Qinglin Zhao, Ph.D.

Professor, Senior Member, IEEE

School of Computer Science and Engineering, Macau University of Science and Technology

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SUMMARY

Professor and IEEE Senior Member with over 15 years of academic and research experience in Computer Science. Served as an Associate Editor for *IEEE Transactions on Mobile Computing* and *IET Communications*. Author of over 100 peer-reviewed papers in top-tier venues including IEEE TMC, IEEE JSAC, IEEE TWC, and INFOCOM. Possesses a proven track record of efficient editorial management, with a focus on AI/Machine learning, Blockchain/Web3/Decentralized Computing, Internet of Things (IoT), Wireless Communications and Networking, and Cloud and Edge Computing.

EDITORIAL & PROFESSIONAL SERVICE

Editorial Roles

- **Associate Editor**, *IEEE Transactions on Mobile Computing* (2021 – Present)
- **Associate Editor**, *IET Communications* (2021 – Present)
- **Guest Editor**, *Mobile Information Systems*, Special Issue on "Artificial Intelligence for Next-Generation Wireless Networks" (2021)

Committee Memberships & Chairs

- **General Chair**, The 34th IEEE Wireless and Optical Communications Conference (WOCC 2025)
- **Keynote Speaker**, International Conference on Computer Vision and Image Computing (CVIC 2025)
- **Keynote Speaker**, ACM CoNEXT Workshop on Blockchain-Network Synergy (BlockNetSys 2025)
- **Invited Speaker**, WOCC 2024; EITCE 2025
- **Program Chair**, IT Frontiers (PhD Student Seminar), MUST (2017 – 2021)
- **Program Chair**, 6th Int. Conf. on Electronics, Communications, and Networks (2016)
- **Vice-Chair**, 14th IEEE Int. Conf. on Communication Systems (ICCS 2014)

Committee Service & Peer Review

- **IEEE Senior Member**.
- **Blockchain Committee Member**: China Computer Federation.
- **Expert Review Committee Member**: National Natural Science Foundation of China (NSFC) (since 2020); Guangdong Science and Technology Award (since 2019).
- **TPC Member**: IEEE Global Blockchain Conference (2024), IEEE ICNSC (2024), IEEE SMC (2022), BigCom (2020), IEEE Globecom (2017).
- **Journal Reviewer**: IEEE/CAA Journal of Automatica Sinica, IEEE Trans. on Automation Science and Engineering, IEEE Trans. on Intelligent Transportation Systems, IEEE Trans. on Industrial Informatics, IEEE Trans. on Network Science and Engineering, IEEE Trans. on Wireless Communication, IEEE Trans. on Vehicular Technology, IEEE Trans. on Communications, IEEE Trans. on Mobile Computing, IEEE Trans. on Parallel and Distributed Systems, IEEE Trans. on Services Computing, IEEE/ACM Trans. on Networking, IEEE JSAC, IEEE IoT Journal.

RESEARCH INTERESTS

- Deep Learning and Its Applications
- Blockchain, Web3, and Decentralized Computing
- Internet of Things (IoT)
- Wireless Communications and Networking (WiFi, 5G/6G)
- Cloud and Edge Computing
- Privacy-Preserving Computation
- Quantum Machine Learning

EDUCATION

Ph.D. in Computer Architecture 2005
Institute of Computing Technology, Chinese Academy of Sciences *Beijing, China*

M.S. in Applied Mathematics 2001
Huazhong University of Science and Technology *Wuhan, China*

B.S. in Mathematics Education 1998
Hubei University *Wuhan, China*

EMPLOYMENT HISTORY

Professor Jul. 2017 – Present
School of Computer Science and Engineering, Macau University of Science and Technology *Macau*

Associate Professor Jul. 2012 – Jun. 2017
School of Computer Science and Engineering, Macau University of Science and Technology *Macau*

Assistant Professor Aug. 2009 – Jun. 2012
School of Computer Science and Engineering, Macau University of Science and Technology *Macau*

Research Associate Oct. 2006 – Jul. 2009
Dept. of Electronic & Computer Engineering, HKUST *Hong Kong*

Research Associate May 2005 – Sep. 2006
Dept. of Information Engineering, CUHK *Hong Kong*

HONORS AND AWARDS

- **Bank of China (BOC) Excellent Research Award**, Macau University of Science and Technology (2011, 2015).

