XIAOWEN GONG

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Appointments

Godbold Associate Professor — Sept. 2023 - present
Assistant Professor — Jan. 2017 - Aug. 2023
Department of Electrical and Computer Engineering
Auburn University (AU) — Auburn, Alabama, USA

Postdoctoral Researcher — June 2015 - Dec. 2016
Department of Electrical and Computer Engineering
The Ohio State University (OSU) — Columbus, Ohio, USA
Supervisor: Ness Shroff

Education

Ph.D. — Aug. 2010 - May 2015
School of Electrical, Computer and Energy Engineering (ECEE)
Arizona State University (ASU) — Tempe, Arizona, USA
Supervisor: Junshan Zhang
ASU ECEE Palais Outstanding Doctoral Student Award
Thesis:"Wireless network design and optimization: From social awareness to security"

M.Sc. — Sept. 2008 - July 2010
Department of Electrical and Computer Engineering
University of Alberta — Edmonton, Alberta, Canada
Co-supervisors: Chintha Tellambura and Sergiy A. Vorobyov
Thesis:"Joint bandwidth and power allocation in wireless communication networks"

B.Eng. — Sept. 2004 - June 2008
Department of Electronic and Information Engineering
Huazhong University of Science and Technology (HUST) — Wuhan, Hubei, China
Graduated from the Advanced Class (special class for top students)

Research Interests

My research interests are generally in wireless networks and their applications, with current focuses on machine learning (ML) and AI in wireless networks, edge computing, and network security.

Honors and Awards

- **IEEE Internet of Things Journal (IoTJ) Runner-Up Best Paper Award** 2022

- **NSF Faculty Early Career Development Award (CAREER)** 2022
- **ASU ECEE Palais Outstanding Doctoral Student Award** 2015
  - awarded to 1 out of 46 graduating doctoral students in the school of ECEE during the 2014-2015 school year
- **IEEE INFOCOM Runner-up Best Paper Award** 2014
  - 2 winners and 1 runner-up best paper awards selected from 1600+ submissions in 2014
- IEEE INFOCOM Student Travel Grant 2014
- ACM MobiHoc Student Travel Grant 2013
- Excellent Graduate at HUST 2008

Publications

Books or Book Articles

[3] **X. Gong**, "Incentive mechanisms for mobile crowdsensing," Springer Encyclopedia of Wireless Networks, 2018.

[2] **X. Gong**, X. Chen, L. Yang, and J. Zhang, "Efficiency and Pareto optimality," Springer Encyclopedia of Wireless Networks, 2018.

[1] **X. Gong**, X. Chen, L. Yang, and J. Zhang, "Social group utility maximization," Springer Press, 2014.

Journal Papers (Published/Accepted) (my students are marked by *)

[25] **X. Gong**, M. Chen, D. Li, Y. Cao, "Delay-optimal distributed computation offloading in wireless edge networks", IEEE/ACM Trans. on Networking (**ToN**), vol. 32, no. 4, pp. 3376-3391, Aug. 2024.

[24] M. Chen, **X. Gong**, Y. Cao, "Delay-optimal distributed edge computation offloading with correlated computation and communication workloads", IEEE Transactions on Mobile Computing (**TMC**), vol. 22, no. 10, pp. 5846-5857, Oct. 2023.

[23] Q. Fang, Z. Zhai, S. Yu, Q. Wu, **X. Gong**, X. Chen, "Olive branch learning: A topology-aware federated learning framework for space-air-ground integrated network", IEEE Trans. on Wireless Communications (**TWC**), vol. 22, no. 7, pp. 4534-4551, July 2023.

[22] Y. Zhao*, **X. Gong**, F. Lin, X. Chen, "Data poisoning attacks and defenses in dynamic crowdsourcing with online data quality learning", IEEE Transactions on Mobile Computing (**TMC**), vol. 22, no. 5, pp. 2569-2581, May 2023.

[21] Y. Zhao*, **X. Gong**, X. Chen, "Privacy-preserving incentive mechanisms for truthful data quality in data crowdsourcing", IEEE Transactions on Mobile Computing (**TMC**), vol. 21, no. 7, pp. 2518-2532, July 2022.

[20] S. Yu, **X. Gong**, Q. Shi, X. Wang, X. Chen, “EC-SAGINs: Edge computing-enhanced space-air-ground integrated networks for Internet of vehicles”, IEEE Internet of Things Journal (**IoTJ**), vol. 9, no. 8, pp. 5742 - 5754, Apr. 2022.

