Zhang Kun

Beihang University (BUAA)

【PERSONAL DETAILS】

Name：Zhang Kun

Position: Associate Professor, Master's & Doctoral Supervisor in Department of Aerospace Intelligent Science and Technology, School of Astronautics; Concurrently Tutor in National Superior College for Engineers, and Sino-French Engineer School, Beihang University

Research Area: Aerospace System Optimization and Intelligent Control, including: resilient control, optimization algorithms, Secure control, reinforcement learning, dynamic programming and their applications

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【ACADEMIC OVERVIEW】

★ 2024 Recipient of **Beijing Nova Program** (Innovation Nova)

★ 2022 Recipient of China Wu Wenjun **AI Science & Technology Award** (Outstanding PhD Nomination)

★ 2020 Recipient of **China National Postdoctoral Program for Innovative Talent**

★ 2019 Recipient of **Best Prize** of Chinese Automation Congress (CAC) "IET CSR Outstanding Paper" Award (Sole in the Top Automation Conference of China)

★ Published **50+** SCI Journal Articles, **2 ESI Highly Cited** Paper, **1 Hot** Paper

★ Journal Editorial Board Member of *Modern Defense Technology*, the Guest Editor of Journal *Actuators* and *Front. Neurorobot.*, PC Member and Session Chair in Conference of *17th IEEE-ICCA*, *41th CCC*, *18th ICARCV*, *CSIS-IAC*, *IFAC LSS*, etc.

★ Presided Over **8** Research Projects and Cumulative Funding: **4.80+ Million** RMB

★ Applying **8** Invention Patent, **2** Softwares, and Published **10** Conference Papers

★ Reviewer of the SCI Journals of Automatica, IEEE Trans. on AC/Cyber/NNLS/AES/ITS/SMC/FS/ASE/II/IE/IV/AI/CAS/ESA/IFS, and IJRNC, Franklin, AOC, etc., awarded "Certificate of Outstanding Contribution" and "Certificate of Contribution in Reviewing" many times by these Journals, etc.

【ACADEMIC EXPERIENCE】

(1) 2022.06-now, **Associate Professor, Master's & Doctoral Supervisor**
School of Astronautics, Beihang University, Beijing, China

(2) 2020.05-2022.06, **Postdoctoral Fellow** in Chinese Academy of Sciences
Academy of Mathematics and Systems Science, Beijing, China
[Supervisor:] Prof. Ji-Feng Zhang (*Fellow IEEE*, *Fellow IFAC*)

(3) 2021.01-2021.12, **Research Fellow** in Nanyang Technological University
School of Electrical and Electronic Engineering, Singapore
[Co-Supervisor:] Prof. Rong Su (*Senior Member IEEE*)

(4) 2015.09-2020.04, **PhD in Control Theory and Control Engineering**
Northeastern University, Shenyang, China
[Supervisor:] Prof. Huaguang Zhang (*Fellow IEEE*, *Fellow IET*)

【PROJECT EXPERIENCE】

► **(Project Leader) National Natural Science Foundation of China**

► **(Project Leader) National CMC Science Foundation of China**

► **(Project Leader) Beijing Nova Program**

► **(Project Leader) China National Postdoctoral Program for Innovative Talent**

► **(Project Leader) Beihang World TOP University Cooperation Program**

► **(Project Leader) China Postdoctoral Science Foundation**

► **(Project Leader) Project for CAS Special Research Assistant (SRA) Program**

► **(Project Leader) Fundamental Research Funds for the Central Universities**

【RESEARCH RESULTS】

1. **Kun Zhang***, Shijie Luo, Huai-Ning Wu, Rong Su, Data-Driven Tracking Control for Non-Affine Yaw Channel of Helicopter via Off-Policy Reinforcement Learning, *IEEE Transactions on Aerospace and Electronic Systems*, online, doi:10.1109/TAES.2025.3539264, 2025.

