Jinxian Wu

Ph.D. Candidate
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Statement

Jinxian Wu is a third-year Ph.D. student at the Beijing Institute of Technology. His research focuses on distributed model predictive control (DMPC), specifically on the convex optimization theory and the distributed optimization methods for DMPC.

Education

Beijing Institute of Technology (BIT), Beijing, China 2022 - 2026 (expc.)

Ph.D. candidate in School of Automation

Research Directions: Optimization in DMPC; Iterative DMPC

Supervisor: Prof. Li Dai

Beijing Institute of Technology (BIT), Beijing, China 2019 - 2022

M.Eng. in School of Automation, June 2022

Research Directions: Fuzzy clustering; Fuzzy association rule mining

Supervisor: Prof. Li Dai

Qingdao University (QDU), Shandong, China 2015 - 2019

B.Eng. in Automation, June 2019

Publications (* : corresponding author)

Journal Papers

[J7] **Jinxian Wu**, Li Dai, Songshi Dou, Yunshan Deng, & Yuanqing Xia. (2025). Towards Improved Performance of Inner Convex Approximation for Suboptimal Nonlinear MPC, *IEEE Transactions on Cybernetics*, doi: 10.1109/TCYB.2025.3583588, in Press.

[J6] Yunshan Deng, Yuanqing Xia, Zhongqi Sun, Yuan Zhang, **Jinxian Wu**, & Xiangyu Kong. (2025). Convex MPC with Unreachable Setpoint for A Class of Affine Systems, *IEEE Robotics and Automation Letters*, doi: 10.1109/LRA.2025.3583627, in Press.

[J5] **Jinxian Wu**, Li Dai, Songshi Dou, & Yuanqing Xia. (2025). Accelerated Successive Convex Approximation for Nonlinear Optimization-Based Control, *IEEE Transactions on Automatic Control*, doi: 10.1109/TAC.2025.3555375, early access.

[J4] **Jinxian Wu**, Li Dai, & Yuanqing Xia. (2025). Iterative Non-Convex Distributed MPC with Flexible Termination Strategy, *IEEE Transactions on Automatic Control*, 70(5), 3008-3023, (**Full paper**).

[J3] **Jinxian Wu**, Li Dai, & Yuanqing Xia. (2024). Iterative Distributed Model Predictive Control for Heterogeneous Systems with Non-convex Coupled Constraints. *Automatica*, 166, 111700, **(Regular Paper)**.

[J2] **Jinxian Wu**, Li Dai, & Yuanqing Xia. (2024). Iterative Distributed Model Predictive Control for Nonlinear Systems with Coupled Non-convex Constraints and Costs, *International Journal of Robust and Nonlinear Control*, 34(11), 7220-7244.

[J1] Li Dai, Yaling Ma, Runze Gao, **Jinxian Wu**, & Yuanqing Xia. (2023). Cloud-based Computational Model Predictive Control Using a Parallel Multi-block ADMM Approach. *IEEE Internet of Things Journal*, 10(12), 10326 - 10343.

Conference Papers

[C2] Zixuan Fan, **Jinxian Wu**, Li Dai, & Yuanqing Xia. (2023). Trajectory Planning Based on MINVO Basis for Autonomous Vehicles in Lane Change Scenarios. In *Proceedings of the 2023 Chinese Control Conference*. IEEE.

[C1] **Jinxian Wu**, Li Dai, Yaling Ma, Weidong Zou, & Yuanqing Xia. (2021). Distributed Fuzzy Clustering Based Association Rule Mining: Design, Deployment and Implementation. In *Proceedings of the 2021 China Automation Congress*. (**Best paper award**)

Manuscripts

[M9] **Jinxian Wu**, Li Dai, Songshi Dou, Yunshan Deng, & Yuanqing Xia. (2025). Nonlinear Distributed Model Predictive Control with Privacy-Preserving Guarantees, submitted to *IEEE Transactions on Automatic Control*.

[M8] Songshi Dou, Feihu Jin, **Jinxian Wu**, Kwan L Yeung. (2025). SpaceMeet: Large Language Model-empowered Efficient Conferencing Services in LEO Satellite Constellations, submitted to *ACM*

[M7] Yunshan Deng, Yuanqing Xia, Zhongqi Sun, Li Dai, & **Jinxian Wu**. (2025). Successive Suboptimal Model Predictive Control Using Sequential Convex Programming, submitted to *International Journal of Robust and Nonlinear Control*.

[M6] Songshi Dou, Shengyu Zhang, Zhenglong Li, **Jinxian Wu**, Xianhao Chen, & Lawrence K. Yeung. (2025). SPACECACHE+: Towards Pervasive Content Delivery via Low-Earth Orbit Mega-Constellations, submitted to *IEEE Transactions on Services Computing*.

[M5] **Jinxian Wu**, Li Dai, Songshi Dou, Yunshan Deng, & Yuanqing Xia. (2025). Distributed Quasi-Newton Method for Nonlinear Optimization-Based Control, submitted to *Automatica*.

[M4] Songshi Dou, **Jinxian Wu***, Shengyu Zhang, Xianhao Chen, & Kwan L Yeung. (2025). MATCHMAKER: Maintaining QoS-aware and Predictable Load Balancing Performance for LEO Mega-Constellations, submitted to *IEEE Transactions on Communication*.

[M3] Yunshan Deng, Yuanqing Xia, Zhongqi Sun, **Jinxian Wu**, Jie Lin, & Li Dai. (2025). Nonlinear Model Predictive Control Using Sequential Convex Programming, submitted to *IEEE Transactions on Automatic Control*.

[M2] Chenlong Fu, **Jinxian Wu**, Li Dai, & Yuanqing Xia. (2025). Distributed MPC-based Trajectory Tracking Control for a Multi-quadrotor UAV Slung Load System, submitted to *IET Control Theory & Applications*.

[M1] Pushen Cai, Huahui Xie, **Jinxian Wu**, & Li Dai. (2025). Distributed Model Predictive Control of Multi-Agent Systems for Tracking Periodic Unreachable Trajectory with Collision Avoidance, submitted to *Journal of the Franklin Institute*.

PATENTS

[P1] Li Dai, Yaling Ma, Runze Gao, **Jinxian Wu** et al. (2022). An automotive energy management method based on container and model predictive control. Chinese Patent, CN202210816336.X.

TALKS & PRESENTATIONS

"Distributed Fuzzy Clustering Based Association Rule Mining: Design, Deployment and Implementation", *2021 China Automation Congress*, Kunming, Yunnan, China, August 2022.

RESEARCH GRANTS

Principal Investigator, *Optimization-based control for resource-constrained autonomous unmanned systems*, BIT Research and Innovation Promoting Project (Grant No.2024YCXY035), November 2024 to November 2025.

TEACHING EXPERIENCE

Theory and Application of Stochastic Process (Fall 2019, Teaching assistant)

ACADEMIC SERVICES

Reviewer for Journals

- IEEE Transactions on Automatic Control
- IEEE Transactions on Control Systems Technology
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Transactions on Cybernetics

- Automatica
- System & Control Letters
- Nonlinear Dynamics

Honors & Awards

Huawei Scholarship (Top 1%), Huawei Technologies Co Ltd 2024

Outstanding Ph.D. Student (Top 5%), Beijing Institute of Technology 2024

Outstanding Graduates (Top 1%), Beijing Institute of Technology 2022

Best Paper Award of CAC 2021 (Top 0.5%), Chinese Association of Automation 2021

Outstanding Master Student (Top 5%), Beijing Institute of Technology 2021