[19] Z. Shi, G. Yang, **X. Gong**, S. He, J. Chen, “Quality-aware incentive mechanisms under social influences in data crowdsourcing”, IEEE/ACM Transactions on Networking (**ToN**), vol. 30, no. 1, pp. 176-189, Feb. 2022.

[18] S. Yu, X. Chen, Z. Zhou, **X. Gong**, D. Wu, “When deep reinforcement learning meets federated learning: Intelligent multi-timescale resource management for multi-access edge computing in 5G ultra dense network,” IEEE Internet of Things Journal **(IoTJ)**, vol. 8, no. 4, pp. 2238-2251, Feb. 2021.

[17] C. Gong, F. Lin, **X. Gong**, Y. Lu, “Intelligent cooperative edge computing in the Internet of Things,” IEEE Internet of Things Journal **(IoTJ)**, vol. 7, no. 10, pp. 9372-9382, Oct. 2020.

[16] M. Zhang, J. Chen, S. He, L. Yang, **X. Gong**, J. Zhang, “Privacy-preserving database assisted spectrum access for industrial Internet of Things: A distributed learning approach,” IEEE Transactions on Industrial Electronics **(TIE)**, vol. 67, no. 8, pp. 7094-7103, Aug. 2020.

[15] **X. Gong**, N. Shroff, “Truthful data quality elicitation for quality-aware data crowdsourcing,” IEEE Transactions on Control of Network Systems **(TCNS)**, vol. 7, no. 1, pp. 326-337, Mar. 2020.

[14] **X. Gong**, N. Shroff, “Truthful mobile crowdsensing for strategic users with private data quality,” IEEE/ACM Transactions on Networking **(ToN)**, vol. 27, no. 5, pp. 1959-1972, Oct. 2019.

[13] M. Zhang, L. Yang, **X. Gong**, S. He, J. Zhang, “Wireless service pricing competition under network effect, congestion effect, and bounded rationality,” IEEE Transactions on Vehicular Technology **(TVT)**, vol. 67, no. 8, pp. 7497-7507, Aug. 2018.

[12] **X. Gong**, X. Chen, K. Xing, D.-H. Shin, M. Zhang, and J. Zhang, “From social group utility maximization to personalized location privacy in mobile networks,” IEEE/ACM Transactions on Networking **(ToN)**, vol. 25, no. 3, pp. 1703-1716, June 2017.

[11] **X. Gong**, L. Duan, X. Chen, and J. Zhang, “When social network effect meets congestion effect in wireless networks: Data usage equilibrium and optimal pricing” IEEE Journal on Selected Areas of Communications (special issue on game theory for networks) **(JSAC)**, vol. 35, no. 2, pp. 449-462, Feb. 2017.

[10] X. Chen, **X. Gong**, L. Yang, and J. Zhang, “Amazon in the white space: Social recommendation aided distributed spectrum access,” IEEE/ACM Transactions on Networking **(ToN)**, vol. 25, no. 1, pp. 536-549, Feb. 2017.

[9] X. Chen, **X. Gong**, L. Yang, and J. Zhang, “Exploiting social tie structure for cooperative wireless networking: A social group utility maximization framework,” IEEE/ACM Transactions on Networking **(ToN)**, vol. 24, no. 6, pp. 3593-3606, Dec. 2016.

[8] **X. Gong**, J. Zhang, D. Cochran, and K. Xing, “Optimal placement for barrier coverage in bistatic radar sensor networks,” IEEE/ACM Transactions on Networking **(ToN)**, vol. 24, no. 1, pp. 259-271, Feb. 2016.

[7] X. Chen, B. Proulx, **X. Gong**, and J. Zhang, “Exploiting social ties for cooperative D2D communications: A mobile social networking case,” IEEE/ACM Transactions on Networking **(ToN)**, vol. 23, no. 5, pp. 1471-1484, Oct. 2015.

[6] **X. Gong**, X. Chen, J. Zhang, and H. V. Poor “Exploiting social trust assisted reciprocity (STAR) towards utility-optimal socially-aware crowdsensing,” IEEE Transactions on Signal and Information Processing over Networks **(TSIPN)**, vol. 1, no. 3, pp. 195-208, Sept. 2015.

[5] S. He, **X. Gong**, J. Zhang, J. Chen and Y. Sun, “Curve-based deployment for barrier coverage in wireless sensor networks,” IEEE Transactions on Wireless Communications **(TWC)**, vol. 13, no. 2, Feb. 2014.

