinese University of Hong Kong**

Supervisor: Prof. Yun-Hui Liu

Research Interests

- Planning and coordination of multi-robot systems
- Localization, planning and control of autonomous navigation systems
- Robot learning and reinforcement learning based control systems
- Robotic warehousing and logistics
- Intelligent and flexible manufacturing, factory automation

Awards

2024 **New Generation Star**

IEEE/RSJ International Conference on Intelligent Robots & Systems (IROS)

2023 **Outstanding Associate Editor Award**

IEEE International Conference on Robotics & Automation (ICRA)

2022 **Best Conference Paper Award**

IEEE International Conference on Cyber Technology in Automation, Control & Intelligent Systems (CYBER)

2022 **Best Conference Paper Award**

IEEE International Conference on Robotics & Biomimetics (ROBIO)

2020 **Best Conference Paper Award**

IEEE International Conference on Real-Time Computing & Robotics (RCAR)

2020 **Best Paper Award Finalist**

IEEE Robotics and Automation Letter (RA-L)

Academic Activities

- **Editor** (IEEE International Conference on Robotics & Automation, 2025-2027)
- **Associate Editor** (IEEE Transactions on Automation Science & Engineering, 2024-2026)
- **Associate Editor** (Robotic Intelligence & Automation, 2024-2026)
- **Associate Editor** (IEEE ICRA 2021-2024, IEEE IROS 2025)
- **General Chair** of IEEE RCAR2026, **Program Chair** of IEEE RCAR2025, **Financial Chair** of IEEE IROS2025

Selected Journal Papers in Recent Five Years

- [1] H. Li, X. Meng, X. Zuo, **Z. Liu**, H. Wang, D. Cremers, "PG-SLAM: Photo-realistic and geometry-aware RGB-D SLAM in dynamic environments," *IEEE Transactions on Robotics*, 2025.
- [2] G. Wang, Y. Zheng, Y. Wu, Y. Guo, **Z. Liu**, Y. Zhu, W. Burgard, H. Wang, "End-to-end 2d-3d registration between image and lidar point cloud for vehicle localization," *IEEE Transactions on Robotics*, 2025.
- [3] M. Xu, Q. De, D. Yu, A. Hu, **Z. Liu**, H. Wang, "Biomimetic Morphing Quadrotor Inspired by Eagle Claw for Dynamic Grasping," *IEEE Transactions on Robotics*, 2025.
- [4] Q. Liu, H. Xin, **Z. Liu**, H. Wang, "Integrating neural radiance fields end-to-end for cognitive visuomotor navigation," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2024.
- [5] **Z. Liu**, Y. Zhai, J. Li, G. Wang, Y. Miao, H. Wang, "Graph relational reinforcement learning for mobile robot navigation in large-scale crowded environments," *IEEE Transactions on Intelligent Transportation Systems*, 2023.
- [6] **Z. Liu**, K. Li, T. Hao, H. Wang, "Visual servoing of rigid-link flexible-joint manipulators in the presence of unknown camera parameters and boundary output," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2023.
- [7] J. Liu, G. Wang, **Z. Liu**, C. Jiang, M. Pollefeys, H. Wang, "Regformer: An efficient projection-aware transformer network for large-scale point cloud registration," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2023.
- [8] **Z. Liu**, H. Wang, Y. Wang, H. Wang. "Cooperative platoon control of automated industrial vehicles: a synchronization approach and real-world experiments," *IEEE/ASME Transactions on Mechatronics*, 2022.
- [9] **Z. Liu**, H. Wei, H. Wang, H. Li, H. Wang. "Integrated task allocation and path coordination for large-scale robot networks with uncertainties," *IEEE Transactions on Automation Science and Engineering*, 2022.
- [10] **Z. Liu**, Q. Liu, L. Tang, K. Jin, H. Wang, M. Liu, H. Wang. "Visuomotor reinforcement learning for multi-robot cooperative navigation," *IEEE Transactions on Automation Science and Engineering*, 2022.
- [11] G. Wang, Y. Yang, H. Zhang, **Z. Liu**, H. Wang, "Spherical interpolated convolutional network with distance-feature density for 3-D semantic segmentation of point clouds," *IEEE Transactions on Cybernetics*, 2021.
- [12] X. Liang, H. Wang, Y.-H. Liu, **Z. Liu**, B. You, Z. Jing, W. Chen. "Purely image-based pose stabilization of nonholonomic mobile robots with a truly uncalibrated overhead camera," *IEEE Transactions on Robotics*, 2020.
- [13] **Z. Liu**, W. Chen, H. Wang, Y.-H. Liu, Y. Shen, X. Fu. "A self-repairing algorithm with optimal repair path for maintaining motion synchronization of mobile robot network," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2020.
- [14] **Z. Liu**, H. Wang, H. Wei, M. Liu, Y.-H. Liu. "Prediction, planning and coordination of thousand-warehousing-robot networks with motion and communication uncertainties," *IEEE Transactions on Automation Science and Engineering*, 2020.
- [15] B. Wang, **Z. Liu**, Q. Li, A. Prorok, "Mobile robot path planning in dynamic environments through globally guided reinforcement learning," *IEEE Robotics and Automation Letters*, 2020.
- [16] **Z. Liu**, C. Suo, Y. Liu, Y. Shen, Z. Qiao, H. Wei, S. Zhou, H. Li, X. Liang, H. Wang, Y.-H. Liu, "Deep learning-based localization and perception systems: Approaches for autonomous cargo transportation vehicles in large-scale, semi-closed environments," *IEEE Robotics and Automation Magazine*, 2020.
- [17] X. Liang, H. Wang, Y.-H. Liu, **Z. Liu**, B. You, Z. Jing, W. Chen, "Purely Image-Based Pose Stabilization of Nonholonomic Mobile Robots With a Truly Uncalibrated Overhead Camera," *IEEE Transactions on Robotics*, 2020.

