

DINGHAN WANG

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Education

Northwestern Polytechnical University, Shaanxi, China

Sep 2022 - Present

M.Eng. Control Science and Engineering

90.61/100 CGPA, 1/16 RANK

- IELTS Score: 6.5 (L: 6.0 R: 6.5 W: 6.5 S: 6.0)
- Thesis: Formation Coordination Control and Confrontation Based on Reinforcement Learning
- Research interests: Deep Reinforcement Learning, Computer Vision, Intelligent Systems, UAV, Control Systems, Game Theory

Northwestern Polytechnical University, Shaanxi, China

Sep 2018 - Jun 2022

B.Eng. Detection, Guidance and Control Technology

3.46/4 GPA, 10/65 RANK

- Thesis: Research on UAV Air Combat Decision-making Based on Hierarchical Reinforcement Learning
- Full marks in Theoretical Mechanics, Principle of Automatic Control I and Computational Methods courses.

Publications

- Jiandong Zhang, **Dinghan Wang**, Qiming Yang, Zhuoyong Shi, Longmeng Ji, Guoqing Shi, Yong Wu. Loyal wingman task execution for future aerial combat: A hierarchical prior-based reinforcement learning approach[J]. *Chinese Journal of Aeronautics*. (co-first author), SCI JCR Q1 DOI: 10.1016/j.cja.2024.03.009
- Xiaoyang Li, Teng Wang, **Dinghan Wang**, Hairuo Zhang, Ying Zhou, Deyun Zhou. Intelligent Decision-Making Algorithm for Airborne Phased Array Radar Search Tasks Based on a Hierarchical Strategy Framework[J]. *Chinese Journal of Aeronautics*. (spotlight article), SCI JCR Q1 DOI: 10.1016/j.cja.2024.09.006
- **Dinghan Wang**, Longmeng Ji, Jingbo Wang, Zhuoyong Shi, Jiandong Zhang, Qiming Yang, Guoqing Shi, Yong Wu, Yan Zhu, Jinwen Hu. Dogfight Advantage Occupancy Method Based on Imperfect Information Self-play[C]. *IEEE ICCA 2024*. DOI: 10.1109/ICCA62789.2024.10591896
- **Dinghan Wang**, Jiandong Zhang, Qiming Yang*, Jieling Liu, Guoqing Shi, Yaozhong Zhang. An Autonomous Attack Decision-Making Method Based on Hierarchical Virtual Bayesian Reinforcement Learning[J]. *IEEE Transactions on Aerospace and Electronic Systems*. (co-first author), SCI JCR Q1 DOI: 10.1109/TAES.2024.3410249
- Jiandong Zhang, **Dinghan Wang**, Qiming Yang*, Guoqing Shi, Yi Lu, Yaozhong Zhang. Multi-Dimensional Decision-Making for UAV Air Combat Based on Hierarchical Reinforcement Learning[J]. *Acta Armamentarii*. Top journal in China DOI: 10.12382/bgxb.2022.0711
- Zhuoyong Shi, Yetao Jia, Yong Wu, Kexin Zhang, Longmeng Ji, **Dinghan Wang**. Design of motor skill recognition and hierarchical evaluation system for table tennis players[J]. *IEEE Sensors Journal*. SCI JCR Q1 DOI: 10.1109/JSEN.2023.3346880
- Zhuoyong Shi, Guoqing Shi, Jiandong Zhang, **Dinghan Wang**, Tianyue Xu, Longmeng Ji, Yong Wu. Design of UAV Flight State Recognition System for Multi-sensor Data Fusion[J]. *IEEE Sensors Journal*. SCI JCR Q1 DOI: 10.1109/JSEN.2024.3394883
- Zhuoyong Shi, Jiandong Zhang, Guoqing Shi, Longmeng Ji, **Dinghan Wang**, Yong Wu. Design of a UAV Trajectory Prediction System Based on Multi-Flight Modes[J]. *Drones*. SCI JCR Q1 DOI: 10.3390/drones8060255
- Zhuoyong Shi, Liuming Yang, Yong Wu, **Dinghan Wang**, Jiandong Zhang, Anli Zhang. Design of motion pattern recognition system based on artificial intelligence methods[C]. *IEEE ICCSI*. DOI: 10.1109/ICCSI58851.2023.10303805
- Zhuoyong Shi, Mingyang Liu, Qiming Yang, Jieling Liu, **Dinghan Wang**, Jiandong Zhang. Autonomous Security Evaluation Model for UAV Based on Airborne Information[C]. *IEEE ICICSP*. DOI: 10.1109/ICICSP59554.2023.10390620
- Yunhong Ma, Yunhao Liu, Yuqiao Yang, **Dinghan Wang**, Jian Zhang. Design of a UAV Trajectory Prediction System Based on Multi-Flight Modes[J]. *Unmanned Systems Technology*. DOI: 10.19942/j.issn.2096-5915.2021.4.036