2. **Kun Zhang**, Zhixuan Zhang, Xiangpeng Xie*, Jose de Jesus Rubio. An Unknown Multi-player Nonzero-Sum Game: Prescribed-time Dynamic Event-triggered Control via Adaptive

Dynamic Programming, *IEEE Transactions on Automation Science and Engineering*, online, doi: 10.1109/TASE.2024.3484412, 2024.

3. **Kun Zhang***, Rong Su, Huaguang Zhang. A Novel Resilient Control Scheme for a Class of Markovian Jump Systems with Partially Unknown Information, *IEEE Transactions on Cybernetics*, 52(8): 8191-8200, 2022.

4. **Kun Zhang***, Rong Su, Huaguang Zhang, Y. Tian. Adaptive Resilient Event-Triggered Control Design of Autonomous Vehicles with an Iterative Single Critic Learning Framework, *IEEE Transactions on Neural Networks and Learning Systems*, 32 (12): 5502-5511, 2021.

5. **Kun Zhang**, H. Zhang*, Y. Mu, C. Liu. Decentralized Tracking Optimization Control for Partially Unknown Fuzzy Interconnected Systems via Reinforcement Learning Method, *IEEE Transactions on Fuzzy Systems*, 29 (4): 917-926, 2021 (**ESI** Highly Cited Paper).

6. **Kun Zhang**, H. Zhang*, Y. Cai, Rong Su. Parallel Optimal Tracking Control Schemes for Mode-Dependent Control of Coupled Markov Jump Systems via Integral RL Method, *IEEE Transactions on Automation Science and Engineering*, 17 (3): 1332-1342, 2020

7. Z. Hu, **Kun Zhang***, R. Su, R. Wang, Y. Li, Robust cooperative load frequency control for enhancing wind energy integration in multi-area power systems, *IEEE Transactions on Automation Science and Engineering*, online, doi: 10.1109/TASE. 2024.3367030, 2024.

8. **Kun Zhang**, H. Zhang, X. Liang, Z. Wang. Neuro-dynamic programming and optimal tracking scheme of constrained-input systems via a novel event-triggered PI algorithm, *Applied Soft Computing*, 83: 105629, 2019.

9. K. Han, **Kun Zhang***, Z. Wang, Rong Su, Resilient predictive load frequency control of multi-area interconnected power systems with privacy preserving and active detection against stealthy cyber attacks, *IEEE Internet of Things Journal*, online, doi: 10.1109/JIOT.2024.3507291, 2024.

10. **Kun Zhang**, H. Zhang, Y. Mu, S. Sun. Tracking control optimization scheme for a class of completely unknown fuzzy systems by using integral reinforcement learning architecture, *Applied Mathematics and Computation*, 359: 344-356, 2019.

11. Z. Hu, R. Su, R. Wang, G. Liu, **Kun Zhang***, X. Xie, Robust distributed load frequency control for multi-area wind energy-dominated microgrids considering phasor measurement unit failures, *IEEE Internet of Things Journal*, online, doi: 10.1109/JIOT.2024.3385992, 2024.

12. H. Zhang, **Kun Zhang**, G. Xiao, H. Jiang. Robust optimal control scheme for unknown constrained-input nonlinear systems via a plug-n-play event-sampled critic-only algorithm, *IEEE Transactions on Systems Man and Cybernetics: Systems*, 50 (9): 3169-3180, 2020 (**ESI Highly Cited Paper, Hot Paper**).

13. **Kun Zhang**, H. Zhang, G. Xiao, H. Su. Tracking control optimization scheme of continuous time nonlinear system via online single network adaptive critic design method, *Neurocomputing*, 251: 127-135, 2017.

14. N. Zhao, B. Wang, **Kun Zhang***, Yun Lu, Ruikang Luo, Rong Su, LC-RSS: A lane-change responsibility-sensitive safety framework based on data-driven lane-change prediction, *IEEE Transactions on Intelligent Vehicles*, 9(1): 2531-2541, 2024.

