

LIANG ZHANG

Associate Professor · Ph.D. and Master's Supervisor

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My research focuses on multi-robot systems and the emergence of autonomous capabilities in complex interacting systems operating in real-world environments. I work on swarm coordination, collective perception and information-aware planning, with applications to cooperative localization, positioning services and autonomous exploration.

Academic Appointment

Nov 2021 - present	Anhui University Faculty, School of Electrical Engineering and Automation. Current role: Associate Professor; supervisor of doctoral and master's students.
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Education and Research Training

Nov 2021	Harbin Institute of Technology Ph.D. in Aeronautical and Astronautical Science and Technology.
Aug 2018 - Aug 2019	ETH Zurich, Autonomous Systems Lab (ASL) Joint doctoral research, supported by the China Scholarship Council. Host advisor: Prof. Roland Siegwart.
Sep 2011 - Jun 2015	Shandong University B.Eng. in Automation.

Research Interests

Swarm coordination and control. Distributed control, formation and enclosing control, and coverage control.

Cooperative localization and positioning. Multi-robot positioning system deployment, bearing-based sensing and localization accuracy optimization.

Collective perception and information-aware planning. Active sensing, network connectivity prediction, multi-robot mapping and autonomous exploration.

Selected Projects as Principal Investigator

National Natural Science Foundation of China - Young Scientists Fund. Distributed resilient deployment of large-scale pseudolite PNT systems in GNSS-denied environments.

State Key Laboratory Open Fund. Optimal deployment of pseudolite swarms for cooperative navigation in lunar in-situ construction.

Anhui Provincial Department of Education - Key Research Project. Rapid localization and mapping for unmanned swarms in constrained environments.

Industry-commissioned research. Integrated communication, navigation, sensing, telemetry and control for new-energy UAV swarms.

Industry-commissioned research. UAV flight control for disturbance-resistant standoff tracking.

Selected Publications

Reverse chronological order. My name is bold; * indicates my corresponding authorship.

01. Z. Chen, E. A. T. Yew, Y. Fu, Z. Kong, **L. Zhang***, S. Sun.
Mode-Scheduled Hybrid Control of Magnetorheological-Assisted Robotic Joints for Improved Energy Efficiency and Disturbance Rejection
IEEE Transactions on Industrial Electronics, 2026, Early Access: 1-13. DOI
02. E. A. T. Yew, Z. Tao, H. Cai, Z. Kong, B. Zhou, **L. Zhang***, S. Sun.
MR_Go: A Magnetorheological Quadruped Robot for Energy-Efficient, High-Payload, and Impact-Tolerant Planetary Exploration
IEEE Robotics and Automation Letters, 2026, 11(5): 5670-5677. DOI
03. K. Lin, **L. Zhang***, Z. Liu, Y. Huang, Z. Zhang.
Optimal Placement and Selection of Camera-Based Target Localization System Using Relative Bearing Measurements
IEEE Sensors Journal, 2026, 26(6): 8956-8969. DOI
04. J. Liu, Z. Zhang, **L. Zhang**, K. Zhang, C. Yan.
A Decoupled Nonuniform Guiding Vector Field for Multirobot Coordinated Path-Following on 2-D Manifolds
IEEE Transactions on Aerospace and Electronic Systems, 2026, 62: 5751-5766. DOI
05. K. Lin, **L. Zhang***, K. Wu, Z. Liu.
Optimal Deployment of Multi-Robot Based Regional Positioning System Using Relative Bearing Measurement
IEEE Robotics and Automation Letters, 2025, 10(10): 10602-10609. DOI
06. **L. Zhang***, J. Deng.
Deep Compressed Communication and Application in Multi-Robot 2D-Lidar SLAM: An Intelligent Huffman Algorithm
Sensors, 2024, 24(10): 3154. DOI
07. **L. Zhang**, Z. Zhang, R. Siegwart, J. J. Chung.
Probabilistic Network Topology Prediction for Active Planning: An Adaptive Algorithm and Application
IEEE Transactions on Robotics, 2023, 39(1): 147-164. DOI
08. **L. Zhang**, Z. Zhang, R. Siegwart, J. J. Chung.
Distributed PDOP Coverage Control: Providing Large-Scale Positioning Service Using a Multi-Robot System
IEEE Robotics and Automation Letters, 2021, 6(2): 2217-2224. DOI

A full publication list and available paper files are provided on my website.

Service and Mentorship

Selected Granted Invention Patents

1. Infrared-guided landing apparatus and landing method

ZL202411305216.9 | 2025-09-26
2. Camera deployment optimization and selection method based on multi-camera cooperative localization

ZL202411913152.0 | 2025-12-09
3. Multi-rover coverage method for environments unknown a priori

ZL202511100975.6 | 2025-10-17
4. Time-based coverage control method for heterogeneous mobile robot swarms

ZL202211630146.5 | 2023-03-21
5. Multi-LiDAR calibration and fused mapping method for autonomous driving in complex environments

ZL202410268553.9 | 2024-05-31

English patent titles are translations of the Chinese titles.

Professional Memberships and Academic Service

- Youth member, Space Intelligence Committee, Chinese Society of Space Research.
- Member, IEEE RAS Technical Committee on Multi-Robot Systems.
- Senior member, Chinese Society of Astronautics; member, Chinese Association of Automation.
- Session chair at YAC 2023, IFAC ACA 2025 and other academic conferences.
- Reviewer for international journals in robotics, control, and aerospace engineering.

Selected Honors and Awards

- Anhui Provincial Teaching Achievement Awards: First Prize and Second Prize.
- Best Reviewer, IFAC ACA 2025.
- Outstanding Young Faculty Member, Anhui Robotics Society.
- Outstanding Advisor, Anhui Division, China Undergraduate Mathematical Contest in Modeling.

Student Supervision

- Graduate alumni have pursued doctoral study or joined companies including Conch Cement and ChangXin Memory Technologies.
- Advised undergraduate teams receiving more than 20 national and provincial competition awards; supervised two undergraduate research publications.
- Supervised students receiving an Outstanding Paper Award at a subforum of the 2024 International Moon Day main event.