Mingliang Xiong

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Google scholar citation: 121; h-index: 8 (May. 11, 2022)

BIOGRAPHY

Mingliang Xiong received his B.Eng. degree in communications engineering from the Nanjing University of Posts and Telecommunications (NUPT), Nanjing, China, in 2017. He is currently working toward the Ph.D. degree in the College of Electronics and Information Engineering, Tongji University (top 8 in China mainland, QS rankings 2022), Shanghai, China, supervised by Prof. Qingwen Liu. He has published 12 journal papers on *IEEE TWC*, *COMMAG*, *IOTJ*, *TCOM*, etc., and 3 conference papers on *IEEE ICC*, etc., and was granted 9 Chinese patents. He also led the developments of long-range wireless charging system based on intra-cavity resonant laser beam (reported by *China Science Daily*) and self-aligned laser communication system. He served as the reviewer of *IEEE TWC*, *TSIPN*, *TVT*, *WCSP*, etc. He was awarded the Huawei Scholarship in 2021, the National Scholarship (top 2% among all graduate students) in 2020, and the Phoenix Contact Scholarship in 2018. Recently, he won the Academic Pioneer Award which was awarded to only 10 graduate students every year by Tongji University.

EDUCATION

09/2017 – present: Tongji University, Shanghai, China
Ph.D. Candidate in Computer Science and Technology
College of Electronic and Information Engineering
Advisor: Prof. Qingwen Liu

09/2013 – 07/2017: Nanjing University of Posts and Telecommunications, Nanjing, China
B.Eng. in Communications Engineering
Bell Honors School

- **01/2016 – 02/2016: Columbia University, New York, USA**
  2016 NUPT Columbia Academic Program: Academic Lectures and Cultural Studies

RESEARCH INTERESTS

6G, Internet of Things, Wireless Powered Communication Network, Metaverse

HONORS & AWARDS

12/2021: Academic Pioneer Award for Graduate Students of Tongji University (10/30000 university-wide)
12/2021: Huawei Scholarship
12/2020: National Scholarship of China (Top 2% among all graduate students)
10/2018: Phoenix Contact Scholarship
10/2016: Excellent Student Award and First-Class Scholarship of NUPT
08/2016: Second Prize in Chinese Undergraduate Computer Design Contest
12/2015: Second Prize in Certificate Authority Cup International Mathematical Contest in Modeling
08/2015: First Prize in National Undergraduate Electronic Design Contest (Jiangsu Division)

05/2015: First Prize in Student's Optoelectronic Design Competition of NUPT

12/2014: First Prize in "Innovation Cup" Extracurricular Academic and Technical Works Competition of NUPT

10/2014: Excellent Student Award and First-Class Scholarship of NUPT

PUBLICATIONS

Journal Papers

Co-first author.

[1] **M. Xiong**, Q. Liu*, and S. Zhou, "Optimization of a mobile optical SWIPT system with asymmetric spatially separated laser resonator," ***IEEE Transactions on Wireless Communications***, 2022, to appear.

[2] Q. Liu[#(advisor)], **M. Xiong**[#], M. Liu[#], Q. Jiang, W. Fang, and Y. Bai, "Charging a smartphone over the air: The resonant beam charging method," ***IEEE Internet of Things Journal***, 2022, to appear.

[3] **M. Xiong**, Q. Liu, X. Wang, S. Zhou, B. Zhou, and Z. Bu, "Mobile optical communications using second harmonic of intra-cavity laser", ***IEEE Transactions on Wireless Communications***, vol. 21, no. 5, May 2021.

[4] **M. Xiong**, M. Liu, Q. Jiang, J. Zhou, Q. Liu, and H. Deng, "Retro-reflective beam communications with spatially separated laser resonator," ***IEEE Transactions on Wireless Communications***, vol. 20, no. 8, pp. 4917-4928, Aug. 2021.

[5] **M. Xiong**, Q. Liu, G. Wang, G. B. Giannakis, S. Zhang, J. Zhu, C. Huang, "Resonant beam communications with echo interference elimination," ***IEEE Internet of Things Journal***, vol. 8, no. 4, pp. 2875-2885, Feb. 2021.

[6] **M. Xiong**, Q. Liu, M. Liu, X. Wang, and H. Deng, "Resonant beam communications with photovoltaic receiver for optical data and power transfer," ***IEEE Transactions on Communications***, vol. 68, no. 5, pp. 3033-3041, May 2020.

