

NING WANG

Department of Computer Science, Rowan University
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EDUCATION

- ◇ **Ph.D.**, Computer and Information Sciences *09/2013 - 07/2018*
Temple University, Philadelphia, USA
Thesis: Efficient Routing and Offloading Schemes Design for Internet-of-Things Systems
- ◇ **B.E.**, Electrical Engineering *09/2009 - 06/2013*
University of Electronic Science and Technology of China (UESTC), Chengdu, Sichuan, China

EMPLOYMENT

- ◇ **Assistant Professor**, Dept. of Computer Science *09/2018 - now*
Rowan University, Glassboro, USA

RESEARCH

◇ Research Interest

My research interests belong to the broad category of Internet-of-Things systems with a focus on decision-making, resource management, and optimization problems. Specific topics include Distributed Machine Learning Training and Inferencing, Mobile Edge Computing, Smart Cities, Wireless Communication, etc.

◇ Published Conference Papers

- C1. Dylan Perry, **N. Wang** and S. Ho, “Energy Demand Prediction with Optimized Clustering-Based Federated Learning,” *Proc. of IEEE Global Communications Conference (GLOBECOM’21)*.
- C2. M. Schofield, S. Ho, and **N. Wang**, “Handling Rebalancing Problem in Shared Mobility Services via Reinforcement Learning-based Incentive Mechanism,” *Proc. of 24th IEEE International Conference on Intelligent Transportation (ITSC’21)*.
- C3. **N. Wang**, Y. Duan, and J. Wu, “Accelerate Cooperative Deep Inference via Layer-wise Processing Schedule Optimization,” *Proc. of 30th International Conference on Computer Communications and Networks (ICCCN’21)*.
- C4. Y. Duan, **N. Wang** and J. Wu, “Reducing Makespans of DAG Scheduling through Interleaving Overlapping Resource Utilization,” *Proc. of the 17th International Conference on Mobile Ad Hoc and Sensor Systems (MASS’20)*.
- C5. S. Lu, J. Wu, Y. Duan, **N. Wang**, and J. Fang, “Cost-Efficient Resource Provision for Multiple Mobile Users in Fog Computing,” *Proc. of the 25th International Conference on Parallel and Distributed Systems (ICPADS’19)*.
- C6. **N. Wang** and J. Wu, “Cost-Efficient Worker Trajectory Planning Optimization in Spatial Crowdsourcing Platform,” *Proc. of the 16th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS’19)*.
- C7. Y. Duan, **N. Wang** and J. Wu, “Optimizing Order Dispatch for Ride-sharing Systems,” *Proc. of the 28th International Conference on Computer Communications and Networks (ICCCN’19)*.

- C8. **N. Wang**, J. Wu, and H. Dai, “Bundle Charging: Mobile Charging Trajectory Optimization in Dense Wireless Sensor Networks.”, *Proc. of the 39th IEEE International Conference on Distributed Computing Systems (ICDCS’19)*.
- C9. H. Zheng, **N. Wang** and J. Wu, “Non-Submodularity and Approximability: Influence Maximization in Online Social Networks,” *Proc. of the 20th IEEE International Conference on a World of Wireless, Mobile and Multimedia Networks (WoWMoM’19)*.
- C10. S. Lu, J. Wu, Y. Duan, **N. Wang**, and Z. Fang, “Cost-Efficient Resource Provisioning in Delay-Sensitive Cooperative Fog Computing,” *Proc. of the 24th IEEE International Conference on Parallel and Distributed Systems (ICPADS’18)*.
- C11. **N. Wang** and J. Wu, “Optimal Cloud Instance Acquisition via IaaS Cloud Brokerage with Volume Discount,” *Proc. of IEEE/ACM 26th International Symposium on Quality of Service (IWQoS’18)*.
- C12. **N. Wang** and J. Wu, “Latency Minimization Through Optimal Player Matchmaking in Multi-Party Online Gaming,” *Proc. of the 19th IEEE International Conference on a World of Wireless, Mobile and Multimedia Networks (WoWMoM’18)*.
- C13. **N. Wang** and J. Wu, “Optimal Data Partitioning and Forwarding in Opportunistic Mobile Networks,” *Proc. of the IEEE International Conference on Wireless Communications and Networking Conference (WCNC’18)*.
- C14. **N. Wang** and J. Wu, “Optimal Cellular Traffic Offloading Through Opportunistic Mobile Networks by Data Partitioning,” *Proc. of the IEEE International Conference on International Conference on Communications (ICC’18)*.
- C15. **N. Wang**, J. Wu, and P. Ostovari, “Coverage and Min-Max Workload Cost Balancing in Spatial Crowdsourcing,” *Proc. of the 14th IEEE International Conference on Ubiquitous Intelligence and Computing (UIC’17)*.
- C16. **N. Wang** and J. Wu, “Mutually Exclusive Data Dissemination in the Mobile Publish/Subscribe System,” *Proc. of the 13th IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS’16)*.
- C17. **N. Wang** and J. Wu, “Minimizing the Subscription Aggregation Cost in the Content-based Pub/Sub System,” *Proc. of the 25th IEEE International Conference on Computer Communications and Networks (ICCCN’16)*.
- C18. **N. Wang** and J. Wu. “Opportunistic WiFi Offloading in a Vehicular Environment: Waiting or Downloading Now?,” *Proc. of the 35th IEEE International Conference on Computer Communications (INFOCOM’16)*.
- C19. **N. Wang** and J. Wu. “Trajectory Scheduling for Timely Data Report in Underwater Wireless Sensor Networks,” *Proc. of the IEEE Global Communications Conference (GLOBECOM’15)*.
- C20. **N. Wang** and J. Wu. “A General Data and Acknowledgement Dissemination Scheme in Mobile Social Networks,” *Proc. of the 11th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS’14)*.