15. **Kun Zhang**, H. Zhang, Z. Gao, H. Su. Online adaptive policy iteration based fault tolerant control algorithm for continuous-time nonlinear tracking systems with actuator failures, *Journal of the Franklin Institute*, 355 (15): 6947-6968, 2018.

16. H. Zhang, **Kun Zhang**, Y. Cai, J. Han. Adaptive fuzzy fault-tolerant tracking control for partially unknown systems with actuator faults via integral reinforcement learning method, *IEEE Transactions on Fuzzy System*, 27 (10):1986-1998, 2019.

17. **Kun Zhang**, H. Zhang, H. Jiang, Y. Wang. Near-optimal output tracking controller design for nonlinear systems using an event-driven ADP approach, *Neurocomputing*, 309: 168-178, 2018.

18. Z. Zhang, **Kun Zhang**, X. Xie, J. Su, Fixed-time zero-sum pursuit-evasion game control of multi-satellite via adaptive dynamic programming, *IEEE Transactions on Aerospace and Electronic Systems*, online, doi: 10.1109/TAES.2024.3351810, 2024.

19. **Kun Zhang**, H. Zhang, Y. Liang, Y. Wen. A new robust output tracking control for discrete-time switched constrained-input systems with uncertainty via a critic-only iteration learning method, *Neurocomputing*, 396: 162-171, 2020.

20. X. Song, Z. LI, P. Chen, **Zhang Kun***, Y. Zou, W. He. Modeling and intelligent optimization of the deployment system of defensive weapons based on the interior point method with barrier functions. *Chinese Journal of Engineering*, 46(1): 157-165, 2024.

21. Q. Zhu, **Kun Zhang**, and X. Xie. Multi-event-triggered adaptive dynamic programming for non-zero-sum game of unknown nonlinear system, *International Journal of Robust and Nonlinear Control*, online, doi:10.1002/rnc.7256, 2024.

22. **Kun Zhang**, H. Zhang, H. Jiang, C. Liu. Data-driven optimal control for a class of unknown continuous-time nonlinear system using a novel ADP method, *IEEE International Conference on Intelligent Control and Information Processing (ICIP)*, 117-124, 2016.

23. **Kun Zhang**, H. Zhang, Z. Wang, Y. Luo. An event-triggered optimal control with single-critic architecture for a class of nonlinear systems, *China Automation Congress (CAC)*, 6203-6208, 2020.

24. **Kun Zhang**, W. Xue, R. Zhang, C. Wei. A model-free resilient tracking control scheme for non-affine nonlinear continuous systems with uncertainties, *41st Chinese Control Conference (CCC)*, 2344-2349, 2022.

25. **Kun Zhang**, H. Zhang, W. Xue, R. Zhang. A robust control scheme for autonomous vehicles path tracking under unreliable communication, *IEEE 11th Data Driven Control and Learning Systems Conference (DDCLS)*, 1413-1418, 2022.

26. L. Zhang, **Kun Zhang**, X. Xie, M. Chadli, Adaptive critic control with knowledge transfer for uncertain nonlinear dynamical systems: A reinforcement learning approach, IEEE Trans. on Automation Science and Engineering, online, doi:10.1109/TASE.2024.3453926, 2024.

27. **Kun Zhang**, H. Zhang, W. Xue, R. Zhang. An optimal traffic dispatching strategy with uncertain evacuees' behaviors under emergency evacuation situation, *IEEE 17th International Conference on Control & Automation (ICCA)*, 746-751, 2022.

28. Y. Wang, W. Wang, **Kun Zhang**, Y. Xu*, R. Su, Risk-constrained linear quadratic control with one-step delayed sharing information pattern, Automatica, 174: 112093, 2025.