[7] **M. Xiong**, Q. Liu, G. Wang, G. B. Giannakis, and C. Huang, "Resonant beam communications: Principles and designs," ***IEEE Communications Magazine***, vol. 57, no. 10, pp. 34-39, Oct. 2019.

[8] **M. Xiong**, M. Liu, Q. Zhang, Q. Liu, J. Wu, and P. Xia, "TDMA in adaptive resonant beam charging for IoT devices," ***IEEE Internet of Things Journal***, vol. 6, no. 1, pp. 867-877, Feb. 2019.

[9] J. Zhou, **M. Xiong**, M. Liu, Q. Liu, and S. Zhou, "Transient analysis for resonant beam charging and communication", ***IEEE Internet of Things Journal***, vol. 9, no. 4, pp. 3074-3082, Feb. 2022.

[10] M. Liu, **M. Xiong**, Q. Liu, S. Zhou, and H. Deng, "Mobility-enhanced simultaneous light wave information and power transfer", ***IEEE Transactions on Wireless Communications***, vol. 20, no. 10, pp. 6927-6939, Oct. 2021.

[11] M. Liu, H. Deng, Q. Liu, J. Zhou, **M Xiong**, L. Yang, and G. B. Giannakis, "Simultaneous mobile information and power transfer by resonant beam", ***IEEE Transactions on Signal Processing***, vol. 69, pp. 2766-2778, May 2021.

[12] Q. Zhang, W. Fang, **M. Xiong**, Q. Liu, J. Wu, and P. Xia, "Adaptive resonant beam charging for intelligent wireless power transfer," ***IEEE Internet of Things Journal***, vol. 6, no. 1, pp. 1160-1172, Feb. 2019.

[13] M. Liu, G. Wang, G. B. Giannakis, **M. Xiong**, Q. Liu, and H. Deng, "Wireless power transmitter deployment for balancing fairness and charging service quality," ***IEEE Internet of Things Journal***, vol. 7, no. 3, pp. 2223- 2234, Mar. 2020.

Conference Papers

Co-first author.

[14] **M. Xiong**[#], Q. Liu[#], M. Liu, and P. Xia, "Resonant beam communications," in *Proc.* ***IEEE International Conference on Communications (ICC)***, Shanghai, China, Dec. 2019, pp. 1-6. **(Oral presentation)**

[15] **M. Xiong**, Q. Liu, G. Wang, G. B. Giannakis, S. Zhang, and C. Huang, "Analytical models for resonant beam communications," in *Proc.* ***11th International Conference on Wireless Communications and Signal Processing (WCSP)***, Xi'an, China, Oct. 2019, pp. 1-6.

[16] **M. Xiong**, Y. Wu, Y. Ding, X. Mao, Z. Fang, and H. Huang, "A smart home control system based on indoor location and attitude estimation," in *Proc.* ***International Conference on Computer, Information and Telecommunication Systems (CITS)****, Kunming*, China, Aug. 2016, pp. 1-5. **(Oral presentation)**

Preprint Papers

[17] **M. Xiong**, Q. Liu, S. Zhou, S. Han, and M. Liu, "High-power and high-capacity mobile optical SWIPT", submitted to ***IEEE Transactions on Communications***, Preprint arxiv: 2107.09299. (**Under review**)

PATENTS ISSUED

[1] **M. Xiong**, Q. Liu, D. Hao, and Q. Zhang, "Mobile optical charging system based on Time division multiplexing and pulse width modulation and its application," Chinese Patent No. ZL201711394642.4, issued Dec. 21, 2021.

[2] **M. Xiong**, Q. Liu, D. Hao, Q. Zhang, W. Fang, and A. Wu, "A method and system of wireless optical charging safety control based on safeguard light," Chinese Patent No. ZL201810246633.9, issued Sept. 3, 2021.

[3] **M. Xiong**, Q. Liu, D. Hao, Q. Zhang, Y. Bai, and H. Li, "A resonance beam communication device based on detection and feedback control," Chinese Patent No. ZL201911001138.2, issued June 4, 2021.

[4] **M. Xiong,** Q. Liu, D. Hao, and Q. Zhang, "A mobile optical communication device supporting high-speed multi-beam tracking," Chinese Patent No. ZL201910978949.1, issued Mar. 26, 2021.

[5] **M. Xiong**, Q. Liu, D. Hao, W. Fang, Q. Zhang, and A. Wu, "Wireless communication device based on distributed optical resonator," Chinese Patent No. ZL201711063529.8, issued June 26, 2020.

[6] **M. Xiong**, M. Liu, Q. Liu, D. Hao, W. Fang, and Q. Zhang, "A square sunken stair shaped retroreflector and arrays," Chinese Patent No. ZL201811236796.5, issued Oct. 2, 2020.