◇ **Published Journal Papers**

- J1. J. Zhang, J. Li, **N. Wang**, B. Wu, “An Enhanced Predictive Hierarchical Power Management Framework for Islanded Microgrids,” accepted to be appear in *IET Generation, Transmission Distribution*, 2021.
- J2. S. Lu, J. Wu, **N. Wang**, Y. Duan, H. Liu, J. Zhang, and J. Fang, “Resource provisioning in collaborative fog computing for multiple delaysensitive users,” accepted to be appear in *Software: Practice and Experience*, 2021.
- J3. Y. Duan, **N. Wang** and J. Wu, “Minimizing Training Time of Distributed Machine Learning by Reducing Data Communication,” accepted to be appear in **IEEE Transactions on Network Science and Engineering (TNSE)**, 2021.

- J4. **N. Wang**, J. Li, S. Ho, C. Qiu, “Distributed Machine Learning for Energy Trading in Electric Distribution System of the Future,” *The Electricity Journal* Vol. 34, No. 1, 2021.
- J5. S. Ho, M. Schofield, and **N. Wang**, “Learning Incentization Strategy for Resource Rebalancing in Shared Services With A Budget Constraint,” *Journal of Applied and Numerical Optimization (JANO)*, Vol 3, pp 105-114, 2021.
- J6. C. Qiu, A. Squicciarini, C. Pang, **N. Wang**, and B. Wu, “Location Privacy Protection in Vehicle-Based Spatial Crowdsourcing via Geo-Indistinguishability,” **IEEE Transactions on Mobile Computing (TMC)**, 2020.
- J7. S. Lu, J. Wu, Y. Duan, **N. Wang**, and J. Fang, “Towards cost-efficient resource provisioning with multiple mobile users in fog computing,” **Journal of Parallel and Distributed Computing**, Vol. 146, pp 96-106, 2020.
- J8. **N. Wang**, J. Wu and L. Sheng, “Rethink Data Forwarding in Mobile Social Networks using Movement History Information,” *Ad Hoc & Sensor Wireless Networks*, Vol. 46, pp 163-188, 2020.
- J9. J. Wu and **N. Wang**, “Approximating Special Social Influence Maximization Problems,” in *Tsinghua Science and Technology*, Vol. 25, No. 6, pp. 703-711, 2020.
- J10. H. Zhou, H. Wang, **N. Wang**, D. Li, Y. Cao, and J. Wu, “Exploiting Mobile Social Networks from Temporal Perspective: A Survey,” *IEEE Access*. Vol 7, pp 180818 - 180834, 2019.
- J11. **N. Wang** and J. Wu, “Cost-efficient Heterogeneous Worker Recruitment under Coverage Requirement in Spatial Crowdsourcing,” **IEEE Transactions on Big Data**, Early Access.
- J12. **N. Wang** and J. Wu, “Rethink Data Dissemination in Opportunistic Mobile Networks with Mutually Exclusive Requirement,” **Journal of Parallel and Distributed Computing**, Vol. 119,ba pp 50-63, 2018.
- J13. H. Zheng, **N. Wang**, and J. Wu, “Minimizing Deep Sea Data Collection Delay with Autonomous Underwater Vehicles,” **Journal of Parallel and Distributed Computing**, Vol. 104, pp 99-113, 2017.
- J14. **N. Wang** and J. Wu, “Data Dissemination in Mobile Social Networks with the Acknowledgment Feedback,” *Journal of Sensor and Actuator Networks*, Vol. 5, No. 2, 2016.

