

Junkai Tan

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 Google Scholar |  Github |  LinkedIn |  Researchgate |  ORCID

Xi'an, Shaanxi - 710049, China

EDUCATION

• Xi'an Jiaotong University (C9 & 985 Project University)

M.S. in Electrical Engineering

Sep 2023 - Jun 2026

Xi'an, China

◦ GPA: **90.74**/100 (3.65/4.0)

◦ Rank: 3/45 (**Top 7%**)

◦ School of Electrical Engineering

• Xi'an Jiaotong University (C9 & 985 Project University)

B.E. in Electrical Engineering and Automation

Sep 2019 - Jun 2023

Xi'an, China

◦ GPA: **90.51**/100 (3.86/4.3)

◦ Rank: 29/356 (**Top 8%**)

◦ Honorable Graduate of Xi'an Jiaotong University

◦ School of Electrical Engineering

PUBLICATIONS AND PATENTS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [J.1] **J. Tan**, S. Xue, H. Li, et al. (2025). **Prescribed performance robust approximate optimal tracking control via stackelberg game**. *IEEE Trans. Autom. Sci. Eng.*, Mar. 2025. (IF: 5.9, JCR Q1)
- [J.2] **J. Tan**, S. Xue, H. Li, et al. (2024). **Hierarchical safe reinforcement learning control for leader-follower systems with prescribed performance**. *IEEE Trans. Autom. Sci. Eng.* (Conditionally Accepted, IF: 5.9, JCR Q1)
- [J.3] **J. Tan**, S. Xue, Q. Guan, et al. **Finite-time safe reinforcement learning control of multi-player nonzero-sum game for quadcopter systems**. *Inf. Sci.*, p. 122117, Mar. 2025. (IF: 8.1, JCR Q1)
- [J.4] **J. Tan**, S. Xue, Q. Guan, et al. (2025). **Unmanned aerial-ground vehicle finite-time docking control via pursuit-evasion games**. *Nonlinear Dyn.*, Mar. 2025. (IF: 5.2, JCR Q1)
- [J.5] **J. Tan**, S. Xue, T. S. Niu, et al. (2025). **Fixed-time concurrent learning-based robust approximate optimal control**. *Nonlinear Dyn.* May. 2025. (IF: 5.2, JCR Q1)
- [J.6] **J. Tan**, S. Xue, Z. Guo, et al. (2025). **Data-driven optimal shared control of unmanned aerial vehicles**. *Neurocomputing*, vol. 622, pp. 129428-129440. (IF: 5.5, JCR Q1)
- [J.7] S. Xue, **J. Tan**, Z. Guo, et al. (2024). **Cooperative game-based optimal shared control of unmanned aerial vehicle**. *Unmanned Syst.* (IF: 3.0, JCR Q1)
- [J.8] **J. Tan**, J. Wang, S. Xue, et al. (2025). **Human-machine shared stabilization control based on safe adaptive dynamic programming with bounded rationality**. *Int. J. Robust Nonlinear Control*, Mar. 2025. (IF: 3.2, JCR Q1)
- [J.9] **J. Tan**, S. Xue, H. Cao, and S. S. Ge. (2025). **Human-AI interactive optimized shared control**. *J. Autom. Intell.*
- [J.10] **J. Tan**, S. Xue, and H. Cao. (2025). **Stackelberg game-based robust optimal control of cyber-physical system under hybrid attacks**. May. 2025. *Int. J. Intell. Control Syst.*
- [S.1] **J. Tan**, S. Xue, Z. Guo, et al. (2025). **Fixed-Time Hierarchical Game-Based Unmanned Aerial-Ground Vehicle Docking Control**. *IEEE/CAA J. Autom. Sinica* (Revise and Resubmit, IF: 15.3, JCR Q1)
- [S.3] S. Xue, **J. Tan**, T. S. Niu, et al. (2025). **Prescribed performance optimized control of UAV with robust approximate dynamic programming under disturbance**. *IEEE Trans. Ind. Electron.* (Major Revision, IF: 7.5, JCR Q1)
- [S.4] **J. Tan**, S. Xue, Z. Guo, et al. (2024). **Adaptive safe control of quadcopter: a hierarchical safe reinforcement learning approach**. *Eng. Appl. Artif. Intell.* (Under Review)
- [S.5] S. Xue, **J. Tan**, Z. Guo, et al. (2024). **Finite-time dynamic event-triggered actor-critic-identifier for optimal control of nonlinear drifted system**. *Inf. Sci.* (Under Review)
- [S.6] **J. Tan**, S. Xue, H. Cao, et al. (2025). **Finite-Time Stackelberg Game-Based Hybrid Attack-Defense Control for Cyber-Physical Systems**. *IEEE/CAA J. Autom. Sinica* (Under Review)
- [S.7] **J. Tan**, S. Xue, Z. Guo, et al. (2025). **Composite learning-based fixed-time optimized shared prescribed-performance control for human-robotics cooperative game**. *Inf. Sci.* (Under Review)
- [S.8] **J. Tan**, S. Xue, H. Cao, et al. (2025). **Data-driven Fixed-time Inverse Optimal Shared Control for Human-UAV Interaction**. *IEEE Trans. Artif. Intell.* (Under Review)
- [S.9] **J. Tan**, S. Xue, Q. Guan, et al. (2025). **Fixed-time Stochastic Learning from Human-UAV Interaction with State-Input Constraints**. *IEEE Trans. Ind. Electron.* (Under Review)
- [C.1] **J. Tan**, S. Xue, H. Li, et al. (2024). **Safe stabilization control for interconnected virtual-real systems via model-based reinforcement learning**. In *2024 14th Asian Control Conference (ASCC)*, pp. 605-610.
- [C.2] **J. Tan**, S. Xue, H. Cao, et al. (2023). **Safe human-machine cooperative game with level-k rationality modeled human impact**. In *2023 IEEE International Conference on Development and Learning (ICDL)*, pp. 188-193.
- [C.3] **J. Tan**, S. Xue, H. Cao, et al. (2023). **Nash equilibrium solution based on safety-guarding reinforcement learning in nonzero-sum game**. In *2023 International Conference on Advanced Robotics and Mechatronics (ICARM)*, pp. 630-635.

