Yannan Wei

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EDUCATION

- Doctor of Philosophy, Electrical and Computer Engineering, Sep. 2020 – Jul. 2025
  Broadband Communications Research (BBCR), University of Waterloo (UW), Waterloo, Ontario, Canada
  Supervisor: Prof. Weihua Zhuang
  Thesis: E2E Service Performance Enhancement for Tile-based Adaptive 360º VR Video Streaming
- Master of Engineering, Information and Communication Engineering, Sep. 2017 – Jun. 2020
  Chongqing Key Laboratory of Mobile Communications Technology, Chongqing University of Posts and Telecommunications (CQUPT), Chongqing, China
  Supervisor: Prof. Qianbin Chen & Prof. Lun Tang
  Thesis: Research on Online Wireless Resource Management Based on Networking Slicing
- Bachelor of Engineering, Communication Engineering, Sep. 2013 – Jun. 2017
  CQUPT, Chongqing, China
  Thesis: Research on Joint Resource Allocation Algorithm for Wireless Access and Backhaul in In-Band Full-Duplex System

RESEARCH INTEREST

- Communication networks: SDN, SAGIN, IoT, IoV
- Service provisioning: Computation offloading, resource management, protocol design, QoS/QoE-oriented algorithm design
- Network intelligence: Split learning, edge inference, deep (reinforcement) learning

SELECTED PUBLICATIONS

Journal and Magazine Papers

[J1] **Y. Wei**, Q. Ye, W. Zhuang and X. Shen, "Energy-efficient multi-user adaptive 360° video streaming: A two-step approach with device video super-resolution," *IEEE Transactions on Network Science and Engineering*, early access, Oct. 3, 2025, doi: 10.1109/TNSE.2025.3617381. (JCR Q1)

[J2] **Y. Wei**, Q. Ye, K. Qu, W. Zhuang and X. Shen, "E2E performance modeling for slice-based video streaming with layered encoding," *IEEE Transactions on Networking*, early access, Jul. 31, 2025, doi: 10.1109/TON.2025.3591401. (CCF A)

[J3] **Y. Wei**, Q. Ye, K. Qu, W. Zhuang and X. Shen, "Customized transmission protocol for tile-based 360° VR video streaming over core network slices," *IEEE/ACM Transactions on Networking*, vol. 33, no. 1, pp. 340-354, 2025. (CCF A)

[J4] L. Tang, **Y. Wei**, Q. Tan, *et al.*, "Joint congestion control and resource allocation dynamic scheduling strategy for network slices in H-CRAN," *Journal of Electronics & Information Technology*, vol. 42, no. 5, pp. 1244-1252, 2020. (CCF T1)

[J5] L. Tang, **Y. Wei**, R. Ma, *et al.*, "Online learning-based virtual resource allocation for network slicing in virtualized cloud radio access network," *Journal of Electronics & Information Technology*, vol. 41, no. 7, pp. 1533-1539, 2019. (CCF T1)

[J6] L. Tang, **Y. Wei**, *et al.*, "Queue-aware dynamic resource reuse and joint allocation algorithm in self-backhaul small cell networks," *IEEE Access*, vol. 6, pp. 61077-61090, 2018. (JCR Q2)

[J7] L. Tang, **Y. Wei**, *et al.*, "Delay-aware dynamic resource allocation and ABS configuration algorithm in HetNets based on Lyapunov optimization," *IEEE Access*, vol. 5, pp. 23764-23775, 2017. (JCR Q2)

Conference Papers

[C1] **Y. Wei**, Q. Ye, W. Zhuang and X. Shen, "Energy-efficient multi-user adaptive 360° video streaming with device video super-resolution", in *Proc. IEEE Globecom Workshops (GC Wkshps)*, Taipei, Taiwan, to appear.

[C2] **Y. Wei**, Q. Ye, K. Qu, W. Zhuang and X. S. Shen, "Transmission protocol customization for on-demand tile based 360° VR video streaming," in *Proc. IEEE/CIC International Conference on Communications in China (ICCC)*, Hangzhou, China, July 2024.

Patents

[P1] Q. Chen, R. Ma, **Y. Wei**, *et al*. A method of joint resource allocation and content caching in F-RAN architecture. Invention Patent (Granted), CN109951849B, CNIPA, 2023.

[P2] Q. Chen, **Y. Wei**, Q. Tan, *et al*. A dynamic scheduling method of joint congestion control and resource allocation for network slices in H-CRAN. Invention Patent (Granted), CN110809261B, CNIPA, 2022.

[P3] Q. Chen, L. Guan, **Y. Wei**, *et al*. A DRL-based resource allocation method in heterogeneous cloud wireless access network. Invention Patent (Granted), CN110493826B, CNIPA, 2022.

[P4] L. Tang, J. Xiao, **Y. Wei**, *et al*. An energy-efficiency-based dynamic resource scheduling method in NOMA cellular vehicular network. Invention Patent (Granted), CN109905918B, CNIPA, 2022.