PUBLICATIONS

Quantum Machine Learning

1. Hui Zhang, Qinglin Zhao, Mengchu Zhou, Li Feng, Dusit Niyato, Shenggen Zheng, and Lin Chen. A Survey of Quantum Transformers: Technical Approaches, Challenges and Outlooks. arXiv:2504.03192.

2. Haitao Huang, Qinglin Zhao, Chuangtao Chen, Li Feng, MengChu Zhou, Dusit Niyato, and Xiaoyu Li, Continuous-Variable Quantum Diffusion Models for High-Fidelity State Generation and Restoration, In Review.

3. Hui Zhang, Qinglin Zhao, Mengchu Zhou, and Li Feng. HQViT: Hybrid Quantum Vision Transformer for Image Classification. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, In review. arXiv:2504.02730.

4. Chuangtao Chen, Qinglin Zhao, MengChu Zhou, Zhimin He, Zhili Sun, and Haozhen Situ. Quantum Generative Diffusion Model: A Fully Quantum-Mechanical Model for Generating Quantum State Ensemble. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, In review. arXiv:2401.07039.

5. Fu Chen, Qinglin Zhao, Li Feng, Longfei Tang, and Yangbin Lin. Quantum Complex-Valued Self-Attention Model. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, In review. arXiv:2503.19002.

6. Chuangtao Chen, Qinglin Zhao, MengChu Zhou, Dusit Niyato, Zhimin He, and Haozhen Situ. Overcoming Dimensional Factorization Limits in Discrete Diffusion Models through Quantum Joint Distribution Learning. *npj Quantum Information*, In review. arXiv:2505.05151.

7. Chen, Fu, Qinglin Zhao, Li Feng, Chuangtao Chen, Yangbin Lin, and Jianhong Lin. Quantum Mixed-State Self-Attention Network. *Neural Networks*, 185: 107123, 2025

8. Zhang, Hui, Qinglin Zhao, and Chuangtao Chen. A Light-Weight Quantum Self-Attention Model for Classical Data Classification. *Applied Intelligence*, 54(4): 3077-3091, 2024.

Blockchain, Machine Learning, Wireless Networks, IoT & Security

1. Jian Li, Yibo Chen, Qinglin Zhao, Jincheng Cai, Shaohua Teng, and Naiqi Wu. EdgeBatch: Efficient Decentralized Batch Verification for Edge Data Integrity via Reputation-Aware Combination Selection. *IEEE Transactions on Mobile Computing*. Accepted.

2. Peiyun Zhang, Jigang Ren, Jishi Yin, Qinglin Zhao, and Haibin Zhu. Decoupling Location and Preference: a Dual-Branch Architecture for Robust QoS Prediction under Extreme Sparsity. *IEEE Transactions on Services Computing*. Accepted.

3. Shuhan Qi, Qinglin Zhao, Zijie Liu, MengChu Zhou, Meng Shen, Peiyun Zhang, and Yi Sun. Modeling the Performance-Security Trade-off of Gasper's Block Proposal Mechanism Under Latency-Driven Attacks. *IEEE Transactions on Information Forensics and Security*. Accepted.

4. Shuang Gao, Qinglin Zhao, Guangcheng Li, Li Feng, Meng Shen, Peiyun Zhang, Yi Sun. SegSub: Balancing Security and Efficiency for Large-Scale Decentralized Data Subscription in Web3. *IEEE Transactions on Network Science and Engineering*. Accepted.

5. Yuzhi Liu, Meng Shen, Yue Su, Yong Xie, Wei Wang, Qinglin Zhao, Jiayang Wang, Jin Dong, Gerui Wang, and Liehuang Zhu. Enabling Verifiable Keyword Search over Encrypted Data via Dynamic Version-Aware Indexing. *IEEE Transactions on Network Science and Engineering*. Early Access Article, 2025.

