

Xu JIN

CONTACT INFORMATION

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ACADEMIC EMPLOYMENT

University of Kentucky, Lexington, KY, United States
Assistant Professor, Department of Mechanical Engineering

Sep. 2019 - Present

EDUCATION

Georgia Institute of Technology, Atlanta, GA, United States

Ph. D. in Aerospace Engineering (GPA: 4.0/4.0) Aug. 2015 - Aug. 2019

Advisor: Prof. Wassim M. Haddad, IEEE Fellow

Thesis Title: Cyber-Physical System Security, Optimal Control, and Consensus Protocols for Nonlinear Stochastic Systems

M. S. in Mathematics (GPA: 4.0/4.0)

Aug. 2015 - Aug. 2018

University of Toronto, Toronto, ON, Canada

M.A.Sc. in Electrical and Computer Engineering (GPA: 4.0/4.0)

Sep. 2013 - Jun. 2015

Advisor: Prof. Raymond H. Kwong, IEEE Life Senior Member

Thesis Title: Adaptive Fault Tolerant Control For Nonlinear Systems With Constraints

National University of Singapore, Singapore

B. Eng. in Electrical and Computer Engineering (GPA: 4.79/5.00)

Aug. 2009 - Feb. 2013

Advisor: Prof. Jian-Xin Xu (deceased), IEEE Fellow

(Prof. Jian-Xin Xu has rested in peace in Feb. 2018 after a long and brave fight with cancer)

Thesis Title: On Iterative Learning Control Schemes With Composite Energy Function

RESEARCH INTERESTS

Adaptive Control

Iterative Learning Control

Stochastic Control

Fault Tolerant Control

Cooperative Control

Consensus Protocols

Cyber-Physical Systems

Constrained Nonlinear Systems

Multiagent Systems

Interconnected Systems

Robotics

Autonomous Vehicles

JOURNAL PAPERS (ACCEPTED)

Citations: 752, H-Index: 13 (As of Sep. 5, 2019)

(Google Scholar: <https://scholar.google.com/citations?user=nMrTISsAAAAJ&hl=en>)

(*: Corresponding Author)

- J1. W. M. Haddad*, T. Rajpourehit, and **X. Jin**, "Stochastic semistability for nonlinear dynamical systems with application to consensus on networks with communication uncertainty," *IEEE Transactions on Automatic Control*, to appear. (Journal Impact Factor: 5.093)
- J2. W. M. Haddad* and **X. Jin**, "Implications of dissipativity, inverse optimal control, and stability margins for nonlinear stochastic feedback regulators," *International Journal of Robust and Nonlinear Control*, to appear. (Journal Impact Factor: 3.953)
- J3. **X. Jin**, W. M. Haddad*, Z. P. Jiang, A. Kanellopoulos, and K. G. Vamvoudakis, "An adaptive learning and control architecture for mitigating sensor and actuator attacks in connected autonomous vehicle platoons," *International Journal of Adaptive Control and Signal Processing*, to appear. (Journal Impact Factor: 2.239)
- J4. **X. Jin** and W. M. Haddad*, "An adaptive control architecture for leader-follower multiagent systems with stochastic disturbances and sensor and actuator attacks," *International Journal of Control*, vol. 92, pp. 2561-2570, 2019. (Journal Impact Factor: 2.930)

