Xiaozhen Zhang

jiaozhen@mail.nwpu.edu.cn · https://mkb9559.github.io/zxz-main/

1 Affiliations

The Hong Kong Polytechnic University, Hong Kong 2025.10 – present

Postdoctoral Fellow, Department of Aeronautical and Aviation Engineering, supervisor: Hailong Huang

2 Education

Beijing Institute of Technology, China 2021.9 – 2025.9

Ph.D. Degree, School of Automation, supervisor: Qingkai Yang

Nanyang Technological University, Singapore 2025.2 – 2025.8

Visiting Ph.D. Student, School of Electrical & Electronic Engineering, supervisor: Lihua Xie

Northwestern Polytechnical University, China 2018.6 – 2021.4

M.S. Degree, School of Astronautics, supervisor: Panfeng Huang

Northwestern Polytechnical University, China 2014.9 – 2018.6

B.S. Degree, Honor College

3 Research Interests

- **Robotics and autonomous systems**
- **Multi-agent systems**
- **Swarm intelligence**
- **Distributed control and optimization**
- **Learning-enabled autonomy**
- **Human-swarm interaction and collaboration**

I am dedicated to exploring the coordination and autonomy of multi-robot systems, with the ultimate vision of enabling robot swarms to achieve autonomous, intelligent, and human-compatible collective behavior in complex environments. To pursue this vision, I integrate distributed control, optimization, estimation, and learning-enabled AI techniques to bridge the gap between individual intelligence and collective autonomy.

4 Publications

1. **Xiaozhen Zhang**, Qingkai Yang*, Xianlin Zeng, Hao Fang, Lihua Xie, and Jie Chen, "Distributed Nominal Configuration Design for Linear Formations," ***IEEE Transactions on Automatic Control***, 2026.
2. Hanyang Sheng, **Xiaozhen Zhang**, and Qingkai Yang*, "Dynamic event-triggered linear formation stabilization for nonholonomic mobile robots," ***Asian Journal of Control***, 2026.
3. **Xiaozhen Zhang**, Qingkai Yang*, Xianlin Zeng, Hao Fang, and Jie Chen, "Cooperative Shape-Translation Estimation and Control for Time-Varying Linear Formation," ***IEEE Transactions on Automatic Control***, 2025. **(Full Paper)**
4. **Xiaozhen Zhang**, Qingkai Yang*, Fan Xiao, Hao Fang, and Jie Chen, "Linear Formation Control of Multi-agent Systems," ***Automatica***, 2025. **(Regular Paper)**
5. Zeming Zhao, **Xiaozhen Zhang**, Hao Fang, and Qingkai Yang*, "Distributed Formation Planning for Unmanned Aerial Vehicles", ***Drones***, 2025.
6. Qingkai Yang*, **Xiaozhen Zhang**, Hao Fang, Ming Cao, and Jie Chen, "Joint Estimation and Planar Affine Formation Control with Displacement Measurements," ***IEEE Transactions on Control Systems Technology***, 2024. **(Full Paper)**
7. **Xiaozhen Zhang**, Qingkai Yang*, Jingshuo Lyu, Xinyue Zhao, and Hao Fang, "Distributed Variation Parameter Design for Dynamic Formation Maneuvers With Bearing Constraints," ***IEEE Transactions on Automation Science and Engineering***, 2024.

8. **Xiaozhen Zhang**, Fan Zhang*, and Panfeng Huang, "Formation Planning for Tethered Multirotor UAV Cooperative Transportation With Unknown Payload and Cable Length", ***IEEE Transactions on Automation Science and Engineering***, 2024.
9. **Xiaozhen Zhang**, Fan Zhang*, Panfeng Huang, Jiale Gao, Hang Yu, Chongxu Pei, and Yizhai Zhang, "Self-Triggered Based Coordinate Control With Low Communication for Tethered Multi-UAV Collaborative Transportation", ***IEEE Robotics and Automation Letters***, 2021.
10. Ya Liu, Fan Zhang*, Panfeng Huang, and **Xiaozhen Zhang**, "Analysis, planning and control for cooperative transportation of tethered multi-rotor UAVs", ***Aerospace Science and Technology***, 2021.