6. Qinglin Zhao, Fangxin Xu, Li Feng, Mengchu Zhou, Meng Shen, Peiyun Zhang, and Yi Sun. CollFree: Exploiting Full-Duplex Capabilities in WiFi Contention for Enhanced Throughput Efficiency. *IEEE Journal on Selected Areas in Communications*, 43(11): 3875-3888, October 2025.

7. Shumin Yao, Qinglin Zhao, MengChu Zhou, Li Feng, Peiyun Zhang, and Aiiad Albeshri. General and Offset-Resistant Physical-Layer Acknowledgement Approach for Cross-Technology Communication. *IEEE Transactions on Communications*, 73(9): 8211-8227, September 2025.

8. Peiyun Zhang, Jiajun Fan, Yutong Chen, Wenjun Huang, Haibin Zhu, and Qinglin Zhao. An End-to-End Deep Learning QoS Prediction Model Based on Temporal Context and Feature Fusion. *IEEE Transactions on Services Computing*, 18(3): 1232-1244, May-June 2025.

9. Zheng Che, Meng Shen, Zhehui Tan, Hanbiao Du, Wei Wang, Ting Chen, Qinglin Zhao, Yong Xie, and Liehuang Zhu. Across-Platform Detection of Malicious Cryptocurrency Accounts via Interaction Feature Learning. *IEEE Transactions on Information Forensics and Security*, 20: 4783-4798, April 2025.

10. Hao Huang, Xiaofen Wang, Man Ho Au, Sheng Cao, Qinglin Zhao, and Jiguo Yu. An Enhanced Linearly Homomorphic Network Coding Signature Scheme for Secure Data Delivery in IoT Networks. *IEEE Transactions on Information Forensics and Security*, 20: 5534-5548, April 2025.

11. Shumin Yao, Qinglin Zhao, MengChu Zhou, Li Feng, Peiyun Zhang, Xiaodong Xu, and Hao Chen. Offset-Resistant Physical-Layer Cross-Technology Acknowledgment: A General Approach and Its Case Studies. *IEEE Wireless Communications*, 32(5): 118-126, October 2025.

12. Peiyun Zhang, Fuya Xu, Tianlin Huang, Haibin Zhu, and Qinglin Zhao. CTT: A Three-Layer Tree Consensus Mechanism for Consortium Blockchains with Enhanced Security and Reduced Communication Cost. *IEEE Transactions on Industrial Informatics*, 21(6): 4355-4366, June 2025.

13. Lingqiang Chen, Qinglin Zhao, Guanghui Li, Mengchu Zhou, Chenglong Dai, and Yiming Feng. A Sparse Cross Attention-based Graph Convolution Network with Auxiliary Information Awareness for Traffic Flow Prediction. *IEEE Transactions on Intelligent Transportation Systems*, 26(3): 3210-3222, March 2025.

14. Jin Meng, Qinglin Zhao, Weimin Wu, Minghao Jin, Penghui Song, and Yingzhuang Liu. Enhancing IEEE 802.11ax Network Performance: An Investigation and Modeling into Multi-User Transmission. *IEEE Transactions on Mobile Computing*, 24(3): 2151-2165, March 2025.

15. Bo Li, Tiantian Duan, Qinglin Zhao, Yi Guo, Zhaoxiong Song, Hanwen Zhang, Zhongcheng Li, and Yi Sun. Performance Modeling of Relay Chain. *IEEE/ACM Transactions on Networking*, 33(1): 194-209, February 2025.

16. Jian Li, Qinglin Zhao, Shaohua Teng, Naiqi Wu, and Peiyun Zhang. Efficient Deterministic Verification and Rapid Corruption Localization for Edge Data Integrity. *IEEE Internet of Things Journal*, 11(20): 33346-33360, October 2024.

17. Qinglin Zhao, Li Feng, MengChu Zhou, Di Wu, Xiaofen Wang, and Peiyun Zhang. Full-Duplex Time-Domain Contention for WiFi Networks: Opportunities and Challenges. *IEEE Wireless Communications*, 31(6): 142-151, December 2024.