[4] L. Tang, **X. Gong**, J. Zhang, and J. Wu, “Target detection in bistatic radar networks: Node placement and repeated security game,” IEEE Transactions on Wireless Communications **(TWC)**, vol. 12, no. 3, pp. 1279-1289, Mar. 2013.

[3] **X. Gong**, C. Thejaswi, J. Zhang, and H. V. Poor, “Opportunistic cooperative networking: To relay or not to relay?” IEEE Journal on Selected Areas of Communications (special issue on cooperative networking — challenges and applications) **(JSAC)**, vol. 30, no. 2, pp. 307-314, Feb. 2012.

[2] **X. Gong**, S. A. Vorobyov, and C. Tellambura, “Optimal bandwidth and power allocation for sum ergodic capacity under fading channels in cognitive radio networks,” IEEE Transactions on Signal Processing **(TSP)**, vol. 59, no. 4, pp. 1814-1826, Apr. 2011.

[1] **X. Gong**, S. A. Vorobyov, and C. Tellambura, “Joint bandwidth and power allocation with admission control in wireless multi-user networks with and without relaying,” IEEE Transactions on Signal Processing **(TSP)**, vol. 59, no. 4, pp. 1801-1813, Apr. 2011.

Conference Papers (my students are marked by *)

[33] D. Li*, **X. Gong**, “Anarchic federated learning with delayed gradient aggregation”, ACM International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing (**MobiHoc**), Washington DC, USA, Oct. 23-26, 2023.

[32] D. Li*, **X. Gong**, “Anarchic convex federated learning”, IEEE International Conference on Computer Communications (**INFOCOM**) Workshop on Distributed Machine Learning and Fog Networks (**FOGML**), online, May 20, 2023.

[31] Y. Zhu*, **X. Gong**, “Distributed policy gradient with heterogeneous computation for federated reinforcement learning”, Conference on Information Sciences and Systems (**CISS**), Baltimore, MD, USA, Mar. 22-24, 2023.

[30] Y. Zhao*, **X. Gong**, S. Mao, “Truthful incentive mechanism for federated learning with crowdsourced data labeling”, IEEE International Conference on Computer Communications (**INFOCOM**), New York area, USA, May 17-20, 2023.

[29] D. Li*, Y. Zhao*, **X. Gong**, “Quality-aware distributed computation and communication scheduling for fast convergent wireless federated learning”, International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (**WiOpt**), online, Oct. 18-21, 2021.

[28] Y. Zhao*, **X. Gong**, “Quality-aware distributed computation for cost-effective non-convex and asynchronous wireless federated learning”, International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (**WiOpt**), online, Oct. 18-21, 2021.

[27] Y. Zhao*, **X. Gong**, “Quality-aware distributed computation and user selection for cost-effective federated learning”, IEEE International Conference on Computer Communications (**INFOCOM**) Workshop on Distributed Machine Learning and Fog Networks (**FOGML**), online, May 10, 2021.

[26] **X. Gong**, “Delay-optimal distributed edge computing in wireless edge networks,” IEEE International Conference on Computer Communications (**INFOCOM**), July 6-9, online, 2020.

[25] Y. Zhao*, **X. Gong**, “Truthful quality-aware data crowdsensing for machine learning,” IEEE International Conference on Sensor and Ad Hoc Communications and Networks **(SECON)**, Boston, MA, USA, June 10-13, 2019.

[24] X. Zhang*, **X. Gong**, “Online data quality learning for quality-aware crowdsensing,” IEEE International Conference on Sensor and Ad Hoc Communications and Networks **(SECON)**, Boston, MA, USA, June 10-13, 2019.

[23] **X. Gong**, “Incentivizing quality-based data crowdsourcing,” IJCAI-ECAI Workshop on Game-Theoretic Mechanisms for Data and Information (**GameData**), Stockholm, Sweden, July 14, 2018.

[22] **X. Gong**, N. B. Shroff, “Incentivizing truthful data quality in quality-aware mobile data crowdsourcing,” ACM International Symposium on Mobile Ad Hoc Networking and Computing **(MobiHoc)**, Los Angeles, CA, USA, June 25-28, 2018.

[21] **X. Gong**, N. B. Shroff, “Truthful mobile crowdsensing for strategic users with private qualities,” International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (**WiOpt**), Paris, France, May 15-19, 2017.

[20] M. Zhang, L. Yang, **X. Gong**, and J. Zhang, "Privacy-preserving crowdsensing: privacy valuation, network effect, and profit maximization,” IEEE Global Telecommunications Conference **(GLOBECOM)**, Washington, DC, USA, Dec. 4-8, 2016.