29. Z. Zhang, **Kun Zhang**, X. Xie, Vladimir Stojanovic. ADP-based prescribed-time control for nonlinear time-varying delay systems with uncertain parameters, *IEEE Transactions on Automation Science and Engineering*, online, doi: 10.1109/TASE.2024.3389020, 2024.

30. N. Liu, **Kun Zhang**, and X. Xie. Optimal control of unknown nonlinear system under event-triggered mechanism and identifier-critic-actor architecture, *International Journal of Robust and Nonlinear Control*, 34(1): 530-550, 2024.

31. Ze Lu, Yingzhi Wu, Sijie Yang, **Kun Zhang** and Quan Quan*, Fast and Omnidirectional Relative Position Estimation with Circular Markers for UAV Swarm, IEEE Transactions on Instrumentation and Measurement, 73: 5034911, 2025.

32. Ning Liu, **Kun Zhang**, Xiangpeng Xie, Dong Yue, UKF-Based Optimal Tracking Control for Uncertain Dynamic Systems With Asymmetric Input Constraints, IEEE Transactions on Cybernetics, 54 (12): 7224-7235, oct. 2024.

33. Y. Zhang, **Kun Zhang***, N. Zhao, S. Luo. An aircraft trajectory intelligent prediction scheme with heading change modeling, *International Annual Conference on Complex Systems and Intelligent Science (CSIS-IAC)*, 760-765, 2023.

34. P. Zhang, **Kun Zhang***, S. Gao, J. Zhang. Resilient event-triggered fault-tolerant control for multiagent systems under communication failure and hybird actuator faults, *41st Chinese Control Conference (CCC)*, 2326-2331, 2022.

35. H. Zhang, H. Su, **Kun Zhang**, Y. Luo. Event-triggered adaptive dynamic programming algorithm for non-zero-sum games of unknown nonlinear systems via generalized fuzzy hyperbolic models, *IEEE Transactions on Fuzzy Systems*, 27 (11): 2202-2214, 2019.

36. Y. Cai, H. Zhang, **Kun Zhang**, Y. Liang, Distributed leader-following consensus of heterogeneous second-order time-varying nonlinear multi-agent systems under directed switching topology, *Neurocomputing*, 325: 31-47, 2019.

37. Y. Cai, H. Zhang, **Kun Zhang**, C. Liu, Fuzzy adaptive dynamic programming-based optimal leader-following consensus for heterogeneous nonlinear multi-agent systems, *Neural Computing and Applications*, 32 (13): 8763-8781, 2020.

38. G. Xiao, H. Zhang, **Kun Zhang**, Y. Wen, Value iteration based integral reinforcement learning approach for H_∞ controller design of continuous-time nonlinear systems, *Neurocomputing*, 285: 51-59, 2018.

39. H. Jiang, H. Zhang, **Kun Zhang**, X. Cui, Data-driven adaptive dynamic programming schemes for non-zero-sum games of unknown discrete-time nonlinear systems, *Neurocomputing*, 275: 649-658, 2018.

40. Y. Mu, H. Zhang, **Kun Zhang**, H. Ren, Integrated design of robust fault estimation and fault-tolerant control against simultaneous actuator and sensor faults, *Asian Journal of Control*, 23(1): 341-350, 2021.

41. Y. Liang, H. Zhang, **Kun Zhang**, R. Wang, A novel neural network discrete-time optimal control design for nonlinear time-delay systems using adaptive critic designs, *Optimal Control Applications & Methods*, 41(3): 748-764, 2020.

42. H. Zhang, C. Liu, H. Su, **Kun Zhang**. Echo state network based decentralized control of continuous-time nonlinear large-scale interconnected systems, *IEEE Transactions on Systems Man and Cybernetics: Systems*, 51(10): 6293-6303, 2020.

43. Z. Gao, S. Song, **Kun Zhang**, X. Guo, The application of generalized coupled higher-order nonlinear Schrödinger equations with variable coefficients in optical fibers, *Optik*, 147: 306-320, 2017.