- J5. **X. Jin**^{*}, “Adaptive fixed-time control for MIMO nonlinear systems with asymmetric output constraints using universal barrier functions,” *IEEE Transactions on Automatic Control*, vol. 64, pp. 3046-3053, 2019. (Journal Impact Factor: 5.093)
- J6. **X. Jin**^{*}, “Non-repetitive trajectory tracking for nonlinear autonomous agents with asymmetric output constraints using parametric iterative learning control,” *International Journal of Robust and Nonlinear Control*, vol. 29, pp. 1941-1955, 2019. (Journal Impact Factor: 3.953)
- J7. **X. Jin**^{*}, “Fault tolerant non-repetitive trajectory tracking for MIMO output constrained nonlinear systems using iterative learning control,” *IEEE Transactions on Cybernetics*, vol. 49, pp. 3180-3190, 2019. (Journal Impact Factor: 10.387)
- J8. **X. Jin**^{*}, “Non-repetitive leader-follower formation tracking for multiagent systems with LOS range and angle constraints using iterative learning control,” *IEEE Transactions on Cybernetics*, vol. 49, pp. 1748-1758, 2019. (Journal Impact Factor: 10.387)
- J9. W. M. Haddad^{*}, T. Rajpurohit, and **X. Jin**, “Energy-based feedback control for stochastic port-controlled Hamiltonian systems,” *Automatica*, vol. 97, pp. 134-142, 2018. (Journal Impact Factor: 6.355)
- J10. **X. Jin**, W. M. Haddad^{*}, and T. Hayakawa, “An adaptive control architecture for cyber-physical system security in the face of sensor and actuator attacks and exogenous stochastic disturbances,” *Cyber-Physical Systems*, vol. 4, no. 1, pp. 39-56, 2018. (Journal Impact Factor: N/A)
- J11. **X. Jin**^{*}, “Fault-tolerant iterative learning control for mobile robots non-repetitive trajectory tracking with output constraints,” *Automatica*, vol. 94, pp. 63-71, 2018. (Journal Impact Factor: 6.355)
- J12. **X. Jin**^{*}, “Adaptive decentralized finite-time output tracking control for MIMO interconnected nonlinear systems with output constraints and actuator faults,” *International Journal of Robust and Nonlinear Control*, vol. 28, no. 5, pp. 1808-1829, 2018. (Journal Impact Factor: 3.953)
- J13. **X. Jin**^{*}, “Iterative learning control for output constrained nonlinear systems with input quantization and actuator faults,” *International Journal of Robust and Nonlinear Control*, vol. 28, no. 2, pp. 729-741, 2018. (Journal Impact Factor: 3.953)
- J14. **X. Jin**, W. M. Haddad^{*}, and T. Yucelen, “An adaptive control architecture for mitigating sensor and actuator attacks in cyber-physical systems,” *IEEE Transactions on Automatic Control*, vol. 62, no. 11, pp. 6058-6064, 2017. (Journal Impact Factor: 5.093)
- J15. **X. Jin**^{*}, “Adaptive fault tolerant tracking control for a class of stochastic nonlinear systems with output constraint and actuator faults,” *Systems & Control Letters*, vol. 107, pp. 100-109, 2017. (Journal Impact Factor: 2.624)
- J16. **X. Jin**^{*}, “Adaptive fault tolerant control for a class of MIMO nonlinear systems with both sensor and actuator faults,” *International Journal of Adaptive Control and Signal Processing*, vol. 31, no. 10, pp. 1418-1427, 2017. (Journal Impact Factor: 2.239)
- J17. **X. Jin**^{*}, “Iterative learning control for non-repetitive trajectory tracking of robot manipulators with joint position constraints and actuator faults,” *International Journal of Adaptive Control and Signal Processing*, vol. 31, no. 6, pp. 859-875, 2017. (Journal Impact Factor: 2.239)
- J18. **X. Jin**^{*}, “Adaptive finite-time fault tolerant tracking control for a class of MIMO nonlinear systems with output constraints,” *International Journal of Robust and Nonlinear Control*, vol. 27, no. 5, pp. 722-741, 2017. (Journal Impact Factor: 3.953)
- J19. **X. Jin**^{*}, “Fault tolerant finite-time leader-follower formation control for autonomous surface vessels with LOS range and angle constraints,” *Automatica*, vol. 68, pp. 228-236, 2016. (Journal Impact Factor: 6.355)
- J20. **X. Jin**^{*}, “Adaptive iterative learning control for high-order nonlinear multi-agent systems consensus tracking,” *Systems & Control Letters*, vol. 89, pp. 16-23, 2016. (Journal Impact Factor: 2.624)

