Qiang Liu	*Assistant Professor*	**Last update: July 29, 2022**

CONTACT
INFORMATION

School of Computing
University of Nebraska-Lincoln
Office: 262 Avery Hall, Lincoln, NE, United States
Email: qiang.liu@unl.edu
Tel: 402-472-5006
Web: https://cse.unl.edu/~qliu/

RESEARCH
INTERESTS

Wireless Communication, Computer Networking, Machine Learning, Edge Computing, Augmented Reality, Autonomous Driving, Internet of Things

EDUCATION

The University of North Carolina at Charlotte, Charlotte, NC   2016–2020

- Ph.D. in Electrical Engineering
- Advisor: Tao Han.

University of Electronic Science and Technology of China, Chengdu, China   2013–2016

- M.S. in Communication and Information System
- Advisor: Gang Wu

HONORS AND
AWARDS

◇ ***Best Paper Award***, IEEE International Conference on Communications (ICC)   2022

◇ ***Best Paper Award***, IEEE ComSoc on Transmission, Access, and Optical Systems (TAOS) 2019

◇ ***Best Paper Award***, IEEE International Conference on Communications (ICC)   2019

◇ ***Outstanding Graduate Student Award***, UNC-Charlotte   2019

◇ ***Graduate and Professional Student Government Travel Award***, UNC-Charlotte   2019

◇ ***Student Travel Grant Award***, IEEE International Conference on Network Protocols (ICNP) 2018

◇ ***Student Travel Grant Award***, ACM/IEEE Symposiumon Edge Computing (SEC)   2017

◇ ***Excellent Graduate Student Award***, University of Electronic Science and Technology of China (UESTC)   2016

◇ ***Bronze Medal Award***, 5G Algorithm Innovation Competition   2015

GRANTS

- ***Nation Science Foundation***, CNS Core: Medium: Field-Nets: Field-to-Edge Connectivity for Joint Communication and Sensing in Next-Generation Intelligent Agricultural Networks, **Co-PI**, $1,000,000   2022 - 2025

- ***UNL Layman Fund***, Automated offline simulator augmentation with real-to-sim learning in mobile networks, **Sole PI**, $10,000,   2022 - 2023

PUBLICATIONS

Conferences

19. Q. Liu, Y. Zhang, H. Wang, "EdgeMap: CrowdSourcing High Definition Map in Automotive Edge Computing", in *IEEE International Conference on Communications* (**ICC**), Virtual, May. 2022

18. T. Hu, Q. Liao, Q. Liu, D. Wellington, G. Carle, "Inter-Cell Slicing Resource Partitioning via Coordinated Multi-Agent Deep Reinforcement Learning", in *IEEE International Conference on Communications* (**ICC**), Virtual, May. 2022 (**Best Paper Award**)

17. Q. Liu, N. Choi, T. Han, "OnSlicing: Online End-to-End Network Slicing with Reinforcement Learning", *The 17th International Conference on emerging Networking EXperiments and Technologies* (**CoNEXT**), Virtual, Dec. 2021 (acceptance rate: **22%**)

16. Q. Liu, N. Choi, T. Han, "Constraint-Aware Deep Reinforcement Learning for End-to-End Resource Orchestration in Mobile Networks", *IEEE International Conference on Network Protocols* (**ICNP**), Virtual, Nov. 2021 (acceptance rate: **24%**)

15. Q. Liu, T. Han, L. Xie, B. Kim, "LiveMap: Real-Time Dynamic Map in Automotive Edge Computing", *IEEE International Conference on Computer Communications* (**INFOCOM**), Virtual, May 2021 (acceptance rate: **19.9%**)

14. Q. Liu, T. Han, E. Moges, "EdgeSlice: Slicing Wireless Edge Computing Network with Decentralized Deep Reinforcement Learning", in *IEEE International Conference on Distributed Computing Systems* (**ICDCS**), Singapore, Dec. 2020 (acceptance rate: **18%**)

13. Q. Liu, T. Han, N. Zhang, Y. Wang, "DeepSlicing: Deep Reinforcement Learning Assisted Resource Allocation for Network Slicing", in *IEEE Global Communications Conference* (**GLOBECOM**), Taipei, Taiwan, Dec. 2020

