Xiaozhen Zhang

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

1 Education

Beijing Institute of Technology, China 2021 – Present

Ph.D. candidate, School of automation, Supervisor: Qingkai Yang

Northwestern Polytechnical University, China 2018 – 2021

M.S. degree, School of aerospace, Supervisor: Panfeng Huang

Northwestern Polytechnical University, China 2014 – 2018

B.S. degree, Honour college.

2 Research Interests

Cooperative transportation 2018 – 2021

Cooperative work is usually more effective than a single individual. I focus on the tethered aerial cooperative transportation system, where the payload is tethered by multiple multi-rotor UAVs via cables. I have studied the tracking control problem of the payload, the time synchronization problem of UAVs', and the transportation formation design problem based on cable tension.

Swarm robotics 2018 – Present

Clusters of robots have been employed in various collaborative scenarios. The formation, serving as an elegant way to specify coordinate relationships among robots, can guide the overall cluster to achieve global cooperative objectives. I have contributed to formation control through my research on aerial cooperative transportation. Moreover, I have also studied linear transformation-based formation maneuver problems for multi-agent systems. Now, I am exploring mission-oriented swarm behaviors of robotics.

Networked control and estimation 2018 – Present

For multi-agent systems, distributed control and estimation technology is an emerging requirement for achieving a coincident goal. I have contributed to this topic through my research on distributed formation tracking and cooperative swarm parameter estimation. Furthermore, I have also studied the inner relationships between distributed estimation and cooperative solving of a system of linear equations. Now, I am working on emerging the compliance of swarm robotics.

3 Publications

1. 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)
2. **Xiaozhen Zhang**, Qingkai Yang, Fan Xiao, and Hao Fang, "Linear Formation Control of Multi-agent Systems," ***Automatica***, 2024. (Regular Paper) (Accepted)
3. **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.
4. **Xiaozhen Zhang**, Fan Zhang, Panfeng Huang, "Formation Planning for Tethered Multirotor UAV Cooperative Transportation With Unknown Payload and Cable Length", ***IEEE Transactions on Automation Science and Engineering***, 2024.
5. **Xiaozhen Zhang**, Fan Zhang, Panfeng Huang, Jiale Gao, Hang Yu, Chongxu Pei, Yizhai Zhang, "Self-Triggered Based Coordinate Control With Low Communication for Tethered Multi-UAV Collaborative Transportation", ***IEEE Robotics and Automation Letters***, 2021.
6. Ya Liu, Fan Zhang, Panfeng Huang, **Xiaozhen Zhang**, "Analysis, planning and control for cooperative transportation of tethered multi-rotor UAVs", ***Aerospace Science and Technology***, 2021.

7. **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***. (Under review)

4 Conference

1. **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.
2. **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.
3. **Xiaozhen Zhang**, Jingshuo Lv, Shaolei Wei, 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.
4. **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.

5 Academic Service

- **Conference Reviewer**: IROS2019, IROS2021, IROS2022, ACC2022, CDC2023, ICIT2024, ICLR2025.
- **Journal Reviewer**: IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Control Systems Technology, IEEE Transactions on Signal and Information Processing over Networks, Journal of Advanced Computational Intelligence and Intelligent Informatics, Autonomous Intelligent Systems, Discover Applied Sciences.

6 Others

- **Google scholar**: https://scholar.google.com/citations?user=rcMx3LUAAAAJ
- **Personal page**: https://mkb9559.github.io/zxz-main/
- **GitHub**: https://github.com/mkb9559