Jie Lu

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Highlights: IEEE INFOCOM 2026 (Accepted); IEEE ICC 2023 (Oral); IEEE Transactions Journals
Research Interests: O-RAN, 5G NR, and Machine Learning for Wireless Networks

Education

Ph.D., Computer Science and Engineering, Michigan State University, USA (Advisor: Prof. Huacheng Zeng)	08/2024 - Present
M.Eng., Communication Engineering, Chongqing University, China	09/2021 - 06/2024
B.Eng., Electronic Information Engineering, South-Central Minzu University, China	09/2017 - 06/2021

Technical Skills

Programming Languages: C++, Python (PyTorch), MATLAB, Linux/Bash
Skills: 5G NR (MAC Layer), O-RAN (xApp Development), Near-real-time Radio Resource Management, Deep Reinforcement Learning (PPO, SAC), End-to-end O-RAN testbed implementation with USRP/commercial radio unit and 10+ smartphones

Research Experience

EExAPP: Energy-Aware Resource Slicing in Open Radio Access Network (O-RAN) – NTIA and NSF   01/2025–07/2025
- Developed an online-learning xApp using a Dual-Actor-Dual-Critic Proximal Policy Optimization (PPO) framework to jointly optimize sleep scheduling and resource slicing for 5G O-RAN in near-real-time.
- Implemented a Transformer-based encoder and Graph Attention Network (GAT) to enable scalable resource management for dynamic user populations.
- Validated performance on a real-world O-RAN testbed with commercial RU and live traffic, achieving 62% reward improvement while maintaining QoS. (Outcomes: **P1**).

xSlice: Graph-Learning Enhanced Resource Slicing – NTIA and NSF   10/2024–01/2025
- Designed an online-learning xApp that adaptively adjusts MAC-layer resource allocation based on time-varying channel conditions and traffic fluctuations in near-real-time.
- Integrated Graph Convolutional Networks (GCN) with PPO to minimize performance regret by 67% in heterogeneous traffic scenarios.
- Conducted over-the-air experiments with USRP and commercial smartphones to evaluate near-real-time QoS optimization and spectrum efficiency. (Outcomes: **P2**).

Interference Management in UAV-Assisted Heterogeneous Network – NSFC   01/2022–08/2023
- Proposed a UAV-assisted Heterogeneous Cloud Radio Access Network (H-CRAN) architecture using multiple UAVs as flying radio remote heads (RRHs) to offload traffic and provide seamless coverage.
- Developed a comprehensive Interference Management scheme (SIC-STIA-IS) to mitigate cross-tier and co-channel interference in H-CRAN.
- Performed extensive simulations to optimize beamforming and sector division, achiving a 45% increase in the sum rate. (Outcomes: **P3 & P4**).

Selected Publications

[**P1**] **J. Lu**, P. Yan, and H. Zeng, "EExApp: GNN-Based Reinforcement Learning for Radio Unit Energy Optimization in 5G O-RAN", *IEEE International Conference on Computer Communications (INFOCOM)*, 2026. [**Acceptance rate: 18.9%**]

[**P2**] P. Yan, **J. Lu**, H. Zeng., and Y.T. Hou, "Near-Real-Time Resource Slicing for QoS Optimization in 5G O-RAN using Deep Reinforcement Learning", *IEEE/ACM Transactions on Networking*, 2025.

[**P3**] **J. Lu**, J. Li, F.R. Yu, et al., "UAV-Assisted Heterogeneous Cloud Radio Access Network With Comprehensive Interference Management", *IEEE Transactions on Vehicular Technology*, 2024.

[**P4**] **J. Lu**, J. Nie, J. Li, et al., "SIC-STIA-IS: An interference management scheme for the UAV-assisted heterogeneous network", *ICC 2023-IEEE International Conference on Communications*, 2023.

Honors & Awards

- National Scholarship for Graduate Students (**Top 1%**, highest honor for graduate students in China)   2023

- Outstanding Graduate Award   2023

- First-Class Graduate Scholarship   2022

- National Scholarship for Undergraduate Students (**Top 1%**, highest honor for undergraduate students in China) 2018, 2019, 2020