

Jianchen Hu

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Academic Curriculum Vitae

RESEARCH INTERESTS

My interests are centered around automatic control and system optimization. My particular focuses are on model predictive control, cloud resource allocation, black-box optimization and optimization in robotics.

ACADEMIC POSITION

May'23-current Associate Professor, *Xi'an Jiaotong University*, China
Apr'20-May'23 Assistant Professor, *Xi'an Jiaotong University*, China

ACADEMIC DEGREES

Sep'15-Dec'19 PH.D. in Control Science and Engineering, *Xi'an Jiaotong University*, China
Advisor: Yuanli Cai & Baocang Ding
Aug'11-Dec'13 MS. in Control Systems Technology, *Arizona State University*, United States
Advisor: Narciso Macia
Sep'07-May'11 BS. in Electronic Science and Engineering, *Northwest University*, China

Awards

ACADEMIC AWARD

2020 2nd Natural Science Award of the Chinese Society of Automation
(*Output feedback robust model predictive control*, Baocang Ding, Hongguang Pan, Jianchen Hu)

PAPER AWARD

2024 Peter Luh Memorial Best Paper Award for Young Researcher at *IEEE CASE*

Teaching Activities

2023-current *Expression and Communication*
2023-current *Cyber-physical Energy Systems*

Mentoring

DOCTORAL STUDENTS

Sep'21-current Xingqi Li

(co-advised with Xiaohong Guan)

Sep'23-current Kang Liu

MASTER & BACHELOR STUDENTS

Sep'23-current Master Students: Yi Xia, Lantian Hu, Wei Peng, Jiaming Xu, Jiayi Shi, Chang Guo

Sep'20-current Bachelor Students: Binhang Wu, Minghao Han

Professional Service

EDITORIAL SERVICE FOR JOURNALS

2024-current Associate Editor for *IEEE Robotics and Automation Letters*

ORGANIZATION OF TECHNICAL CONFERENCES

2024 Co-chair a Session on *IEEE Conference on Automation Science and Engineering*

2024 Co-chair a Forum on *IEEE International Conference on Intelligent Robotics and Control Engineering*

2023 Co-chair a Session on *IFAC workshop on Control of Smart Cities*

PROFESSIONAL AFFILIATIONS

Member, Institute for Electrical and Electronics Engineers (IEEE)

ACTIVE REVIEWERS

IEEE Transactions on Automatic Control, Automatica, IEEE Transactions on Fuzzy Systems, IEEE Transaction on Automation Science and Engineering, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Industrial Informatics, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Cognitive and Development Systems, IEEE Robotics and Automation Letter, International Journal of Robust and Nonlinear Control, IEEE Transactions on Cybernetics, IEEE Transactions on Systems, Man and Cybernetics, Control Engineering Practice, Journal of the Franklin Institute, Journal of Field Robotics, International Journal of Production Research, ISA Transactions, Results in Control and Optimization, and many other Journals and Conferences on control and optimization.

Publications & talks

JOURNAL ARTICLES

- [J1] **J. Hu**. Dynamic output feedback MPC with pre-optimized feedback estimator gain. 2024. Submitted.
- [J2] **J. Hu**, K. Liu, Y. Zhang, X. Sun, Q. Zhai, X. Cao, L. Zhu, L. Su, W. Zhou, F. Ming, Y. Xia, F. Gao, X. Guan. A relax-and-round optimization algorithm for online NUMA-aware virtual machine placement. 2024. Submitted.