- J21. **X. Jin**^{*}, “Adaptive fault tolerant control for a class of input and state constrained MIMO nonlinear systems,” *International Journal of Robust and Nonlinear Control*, vol. 26, no. 2, pp. 286-302, 2016. (Journal Impact Factor: 3.953)
- J22. **X. Jin**^{*}, “Adaptive fault tolerant control for a class of output-constrained nonlinear systems,” *International Journal of Robust and Nonlinear Control*, vol. 25, no. 18, pp. 3237-3745, 2015. (Journal Impact Factor: 3.953)
- J23. D. Huang, J.-X. Xu^{*}, S. Yang, and **X. Jin**, “Observer based repetitive learning control for a class of nonlinear systems with non-parametric uncertainties,” *International Journal of Robust and Nonlinear Control*, vol. 25, no. 8, pp. 1214-1229, 2015. (Journal Impact Factor: 3.953)
- J24. **X. Jin** and J.-X. Xu^{*}, “A barrier composite energy function approach for robot manipulators under alignment condition with position constraints,” *International Journal of Robust and Nonlinear Control*, vol. 24, no. 17, pp. 2840-2851, 2014. (Journal Impact Factor: 3.953)
- J25. J.-X. Xu^{*}, **X. Jin**, and D. Huang, “Composite energy function based iterative learning control for systems with nonparametric uncertainties,” *International Journal of Adaptive Control and Signal Processing*, vol. 28, no. 1, pp. 1-13, 2014. (Journal Impact Factor: 2.239)
- J26. **X. Jin** and J.-X. Xu^{*}, “Iterative learning control for output-constrained systems with both parametric and non-parametric uncertainties,” *Automatica*, vol. 49, no. 8, pp. 2508-2516, 2013. (Journal Impact Factor: 6.355)
- J27. J.-X. Xu^{*} and **X. Jin**, “State-constrained iterative learning control for a class of MIMO systems,” *IEEE Transactions on Automatic Control*, vol. 58, no. 5, pp. 1322-1327, 2013. (Journal Impact Factor: 5.093)

CONFERENCE
PAPERS

- C1. W. M. Haddad, T. Rajpurohit, and **X. Jin**, “Finite time semistability and consensus in networks with communication uncertainty,” in *Proc. IEEE Conference on Decision and Control*, Nice, France, December 2019, to appear.
- C2. W. M. Haddad and **X. Jin**, “Universal feedback controllers and inverse optimality for nonlinear stochastic systems,” in *Proc. IEEE Conference on Decision and Control*, Nice, France, December 2019, to appear.
- C3. **X. Jin** and W. M. Haddad, “Robust adaptive control for leader-follower multiagent systems with stochastic disturbances, system uncertainty, and sensor-actuator attacks,” in *Proc. IEEE Conference on Decision and Control*, pp. 1397-1402, Miami Beach, FL, USA, 2018.
- C4. **X. Jin**, W. M. Haddad, Z.-P. Jiang, and K. G. Vamvoudakis, “Adaptive control for mitigating sensor and actuator attacks in connected autonomous vehicle platoons,” in *Proc. IEEE Conference on Decision and Control*, pp. 2810-2815, Miami Beach, FL, USA, 2018.
- C5. W. M. Haddad, T. Rajpurohit, and **X. Jin**, “Energy-based feedback control for stochastic port-controlled Hamiltonian systems,” in *Proc. American Control Conference*, pp. 5473-5478, Milwaukee, WI, USA, 2018.
- C6. W. M. Haddad, **X. Jin**, and T. Rajpurohit, “A conservation-based distributed control architecture for network consensus with multiplicative system uncertainty,” in *Proc. American Control Conference*, pp. 1262-1267, Milwaukee, WI, USA, 2018.
- C7. **X. Jin** and W. M. Haddad, “An adaptive control architecture for leader-follower multiagent systems with stochastic disturbances and sensor and actuator attacks,” in *Proc. American Control Conference*, pp. 980-985, Milwaukee, WI, USA, 2018.
- C8. **X. Jin**, W. M. Haddad, and T. Hayakawa, “An adaptive control architecture for cyber-physical system security in the face of sensor and actuator attacks and stochastic disturbances,” in *Proc. IEEE Conference on Decision and Control*, pp. 1380-1385, Melbourne, Australia, 2017.
- C9. **X. Jin**, “Non-repetitive trajectory tracking for joint position constrained robot manipulators using iterative learning control,” in *Proc. IEEE Conference on Decision and Control*, pp. 5490-5495, Las Vegas, NV, USA, 2016.

