Xingyu **Zhou**

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EDUCATIONAL BACKGROUND

Northwestern Polytechnical University 2021/09 -present

Degree: *Master of Engineering in Electronic Information,* **Average score: 90.14/100, Ranking: 20/143**

- **Graduation Thesis:** Research on Formation Coordination and Intelligent Aerial Combat Tactical Decision-Making Model
- **Core Courses:** Military Operations Research(98), Avionics System Simulation Test and Analysis(95), Avionics Integrated Systems(93), Mathematical Statistics(92), Matrix Theory(87)
- **Awards:** Second-class Postgraduate Scholarship (2021-2023), Excellent Postgraduate Student (2021-2023), Excellent Member of the Communist Youth League (2022), One-star Volunteer (170+ hours, 2022-2023)

Xi'an University of Technology 2016/09 - 2020/06

Degree: *Bachelor of Engineering in Electronic Information,* **Average score: 89/100, Ranking:10/79**

- **Graduation Thesis:** Simulation of the Brain Storm Optimization Algorithm in Path Optimization Problems (Excellent Graduation Design)
- **Core Courses:** Digital Electronics(96), Signals and Systems(93), Higher Mathematics(92), Circuit Fundamentals(92), Communication Principle(92), Optimization Methods(90)
- **Awards:** Annual Scholarship (2017-2019), Excellent Member of the Communist Youth League (2017), Outstanding Student Award (2018)

PUBLICATIONS & PATENTS

PUBLICATIONS:

- **(First author) Zhou X**, Zhang J, Liu J, et al. Evaluation of Autonomous Capability of Ground Attack UAV Based on Hierarchical Analysis Method (EI, ICAUS)
- **(Conference Papers)** Research on Threat Assessment Method of Formation Cooperative Combat in a Complex Environment (EI, ICAUS)
- **(Under Review)** Enhanced Cascade R-CNN for Multi-scale Object Detection in Dense Scenes from SAR Images, IEEE Sensors Journal (SCI Q2)

PATENTS:

- Evaluation Method for Autonomous Ground Attack Capability of UAV (Patent No. ZL202205096301)

RESEARCH PROJECTS

Formation Collaboration Intelligent Tactical Decision Model and Interoperability Design 2023/04 - 2023/09

Project led by Chengdu Aircraft Design Institute

- Designed and implemented an innovative evaluation system for the combat capability of unmanned combat aerial vehicles, effectively categorizing capability indicators and integrating the Analytic Hierarchy Process (AHP) and ADC performance assessment method, successfully enhancing the accuracy and reliability of air-to-air combat efficiency evaluations.
- Developed an advanced air-to-air situation threat assessment model based on artificial neural networks, which accurately predicted threat levels, significantly improving the precision and response speed of aerial combat decision-making.
- Employed Bayesian networks to successfully fit and optimize the decision-making rules for drones, effectively increasing the accuracy of optimal tactical decisions in complex battlefield environments.
- Simulated and designed a series of formation collaborative combat scenarios for various mission requirements, achieving highly realistic decision-making process simulations through reinforcement learning algorithms.
- Successfully translated and analyzed approximately 300 pages of U.S. military formation collaboration and interoperability design specifications.

- Completed a comprehensive 150-page project report that included detailed modeling of mission requirements and comparative analysis of various algorithms, providing a thorough strategic evaluation.

Integrated Communication Identification Simulation System 2022/06-2023/04

Project led by Shenyang Aircraft Design Institute

- Pioneered the design of a human-computer interaction interface on the QT platform, leveraging advanced C++ skills; efficiently managed simulation parameters.
- Deep-dived into the intricacies of integrated communication identification simulators, mastering transmission modes, data processing logic, and 1553B bus communication.
- Implemented encoding and decoding functionalities as per the 1553B bus protocol, simulating data lifecycle processes—transmission, reception, storage, and playback.
- Authored a comprehensive 61-page research report detailing the system's functionality, challenges encountered, and solutions implemented.

Research on the Evaluation System of Autonomous Ground Attack by UAV Combat 2020/11-2021/12

Project led by China Flight Test Institute

- Conducted an exhaustive review of both domestic and international methodologies, assessing the intelligence levels of UAVs, establishing a solid foundation for further research.
- Formulated a UAV autonomous ground attack capability evaluation model tailored for China, encompassing an intricate framework of indicator systems.
- Exploited MATLAB's GUI functionalities to simulate the UAV evaluation system, harnessing the power of AHP for a multi-criteria assessment.
- Authored a detailed 167-page research report, providing insights into model development, simulation outcomes, and recommendations for future UAV combat evaluations.

OTHER INFORMATION

Professional Skills:

- Expertise in intelligent optimization algorithms; project-specific modeling; and evaluation system development.
- Proficient in **C++** (client-side development), **Matlab** (simulation experiments), and **Python** (machine learning model training).
- Skilled in using **LaTex** for research paper writing.

Academic Activities:

- Participated in the 8th International Conference on Computational Intelligence and Applications (ICCIA) in 2023, where I presented my research findings and delivered a report in English within the specialized sessions on System Model Design and Intelligent Computing.
- Attended the 2022 International Conference on Autonomous Unmanned Systems to share industry views on the technologies of intelligent unmanned systems and present academic results related to unmanned systems modeling, control and estimation
- Engaged in the project "Research on Dynamic Planning Techniques for Distributed Cooperative Attack Paths", proposing planning the paths of multiple UAVs for different combat missions, improving the existing path planning algorithm to better meet the multi-UAV combat requirements, and applying for the Aeronautical Science Fund
- Served as the director of the Academic Department of the Graduate Union of the School of Electronics and Information, Northwestern Polytechnical University, organizing many academic exchange activities, such as the academic reports and exchange activity for doctors returned from overseas

Competition Awards:

- Second prize in the 2022 “Aoxiang Cup” Graduate Electronics Design Competition of Northwestern Polytechnical University
- Third prize in the category of Technology Breakthroughs of the 2022 CASIC “Zhixin Cup” Innovation and Creativity Competition for College Students
- Third prize in the 2018 “Li’ao Cup” Science and Technology Competition of Xi’an University of Technology