Fan Zhang

Professor (Young Talent)

Northwestern Polytechnical University
National-Local Joint Engineering Laboratory of Microsatellite
Technology and Application, Xi'an Shaanxi 710072, P.R.China
zhangfan_nwpu@nwpu.edu.cn
https://teacher.nwpu.edu.cn/en/zhangfannwpu.html

Research Interests

Learning control, micro-nano satellite control, multi-agent systems (Aerospace Applications and Robotics)

Education

2024 **Ph.D. in Control Science and Engineering**, *Beihang University, China*

2018 **M.Eng. in Navigation, Guidance and Control**, *Northwestern Polytechnical University, China*

2015 **B.Eng. in Detection, Guidance and Control Technology**, *Northwestern Polytechnical University*

Distinctions

2024 Young scientific and Technological Talent Award, Shaanxi Society of Astronautics

2023 Best Poster Paper Award, 7th Chinese Conference on Swarm Intelligence and Cooperative Control

2022 Guorui Fellowship, China Electronic Technology Group Corporation

2022 Segway-Ninebot Robotics Fellowship, Segway Inc.

2017 Industry and Information Scholarship, Ministry of Industry and Information Technology of China

2017 Huawei Postgraduate Fellowship, Huawei Technologies Co., Ltd.

2016 Champion, 2nd China International College Students' Innovation Competition

2016 First Prize, Micro Satellite Payload and Application Competition of Shaanxi Province

2014 Honorable Mention, Mathematical Contest in Modeling of USA

2013 Champion, 18th FIRA RoboWorld Cup & Congress Simulation 5v5 Program

Publications

[01] **F. Zhang**, D. Meng, X. Li. Robust adaptive learning for attitude control of rigid bodies with initial alignment errors, ***Automatica***, 137: 110024, 2022

[02] **F. Zhang**, D. Meng, X. Li. Chattering-free adaptive iterative learning for attitude tracking control of uncertain spacecraft, ***Automatica***, 151: 110902, 2023

[03] **F. Zhang**, D. Meng. Bettering adaptive iterative learning for rotation maneuvers using segment-wise rectification, ***Automatica***, accepted

[04] **F. Zhang**, D. Meng, K. Cai. Safe iterative learning for high-precision attitude tracking of rigid bodies under nonconvex orientation constraints, ***IEEE Transactions on Automation Science and Engineering***, 21(4): 5024-5036, 2024

[05] **F. Zhang**, D. Meng, J. Zhang. Global attitude synchronization for networked rigid bodies under directed topologies, ***IEEE Transactions on Control of Network Systems***, 10(3): 1362-1373, 2023

[06] **F. Zhang**, D. Meng, K. Cai. Segment-wise learning control for trajectory tracking of robot manipulators under iteration-dependent periods, ***Science China Information Sciences***, 67(3): 132203, 2024

[07] **F. Zhang**, D. Meng, Z. Wu, et al. Hybrid triggering design for global attitude synchronization of networked rigid bodies, ***ISA Transactions***, 142: 188-197, 2023

[08] Y. Qu, X. Zhong, **F. Zhang**, et al. Robust disturbance observer-based fast maneuver method for attitude control of optical remote sensing satellites, ***Acta Astronautica***, 201: 83-93, 2022

[09] **F. Zhang**, D. Meng. Quaternion-based adaptive iterative learning control for attitude tracking of spacecraft, *Chinese Automation Congress*, China, 7226-7231, 2020

[10] **F. Zhang**, D. Meng. Distributed adaptive learning control for trajectory tracking of networked robot

manipulators, *Chinese Conference on Swarm Intelligence and Cooperative Control*, China, 441-449, 2023

[11] Y. San, **F. Zhang**, C. Lu, et al. Optimization-based design for data-driven control of SISO nonaffine nonlinear systems, *Chinese Control Conference*, Hefei, China, 5645-5650, 2022

[12] **F. Zhang**. Robust iterative learning control for repetitive tasks of rigid body systems, 2024 (Ph.D. Thesis)

Patents

[01] Y. Liu, J. Zhou, **F. Zhang**, et al. An anti-interference method for analog sun sensors subject to the Earth albedo, China authorization number: ZL201810322954.2, October 26, 2021

[02] D. Meng, **F. Zhang**. An attitude tracking method and system based on iterative learning for rigid aircraft, China authorization number: ZL202111196418.0, August 8, 2023

Research and Work Experience

[01] Northwestern Polytechnical University, Young Talent Professor/Designer-in-Chief of micro-nano satellite control system — 2024-Now
- Iterative/Reinforcement/Cooperative learning control
- Shaanxi Qinling ecological satellite

[02] Beihang University, Ph.D. Candidate — 2019-2024

Advisor: *Deyuan Meng, IEEE Senior Member*
- Robust iterative learning control
- Safe iterative learning control
- Bettering data storage and learning effectiveness of iterative learning control

[03] Huawei Cloud Computing Technologies Co., Ltd., Solution Engineer — 2018-2019

Advisor: *Tao Chen, Lead Architect*
- General-purpose solutions of cloud computing

[04] Northwestern Polytechnical University, M.Eng. Student — 2015-2018

Advisor: *Jun Zhou, Top 2% Scientists Worldwide 2023*
- Development of the attitude determination of "Star of Aoxiang " CubeSat (NWPU Project)
- Development of the attitude control system of "Xingyun Experiment 1" CubeSat (Xingyun Project)
- Development of the attitude-orbit control system of "Aoxiang 1" CubeSat (EU QB50 Project)

Conference Orals and Posters

[01] 7th Chinese Conference on Swarm Intelligence and Cooperative Control, Nanjing, China, November 2023

[02] IEEE 12th Data Driven Control and Learning Systems Conference, Xiangtan, China, May 2023

[03] IEEE 10th Data Driven Control and Learning Systems Conference, Suzhou, China, May 2021

[04] China Automation Congress, Shanghai, China, November 2020

[05] 39th Chinese Control Conference, virtual, August 2020

[06] International Forum on Education for Rural Transformation, Pathum Thani, Thailand, November 2017

Services

[01] Editorial Board Member of SCI Journal <Control Engineering Practice>, <Franklin Open>, <Journal of Naval Aviation University> and <Journal of Projectiles, Rockets, Missiles and Guidance>

[02] Reviewer of Automatica, International Journal of Robust and Nonlinear Control, Journal of the Franklin Institute, Journal of Aerospace Engineering, IEEE Data Driven Control and Learning Systems Conference, Chinese Automation Congress, Chinese Conference on Swarm Intelligence and Cooperative Control

[03] Member of Chinese Association of Automation and Chinese Society of Astronautics

[04] Member of the technical committee of the 2024 China Robot Competition and the RoboCup China Open

[05] Rising Star Member of CSDN (Chinese Software Developer Network) with 7k+ followers