

Ke Xu

Nanjing University of Posts and Telecommunications

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EDUCATION

Nanjing University of Posts and Telecommunications

Nanjing, China

*MPhil in Communication & Information System, School of Telecommunications & Information Engineering,
National Engineering Research Center of Communications & Networking*

Sep 2022 – Jun 2025

- GPA: 84/100
- **Research Interests:** Wireless communications, MAC protocol, deep reinforcement learning, reconfigurable intelligent surface, random access procedure, cell-free network, mMTC

Nantong University

Nantong, China

B.Eng. in Electronics & Information Engineering, School of Information Science & Technology

Sep 2018 – Jun 2022

- Comprehensive GPA: 89.7/100, ranking: 1/28
- Relevant Coursework: Communication Principles (94), Information Theory & Coding (92)

Nagasaki Wesleyan University, Nagasaki Institute of Applied Science

Jul 2019

Summer program of Telecommunications

Nagasaki, Japan

PUBLICATIONS

- [1] **K. Xu**, Y. Xu, and Xiaoming Wang, “Learning-Based Random Access Protocol With RIS-Aided Cell-Free Networks,” in *IEEE 16th International Conference on Wireless Communications and Signal Processing (WCSP2024)* (under review)
- [2] **K. Xu**, Y. Xu, and Xiaoming Wang, Xianbin Wang “A Hybrid Collaborative Learning for Age of Information Minimization in Massive Access,” *IEEE Transactions on Vehicular Technology*(accepted)
- [3] **K. Xu**, Y. Xu, and X. Wang, “Research On Massive Random Access Method for Space-Air-Ground Integrated Network,” *Mobile Communications*, vol. 47, no. 7, pp. 58–63, Jul. 2023, doi: 10.3969/j.issn.1006-1010.20230514-0001.

RESEARCH EXPERIENCE

Learning-Based Random Access Protocol With RIS-Aided Cell-Free Networks

Author: Ke Xu

Mar 2024 - Jul 2024

- Conducted analysis of the channel model for random access in RIS-aided cell-free networks, optimizing preamble collision and access performance using a deep reinforcement learning algorithm.
- Utilized practical channel and preamble properties from 3GPP and ETSI to achieve robust simulation results for throughput and age of information.
- Developed a collision resolution algorithm based on varying energy levels among cell-free clusters to address the issue of multiple users accessing the same preamble.

Hybrid Collaborative Learning for Age of Information Minimization in Massive Access

Author: Ke Xu

Aug 2023 - Jul 2024

- Analyzed the random access procedure using age-critical frameless ALOHA, formulated the optimization problem, and proposed a hybrid collaborative learning algorithm to optimize the age of information.
- Designed reward functions for devices and base stations (BS) to address the trade-off between the age of information and normalized throughput, ensuring cooperative operation.

Research On Massive Random Access for Space-Air-Ground Integrated Network

Author: Ke Xu

Jan 2023 - Jul 2023

- Analyzed the optimization problem of massive access in space-air-ground integrated networks, and proposed a reinforcement learning-based random access method that outperforms the traditional access class barring (ACB) method.

National Natural Science Foundation of China

Jan 2023 – Present

Supervisor: Youyun Xu

Nanjing

Project: Multi-RIS-assisted V2X Communication Enhancement Technology in Urban Environments

No.62371246

- Optimizing beam and access efficiency under uncertain and complex link blockage, realizing the seamless coverage of multi-mobile vehicle communication.

Research on Service Customized Network Architecture and Key Technologies

Jan 2023 – Jan 2024

National Innovation Center par Excellence, Jiangsu Industrial Technology Research Institute

Nanjing

Project: Key Technologies and Application Scenarios of Deterministic Networks

- Analyzed the application scenarios and requirements of deterministic networking technologies in the industrial Internet, vehicle networks (V2X), and mobile communication networks, and wrote a related report.

The National Key Research and Development Program of China (International)

Sep 2021 – Sep 2022

Supervisor: Youyun Xu

Nanjing

Project: A New Generation Wireless Mobile Communication System for Intelligent Railway

No. 2016YFE0200200

- Proposed a new generation integrated architecture for railway wireless mobile communication ground-air integration

SCIENTIFIC COMPETITIONS

The Challenge Cup College Student Entrepreneurship Plan Competition

May 2023

Leader: Ke Xu

Nanjing

Project: Construction Project of Smart Power IoT platform based on 5G

Bronze Award

- Built a smart energy IoT platform based on 5G. The platform could collect status information from various terminal devices, use edge computing technology to intelligently identify the status information, and upload sensitive status information to the cloud platform via 5G communication technology.

China College Students' Innovational Competition

Jul 2020

Keynote Speaker: Ke Xu

Nantong

Project: Sea Area Communication

Gold Award

- Built a shipborne base station network, designed a mobile shipborne antenna, and used a Customer Premises Equipment (CPE) platform to convert LTE and 5G signals into WiFi signals.

HONORS & AWARDS

The Third Prize Scholarship

Sep 2023

Bronze Award of 2023 "The Challenge Cup" in NJUPT

May 2023

The First Prize Scholarship(top 10%)

Sep 2022

Recommendation: Formally recommended for further studies in MPhil at NJUPT(top 3%, 1/28)

Sep 2021

The First Prize Scholarship

Sep 2021

Jiangsu Computer Rank Examination Certificate, level 3:

Achieved the highest level with a focus on Microcomputer Principle and Interface Technology

May 2021

The Second Prize Scholarship

Sep 2020

Gold Award of 2020 China College Students' Innovational Competition in Nantong University

Jul 2020

The First Prize Scholarship

Sep 2019

WORKING EXPERIENCE

NJUPT Research Academy of Communication & Networking Industry

Aug 2022 – Aug 2023

- Intelligent and Digital Transformation of Manufacturing Industry with Jiangsu Province Government
 - * Conducted factory field research, generated diagnostic reports about the level of their intelligent transformation and the places need improving.
- Communication Network and Intelligent Terminal Research with Sheng Xun Co., Ltd
 - * Conducted researches on standards and patents of wearable electronic devices, involving in 3GPP reports and Chinese patents, a patent disclosure is accomplished.

China Mobile Communications Corporation, Siyang Branch

Jun 2022 – Jul 2022

- Checked the connected functionality of Base Station in 3G, LTE, and 5G regularly
- Negotiation of construction of central communication processing room

SKILLS

Languages: Mandarin (Native), English (IELTS: 6.5, CET4: 548, CET6: 531)

Technical: Matlab, Python, LaTeX, Arduino, Unity, C++

Artistic: Silver Award of the 6th National College Student Art Exhibition in Jiangsu Province(vocal), as Tenor, 2020; Champion of the College-level Singing Competition in Nantong University, 2018

Volunteer: Advanced Individual Award of Summer Social Practice, 2019; Volunteer as sports player assistant of Sports Day in Nantong University, 2019