[P5] Q. Chen, **Y. Wei**, Y. Zhou, *et al*. A joint resource allocation method for wireless access and backhaul in in-band full-duplex system. Invention Patent (Granted), CN108964806B, CNIPA, 2021.

SELECTED RESEARCH EXPERIENCE

- **E2E Performance Enhancement for Tile-based Adaptive 360° (VR) Video Streaming Service (2020 – 2025, Participant)**, *Funded by the Ottawa Huawei and Natural Sciences and Engineering Research Council (NSERC) of Canada* *Advisor: Weihua Zhuang*
  - **Transmission Protocol Customization**
    - Develop a slice-level customized transmission protocol based on QUIC, including tailored QUIC with tile-to-stream mappings to accommodate various VR video packet properties and customized protocol functionalities to support prompt response to viewing behavior dynamics and efficient transmission control
  - **E2E Performance Analytical Modeling**
    - Propose a segment-based analysis framework for E2E service performance modeling of slice-based layer-encoded video packet transmission
    - Propose a two-stage queuing model for segment-level performance analysis. Achieve the independence between two consecutive segments for E2E analysis tractability
    - Analyze the E2E BL/EL packet delay, deadline violation probability, and throughput
  - **Adaptive Streaming Scheme Design**
    - Propose a two-step adaptive streaming scheme, which captures the interplay among video playback smoothness, perceived FoV quality, and FoV prediction accuracy
    - Adopt a time-difference approach for viewing QoE modeling to estimate the contribution of prefetching a new chunk or enhancing a prefetched chunk
    - Develop a practical PSO-based algorithm to achieve energy-efficient multi-user viewing QoE optimization
- **Research on Intelligent Control Theory and Method of 5G Network Based on Data-driven Artificial Intelligence (2018 – 2020, Participant)**, *Funded by the Science and*

Technology Research Program of Chongqing Municipal Education Commission

Advisor: Lun Tang

- Develop an online learning-based virtual resource allocation scheme for network slices in C-RAN to achieve network performance optimization with QoS guarantee
- Investigate the potential of DRL in wireless network resource management (e.g., addressing the curse of dimensionality)

Research on Self-organization Mechanism and Self-optimization Method of 5G Network Based on Multi-domain Environment Awareness (2017 – 2020, Participant),

Funded by the National Natural Science Foundation of China *Advisor: Qianbin Chen*

- Investigate environment-aware self-optimization techniques under various emerging network architectures (e.g., dense HetNets and MEC), focusing on topics such as resource management, interference management, and SFC deployment with VNF migration
- Propose a hybrid interference coordination scheme based on dynamic eICIC and CoMP in dense HetNets; propose a delay-aware resource allocation and ABS configuration strategy in HetNets
- Propose a queue-aware dynamic resource reuse and allocation scheme in self-backhaul small cell networks for spectral efficiency improvement

PROFESSIONAL SERVICE

Conference Technical Program Committee (TPC) Member

- IEEE VTC-Fall (2024), IEEE ICCT (2023)

Reviewer of Refereed Journals and Conferences

- IEEE Transactions on Wireless Communications, IEEE Transactions on Mobile Computing, IEEE Internet of Things Journal, IEEE Transactions on Cognitive Communications and Networking, IEEE Open Journal of the Communications Society, IEEE Internet of Things Magazine, IEEE Access
- IEEE INFOCOM (2023 workshop), IEEE VTC (2021, 2022, 2024, 2025), IEEE ICCT (2023), IEEE/CIC ICCC (2024), IEEE GLOBECOM (2024), CANAI (2023)

SELECTED AWARDS & HONORS

- Best Paper Award, IEEE/CIC ICCC, 2024
- Xuemin Shen Graduate Scholarship, University of Waterloo, 2022/2024
- Jon W. Mark Graduate Scholarship, University of Waterloo, 2021
- Graduate Research Studentship, University of Waterloo, 2020 – 2025
- International Doctoral Student Award, University of Waterloo, 2020 – 2024
- Huawei Graduate Entrance Award, University of Waterloo, 2020
- The Outstanding Graduate Student, CQUPT, 2018
- The 15th China Postgraduate Mathematical Contest in Modeling, Third Prize, 2018
- The Outstanding Graduate in Chongqing, Chongqing, China, 2017/2020
- The First-class Academic Scholarship, CQUPT, 2017/2018/2020
- National Scholarship, China, 2016/2019
- The Excellent Graduate, CQUPT, 2016/2019
- The Outstanding Student Leader in Chongqing, Chongqing, China, 2015
- The Merit Student, CQUPT, 2015/2016
- The Individual Scholarship, CQUPT, 2015/2016

- China Undergraduate Mathematical Contest in Modeling, First Prize in Chongqing, 2015
- The Second/First-class Scholarship for Outstanding Students, CQUPT, 2014/2015
- The Outstanding Student Leader, CQUPT, 2014