- [J3] K. Liu, **J. Hu**, D. Ma, X. Cao, Y. Zhou, L. Zhu, L. Su, W. Zhou, X. Wu, F. Gao. Topology-aware VM placement through the buffer migration mechanism. 2024. Submitted.
- [J4] X. Lv, Q. Zhai, Y. Zhu, **J. Hu**, X. Guan. IPLAM: A high-dimensional expensive simulation optimization method with application to design space exploration in processor. 2024. Submitted.
- [J5] X. Li, F. Ming, **J. Hu**, Z. Xu, K. Liu, F. Gao, X. Guan. A constrained deep reinforcement learning approach for charging scheduling of a battery swapping station. 2024. Submitted.
- [J6] M. Han, **J. Hu**, M. Zhang, C. Wu, Y. Shi. Data-Driven Moving Horizon Estimator with Finite and Noisy Data. 2024. Submitted.
- [J7] B. Wu, **J. Hu**, M. Zhang, H. Pan, Z. Wu. A multi-step multi-ellipsoid approach of the dynamic output feedback MPC. *IEEE Transactions Fuzzy Systems*, 2024, 32(8): 4542-4556.
- [J8] **J. Hu**, X. Lv, H. Pan, M. Zhang. Handling the constraints in min-max MPC. *IEEE Transactions Automation Science and Engineering*, 2024, 21(1): 296-304.
- [J9] **J. Hu**, K. Liu, Y. Xia. Output feedback fuzzy model predictive control with multiple objectives. *Journal of the Franklin Institute*, 2024, 361(1): 32-45.
- [J10] L. Li, T. Gu, H. Pan, **J. Hu**, X. Yu. Sensor and actuator fault estimations and self-healing control of discrete-time T-S fuzzy model with double observers and its application to wastewater treatment process. *IEEE Transactions on Fuzzy Systems*, 2024, 32(4): 2428-2437.
- [J11] X. Zhou, M. Zhang, **J. Hu**, L. Li, X. Guan. A robust in-motion coarse alignment method for low-accuracy SINS and GPS integrated system. *IEEE/ASME Transactions on Mechatronics*, 2024, To appear.
- [J12] H. Huang, M. Zhang, L. Lin, **J. Hu**, H. Wang. GTSCalib: Generalized target segmentation for target-based extrinsic calibration of non-repetitive scanning LiDAR and camera. *IEEE Transactions on Automation Science and Engineering*, 2024, To appear.
- [J13] X. Sun, X. Cao, Q. Zhai, H. Tan, **J. Hu**, L. Zhu, L. Su, W. Zhou, F. Gao, X. Guan. NUMA-aware virtual machine placement: New MMMK model and column generation-based decomposition approach. *IEEE Transactions on Automation Science and Engineering*, 2024, To appear.
- [J14] X. Lv, Q. Zhai, **J. Hu**, Y. Zhu, J. Liu, X. Guan. An efficient binary programming method for black-box optimization and its application in processor design. *Science China Information Science*, 2024, To appear.
- [J15] **J. Hu**, B. Ding. Output feedback MPC for nonlinear system in large operation range. *IEEE Transactions on Automatic Control*, 2023, 68(12): 7903-7910.
- [J16] **J. Hu**, B. Ding, M. Zhang, J. Zhao, Z. Xu, H. Pan. Enhancing Output Feedback Robust MPC via Lexicographic Optimization. *IEEE Transactions on Industrial Informatics*, 2023, 19(2): 3068-3078.
- [J17] **J. Hu**, X. Li, Z. Xu, H. Pan. Co-design of Quantized Dynamic Output Feedback MPC for Takagi-Sugeno Model. *IEEE Transactions on Industrial Informatics*, 2023, 19(7): 8049-8060.
- [J18] H. Pan, Y. Fu, Z. Li, F. Wen, **J. Hu**. Images Reconstruction from Functional Magnetic Resonance Imaging Patterns Based on the Improved Deep Generative Multiview Model. *Neuroscience*, 2023, 509: 103-112.
- [J19] H. Pan, X. Yu, **J. Hu**, L. Li, Y. She, Y. Zhang, H. Zan. A self-healing controller based on sliding-mode control for sensor fault in wastewater treatment processes. *Journal of Process Control*, 2023, 127: 102997.

- [J20] **J. Hu**, X., M. Zhang, P. Shi. An off-line fuzzy model predictive control approach using cache. *IEEE Transactions on Fuzzy Systems*, 2022, 30(10): 4504-4514.
- [J21] X. Ping, **J. Hu**, T. Lin, B. Ding, P. Wang, Z. Li. A survey of output feedback robust MPC for linear parameter varying systems. *IEEE/CAA Journal of Automatica Sinica*, 2022, 9(10): 1717-1751.
- [J22] **J. Hu**, B. Ding. A periodic approach to dynamic output feedback MPC for quasi-LPV model. *IEEE Transactions on Automatic Control*, 2021, 66(5): 2257-2264.
- [J23] **J. Hu**. Dynamic output feedback MPC of polytopic uncertain systems: Efficient LMI conditions. *IEEE Transactions on Circuits and Systems-II: Express Briefs*, 2021, 68(7): 2568-2572.
- [J24] **J. Hu**, B. Ding. Output feedback robust MPC of uncertain norm-bounded linear systems with disturbance. *International Journal of Control*, 2021, 94(9): 2388-2395.
- [J25] **J. Hu**, B. Ding. Output feedback model predictive control with steady state target calculation for fuzzy systems. *IEEE Transactions on Fuzzy Systems*, 2020, 28(12): 3442-3449.
- [J26] **J. Hu**, B. Ding. Off-line output feedback robust MPC with general polyhedral and ellipsoidal true state bound. *Journal of the Franklin Institute*, 2020, 357(8): 4505-4523.
- [J27] **J. Hu**, B. Ding. One-step ahead robust MPC for LPV model with bounded disturbance. *European Journal of Control*, 2020, 52: 59-66.
- [J28] **J. Hu**, B. Ding. Heuristic open-loop output feedback model predictive control for control of intermittent transonic wind tunnel. *Transactions of the Institute of Measurement and Control*, 2020, 42(4): 832-839.
- [J29] J. Wang, B. Ding, **J. Hu**. Security control for LPV system with deception attacks via model predictive control: A dynamic output feedback approach. *IEEE Transactions on Automatic Control*. 2020, 66(2): 760-767.
- [J30] **J. Hu**, Y. Wang, B. Ding. An open-loop output feedback control, *Control Theory & Applications*, 2020, 37(1): 31-37.
- [J31] **J. Hu**, B. Ding. Output feedback robust MPC for linear systems with norm-bounded model uncertainty and disturbance. *Automatica*, 2019, 108: 108489.
- [J32] **J. Hu**, B. Ding. Dynamic output feedback predictive control with one free control move for the Takagi-Sugeno model with bounded disturbance. *IEEE Transactions on Fuzzy Systems*, 2019, 27(3): 462-473.
- [J33] **J. Hu**, B. Ding. An efficient offline implementation for output feedback min-max MPC. *International Journal of Robust and Nonlinear Control*, 2019, 29(2): 492-506.
- [J34] **J. Hu**, B. Ding. Dynamic output feedback robust MPC with convex optimisation for system with polytopic uncertainty. *International Journal of Systems Science*, 2019, 50(4): 739-748.
- [J35] B. Ding, J. Dong, **J. Hu**. Output feedback robust MPC using general polyhedral and ellipsoidal true state bounds for LPV model with bounded disturbance. *International Journal of Systems Science*, 2019, 50(3): 625-637.
- [J36] B. Ding, X. Tang, **J. Hu**. A Summary of Dynamic Output Feedback Robust MPC for Linear Polytopic Uncertainty Model with Bounded Disturbance. *Mathematical Problems in Engineering*, 2019, 3830724: 1-19.
- [J37] B. Ding, P. Wang, **J. Hu**. Dynamic output feedback robust MPC with one free control move for LPV model with bounded disturbance. *Asian Journal of Control*, 2018, 20(2): 755-767.