44. H. Su, H. Zhang, **Kun Zhang**, W. Gao, Online reinforcement learning for a class of partially unknown continuous-time nonlinear systems via value iteration, *Optimal Control Applications & Methods*, 39(12): 1011-1028, 2017.

45. H. Jiang, H. Zhang, J. Han, **Kun Zhang**, Iterative adaptive dynamic programming methods with neural network implementation for multi-player zero-sum games, *Neurocomputing*, 307: 54-60, 2018.

46. J. Duan, H. Zhang, Y. Cai, **Kun Zhang**, Finite-time time-varying output formation tracking of heterogeneous linear multi-agent systems, *Journal of the Franklin Institute*, 357 (2): 926-941, 2020.

47. C. Liu, H. Zhang, Y. Luo, **Kun Zhang**, Echo state network-based online optimal control for discrete-time nonlinear systems, *Applied Mathematics and Computation*, 409: 126324, 2021.

48. Y. Wen, H. Zhang, H. Ren, **Kun Zhang**, Off-policy based Adaptive Dynamic Programming Method for Nonzero-sum Games on Discrete-Time System, *Journal of the Franklin Institute*, 357 (12): 8059-8081, 2020.

49. H. Ren, J. Dai, H. Zhang, **Kun Zhang**, Off-policy integral reinforcement learning algorithm in dealing with nonzero sum game for nonlinear distributed parameter systems, *Transactions of the Institute of Measurement and Control*, 42(15): 2919-2928, 2020.

50. Z. Gao, H. Zhang, Y. Wang, **Kun Zhang**, Leader-following consensus conditions for fractional-order descriptor uncertain multi-agent systems with $0 < \alpha < 2$ via output feedback control, *Journal of the Franklin Institute*, 357 (4): 2263-2281, 2020.

51. Y. Mu, H. Zhang, H. Su, **Kun Zhang**. Observer-based actuator fault estimation and proportional derivative fault tolerant control for continuous-time singular systems, *Optimal Control Applications & Method*, 40 (6): 979-997, 2019.

52. J. Han, H. Zhang, Y. Wang, **Kun Zhang**, Fault estimation and fault-tolerant control for switched fuzzy stochastic systems, *IEEE Transactions on Fuzzy Systems*, 26 (5): 2993-3003, 2018,

53. S. Sun, H. Zhang, J. Zhang, **Kun Zhang**, Fault estimation and tolerant control for discrete-time multiple delayed fuzzy stochastic systems with intermittent sensor and actuator faults, *IEEE Transactions on Cybernetics*, 51(12): 6213-6225, 2020.

54. H. Zhang, S. Sun, C. Liu, **Kun Zhang**, A novel approach to observer-based fault estimation and fault-tolerant controller design for t-s fuzzy systems with multiple time delays, *IEEE Transactions on Fuzzy Systems*, 28(8): 1679-1693, 2019.

55. J. Zhang, H. Zhang, **Kun Zhang**, Y. Cai, Observer-based output feedback event-triggered adaptive control for linear multiagent systems under switching topologies, *IEEE Transactios on Neural Networks and Learning Systems*, 33(12): 7161-7171, 2021.

【MEMBERSHIP】

○ **Member** Institute of Electrical & Electronics Engineers (**IEEE**)	2018-now
○ **Member** International Federation of Automatic Control (**IFAC**)	2019-now
○ **Member** Chinese Association of Automation (**CAA**)	2020-now
⊢ **Member** Technical Committee on ADP&RL	2020-now
⊢ **Member** Technical Committee on PCM	2021-now
○ **Member** Chinese Institute of Command and Control (**CICC**)	2021-now
⊢ **Member** Technical Committee on ADRC	2022-now
○ **Member** Chinese Association for Artificial Intelligence (**CAAI**)	2018-now
⊢ **Member** Technical Committee on ICIM	2018-now
⊢ **Member** Technical Committee on DYAL	2021-now