12. Q. Liu, T. Han, "DIRECT: Distributed Cross-Domain Resource Orchestration in Cellular Edge Computing", in *ACM International Symposium on Mobile Ad Hoc Networking and Computing* (**MOBIHOC**), Catania, Italy, Jul. 2019 (acceptance rate: **23.7%**)

11. Q. Liu, T. Han, "VirtualEdge: Multi-Domain Resource Orchestration and Virtualization in Cellular Edge Computing", in *IEEE International Conference on Distributed Computing Systems* (**ICDCS**), Dallas, TX, Jul. 2019 (acceptance rate: **19.6%**)

10. Q. Liu, T. Han, "DARE: Dynamic Adaptive Mobile Augmented Reality with Edge Computing", in *IEEE International Conference on Network Protocols* (**ICNP**), Cambridge, UK, Sep. 2018 (acceptance rate: **17.8%**)

9. Q. Liu, S. Huang, J. Opadere, T. Han, "An Edge Network Orchestrator for Mobile Augmented Reality", in *IEEE International Conference on Computer Communications* (**INFOCOM**), Honolulu, HI, Apr. 2018 (acceptance rate: **19.2%**)

8. J. Opadere, Q. Liu, N. Zhang, T. Han, "Joint Computation and Communication Resource Allocation for Energy-Efficient Mobile Edge Networks", in *IEEE International Conference on Communications* (**ICC**), Shanghai, China, May 2019 **(Best Paper Award)**

7. Q. Liu, T. Han, "Energy-Efficient On-demand Cloud Radio Access Networks Virtualization", in *IEEE Global Communications Conference* (**GLOBECOM**), Abu Dhabi, UAE, Dec. 2018

6. Q. Liu, T. Han, N. Ansari, "Joint Radio and Computation Resource Management for Low Latency Mobile Edge Computing", in *IEEE Global Communications Conference* (**GLOBECOM**), Abu Dhabi, UAE, Dec. 2018

5. J. Opadere, Q. Liu, T. Han, "Energy-Efficient RRH Sleep Mode for Virtual Radio Access Networks", in *IEEE Global Communications Conference* (**GLOBECOM**), Singapore, Dec. 2017

4. S. Huang, Q. Liu, T. Han, N. Ansari, "Data-Driven Network Optimization in Ultra-Dense Radio Access Networks", in *IEEE Global Communications Conference* (**GLOBECOM**), Singapore, Dec. 2017

3. Q. Liu, G. Wu, Y. Guo, Y. Zhang, S. Hu, "Energy Efficient Resource Allocation for Control Data Separated Heterogeneous-CRAN", in *IEEE Global Communications Conference* (**GLOBECOM**), Washington DC, Dec. 2016

2. Q. Liu, T. Han, G. Wu, "Computing Resource Aware Energy Saving Scheme for Cloud Radio Access Networks", in *IEEE Sustainable Computing and Communications* (**SustainCom**), Atlanta, GA, Oct. 2016

1. Y. Guo, Q. Liu, G. Wu, S. Li, "On the Impact of Power Amplifier Efficiency on the Energy Efficiency in a Massive MIMO System", *WiCOM*, Shanghai, China, 2015

Journal and Magazines

5. F. Salahdine, J. Opadere, Q. Liu, T. Han, N. Zhang, S. Wu, "A survey on sleep mode techniques for ultra-dense networks in 5G and beyond", in *Computer Networks*, vol. 201, pp.108567, 2021.

4. Q. Liu, T. Han, N. Ansari, "Learning-Assisted Secure End-to-End Network Slicing for Cyber-Physical Systems", in *IEEE Network Magazine*, vol. 34, no. 3, pp. 37-43, May 2020

3. J. Opadere, Q. Liu, T. Han, N. Ansari, "Energy-efficient Virtual Radio Access Networks for Multi-Operators Cooperative Cellular Networks", in *IEEE Transactions on Green Communications and Networking* (**TGCN**), vol. 3, no. 3, pp. 603-614, Sep. 2019

2. Q. Liu, T. Han, N. Ansari, "Energy-Efficient On-demand Resource Provisioning in Cloud Radio Access Networks", in *IEEE Transactions on Green Communications and Networking* (**TGCN**), vol. 3, no. 4, pp. 1142-1151, Jul. 2019

