

Xiaohe He

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EDUCATION

Innovation Academy for Microsatellites of CAS

PhD. in Communication and Information Systems;

China

Sep 2019 – Jun 2025

ShanghaiTech University

China

Sep 2017 – Jun 2019

Harbin Institute of Technology

China

B.Sc. in Electrical and Information Engineering;

Sep 2011 – Jun 2015

PROJECTS

Agile satellite constellation mission planning

Shanghai, China

PhD Project, part of National Key R&D Program of China (2022YFB3902801)

Dec. 2023 – Apr. 2025

- Designed and implemented a DRL-based clustering-driven task planning algorithm for single-satellite scenarios, achieving significant improvement in observation efficiency compared to traditional cluster-then-plan approaches.
- Proposed a multi-agent Transformer-based task planning solution for multi-satellite coordination scenarios. The solution effectively captures dynamic interactions between constellation satellites through attention mechanisms, demonstrating superior performance over current SOTA methods.
- Built an end-to-end high-fidelity agile satellite constellation simulation system with precise orbital dynamics and attitude control simulation, ensuring system reliability in complex environments. Significantly improved simulation efficiency compared to traditional Matlab and STK environments through multi-threading and GPU acceleration optimization.

Satellite platform technology for cluster/giant constellation applications

Shanghai, China

National Key R&D Program of China (2022YFB3902801)

Sep. 2021 – Dec. 2023

- Conducted in-depth analysis of technical requirements and development trends for 6G space-ground integrated networks. Designed an innovative network architecture based on open-source projects OpenAirInterface (OAI) and Free5GC, providing comprehensive technical support and feasibility validation for project implementation.
- Proposed an elastic network reconstruction solution that achieved dynamic scheduling and optimized configuration of network resources through containerization and Kubernetes, significantly improving system adaptability and efficiency.
- Built an end-to-end hardware-in-the-loop simulation platform and successfully validated system performance metrics across different scenarios, including key parameters such as latency, throughput, and reliability.

VHF Data Exchange System (VDES)

Shanghai, China

A Project of Ministry of Transport of China

Mar. 2021 – Aug. 2021

- Conducted in-depth research on key technologies of VHF Data Exchange System (VDES) in space-ground integrated maritime communication networks. The system aims to provide wide-coverage, highly reliable, and high-speed VHF data transmission links to meet growing maritime communication demands.
- Innovatively proposed a PPO algorithm-based VDE-SAT adaptive access control strategy, achieving near-theoretical maximum access throughput across different terminal distribution areas through dynamic adjustment of access control factors for intelligent access management.
- Research outcomes have been successfully applied to China's Transportation Constellation (Hede-2 EFGH satellites), providing crucial technical support for practical engineering applications.

Precise of Point Positioning and Real-Time Kinematic (PPP-RTK)

Shanghai, China

A Project of Shanghai Ok Space Co Ltd and Geospace

Apr. 2017 – Jun. 2020

- Focused on addressing the urgent need for global seamless high-precision positioning in autonomous driving and future mobility scenarios by improving real-time PPP orbit determination accuracy and convergence speed of LEO satellites, comprehensively enhancing ground-based RTK positioning performance.
- Successfully developed a GPS/BDS-3/LEO multi-orbit signal fusion RTK positioning model and conducted the first quantitative analysis study on the impact of LEO satellite augmentation on medium to long-distance RTK positioning.
- Developed innovative LEO satellite-augmented GNSS RTK positioning data processing strategies to address signal blockage issues in complex environments like urban canyons, effectively improving system positioning accuracy and reliability under adverse conditions.

EXPERIENCE

China HEAD Aerospace Technology Co.

Shanghai, China

Intern

Mar 2021 – Aug 2021

- Participated in VDES system design and development, focusing on channel access control and channel allocation strategies.
- Completed research and writing of a patent titled "Satellite Uplink Access Method, Apparatus, Equipment and Storage Medium".

Numerical Analysis(SI211)

Shanghai, China

Teaching Assistant

Sep 2020 – Nov 2020

- Assisted [Prof. Boris Houska](#) with teaching responsibilities, focusing on designing and grading assignments for Newton's Method related chapters.
- Received the "2020 SIST Outstanding Teaching Assistant Award" for excellent teaching performance and dedication.