- C10. **X. Jin**, “Adaptive control for a class of nonlinear systems with output constraints and actuator faults,” in *Proc. IEEE Conference on Decision and Control*, pp. 1255-1260, Las Vegas, NV, USA, 2016.
- C11. **X. Jin** and R. Kwong, “Adaptive cooperative output tracking control for input and output constrained multiagent systems with actuator faults,” in *Proc. American Control Conference*, pp. 745-750, Boston, MA, USA, 2016.
- C12. **X. Jin**, “Adaptive finite-time tracking control for position constrained robot manipulators with actuator faults,” in *Proc. American Control Conference*, pp. 6018-6023, Boston, MA, USA, 2016.
- C13. **X. Jin**, “Adaptive iterative learning control for nonlinear multi-agent systems consensus output tracking with actuator faults,” in *Proc. American Control Conference*, pp. 1253-1258, Boston, MA, USA, 2016.
- C14. **X. Jin** and R. Kwong, “Adaptive fault tolerant control for a class of MIMO nonlinear systems with input and state constraints,” in *Proc. American Control Conference*, pp. 2254-2259, Chicago, IL, USA, 2015.
- C15. **X. Jin**, Z. Wang, and R. Kwong, “Convex optimization based iterative learning control for iteration-varying systems under output constraints,” in *Proc. IEEE International Conference on Control & Automation*, pp. 1444-1448, Taichung, Taiwan, ROC, 2014.
- C16. **X. Jin**, D. Huang, and J.-X. Xu, “Iterative learning control for systems with nonparametric uncertainties under alignment condition,” in *Proc. IEEE Conference on Decision and Control*, pp. 3942-3947, Maui, HI, USA, 2012.

REFEREE

Automatica
 IEEE Transactions on Automatic Control
 IEEE Transactions on Control Systems Technology
 IEEE Transactions on Cybernetics
 IEEE Transactions on Fuzzy Systems
 IEEE Transactions on Neural Networks and Learning Systems
 IEEE/ASME Transactions on Mechatronics
 IEEE Transactions on Systems, Man and Cybernetics: Systems
 IEEE Access
 IEEE/CAA Journal of Automatica Sinica
 International Journal of Robust and Nonlinear Control
 International Journal of Adaptive Control and Signal Processing
 International Journal of Fuzzy Systems
 Systems & Control Letters (Outstanding reviewer, achieved Nov. 2017)
 Nonlinear Dynamics
 ISA Transactions (Outstanding reviewer, achieved Aug. 2017)
 Mechanical Systems and Signal Processing (Outstanding reviewer, achieved Jan. 2018)
 Journal of the Franklin Institute (Outstanding reviewer, achieved Sep. 2018)
 Journal of Intelligent and Robotic Systems
 Journal of Guidance, Control, and Dynamics
 Expert Systems With Applications (Outstanding reviewer, achieved Jul. 2016)
 Optimal Control, Applications and Methods
 Neurocomputing (Outstanding reviewer, achieved Oct. 2018)
 Applied Ocean Research (Outstanding reviewer, achieved Jul. 2018)
 Acta Astronautica
 Transactions of the Institute of Measurement and Control
 Aerospace Science and Technology (Outstanding reviewer, achieved Jul. 2018)
 Complexity
 2014 IEEE Multi-Conference on Systems and Control (MSC)
 2015, 2016, 2017, 2018, 2019 American Control Conference (ACC)
 2016, 2017 ASME Dynamic Systems and Control Conference (DSCC)
 2017 IEEE Conference on Decision and Control (CDC)
 2017 Asian Control Conference (ASCC)

CONFERENCE
SESSION CHAIR

1. "Adaptive Control I", *American Control Conference*, Boston, MA, USA, July 6, 2016
2. "Robust Adaptive Control", *American Control Conference*, Chicago, IL, USA, July 2, 2015

TEACHING
EXPERIENCE

University of Kentucky

ME 440 DESIGN OF CONTROL SYSTEMS (Lecturer)

Jan. - May 2020

Fundamentals of classical control theory. Mathematical representation of feedback control systems using block diagrams and transfer functions. Design and analysis of feedback control systems using root-locus, Nyquist, and Bode methods to ensure system stability and meet desired system response specifications. Numerical simulation of feedback control systems.

SERVICES

1. 2019-2020: Member, Graduate Studies Committee, Department of Mechanical Engineering, University of Kentucky