1. Q. Liu, T. Han, N. Ansari, G. Wu, "On Designing Energy-Efficient Heterogeneous Cloud Radio Access Networks", in *IEEE Transactions on Green Communications and Networking* (**TGCN**), vol. 2, no. 3, pp. 721-734, May 2018

Workshops and Demos

4. Q. Liu, T. Han, "When Network Slicing meets Deep Reinforcement Learning", in *ACM International Conference on emerging Networking EXperiments and Technologies* (**CoNEXT**) Student Workshop, Orlando, FL, Dec. 2019

3. Q. Liu, T. Han, "Demo Abstract: Themis: Cross-Domain Resource Orchestration and Virtualization in Cellular Computing Networks", in *IEEE International Conference on Network Protocols* (**ICNP**), Cambridge, UK, Sep. 2018

2. Q. Liu, S. Huang, T. Han, "Demo Abstract: Fast and Accurate Object Analysis at the Edge for Mobile Augmented Reality", in *ACM/IEEE Symposium on Edge Computing* (**SEC**), San Jose, CA, Oct. 2017

1. Q. Liu, S. Huang, Y. Deng, T. Han, "Demo Abstract: MExR: Mobile Edge Resource Management for Mixed Reality Applications", in *IEEE International Conference on Computer Communications* (**INFOCOM**), Atlanta, GA, Apr. 2017

ACADEMIC
EXPERIENCE

- **University of Nebraska-Lincoln**   Aug. 2021–Present
  Assistant Professor

- **University of North Carolina at Charlotte**   Aug. 2016–Dec. 2020
  Research, Teaching Assistant

- **University of Electronic Science and Technology of China**   Aug. 2013–Jun. 2016
  Research Assistant

INDUSTRY
EXPERIENCE

- **Nokia Bell Labs**   Jan. 2021–Aug. 2021
  Research Scientist

- **Nokia Bell Labs**   Jun. 2020–Aug. 2020
  Research Intern

- **Toyota InfoTech Labs**   Jan. 2020–Jun. 2020
  Research Intern

- **Facebook Reality Labs**   May. 2019–Nov. 2019
  Research Intern

TEACHING

◇ Instructor, CSCE 464/864: Internet System and Programming, Spring 2022, UNL

◇ Instructor, CSCE 990: Multi-Access Edge Computing, Fall 2021, UNL

◇ Teaching Assistant, Power Electronics I, Fall 2018, UNCC

◇ Teaching Assistant, Computer Utilization in C++, Spring 2018, UNCC

◇ Teaching Assistant, Data Communications and Networking, Spring 2018, UNCC

◇ Teaching Assistant, Signals and Systems II, Fall 2017, UNCC

◇ Teaching Assistant, Logic and Networks, Spring 2017, UNCC

◇ Teaching Assistant, Signals and Systems I, Fall 2016, UNCC

SERVICE
- Poster Chair, The Seventh ACM/IEEE Symposium on Edge Computing (SEC) 2022
- Technical Program Committee Member for The 30th IEEE International Conference on Network Protocols (ICNP) 2022
- Technical Program Committee Member for IEEE International Conference on Communications (ICC) 2022
- Technical Program Committee Member for IEEE 96th Vehicular Technology Conference (VTC-Fall) 2022
- Technical Program Committee Member for The International Conference on Networking and Services (ICNS)
- Reviewer for IEEE Open Journal of the Computer Society
- Reviewer for IEEE System Journal
- Reviewer for IEEE Journal on Selected Areas in Communications
- Reviewer for IEEE Transactions on Cognitive Communications and Networking
- Reviewer for Elsevier Measurement
- Reviewer for Digital Communication and Networks
- Reviewer for IEEE Transactions on Communications
- Reviewer for IEEE Access
- Reviewer for IEEE Communication Letters
- Reviewer for IEEE Transactions on Green Communications and Networking
- Reviewer for Elsevier Computer Communications
- Reviewer for Elsevier Computer Networks
- Reviewer for IEEE Global Communications Conference
- Reviewer for IEEE International Conference on Communications