18. Peiyun Zhang, Wenjun Huang, Yutong Chen, Qinglin Zhao, and Haibin Zhu. A Deep-learning Model for Service QoS Prediction Based on Feature Mapping and Inference. *IEEE Transactions on Services Computing*, 17(4): 1311-1325, July-Aug. 2024.

19. Jian Li, Qinglin Zhao, Shaohua Teng, Naiqi Wu, Guanghui Li, and Yi Sun. HSA-EDI: An Efficient One-Round Integrity Verification for Mobile Edge Caching Using Hierarchical Signature Aggregation. *IEEE Transactions on Network and Service Management*, 21(3): 3358-3371, June 2024.

20. Meng Shen, Jing Wang, Jie Zhang, Qinglin Zhao, Bohan Peng, Tong Wu, Liehuang Zhu, and Ke Xu. Secure Decentralized Aggregation to Prevent Membership Privacy Leakage in Edge-based Federated Learning. *IEEE Transactions on Network Science and Engineering*, 11(3): 3105-3119, May-June, 2024.

21. Peiyun Zhang, Yutong Chen, Wenjun Huang, Haibin Zhu, and Qinglin Zhao. Generative-Adversarial-based Feature Compensation to Predict Quality of Service. *IEEE Transactions on Services Computing*, 17(1): 209-223, Jan.-Feb. 2024.

22. Jian Li, Qinglin Zhao, Hanlei Cheng, Shaohua Teng, Naiqi Wu, Yong Liang. OR-EDI: A Per-Edge One-Round Data Integrity Verification Scheme for Mobile Edge Computing. *IEEE Transactions on Network Science and Engineering*, 11(2): 2074-2086, March-April, 2024.

23. Qinglin Zhao, Tong Jin, Fangxin Xu, Lian Zhao, Li Feng, Yong Liang. Contention with Collision Detection in Wireless Full-duplex Networks. *IEEE Internet of Things Journal*, 11(6): 10398-10410, March, 2024.

24. Yulei Wang, Qinglin Zhao, Shumin Yao, MengChu Zhou, Li Feng, and Peiyun Zhang. Analytical Modeling of Location and Contention Randomness for Node-Assisted WiFi Backscatter Communication. *IEEE Internet of Things Journal*, 11(13): 23336-23347. July, 2024.

25. Laisen Nie, Xiaojie Wang, Qinglin Zhao, Zhigang Shang, Li Feng, and Guojun Li. Digital Twin for Transportation Big Data: A Reinforcement Learning-Based Network Traffic Prediction Approach. *IEEE Transactions on Intelligent Transportation Systems*, 25(1): 896-906, January, 2024.

26. Peiyun Zhang, Song Ding, and Qinglin Zhao. Exploiting Blockchain to Make AI Trustworthy: A Software Development Lifecycle View. *ACM Computing Surveys*, 56(7): 1-31, 2024.

27. Qinglin Zhao, Guangcheng Li, Jincheng Cai, MengChu Zhou, Li Feng. A Tutorial on Internet of Behaviors: Concept, Architecture, Technology, Applications, and Challenges. *IEEE Commun. Surv. Tutorials* 25(2): 1227-1260, 2023.

28. Peiyun Zhang, YanHao Tao, Qinglin Zhao, MengChu Zhou. A Rate-and-Trust-Based Node Selection Model for Block Transmission in Blockchain Networks. *IEEE Internet of Things Journal*, 10(2): 1605-1616, 2023.

29. Li Feng, Qinglin Zhao, Yu Zeng, Mianxiong Dong, et al. M-T2F: A High-Efficient Contention Protocol for Wireless Networking in Cyber-Physical-Social Systems. *IEEE Transactions on Network Science and Engineering*, 9(6): 3860-3869, 2022.

30. Guangcheng Li, Qinglin Zhao, Dongbo Zhang, Mu-Yen Chen, et al. GT-Chain: A Fair Blockchain for Industrial IoT Applications. *IEEE Transactions on Network Science and Engineering*, 9(5): 3244-3257, 2022.

