

Jie Lu

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Highlights: IEEE INFOCOM 2026; IEEE ICC 2023; 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
<ul style="list-style-type: none">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
<ul style="list-style-type: none">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
<ul style="list-style-type: none">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, achieving 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", <i>IEEE International Conference on Computer Communications (INFOCOM)</i> , 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", <i>IEEE/ACM Transactions on Networking</i> , 2025.	
[P3] J. Lu, J. Li, F.R. Yu, et al., "UAV-Assisted Heterogeneous Cloud Radio Access Network With Comprehensive Interference Management", <i>IEEE Transactions on Vehicular Technology</i> , 2024.	
[P4] J. Lu, J. Nie, J. Li, et al., "SIC-STIA-IS: An Interference Management Scheme for the UAV-assisted Heterogeneous Network", <i>ICC 2023-IEEE International Conference on Communications</i> , 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	