Web and content analysis(CS190B)

Shanghai, China

Teaching Assistant

Jul 2018 – Aug 2018

- Assisted [Prof. Yilu Zhou](#) from Fordham University in teaching, providing systematic instruction on the practical applications of the Scrapy web crawling framework and NLTK natural language processing tools.

Shanghai Ok Space Co Ltd

Shanghai, China

Intern

Apl 2017 – Sep 2017

- Investigated the application of LoRa spread spectrum communication technology in satellite IoT.
- Systematically studied RTK high-precision positioning algorithms.

PUBLICATIONS

1. **Xiaohe He**, Junyan Xiang, Mubiao Yan, Chengxi Zhang, Zhuochen Xie, and Xuwen Liang. Agile earth observation satellite constellation mission planning based on multi-agent transformer. *IEICE Transactions on Fundamentals*, 2025
2. **Xiaohe He**, Zongwang Li, Wei Huang, Junyan Xiang, Chengxi Zhang, Zhuochen Xie, and Xuwen Liang. Autonomous agile earth observation satellite mission planning with task clustering. *IEICE Transactions on Fundamentals*, 2025
3. **Xiaohe He**, Junyan Xiang, Mubiao Yan, Chengxi Zhang, Zhuochen Xie, and Xuwen Liang. Integrated clustering and mission planning for agile earth observation satellite constellations. *IEICE Transactions on Electronics*, 2025
4. Junyan Xiang, **Xiaohe He**, Yu Zhao, Zhuochen Xie, and Xuwen Liang. Distributed dynamic routing for leo satellite networks with temporal graph convolutions and imitation acceleration. *IEEE Communications Letters*, 2025
5. Mubiao Yan, **Xiaohe He**, Luyao Wang, Wenxin Yang, Zhangyuhang Liu, Hao Zhou, Zhuochen Xie, and Huijie Liu. Dynamic fine-grained task splitting and offloading in integrated satellite-terrestrial network based on multi-branch ddqn. *IEICE Transactions on Fundamentals*, 2026
6. Zongwang Li, Zhuochen Xie, **Xiaohe He**, and Xuwen Liang. Heterogeneous temporal graph powered drl algorithm for channel allocation in maritime iot systems. *Computer Communications*, 213:260–270, 2024
7. Wei Huang, Zongwang Li, **Xiaohe He**, Junyan Xiang, Xu Du, and Xuwen Liang. Drl-based dynamic destroy approaches for agile-satellite mission planning. *Remote Sensing*, 15(18):4503, 2023
8. Xu Du, Shijie Zhu, Yifei Wang, Boyu Han, and **Xiaohe He**. Optimal demand shut-offs of ac microgrid using ao-sbqp method. *IFAC-PapersOnLine*, 56(2):1431–1436, 2023. 22nd IFAC World Congress
9. Weisheng Hu, Xuwen Liang, Huiling Hou, Zhuochen Xie, and **Xiaohe He**. Research on the performance of multi-gnss medium length baseline rtk with leo-augmented. *IEICE Transactions on Fundamentals*, 103(5):780–784, 2020
10. Weisheng Hu, Huiling Hou, Zhuochen Xie, Xuwen Liang, and **Xiaohe He**. Initial assessment of leo-augmented gps rtk in signal-degraded environment. *IEICE Transactions on Fundamentals*, 103(7):942–946, 2020
11. Lin Qiu, Huijie Liu, Juan Chen, Hao Huang, Andrew W. H. IP, Yung K. L., and **Xiaohe He**. A method for grating lobe suppression in distributed space-based coherent aperture radar based on randomized angle yaw. *IEICE Transactions on Fundamentals*, E109-A(1), January 2026
12. Jianghua Ma, Bo Wang, **Xiaohe He**, and Dezhi Wang. Piece-wise-linear amplitude regulation for oscillator with wide range tail current in inductive position sensors. *IEICE Electronics Express*, 2026
13. Yu Zhao, Xuwen Liang, and **Xiaohe He**. Qct : Quantization training method for seu protection. *IEICE Transactions on Fundamentals*, 2026 (submitted)