LANGTIAN QIN

📞 +1-(213)3598752　✉ qlt315@mail.ustc.edu.cn　⌗ Langtian Qin

EDUCATION

University of Science and Technology of China (USTC)　　Sep. 2021 – Expected Jun. 2024
Master of Science in Electrical Engineering　　*Hefei, China*
- **GPA:3.78/4.3 - Rank: 4/71**

Xidian University　　Sep. 2017 – Jun. 2021
Bachelor of Engineering in Information Engineering　　*Xi'an, China*
- **GPA:3.8/4.0 - Rank: 3/156**

RESEARCH EXPERIENCE

Center for Wireless Communications, UC San Diego, CA　　Jul. 2023 – Present
Graduate Visiting Student
- Implemented a mmWave mesh network testbed based on 802.11ad 60GHz radios. Collected various performance trace data like per-beam RSS and throughput based on the testbed.
- Designed deep reinforcement learning (DRL) models like deep Q-learning to configure the network simulator based on the testbed data.
- Implemented the DRL-enhanced simulator to two use cases, i.e., interference-aware link scheduling and base station association.

Broadband Communications Lab, UC Santa Cruz, CA　　Jun. 2022 – Mar. 2023
Research Intern
- Generated the Jakes wireless channel model and verified the autocorrelation characteristics of the channel.
- Designed deep learning (DL)-based channel estimators with different training methods or data inputs. Verified the MSE of channel estimation and BER performance of neural networks.
- Designed a DL-based channel estimator that can adapt to the dynamic wireless channel.

Information Network Lab, USTC, China　　Sep. 2021 – Aug. 2023
Research Assistant
- Designed a task offloading and resource allocation algorithm in user-centric networks using single agent/ multi-agent DRL. The total energy consumption and average delay can be reduced by at most 67.48% and 48.1%.
- Proposed a joint user access, grouping, power control and computing resource allocation algorithm in NOMA-assisted networks using matching game theory and graph theory. The average uplink rate and average delay can be improved by at most 79.1% and 92.43%.
- Developed a network resource-aware blockchain consensus mechanism based on RAFT to ensure the credibility and reliability of network resource allocation.
- Designed a joint service caching and base station clustering algorithm in user-centric networks using GBD and ADMM optimization methods. The long-term delay and caching cost can be reduced by at most 93.75% and 53.12%.

State Key Lab of ISN, Xidian University, China　　Dec. 2018 – Feb. 2021
Research Assistant
- Used software-defined network (SDN) controller RYU and Mininet to build a software-defined aviation combat network.
- Developed an intelligent routing algorithm based on Dyna-Q-learning, which can reduce the end-to-end latency by up to 21.4% compared to traditional routing algorithms.
- Constructed a wireless sensor network with multiple UWB and LoRa sensor nodes. Assembled a Bluetooth-based remote control anchor car with GPS based on STM32. Used Keil to realize the wireless communications between the mobile anchor and sensor nodes.
- Developed a TOA and RSSI hybrid localization algorithm based on trilateral localization and Kalman filter. The average localization error can be reduced by up to 43.75% compared to traditional TOA and RSSI methods.

PREPRINTS & PUBLICATIONS

1. [**TMC'23**] **L. Qin**, H. Lu, Y. Lu, C. Zhang and F. Wu, "Joint Optimization of Base Station Clustering and Service Caching in User-Centric MEC," in IEEE Transactions on Mobile Computing, 2023, Early Accepted. [PDF] [Code]

2. [**ComMag'23**] **L. Qin**, H. Lu and F. Wu, "When the User-Centric Network Meets Mobile Edge Computing: Challenges and Optimization," in IEEE Communications Magazine, vol. 61, no. 1, pp. 114-120, Jan. 2023. [PDF] [Code]

3. [**TCCN'23**] **L. Qin**, H. Lu, Y. Chen, Z. Gu, D. Zhao and F. Wu, "Energy-Efficient Blockchain-enabled User-Centric Mobile Edge Computing," submitted to IEEE Transactions on Cognitive Communications and Networking, 2023, Under Major Revision. [PDF] [Code]

4. [**TVT'23**] **L. Qin**, H. Lu, Y. Chen, B. Chong and F. Guo, "Joint Transmission and Resource Optimization in NOMA-assisted IoVT with Mobile Edge Computing," submitted to IEEE Transactions on Vehicular Technology, 2023, Under Major Revision.[PDF] [Code]

5. [**TMC'23**] **L. Qin**, H. Lu, Y. Chen, B. Chong and F. Wu, "Towards Decentralized Task Offloading and Resource Allocation in User-Centric Mobile Edge Computing," submitted to IEEE Transactions on Mobile Computing, 2023, Under Review. [PDF] [Code]

6. [**ComMag'23**] Y. Chen, H. Lu, **L. Qin**, Y. Deng and A. Nallanathan, "When xURLLC Meets NOMA: A Stochastic Network Calculus Perspective," in IEEE Communications Magazine, 2023, Early Accepted. [PDF]

7. [**TWC'24**] Y. Chen, H. Lu, **L. Qin**, C. Zhang and C. Chen, "Statistical QoS Provisioning Analysis and Performance Optimization in xURLLC-enabled Massive MU-MIMO Networks: A Stochastic Network Calculus Perspective," in IEEE Transactions on Wireless Communications, 2024, Early Accepted.[PDF]

8. [**TWC'23**] B. Chong, H. Lu, Y. Chen, **L. Qin** and F. Guo, "Achievable Sum Rate Optimization on NOMA-aided Cell-Free Massive MIMO with Finite Block Length Coding," submitted to IEEE Transactions on Wireless Communications, 2023, Under Major Revision. [PDF]

9. [**TWC'23**] Y. Chen, H. Lu, **L. Qin**, C. Wu and C. Chen, "Streaming 360-degree VR Video with Statistical QoS Provisioning in mmWave Networks from Delay and Rate Perspectives," submitted to IEEE Transactions on Wireless Communications, 2023, Under Review. [PDF]

10. [**TCOM'23**] C. Wu, H. Lu, Y Chen and **L. Qin**, "Cross-Layer Optimization for Statistical QoS Provision in C-RAN with Finite-Length Coding," submitted to IEEE Transactions on Communications, 2023, Under Major Revision. [PDF]

AWARDS & HONORS

- 2023 National Scholarship (Awarded to 1% of 1100+ students)

- 2022 First Class Scholarship of University of Science and Technology of China

- 2021 First Class Scholarship of University of Science and Technology of China

- 2020 National Scholarship (Awarded to 1% of 156 students)

- 2020 Meritorious Winner of The Interdisciplinary Contest in Modeling (ICM)
  (Awarded to 8% of 7199 teams over the world)

- 2019 National Scholarship (Awarded to 1% of 156 students)

- Provincial Second Prize in National Mathematical Modeling Contest, 2019

- Provincial Second Prize in Chinese Mathematics Competition, 2019

SKILLS

Languages: MATLAB, Python, C/C++, Java, JavaScript, Solidity
Developer Tools: Pycharm, VS Code, WebStorm, Eclipse, Keil, Remix, CORE, Mininet
Technologies/Frameworks: Linux, GitHub, Git, Tensorflow, Pytorch, Cesium