31. Shumin Yao, Li Feng, Qinglin Zhao, Qiyu Yang, Yong Liang. ERFR-CTC: Exploiting Residual Frequency Resources in Physical-Level Cross-Technology Communication. *IEEE Internet of Things Journal*, 8(7): 6062-6076, 2021.

32. Guangcheng Li, Qinglin Zhao, Yu Wang, et al. A Blockchain-Based Decentralized Framework for Fair Data Processing. *IEEE Transactions on Network Science and Engineering*, 8(3): 2301-2315, 2021.

33. Qinglin Zhao, Li Feng, Lian Zhao, Kan Xie and Yong Liang. Backoff Entropy: Predicting Presaturation Peak for IEEE 802.11 DCF Networks. *IEEE Transactions on Vehicular Technology*, 71(2): 1901-1912, 2021.

34. Molin Li, Xiaobo Zhou, Tie Qiu, Qinglin Zhao, and Keqiu Li. Multi-relay Assisted Computation Offloading for Multi-access Edge Computing Systems with Energy Harvesting. *IEEE Transactions on Vehicular Technology*, 70(10): 10941-10956, 2021.

35. Shumin Yao, Li Feng, Jing Zhao, Qinglin Zhao, Qiyu Yang, and Wenchao Jiang. PatternBee: Enabling ZigBee-to-BLE Direct Communication by Offset Resistant Patterns. *IEEE Wireless Communications*, 28(3): 130-137, 2021.

36. Zhimin Wang, Qinglin Zhao, Li Feng, and Fangxin Xu. How Much Benefit Can Dynamic Frequency Scaling Bring to WiFi? *IEEE Transactions on Mobile Computing*, 20(3): 1046 -1063, 2021.

37. Li Feng, Qinglin Zhao, Zhiguo Shi, Zhenni Li and Yong Liang. Modeling the Impact of the MoreData Parameter for Wireless Power-Saving Protocols. *IEEE Transactions on Green Communications and Networking*, 4(4): 1061-1071, Dec. 2020.

38. Qinglin Zhao, Li Feng, Lian Zhao, Zhenni Li and Yong Liang. SatOpt Partition: Dividing Throughput-Stability Region for IEEE 802.11 DCF Networks. *IEEE Transactions on Vehicular Technology*, 69(9): 10278-10290, Sep. 2020.

39. Yujiong Liu, Shangguang Wang, Qinglin Zhao, Shiyu Du, Ao Zhou, Xiao Ma, and Fangchun Yang. Dependency-Aware Task Scheduling in Vehicular Edge Computing. *IEEE Internet of Things Journal*, 7(6): 4961-4971, 2020.

40. Jun Huang, Chao Huang, Congcong Xing, Zheng Chang, Yanxiao Zhao, and Qinglin Zhao. An Energy-Efficient Communication Scheme for Collaborative Mobile Clouds in Content Sharing: Design and Optimization. *IEEE Transactions on Industrial Informatics*, 15(10): 5700-5707, 2019.

41. Qiang Yang, Siyang Sun, Shuiguang Deng, Qinglin Zhao, and Mengchu Zhou. Optimal Sizing of PEV Fast Charging Stations with Markovian Demand Characterization. *IEEE Transactions on Smart Grid*, 10(4): 4457-4466, 2019.

42. Qinglin Zhao, Soung C. Liew, Shengli Zhang, and Yao Yu. Distance-based Location Management Utilizing Initial Position for Mobile Communication Networks. *IEEE Transactions on Mobile Computing*, 5(1): 107-120, 2016.

43. Fangxin Xu, Qinglin Zhao, and Yu Zeng. How Well Does CSMA/CN Work in WLANs?. *IEEE Transactions on Vehicular Technology*, 65(9): 7662-7669, 2016.

44. Zhijie Ma, Qinglin Zhao, and Tom H. Luan. Providing Utility-Optimal Throughput Guarantees in Wireless LANs. *IEEE Transactions on Vehicular Technology*, 65(9): 7559-7567, 2016.

45. Qinglin Zhao, Danny H. K. Tsang, and Taka Sakurai. A Scalable and Accurate Nonsaturated IEEE 802.11e EDCA Model for an Arbitrary Buffer Size. *IEEE Transactions on Mobile Computing*, 12(12): 2455-2469, 2013.