◇ Published Book Chapters

- B1. **N. Wang** and J. Wu, “Latency Minimization Through Optimal Data Placement in Fog Computing” in *Fog Computing: Theory and Practice*, pp 269 - 291, 2020, (Wiley).

◇ Published Workshop Papers

- W1. H. Zheng, H. Zhou, **N. Wang**, P. Chen, and S. Xu, “Reinforcement Learning for Energy-efficient Edge Caching in Mobile Edge Networks *Proc. of the 3rd IEEE International Workshop on Intelligent Cloud Computing and Networking (INFOCOM ICCN’21)*.
- W2. **N. Wang** and Y. Wang, “AutoWaze: Towards Automatic Event Inference in Intelligent Transportation Systems,” *Proc. of the ICNP Midscale Education and Research Infrastructure and Tools Community Event (ICNP MERIT’19)*.
- W3. **N. Wang** and J. Wu, “Maximizing the User’s Benefit in the Mobile Cloud Computing,” *Proc. of the MobiCom 8th ACM Wireless of the Students, by the Students, and for the Students Workshop (MobiCom S3’16)*.
- W4. **N. Wang** and J. Wu. “InterestSpread: An Efficient Method for Content Transmission in Mobile Social Networks,” *Proc. of the 1st International Workshop on Mobile Sensing, Computing and Communication (MobiHoc MSCC’14)*.

◇ Invited Talks

- Load Management with Schedule Cooperation between Smart Buildings and E-Buses, New Jersey Big Data Alliance (NJBDA), April 30, 2021

- Efficient Routing and Offloading Design in Internet-of-Things Systems, Rowan University, Feb. 20th, 2018
- Opportunistic Routing and Scheduling Design in Internet-of-Things Systems, University of Hartford, Feb. 4th, 2018

◇ **Research Students**

- Brian Joseph Campana (Summer 2021 - present)
- Dylan Jacob Perry (Spring 2020 - present)
- Matthew Schofield (Fall 2019 - present)
- Cameron Samuel Thatcher (Summer 2019 - present)
- Jeffrey Wang (Fall 2018 - Spring 2020)
- Scott Zockoll (Fall 2019 - Spring 2020)
- Zachary Miles (Summer 2019)

◇ **Research Grants**

- **National Science Foundation Cyber-Physical Systems Program** (\$329,493) 2021 - 2024
- Camden Health Research Initiative (\$100,000) 2020 - 2023
- Google Cloud Research Grant (\$ 5000 research credits) 2020 - 2021
- Google Cloud Research Grant (\$ 5000 research credits) 2019 - 2020

PROFESSIONAL ACTIVITIES

◇ **Journal Editor/Guest Editor:**

- Wireless Communications and Mobile Computing
- Wiley International Journal of Communication Systems
- Smart Grid Communications (specialty section of Frontiers in Communications and Networks)

◇ **Track/Workshop Chair/Co-Chair:**

- The 30th International Conference on Computer Communications and Networks (ICCCN 2021)
- The Second International Workshop on Advances in Fog/Edge Computing (AFEC'21)
- The Third International Workshop on Smart Living with IoT, Cloud, and Edge Computing (SLICE'20)
- The First International Workshop on Advances in Fog/Edge Computing (AFEC'20)
- The First International Workshop on Advances in Vehicular Networks (IWAVN'19)