[19] M. Zhang, L. Yang, **X. Gong**, and J. Zhang, "Impact of network effect and congestion effect on price competition among wireless service providers," Conference on Information Sciences and Systems **(CISS)**, Princeton, NJ, USA, Mar. 16-18, 2016.

[18] M. Zhang, L. Yang, D. Shin, **X. Gong**, and J. Zhang, "Privacy-preserving database assisted spectrum access: A socially-aware distributed learning approach," IEEE Global Telecommunications Conference **(GLOBECOM)**, San Diego, CA, USA, Dec. 6-10, 2015.

[17] **X. Gong**, L. Duan, and X. Chen, "When network effect meets congestion effect: Leveraging social services for wireless services," ACM International Symposium on Mobile Ad Hoc Networking and Computing **(MobiHoc)**, Hangzhou, China, Jun. 22-25, 2015. **(acceptance ratio: 14.8%)**

[16] **X. Gong**, X. Chen, K. Xing, D. Shin, M. Zhang, and J. Zhang, "Personalized location privacy in mobile networks: A social group utility approach," IEEE International Conference on Computer Communications **(INFOCOM)**, Hong Kong, China, Apr. 26- May 1, 2015. **(acceptance ratio: 19.3%)**

[15] **X. Gong**, X. Chen, J. Zhang, and H. V. Poor, "From social trust assisted reciprocity (STAR) to utility-optimal mobile crowdsensing," IEEE Global Conference on Signal and Information Processing **(GlobalSIP)**, Atlanta, GA, USA, Dec. 3-5, 2014.

[14] X. Chen, **X. Gong**, L. Yang, and J. Zhang, "A social group utility maximization framework with applications in database assisted spectrum access," IEEE International Conference on Computer Communications **(INFOCOM)**, Toronto, Canada, Apr.27- May 2, 2014. **(Runner-up Best Paper Award)**

[13] **X. Gong**, X. Chen, and J. Zhang, "Social group utility maximization in mobile networks: From altruistic to malicious behavior," IEEE Conference in Information Sciences and Systems **(CISS)**, Princeton, NJ, USA, Mar. 19-21, 2014.

[12] **X. Gong**, X. Chen, and J. Zhang, "Social group utility maximization game with applications in mobile social networks," Allerton Conference on Communication, Control and Computing **(Allerton)**, Monticello, IL, USA, Oct. 2-4, 2013.

[11] **X. Gong**, J. Zhang, D. Cochran, and K. Xing, "Barrier coverage in bistatic radar networks: Cassini oval sensing and optimal placement," ACM International Symposium on Mobile Ad Hoc Networking and Computing **(MobiHoc)**, Bangalore, India, Jul. 29- Aug. 1, 2013. **(acceptance ratio: 10.3%)**

[10] X. Chen, B. Proulx, **X. Gong**, and J. Zhang, "Social trust and social reciprocity based cooperative D2D communications," ACM International Symposium on Mobile Ad Hoc Networking and Computing **(MobiHoc)**, Bangalore, India, Jul. 29- Aug. 1, 2013. **(acceptance ratio: 10.3%)**

[9] **X. Gong**, J. Zhang, and D. Cochran, "When target motion matters: Doppler coverage in radar sensor networks," IEEE International Conference on Computer Communications **(INFOCOM)**, Turin, Italy, Apr. 14-19, 2013. **(acceptance ratio: 17.4%)**

[8] S. He, **X. Gong**, J. Zhang, J. Chen and Y. Sun, "Barrier coverage in wireless sensor networks: From line-based to curve-based deployment," IEEE International Conference on Computer Communications **(INFOCOM)** Mini-Conference, Turin, Italy, Apr. 14-19, 2013.

[7] L. Tang, **X. Gong**, J. Wu, and J. Zhang, "Target detection in bistatic radar networks: Node placement and dynamic frequency selection," IEEE Conference in Information Sciences and Systems **(CISS)**, Princeton, NJ, USA, Mar. 21-23, 2012.

[6] **X. Gong**, C. Thejaswi, J. Zhang, and H. V. Poor, "Distributed opportunistic scheduling for cooperative networking," IEEE Global Telecommunications Conference **(GLOBECOM)**, Houston, TX, USA, Dec. 5-9, 2011.

[5] L. Tang, **X. Gong**, J. Wu, and J. Zhang, "Secure wireless communications via relaying and jamming," IEEE Global Telecommunications Conference **(GLOBECOM)** Workshop on Physical-layer Security, Houston, TX, USA, Dec. 5-9, 2011.