[T.1] J. Tan. (2023). **Research on Safety-Guarding Control of Interconnected Systems Based on Adaptive Dynamic Programming**. Bachelor's Thesis, Xi'an Jiaotong University.

[P.1] S. Xue, J. Tan, H. Cao, et al. (2024). **A pilot-UAV hierarchical reinforcement learning tracking control method**. Patent CN202410717333.X

[P.2] S. Xue, J. Tan, H. Cao, et al. (2024). **An optimal control method for suppressing chaotic phenomena in nonlinear permanent magnet synchronous motors**. Patent CN202410856259.X

[P.3] S. Xue, J. Tan, X. D. Zheng, et al. (2024). **A UAV reinforcement learning tracking control method with prescribed performance under disturbance**. Patent CN202411079828.0

PROJECTS

- Finite-Time Tracking Control Research for Unmanned Systems with Prescribed Performance** Aug 2023 - Present
Tools: Optimal Control, Game Theory, Reinforcement Learning, MATLAB, Unmanned Aerial & Ground Vehicles [G] [G] [G]
 - Developed Stackelberg game-based reinforcement learning framework for robust optimal control
 - Implemented prescribed performance constraints for efficient tracking control in nonlinear systems
 - Created novel game-theoretic optimization method for high-dimensional nonlinear systems
 - Published 5 first-author papers in *IEEE TASE (2), Information Science, Nonlinear Dynamics (2)* and presented at ASCC, ICARM, ICDL
- Human-Machine Hybrid Enhancement Research for Data-Driven Shared Optimal Performance** May 2022 - Dec 2024
Tools: Optimal Control, Reinforcement Learning, Game Theory, MATLAB, Unmanned Aerial Vehicles [G]
 - Developed safety-guarding RL method for optimal shared control in pilot-UAV interactive systems
 - Implemented Nash equilibrium and level-*k* rationality model to enhance human-machine collaboration stability
 - Created data-driven interaction modeling approach to optimize human-machine cooperative strategies
 - Published 4 first-author journal papers in *Neurocomputing, IJRNC, JAI, IJICS* and obtained 3 national patents

JOURNAL REVIEW ACTIVITY

Over 40 papers reviewed for top-tier journals and conferences in control systems and robotics.