[7] **M. Xiong**, Q. Liu, D. Hao, W. Fang, M. Liu, and M. Xu. "An echo-interference-free resonant optical communication device based on optical frequency doubling," Chinese Patent No. ZL201910978155.5, issued Oct. 2, 2020.

[8] H. Deng, M. Liu, **M. Xiong**, Q. Liu, M. Xu, W. Fang, and Y. Bai, "A wireless power transmission system and method based on electromagnetic echo excitation and amplification," Chinese Patent No. ZL201910818272.5, issued Mar. 26, 2021.

[9] M. Xu, M. Liu, Q. Liu, H. Deng, and **M. Xiong**. A positioning system based on distributed optical resonance system. Chinese Patent No. ZL201910816531.0, issued Sept. 3, 2021.

PROJECT EXPERIENCE

11/2019 – present：Mobile optical wireless charging system based on resonant beam (Team Leader)

- ✧ Optical experiments: retroreflector-based thin-disk resonator, photoelectric conversion
- ✧ MPPT and Battery charging management circuit
- ✧ Laser resonator and light field simulation
- ✧ 3D modeling and printing

11/2017 – 10/2019: Long-distance and safe laser power transfer system (Team Leader)

- ✧ Optical experiments: solid-state laser resonator, photoelectric conversion
- ✧ Infrared communications circuit and embedded system
- ✧ MPPT and Battery charging management circuit

12/2016 – 10/2017: Lossless and low-latency AR video transmission system (Major Participant)

- ✧ RaptorQ forward error correction codec
- ✧ Multi-thread coding and decoding
- ✧ Socket for TCP/UDP protocol

03/2016 – 07/2016: Smart home control system based on indoor positioning and attitude recognition (Team Leader)

- ✧ IoT embedded system
- ✧ Android OS Application
- ✧ Positioning based on Bluetooth signal map
- ✧ Web server

06/2015 – 08/2015: Development of 100-MHz spectrum analyzer (Team Leader)

- ✧ Phase-locked loop, voltage-controlled oscillator, narrow-band filter, mixer
- ✧ Analog-to-digital conversion signal link
- ✧ Reliable power supply circuit
- ✧ User interface for spectrum display and parameters setting

09/2014 – 12/2014: Smart parking management system based on BLE4.0 and magnetic sensing (Team Leader)

- ✧ IoT embedded system
- ✧ Bluetooth low power 4.0 protocol
- ✧ Windows application and user interface development

WORKING EXPERIENCES

09/2016 – 11/2016: Nanjing Fujitsu Nanda Software Technology Co.,Ltd, Nanjing, China

Software Engineer Intern: Development of Linux package management software

LECTURES

12/2021: Free-space optical communications and power transfer. Huawei Technologies Co., Ltd.

04/2021: Experience on innovation and writing a scientific paper. Bosi Forum, Tongji University

FUNDING APPLICATION ASSISTANCE

01/2021 – 12/2024: Theory and method of long-distance safe energy transmission of intra-cavity laser

- ✧ Funded by National Natural Science Foundation of China, No. 62071334
- ✧ The second participant

01/2021 – 12/2024: Theory and method of long-range SWIPT system for Internet of Things equipment

- ✧ Funded by the Key Laboratory of Wireless Sensor Network and Communication, Chinese Academy of Sciences

REVIEWERS

IEEE Transactions on Wireless Communications
IEEE Transactions on Vehicular Technology
IEEE Transactions on Signal and Information Processing over Networks
Journal of Communications and Information Networks
Signal Processing
Photonics
IEEE WCSP
IEEE IINTEC

MENTORING EXPERIENCES

Shun Han, Ph.D. student, Tongji University, 2021 - present
Qingwei Jiang, Ph.D. student, Tongji Univeresity, 2020 - present
Jie Zhou, Master student, Tongji Univeresity, 2020 - present
Mengyuan Xu, Ph.D. student, Tongji University, 2019 - present
Zheyi Ma, Master student, Tongji Univeresity, 2019 - 2022 (Microsoft, Suzhou)
Mingqing Liu, Ph.D. student, Tongji Univeresity, 2018 - present

TECHNICAL SKILLS

Programming Skills

C/C++, Matlab, Python, Visual Basic, Verilog

Application Skills

Keil, Altium Designer, Protel, Multisim, Proteus, Matlab, Simulink, Visual Studio, Git, Solid Works, 3D Max, Shapr 3D, Visio, LaTex ...