5 Conferences

1. **Xiaozhen Zhang**, and Chao Huang, "Distributed Swarm Deployment in Fourier Coordinates via Riesz Energy Shaping", in ***IEEE International Conference on Human-Machine Systems (ICHMS)***, 2026.
2. Zeming Zhao, **Xiaozhen Zhang**, Qingkai Yang, and Hao Fang, "Distributed Formation Planning for Unmanned Ground Vehicles", in ***40th Youth Academic Annual Conference of Chinese Association of Automation (YAC)***, 2025. (**Best Student Paper**)
3. **Xiaozhen Zhang**, Qingkai Yang, Hao Fang, and Jie Chen, "How Do Swarms Behave Compliantly?" in ***The 19th IEEE International Conference on Control & Automation***, 2025.
4. **Xiaozhen Zhang**, Qingkai Yang, Haijiao Wei, Wei Chen, Zhihong Peng, and Hao Fang, "A Distributed Algorithm for Solving A Time-Varying Linear Equation", in ***62nd IEEE Conference on Decision and Control (CDC)***, 2023.
5. **Xiaozhen Zhang**, Qingkai Yang, Rui Yu, Delong Wu, Shaozhun Wei, Jingqiang Cui, and Hao Fang, "Design and Analysis of Truss Aerial Transportation System (TATS): The Lightweight Bar Spherical Joint Mechanism", in ***IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)***, 2022.
6. **Xiaozhen Zhang**, Jingshuo Lv, Shaolei Lu, and Qingkai Yang, "Distributed Decision Making on Scaling Size for Obstacle Avoidance in Affine Formation Control", in ***37th Youth Academic Annual Conference of Chinese Association of Automation (YAC)***, 2022.
7. **Xiaozhen Zhang**, Fan Zhang, Panfeng Huang, Chen Wang, and Ya Liu,"Distributed Control for Cooperative Transportation in Presence of Unknown Disturbance", in ***IEEE International Conference on Real-time Computing and Robotics (RCAR)***, 2019.

6 Principal Awards

- The Inaugural Young Elite Scientists Sponsorship Program by CAST, Doctoral Student Special Plan, 2025
- **National Scholarship**, 2024
- **CSC Scholarship**, 2024
- **Outstanding Master's Degree Thesis of Northwestern Polytechnical University**, 2021
- **Outstanding Master Graduates of Northwestern Polytechnical University**, 2021
- **Ministry of Industry and Information Technology Scholarship**, Third Prize, 2017

7 Talks

1. Research on Linear Formation for Robot Swarms
   University of Cyprus, Online, June 2025.
2. Linear Formation Control of Multi-Agent Systems
   The 13th Forum of Young Scientists of China Command and Control Society, Zhuhai, China, April 2025.
3. Research on Motion Control of Swarm Robotics
   The 8th Graduate Forum of Beijing Institute of Technology, Beijing Institute of Technology, Beijing, China, November 2024.
4. Linear Formation Control for Swarm Robots
   International Doctoral Academic Forum on Mechanics and Interdisciplinary Subjects, Peking University, Beijing, China, October 2024.
5. A Distributed Algorithm for Solving A Time-Varying Linear Equation
   AI Future-The 5th Academic Forum on Artificial Intelligence in Beijing Universities, Beijing, China, April 2023.

6. Distributed Decision Making on Scaling Size for Obstacle Avoidance in Affine Formation Control
The Fourteenth Japan-China International Workshop on Information Technology and Control Applications, Online, November 2022.

8 Academic Service

- **Conference Reviewer**: IROS2019, IROS2021, IROS2022, ACC2022, CDC2023, ACC2026, ECC2026, CDC2026
- **Journal Reviewer**:
  - IEEE Transactions on Automatic Control
  - Journal of Field Robotics
  - IEEE Transactions on Fuzzy Systems
  - IEEE Transactions on Automation Science and Engineering
  - IEEE Transactions on Systems, Man and Cybernetics: Systems
  - IEEE Transactions on Control Systems Technology
  - IEEE Transactions on Industrial Electronics
  - IEEE Transactions on Vehicular Technology
  - International Journal of Robust and Nonlinear Control
  - IEEE Transactions on Signal and Information Processing over Networks
  - .....

8 Others

- **Google scholar**: https://scholar.google.com/citations?user=PbZPL9cAAAAJ
- **Personal page**: https://mkb9559.github.io/zxz-main/
- **GitHub**: https://github.com/mkb9559