- Reviewer for **IEEE Transactions on Automation Science and Engineering** (20+)
- Reviewer for **Expert Systems with Applications** (10+)
- Reviewer for **Engineering Applications of Artificial Intelligence** (5+)
- Reviewer for **IEEE Conference on Decision and Control**
- Reviewer for **Measurement**
- Reviewer for **Information sciences**
- Reviewer for **Applied soft computing**.
- Reviewer for **Journal of the Franklin Institute**
- Reviewer for **Acta Astronautica**

SKILLS

- Programming Languages:** MATLAB/Simulink, Python, C++, LaTeX, Git, ROS
- Control & Simulation:** Gazebo, V-REP, AirSim, PX4, ArduPilot, QGroundControl
- Hardware Experience:** Nvidia Jetson, Raspberry Pi, Pixhawk, UAV/UGV Platforms
- Specialized Knowledge:** Optimal Control, Game Theory, System Identification, Nonlinear Control
- Soft Skills:** Teamwork, Communication, Leadership, Problem-Solving
- Languages:** English (CET-6 579), Chinese (Native)

HONORS AND AWARDS (TIMELINE)

- Honorable Graduate** Jun 2023
Xi'an Jiaotong University
 - Recognized for overall excellence in academic performance and contributions
- State Grid UHV Scholarship** Sep 2020
State Grid Corporation of China
 - Merit-based scholarship awarded for academic excellence
- Outstanding Student Award** Sep 2020
Xi'an Jiaotong University
 - Recognized for exceptional academic performance in 2019-2020
- Second Prize, Shaanxi Province** Oct 2020
12th National College Students Mathematics Competition
 - Demonstrated advanced mathematical problem-solving abilities
- First Prize, Shaanxi Province** Oct 2021
National College Student Mathematical Modeling Competition
 - Led team to develop innovative mathematical models for real-world problems
- Second-Class University Scholarship** Oct 2021 & Oct 2022
Xi'an Jiaotong University
 - Awarded for consistent academic excellence

- **Second Prize, Shaanxi Province** Nov 2021 & Aug 2022
National College Students' Electronic Design Competition
◦ Developed innovative electronic systems and solutions
- **Honorable Mention** Apr 2021
Mathematical Contest in Modeling (MCM/ICM)
◦ International recognition for mathematical modeling capabilities
- **Bronze Award** Jul 2021
7th China International College Students' "Internet+" Innovation and Entrepreneurship Competition
◦ Developed innovative internet-based entrepreneurial project
- **Second Prize** Nov 2023
National Graduate Mathematical Modeling Competition
◦ Advanced mathematical modeling and problem-solving at graduate level

LEADERSHIP EXPERIENCE

- **Party Branch Secretary** Jul 2022 - Jun 2023
School of Electrical Engineering - Zhongying College Joint Third Party Branch, Xi'an Jiaotong University
◦ Managed overall party branch work and supervised other committee members' responsibilities
◦ Reported to branch committee, party member assembly and higher party organizations
◦ Organized party member activities and educational programs
- **Session Chair** Jul 2023
2023 International Conference on Advanced Robotics and Mechatronics (ICARM)
◦ Chaired technical session at Class A conference of Chinese Association of Automation
◦ Organized and moderated academic presentations and discussions
- **Fitness Team Leader** Sep 2023 - Present
School of Electrical Engineering, Xi'an Jiaotong University
◦ Manage gym facilities and equipment maintenance
◦ Provide scientific fitness guidance and instruction to students
◦ Organize fitness activities and training programs

CERTIFICATIONS

- **English Proficiency (IELTS): Overall Band Score 7.0 (Reading 9.0)** Jun 2025
- **Computer Skills:** National Computer Rank Examination (Level 3) Nov 2024
- **Music:** Grade 10 Music Performance Certification Jan 2018

ADDITIONAL INFORMATION

Languages: English (Professional working proficiency), Chinese (Native)

Interests: Robotics and Control Systems, Machine Learning, Fitness and Sports, Travel and Photography

REFERENCES

1. **Prof. Hui Cao**
Professor, School of Electrical Engineering
Xi'an Jiaotong University
Email: huicao@mail.xjtu.edu.cn
Phone: +86-139-9119-3207
Relationship: Thesis Advisor & Research Supervisor
2. **Prof. Shuangsi Xue**
Professor, School of Electrical Engineering
Xi'an Jiaotong University
Email: xssxjtu@xjtu.edu.cn
Phone: +86-182-2900-8966
Relationship: Associate Advisor & Senior Research Fellow