

# Xingyu Zhou

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## EDUCATIONAL BACKGROUND

**Northwestern Polytechnical University**

Sep. 2021 – Mar. 2024

**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)
- **Research interests:** Machine Learning, Deep Reinforcement Learning, Intelligent Systems, UAV, Control Systems

**Xi'an University of Technology**

Sep. 2016 – Jun. 2020

**Degree:** *Bachelor of Engineering in Electronic Information*, **Average score: 89.79/100, Ranking: 05/79**

- **Graduation Thesis:** Simulation of the Brain Storm Optimization Algorithm in Path Optimization Problems
- **Core Courses:** Digital Electronics (96), Signals and Systems (93), Higher Mathematics (92), Circuit Fundamentals (92), Communication Principle (92), Optimization Methods (90)

## PUBLICATIONS

- [1] **Xingyu Zhou**, et al. Evaluation of Autonomous Capability of Ground Attack UAV Based on Hierarchical Analysis Method (EI, ICAUS)
- [2] Bosong Chai, Xuan Nie\*, Qifan Zhou, **Xingyu Zhou**. Enhanced Cascade R-CNN for Multi-scale Object Detection in Dense Scenes from SAR Images (SCI, IEEE Sensors Journal, **JCRQ1 IF=4.3**)
- [3] Yang Liu, Jiandong Zhang\*, Kaibo Zhang, **Xingyu Zhou**. Research on Threat Assessment Method of Formation Cooperative Combat in a Complex Environment (EI, ICCIA)
- [4] **Xingyu Zhou**, et al. Multi-UAV Collaborative Route Planning Based on Improved Grey Wolf Optimisation Algorithm (SCI, IEEE Sensors Journal, **JCRQ1 IF=4.3**)
- [5] Jiandong Zhang, Qiming Yang, Zibing Du, **Xingyu Zhou**, et al. Evaluation Method for Autonomous Ground Attack Capability of UAV (Patent No. ZL202205096301)

## RESEARCH PROJECTS

**Formation Collaboration Intelligent Tactical Decision Model and Interoperability Design**

Apr. 2023 - Sep. 2023

*Project led by Chengdu Aircraft Design Institute*

- The project developed a UAV formation collaborative air combat decision-making system, simulating air combat scenarios of UAV formations.
- As the project leader, I formulated the overarching framework of the project, integrating **ADC and AHP** algorithms to analyze UAV attack effectiveness, achieving performance scoring in intelligent air combat. I utilized **BP neural networks** to solve missile engagement zones and employed **deep reinforcement learning algorithms** to complete the UAV air combat **decision-making model**, enabling UAVs to track and strike targets.
- The system can accurately analyze the operational effectiveness of both friendly and enemy UAVs in a contested environment, allocate targets appropriately, and calculate missile engagement zones for tracking and striking targets. Simulation results indicate that the collaborative intelligent air combat tactical decision-making algorithm proposed by this project significantly enhances the combat capabilities of UAV formations, exhibiting excellent operational effectiveness.

**Integrated Communication Identification Simulation System**

Jun. 2022 – Apr. 2023

*Project led by Shenyang Aircraft Design Institute*

- The project designed a human-machine interface that enables communication between a comprehensive communication identification simulator and the core task processor bus.

- As the project leader, I used the **QT** platform to complete the **human-machine interface design**, enabling simulation parameter configuration. I designed the data encoding and decoding process based on data processing logic, implemented data storage, and enabled automatic parameter configuration by reading files.
- The system can perform accurate encrypted and decrypted communication between the industrial control computer and the core task processor through the human-machine interface.

#### Research on the Evaluation System of Autonomous Ground Attack by UAV Combat

May. 2021 – Dec. 2021

*Project led by China Flight Test Institute*

- This project established an evaluation model and indicator system for the autonomous ground attack capability of UAVs and conducted simulations.
- I designed the **scoring structure** for UAV autonomy indicators and realized the simulation of the UAV ground attack evaluation scoring system based on the **AHP** method.
- The project, through the creation of an evaluation system for the autonomous ground attack capability of UAVs, resulted in the production of a **conference paper** and an invention **patent**.

## HONOURS AND AWARDS

Outstanding Graduate of Northwestern Polytechnical University	Mar. 2024
Outstanding Postgraduate of Northwestern Polytechnical University (Twice)	AY 2022-2023
Second Prize Scholarship of Northwestern Polytechnical University (Twice)	AY 2021-2023
"Zhixin Cup" Innovation and Creativity Competition by the Third Academy of Aerospace	Nov. 2022
<i>National Third Prize in the Technical Challenge Category</i>	
"Aoxiang Cup" Postgraduate Electronic Design Competition	Jun. 2022
<i>School-level Second Prize in the Technical Category</i>	
Outstanding Lecturer of Northwestern Polytechnical University	Aug. 2022
Excellent Member of the Communist Youth League (Twice)	AY 2022-2023
Outstanding Graduation Thesis at Xi'an University of Technology	Nov. 2020
Annual Scholarship of Xi'an University of Technology	Jan. 2020
Outstanding Student at Xi'an University of Technology	Dec. 2019
Advanced Individual of Diligent Study at Xi'an University of Technology	Dec. 2019
"Li'ao Cup" University Science and Technology Competition of Xi'an University of Technology	Nov. 2018
<i>School-level Third Prize</i>	
Outstanding Youth League Member at Xi'an University of Technology	May. 2017

## TECHNICAL 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.

## OTHER EXPERIENCE

#### Academic Activities:

- Presented research findings and delivered an **English report** at the 8th International Conference on Computational Intelligence and Applications (ICCIA) in 2023.
- Showcased research findings at the International Conference on Autonomous Unmanned Systems (ICAUS) in 2022.

#### Community Involvement:

- Served as the Head of the Academic Department of the Graduate Student Union at the School of Electronics and Information, Northwestern Polytechnical University, responsible for organizing academic exchange activities and writing press releases for various school events.
- Participated in volunteer activities, accumulating over **170 hours** of service, and was awarded the title of One-Star Volunteer in the 2022-2023 Star Volunteer Certification Results.