Patents & Software Copyright

- Jiandong Zhang, **Dinghan Wang**, Longmeng Ji, Guoqing Shi, Yaozhong Zhang, Qiming Yang, Lihui Zheng, Yong Wu. A method for executing target search and locking tasks of loyal wingman. *Chinese Patent*.
- Qiming Yang, **Dinghan Wang**, Jiandong Zhang, Guoqing Shi, Yaozhong Zhang. Formation collaborative cognition, decision-making and control software. *Software Copyright*.
- Anli Zhang, Zhuoyong Shi, **Dinghan Wang**, Meng Xie, Nan Li, Juan Wang. A Method for Aircraft Atmospheric Data Safety Monitoring and Evaluation. *Chinese Patent*.

Projects

The Key R&D Projects in Shaanxi Province (No.2022GY-089) <i>Multimodal Recognition, Situational Awareness (Student Leader)</i>	Sep. 2022 - Present
The Natural Science Basic Research Program of Shaanxi (No.2022J0-593) <i>Reinforcement learning: Intelligent Decision Making (Student Leader)</i>	Jun. 2022 - Jan. 2024
Aeronautical Science Foundation of China (No.20220013053005) <i>Reinforcement learning: Intelligent Decision Making (Student Leader)</i>	Jun. 2022 - May. 2024
National College Student Innovation Training Program (No.S202010699026) <i>Intelligent Air Combat Electronic Exercise Sandbox (Student Leader)</i>	Sep. 2020 - Nov. 2021
Beijing Institute of Aerospace Intelligence <i>Research on cluster technology of cluster collaborative distributed system</i>	July.2023 - Aug. 2023
Chengdu Aircraft Design and Research Institute (611) <i>Formation intelligent tactical decision-making model and interoperability design (Student Leader)</i>	Apr. 2023 - Aug. 2023
Shenyang Aircraft Design and Research Institute (601) <i>Air-to-air accuracy assessment (Sub-system Student Leader)</i>	Jan. 2023 - Jun. 2023
Shenyang Aircraft Design and Research Institute (601) <i>Data Fusion (Sub-system Student Leader)</i>	Aug. 2022 - Dec. 2022

Open Source Projects

- Vision-based-Intelligent-Robot-Arm-Game
- Intelligent-aircraft-battle-game-sb3-jsbsim-flightgear
- Vision-based-Reinforcement-learning-control-for-aircraft
- Multi-Dimensional-Decision-Making-for-UAV-Air-Combat-Based-on-Hierarchical-Reinforcement-Learning
- stablebaselines3-quad-s2r

Technical Skills

Languages: Python, C, C++, Matlab

Frontend: HTML, CSS, JavaScript

Clouds & Databases: MySQL, Tencent Cloud, Ali Cloud, Azure Cloud

Web Technologies: Docker, NAT(v4&v6), Nginx, HTTP, SSL

Operating Systems: Windows, Debian, Ubuntu, MacOS, OpenWRT, Proxmox VE

Tools: PyTorch, OpenCV, OpenDDS, Git, Vim, LATEX, Ps, Pr ...

Competitions

National Graduate Student Electronic Design Competition <i>Northwestern Regional Second Prize, Team Award (Team Leader)</i>	Aug 2024
MathorCup University Mathematical Modeling Challenge (Big Data Competition) <i>Third Prize, Team Award (Team Leader)</i>	Dec 2023
National Graduate Student Electronic Design Competition <i>Northwestern Regional First Prize, Team Award (Team Leader)</i>	Aug 2023
National Graduate Student Electronic Design Competition (Business Track) <i>Northwestern Regional Third Prize, Team Award</i>	Aug 2023

Honours and Awards

National Scholarship	2024
First-class academic scholarship	2023 & 2024
First Prize Scholarship	2024
Second Prize Scholarship	2023
Outstanding Graduates	2022
Outstanding Graduation Project	2022
College Outstanding Students	2021
Outstanding Communist Youth League Member	2021
Scholarship from the School of Electronic Information	2019 & 2020

Student Work & Experience

Academic Expeditions

- IEEE Sensors Journal Reviewer
- 2023 Future AI Masters and Global IT Training Camp
- Member of the Mathematics Modeling Association

Community Involvement

- Served as a distinguished undergraduate representative, sharing academic and graduate application experiences with fellow undergraduates.
- Shared experiences as a senior student in university career planning courses.
- Acted as a mental health committee member during both undergraduate and master's studies, organizing psychological counseling activities during the pandemic.
- Volunteered as a material transporter during the pandemic.
- Participate in intramural sports (tug of war, marathon) activities.
- Class comprehensive assessment team member.