46. Qinglin Zhao, Danny H. K. Tsang, and Taka Sakurai. A Simple Critical-Load-Based CAC Scheme for IEEE 802.11 DCF Networks. *ACM/IEEE Transactions on Networking*, 19(5): 1485 - 1498, 2011.

47. Qinglin Zhao, Danny H. K. Tsang, and Taka Sakurai. Modeling Nonsaturated IEEE 802.11 DCF Networks under Arbitrary Buffer Size. *IEEE Transactions on Mobile Computing*, 10(9): 1248-1263, 2011.

48. Qinglin Zhao, Danny H. K. Tsang, and Taka Sakurai. A Novel CAC Scheme for Homogeneous 802.11 Networks. *IEEE Transactions on Wireless Communications*, 9(3): 1168-1174, 2010.

49. Qinglin Zhao, Danny H. K. Tsang, and Taka Sakurai. A Simple and Approximate Model for Nonsaturated IEEE 802.11 DCF. *IEEE Transactions on Mobile Computing*, 8(11): 1539-1553, 2009.

50. Qinglin Zhao, Soung C. Liew, and Yao Yu. Location Update Cost of Distance-Based Scheme for PCS Networks with CTRW Model. *IEEE Communications Letters*, 13 (6): 408-410, 2009.

51. Qinglin Zhao, Danny H. K. Tsang. An Equal-spacing-based Design for QoS Guarantee in IEEE 802.11e HCCA Wireless Networks. *IEEE Transactions on Mobile Computing*, 7(11): 134-152, 2008.

52. Qinglin Zhao and Danny H. K. Tsang, and Taka Sakurai. A Simple Model for Nonsaturated IEEE 802.11 DCF Networks. *IEEE Communications Letters*, 12(8): 563–565, 2008.

Selected Conference Papers

1. Aihua Zhu, Rui Su, Qinglin Zhao, Li Feng, Meng Shen, Shibo He, "Hierarchical Schedule Optimization for Fast and Robust Diffusion Model Sampling", *AAAI 2026*, Accepted.

2. Hao Huang, Xiaofen Wang, Man Ho Allen Au, Sheng Cao, Qinglin Zhao, Xiaosong Zhang, "Secure and Efficient Certificateless Homomorphic Signature Scheme for Network Coding", *GLOBECOM 2024: 4818-4823*

3. Shumin Yao, Xiaodong Xu, Hao Chen, Yaping Sun, Qinglin Zhao, "Deep Joint Source-Channel Coding for Efficient and Reliable Cross-Technology Communication", *ICC 2024: 3524-3529*

4. Xianfeng Li, Chongjian Xu, and Qinglin Zhao, "Shellproof: More Efficient Zero-Knowledge Proofs for Confidential Transactions in Blockchain", *IEEE International Conference on Blockchain and Cryptocurrency (ICBC)*, pp. 1-5. IEEE, 2020.

5. Guangcheng Li, Qinglin Zhao, and Xianfeng Li, "A Decentralized Data Processing Framework Based on PoUW Blockchain", *International Conference on Blockchain and Trustworthy Systems (BlockSys)*, 2020.

6. Zhijie Ma, Qinglin Zhao, Jianwen Yuan, Xiaobo Zhou, and Li Feng, "Fork Probability Analysis of PoUW Consensus Mechanism", *IEEE International Conference on Smart Internet of Things (SmartIoT)*, pp. 333-337. IEEE, 2020.

7. Guangcheng Li, Xuanhui Chen, Qinglin Zhao, Daidong Du, Hong Liang, "Analysis of Duplicate Packing in FruitChain", *Proc. 6th International Conference on Robotics and Artificial Intelligence*, 2020.

8. Guangcheng Li, Qinglin Zhao, Mengfei Song, Daidong Du, Jianwen Yuan, Xuanhui Chen, and Hong Liang, "Predicting Global Computing Power of Blockchain Using Cryptocurrency Prices", *International Conference on Machine Learning and Cybernetics (ICMLC)*, pp. 1-6. IEEE, 2019.