[4] **X. Gong**, S. A. Vorobyov, and C. Tellambura, "Joint bandwidth and power allocation in cognitive radio networks under fading channel," IEEE International Conference on Acoustics, Speech, and Signal Processing **(ICASSP)**, Prague, Czech Republic, May 22-27, 2011.

[3] **X. Gong**, S. A. Vorobyov, and C. Tellambura, "Admission control based joint bandwidth and power allocation in multi-user DF relay networks," IEEE Asilomar Conference on Signals, Systems, and Computers **(Asilomar)**, Pacific Grove, California, USA, Nov. 7-10, 2010.

[2] **X. Gong**, S. A. Vorobyov, and C. Tellambura, "Joint bandwidth and power allocation in wireless multi-user DF relay networks," IEEE International Conference on Acoustics, Speech, and Signal Processing **(ICASSP)**, Dallas, Texas, USA, Mar. 14-19, 2010.

[1] **X. Gong**, W. Yuan, W. Liu, W. Cheng, and S. Wang, "A cooperative relay scheme for secondary communication in cognitive radio networks," IEEE Global Telecommunications Conference **(GLOBECOM)**, New Orleans, LA, USA, Nov. 30-Dec. 4, 2008.

Professional Services

Organizing Committee

- Student Travel Grant Chair for IEEE International Conference on Computer Communications (INFOCOM) 2023, 2024
- Student Conference Grant Chair for IEEE International Conference on Computer Communications (INFOCOM) 2022
- Web Chair for IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS) 2021
- Co-Organizer for Computing, Communications and IoT Applications Conference (ComComAp), Special Session on Intelligent Edge Computing and Networking 2019
- Poster Chair for ACSIC Symposium on Frontiers in Computing (SOFC) 2019
- Submission and Publication Chair for ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc) 2018
- Publication Chair for ACM Symposium on Edge Computing (SEC) 2017

Journal Editor

- Lead Guest Editor for IEEE Open Journal of the Communications Society (OJ-COMS), Special Issue on “Distributed edge learning in wireless networks”, 2023
- Associate Editor for IEEE Transactions on Wireless Communications, 2020-present
- Guest Editor for IEEE Transactions on Network Science and Engineering (TNSE), Special Issue on “The Nexus Between Edge Computing and AI for 6G Networks”, 2022
- Guest Editor for Hindawi Wireless Communications and Mobile Computing, Special Issue on Recent Advances in Cloud-Aware Mobile Fog Computing, 2019

Technical Program Committee

- IEEE International Conference on Computer Communications (INFOCOM) 2018-2025
- ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc) 2019-2024
- International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt) 2019-2022
- IEEE Global Communications Conference (GLOBECOM) 2017-2018
- IEEE Wireless Communications and Networking Conference (WCNC) 2017-2018, 2020-2021
- IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC) 2020
- IEEE/CIC International Conference on Communications in China (ICCC) 2015-2018
- EAI International Conference on Communications and Networking in China (CHINACOM) 2015
- IEEE Wireless Communications and Networking Conference (WCNC) 2015 Workshop on Self-Organizing Heterogeneous Networks (So-HetNets)

Journal Reviewer

- IEEE/ACM Transactions on Networking
- ACM Transactions on Sensor Networks
- IEEE Transactions on Mobile Computing
- IEEE Journal on Selected Areas in Communications
- IEEE Transactions on Communications

- IEEE Transactions on Wireless Communications
- IEEE Transactions on Vehicular Technology
- IEEE Communication Letters
- IEEE Transactions on Signal and Information Processing over Networks
- IEEE Internet of Things Journal
- IEEE Access
- IEEE Transactions on Industrial Informatics
- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Information Forensics and Security
- IEEE Transactions on Neural Networks and Learning Systems
- ELSEVIER Ad Hoc Networks
- ELSEVIER Computer Communications

Conference Reviewer

- IEEE International Conference on Computer Communications (INFOCOM) 2016
- ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc) 2015
- IEEE International Symposium on Information Theory (ISIT) 2011
- IEEE Global Telecommunications Conference (GLOBECOM) 2010-2011, 2013
- IEEE International Conference on Communications (ICC) 2011
- IEEE Wireless Communications and Networking Conference (WCNC) 2015
- IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC) 2011, 2013

Volunteer

- ACM Conference on Computer and Communications Security (CCS) 2014
- IEEE International Conference on Computer Communications (INFOCOM) Technical Program Committee Meeting 2013