◇ **Program Committee Member:**

- 2022 IEEE International Conference on Computer Communication (INFOCOM'22)
- 2021 IEEE International Conference on Connected and Autonomous Driving ((MetroCAD'21)
- 2021 IEEE Vehicular Technology Conference Spring (VTC'21)
- 2021 IEEE Wireless Communications and Networking Conference (WCNC'21)
- 2020 IEEE International Conference on Computer Communications and Networks (ICCCN'20)

- 2020 IEEE Wireless Communications and Networking Conference (WCNC'20)
- 2019 IEEE International Conference of Distributed Computer Systems (ICDCS'19)
- 2019 IEEE International Conference on Parallel and Distributed Systems (ICPADS'19)
- 2019 International Conference on Smart City and Informatization (iSCT'19)
- 2019 International Workshop on Cyberspace Security (IWCSS'19)
- 2019 EAI International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (Qshine'19)

◇ **Conference Reviewer:**

- 2018 IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS'18)
- 2018 International Conference on Big Data Computing and Communications (BIGCOM'18)
- 2018 IEEE Global Communications Conference (GLOBECOM'18)
- 2018 IEEE International Conference on Computer Communications and Networks (ICCCN'18)
- 2016 IEEE International Conference on Distributed Computing Systems (ICDCS'16)
- 2015 IEEE International Conference on Computer Communication (INFOCOM'15)
- 2015 IEEE International Conference on Sensing, Communication, and Conference (SECON'15)
- 2015 IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS'15)
- 2015 IEEE Global Communications Conference (GLOBECOM'15)
- 2014 IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS'14)

◇ **Journal Reviewer:**

- ACM Transactions on Internet Technology (TOIT)
- IEEE Transactions on Computers (TC)
- IEEE Transactions on Parallel and Distributed Systems (TPDS)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transaction on Cloud Computing (TCC)
- IEEE Transactions on Intelligent Transportation Systems (TITS)
- IEEE Transactions on Wireless Communications (TWC)
- IEEE Transaction on Service Computing (TSC)
- IEEE Internet of Things Journal (IoT-J)
- Journal of Parallel and Distributed Computing (JPDC)
- Journal of Computer Science and Technology (JCST)
- IEEE Wireless Communications Letters (WCL)
- International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC)
- Concurrency and Computation: Practice and Experience (CCPE)
- Journal on Wireless Communications and Networking
- IEEE Open Journal of the Communications Society

- IEEE Access
- IEEE Wireless Communications Letters
- IEEE Network Magazine
- Peer-to-Peer Networking and Applications
- SCIENCE CHINA Information Sciences

TEACHING EXPERIENCE

◇ Instructor:

- CS 04350: Blockchain Programming (2021 spring)
- CS 06410: Data Communication/Networking (2020 fall, 2020 spring, and 2019 spring)
- CS 04225: Principles of Data Structures (2021 spring, 2020 fall, 2020 spring, 2019 spring, and 2018 fall)
- CS 06510: Computer Networks (2020 fall and 2018 fall)

◇ Teaching Assistant:

- CIS 2107: Computer Systems & Low-Level Programming (2018 spring)
- CIS 2168: Data Structures (2017 fall and 2017 spring)
- CIS 3329: Network Architectures (2014 spring, 2014 fall, 2015 spring, and 2016 fall)
- CIS 1068: Program Design and Abstraction (2015 fall)
- CIS 3319: Wireless Networks and Security (2016 spring)

UNIVERSITY AND DEPARTMENT SERVICES

- Rowan University International Education Council *2019 - now*
- Computer Science Department Certificates of Undergraduate Studies coordinator *2021 - now*
- Computer Science Department Research Activity Committee Member *2018 - now*
- Computer Science Department Industry Outreach Committee Member *2018 - now*

AWARDS

- Outstanding Service Award of the ACM/IEEE IoTDI 2021 *2021*
- Service Award of the IEEE MASS 2019 *2019*
- Midscale Edu. and Res. Infrastructure and Tools Community Event Travel Award *2019*
- CIS Outstanding Graduate Teaching Assistant Award *2018*
- Student travel grant award of the IEEE SmartWorld 2017 *2017*
- Student travel grant award of the IEEE MobiCom 2016 *2016*
- Student travel grant award of the IEEE INFOCOM 2016 *2016*
- Student travel grant award of the IEEE MASS 2014 *2014*