Selected Conference Papers

- [1] Y. Pan, Y. Xu, **Z. Liu**, H. Wang, "Planning from imagination: Episodic simulation and episodic memory for vision-and-language navigation," *AAAI Conference on Artificial Intelligence (AAAI)*, 2025.
- [2] Y. Xu, Y. Pan, **Z. Liu**, H. Wang, "FLAME: Learning to navigate with multimodal llm in urban environments," in *AAAI Conference on Artificial Intelligence (AAAI)*, 2025
- [3] J. Liu, D. Zhuo, Z. Feng, S. Zhu, C. Peng, **Z. Liu**, H. Wang, "Dvlo: Deep visual-lidar odometry with local-to-global feature fusion and bi-directional structure alignment," *European Conference on Computer Vision (ECCV)*, 2025.

- [4] X. Han, S. Chen, X. Xiong, Q. Liu, S. Zhou, H. Zhang, **Z. Liu**, "Traffic flow learning enhanced large-scale multi-robot cooperative path planning under uncertainties," IEEE International Conference on Robotics and Automation (ICRA), 2024.
- [5] J. Liu, G. Wang, W. Ye, C. Jiang, J. Han, **Z. Liu**, G. Zhang, D. Du, H. Wang, "DiffFlow3D: Toward robust uncertainty-aware scene flow estimation with iterative diffusion-based refinement," IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024.
- [6] J. Liu, G. Wang, C. Jiang, **Z. Liu**, H. Wang, "Translo: A window-based masked point transformer framework for large-scale lidar odometry," AAAI Conference on Artificial Intelligence (AAAI), 2023.
- [7] K. Jin, F. Mu, X. Han, G. Wang, **Z. Liu**, "Anomaly detection for robust autonomous navigation," IEEE International Conference on Robotics and Automation (ICRA), 2023.
- [8] W. Wu, G. Wang, J. Zhong, H. Wang, **Z. Liu**, "Self-supervised multi-frame monocular depth estimation with pseudo-LiDAR pose enhancement," IEEE International Conference on Robotics and Automation (ICRA), 2023.
- [9] **Z. Liu**, X. Li, H. Wang, "Robust platoon control of industrial heavy-load autonomous vehicles," IEEE International Conference on Cyber Technology in Automation, Control, and Intelligent Systems (CYBER), 2022, **Best Conference Paper Award**.
- [10] **Z. Liu**, X. Li, H. Wang, "Learning robust vehicle navigation policy under interference and partial sensor failures," IEEE International Conference on Robotics and Biomimetics (ROBIO), 2022, **Best Conference Paper Award**.
- [11] **Z. Liu**, Y. Miao, W. Dai, Y. Zhai. "Planning and scheduling for large-scale robot networks: An efficient and comprehensive approach," IEEE International Conference on Real-time Computing and Robotics (RCAR), 2020, **Best Conference Paper Award**.
- [12] **Z. Liu**, H. Wei, H. Hu, C. Suo, H. Wang, H. Li, Y.-H. Liu. "A synchronization approach for achieving cooperative adaptive cruise control based non-stop intersection passing," IEEE International Conference on Robotics and Automation (ICRA), 2020.
- [13] **Z. Liu**, H. Wang, S. Zhou, Y. Shen, Y.-H. Liu. "A hierarchical framework for coordinating large-scale robot networks," IEEE International Conference on Robotics and Automation (ICRA), 2019.
- [14] **Z. Liu**, S. Zhou, C. Suo, P. Yin, W. Chen, H. Wang, H. Li, Y.-H. Liu. "LPD-Net: 3D point cloud learning for large-scale place recognition and environment analysis," IEEE International Conference on Computer Vision (ICCV), 2019.
- [15] **Z. Liu**, C. Suo, S. Zhou, W. Chen, H. Wang, Y.-H. Liu. "SeqLPD: Sequence matching enhanced loop-closure detection based on large-scale point cloud description for self-driving vehicles," IEEE International Conference on Intelligent Robots and Systems (IROS), 2019.

Patent

- [1] A. Prorok, **Z. Liu**, J. Blumenkamp, and B. Wang, "Method and System for Robot Navigation in Unknown Environments," US Patent App. 18/287,686, 2024.
- [2] S. Zhou, Y.-H. Liu, **Z. Liu**, H. Zhao, W. Chen, and C. Suo, "Systems and Methods for Place Recognition Based on 3D Point Cloud" U.S. Non-Provisional Patent, US 16/665,814, 2020.