Refereed Conference Proceedings

- [C1] X. Lv, Q. Zhai, Y. Zhu, **J. Hu**, Y. Zhou, X. Guan. An efficient parallel single surrogate objective optimization method for bi-objective black-box problem and its application in processor design. *IEEE Conference on Automation Science and Engineering (CASE2024)*, 2024, Aug. 28-Sup. 2, Bari, Italy.
- [C2] H. Li, Y. Zhou, Q. Zhai, J. Zhao, M. Chen, X. Cao, **J. Hu**, L. Yang, K. Liu. A multi-stage stochastic scheduling method for microgrid with multiple types of energy storage. *Asian Control Conference (ASCC2024)*, 2024, Jul. 5-8, Dalian, China.
- [C3] J. Zhao, Q. Zhai, Y. Zhou, X. Cao, **J. Hu**, F. Xue, X. Li. Multi-stage robust implicit decision rule for optimal control problem of energy storage system. *IEEE Conference on Automation Science and Engineering (CASE2024)*, 2024, Aug. 28-Sup. 2, Bari, Italy.
- [C4] L. Qi, C. Yan, M. Zhang, **J. Hu**. A novel material handling system for transporting large-size components using multiple collaborative autonomous mobile robots. *IEEE international Conference on Robotics and Automation (ICRA2024)*, 2024, May 13-17, Yokohama, Japan.
- [C5] Y. Zhang, **J. Hu**, X. Sun, Q. Zhai, L. Zhu, L. Su, W. Zhou, F. Ming, X. Cao, F. Gao. Generating heuristic policies from optimization in large scale cloud computing VM scheduling. *Chinese Control Conference (CCC2024)*, Tianjin, China, July 24-26, 2023.
- [C6] C. Zhou, L. Yang, **J. Hu**, Z. Xu, X. Guan. Double-layered model predictive control for building HVAC systems considering thermal comfort. *IFAC workshop on Control of Smart Cities*, Sozopol, Bulgaria, June 27-30, 2022, 55(11): 96-101.
- [C7] X. Fu, D. Wang, **J. Hu**, J. Wei, C. Yan. Leader-follower based two-AGV cooperative transportation system in 5G environment. *IEEE International Conference on Automation Science and Engineering (CASE2022)*, Mexico City and Chengdu, Mexico, August 20-24, 2022, 67-72.
- [C8] **J. Hu**, B. Ding, Y. Wang, J. Zhao, Z. Xu, T. Zou, Y. Yang, X. Ping. An efficient approach for dynamic output feedback robust model predictive control. *Asian Control Conference (ASCC2019)*, Kitakyushu, Fukuoka, Japan, June 9-12, 2019: 1283-1288.
- [C9] **J. Hu**, B. Ding. An off-line output feedback MPC strategy for nonlinear systems represented by quasi-LPV model. *IFAC conference on NMPC*, Madison, WI, U.S. August 19-22, 2018, 51(20): 66-71.