9. Haisheng Tan, Shaofeng Jiang, Zhenhua Han, Liuyan Liu, Kai Han, and Qinglin Zhao, "Camul: Online Caching on Multiple Caches with Relaying and Bypassing", *IEEE INFOCOM*, April 29 – May 2, 2019, Paris, France.

Book Chapters

- Qinglin Zhao, "Modeling and Performance Evaluation of Mobile IP" (in Chinese), in *Trusted Mobile IPv6 Network and Protocol*, Ed. Yujun Zhang, Science Press, Beijing, China, pp. 91-131, 2008, (ISBN 978-7-03-020428-8).

US PATENTS

1. Qinglin Zhao, Rongchang Duan, Hanwen Zhang, Yujun Zhang, Zhongcheng Li, "Method for Evaluating Performance of a Data Communication Network", US 10,084,661 B2, 2018.

2. Qinglin Zhao, Zhijie Ma, "Method for Optimizing Throughput of a Network", US 9,942,150 B2, 2018.

3. Qinglin Zhao, Fangxin Xu, Yu Zeng, Jie Yang, "Method and System for Contention Queuing Using Queue-Based MAC Protocol", US 9,961,702 B2, 2018.

4. Qinglin Zhao, Fangxin Xu, Yu Zeng, Jie Yang, "Queue-Based MAC Protocol with Subcarrier Allocation Optimization", US 10,004,090 B2, 2018.

5. Qinglin Zhao, Caihong Kai, Hanxu Zheng, "Coding-Aware Scheme to Minimize Energy Consumption and Time Cost", US 10,004,037 B2, 2018.

6. Qinglin Zhao, Yuan Wu, Yanfei He, Jianchao Chen, Liping Qian, "Power Allocation Optimization Under Constraints of Throughput Requirements and Interference Limit for Cognitive Radio Networks", US 9,907,029 B2, 2018.

7. Qinglin Zhao, Zhijie Ma, "Method for Scheduling a Random-Access Communication System with Absolute and Proportional Throughput Guarantees", US 9,307,560 B2, 2016.

8. Qinglin Zhao, "Location Management Utilizing Initial Position for Mobile Networks", US 9,232,351 B1, 2016.

RESEARCH GRANTS

- **2023-2026:** Blockchain-based Cutting-edge Technologies for Web 3.0 (Sub-project: Full Lifecycle Security Protection and Supervision Technology for Web 3.0 Digital Assets). (National Key R&D Program of China). (1,000,000 RMB)
- **2023-2025:** Research and Application of Key Technologies of Real-Time Super-Resolution 360-Degree Panoramic Video Based on Neural Networks (Joint Macau FDCT and China GDST). (1,026,000 MOP)
- **2023-2026:** Exploiting Underlying Network Information for Parallel Dissemination of Block Segments (Macau FDCT). (1,391,000 MOP)
- **2021-2023:** Research and Prototype Implementation for Smart-Contract Support in the 3rd Generation Blockchain (Macau FDCT). (1,064,000 MOP)
- **2019-2022:** Research on Data Processing over PoUW-based Blockchain (NSF of china). (590,000 CNY)
- **2019-2021:** Research and Verification on Blockchain-based Fair Data Processing (Macau FDCT). (1,031,800 MOP)
- **2017-2019:** Study on Frequency-Domain Contention Protocols under Imperfect Synchronization (Macau FDCT). (1,071,400 MOP)
- **2017-2020:** Study and Implementation for Service Reputation-Rating, Transmission and Selection in Information-Centric Networking (Joint Macau FDCT and China MOST). (975,800 MOP)
- **2014-2017:** Design and Analysis of Wireless Protocols Utilizing New Physical-layer Techniques (Macau FDCT). (1,188,000 MOP)
- **2013-2016:** Idle Sense Scheme in Nonsaturated Wireless LANs (Macau FDCT). (1,102,200 MOP)
- **2011-2013:** Modeling, analysis, and application for prioritized contention-based protocols in wireless nonsaturated environment (Macau FDCT). (440,800 MOP)