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EDUCATION

- National University of Singapore, Singapore 2010-2014
- Ph.D., Department of Electrical and Computer Engineering
 - Thesis Topic: *Advances in Resource Allocation for Multiuser Wireless Systems with Joint Energy and Information Transfer*
 - Supervisors: Prof. Rui Zhang (Main Supervisor)
Prof. Kee Chaing Chua (Co-Supervisor)
- Tianjin University, Tianjin, China 2006-2010
- B.Eng., School of Electronic Information Engineering

WORKING EXPERIENCE

- The Hong Kong Polytechnic University, Hong Kong 2019.05-Present
- Assistant Professor
- National University of Singapore, Singapore 2017.11-2019.04
- Research Fellow
- University of Toronto, Canada 2015.11-2017.10
- Postdoctoral Fellow
- National University of Singapore, Singapore 2015.01-2015.10
- Research Fellow

HONORS AND AWARDS

- **Highly Cited Researcher, 2018**, by Clarivate Analytics
- **IEEE Signal Processing Society Young Author Best Paper Award, 2017**
- Best student paper award, IEEE International Conference on Wireless Communications and Signal Processing, 2011
- Exemplary Reviewer for IEEE Transactions on Communications, 2018 (Fewer than 2%)
- Exemplary Reviewer for IEEE Wireless Communications Letters, 2017 (Fewer than 3%)
- Exemplary Reviewer for IEEE Transactions on Communications, 2015 (Fewer than 2%)
- Exemplary Reviewer for IEEE Wireless Communications Letters, 2015 (Fewer than 3%)
- Exemplary Reviewer for IEEE Communications Letters, 2014 (Fewer than 3%)
- Exemplary Reviewer for IEEE Communications Letters, 2013 (Fewer than 3%)
- President's Graduate Fellowships, National University of Singapore, 2011-2014
- Research Scholarship, National University of Singapore, 2010-1011
- National Scholarship, Tianjin University, 2007/2008

RESEARCH INTERESTS

- Wireless communications and networking
- Signal processing and optimization
- Internet of Things (IoT)

PUBLICATIONS ([ResearcherID](#), [Google Scholar Profile](#))

Book Chapter

- B1 **L. Liu**, W. Yu, and O. Simeone, “Fronthaul-aware radio access for cloud-assisted wireless systems,” in *Emerging Technologies for 5G Wireless Systems*, (editors: V. Wong, R. Schober, D. W. K. Ng, and L. C. Wang), Cambridge University Press, 2017.
- B2 **L. Liu**, J. Xu, and R. Zhang, “Transmit beamforming for simultaneous wireless information and energy transfer,” in *Library in Signal Processing*, (editors: R. Chellappa, and S. Theodoridis), New York: Academic Press, 2017.

Journal Paper

- J1 **L. Liu**, R. Zhang, and K. C. Chua, “Achieving global optimality for weighted sum-rate maximization in the K-user Gaussian interference channel with multiple antennas,” *IEEE Trans. Wireless Commun.*, vol. 11, no. 5, pp. 1933-1945, May 2012. (Journal Impact Factor: 6.394)
- J2 **L. Liu**, R. Zhang, and K. C. Chua, “Wireless information transfer with opportunistic energy harvesting,” *IEEE Trans. Wireless Commun.*, vol. 12, no. 1, pp. 288-300, Jan. 2013. ([ESI Highly Cited Paper](#); Journal Impact Factor: 6.394)
- J3 **L. Liu**, R. Zhang, and K. C. Chua, “Wireless information and power transfer: a dynamic power splitting approach,” *IEEE Trans. Commun.*, vol. 61, no. 9, pp. 3990-4001, Sep. 2013. ([ESI Highly Cited Paper](#); Journal Impact Factor: 5.690)
- J4 **L. Liu**, R. Zhang, and K. C. Chua, “Secrecy wireless information and power transfer with MISO beamforming,” *IEEE Trans. Signal Process.*, vol. 62, no. 7, pp. 1850-1863, Apr. 2014. ([ESI Highly Cited Paper](#); Journal Impact Factor: 5.230)
- J5 Q. Shi, **L. Liu**, W. Xu, and R. Zhang, “Joint transmit beamforming and receive power splitting for MISO SWIPT systems” *IEEE Trans. Wireless Commun.*, vol. 13, no. 6, pp. 3269-3280, June, 2014. ([ESI Highly Cited Paper](#); Journal Impact Factor: 6.394)
- J6 J. Xu, **L. Liu**, and R. Zhang, “Multiuser MISO beamforming for simultaneous wireless information and power transfer,” *IEEE Trans. Signal Process.*, vol. 12, no. 8, pp. 4798-4810, Aug. 2014. ([ESI Highly Cited Paper](#); Journal Impact Factor: 5.230)
- J7 **L. Liu**, R. Zhang, and K. C. Chua, “Multi-antenna wireless powered communication with energy beamforming,” *IEEE Trans. Commun.*, vol. 62, no. 12, pp. 4349-4361, Dec. 2014. ([ESI Highly Cited Paper](#); Journal Impact Factor: 5.690)
- J8 S. Lee, **L. Liu**, and R. Zhang, “Collaborative wireless energy and information transfer in interference channel,” *IEEE Trans. Wireless Commun.*, vol. 14, no. 1, pp. 545-557, Jan. 2015. (Journal Impact Factor: 6.394)
- J9 **L. Liu**, and R. Zhang, “Optimized uplink transmission in multi-antenna C-RAN with spatial compression and forward,” *IEEE Trans. Signal Process.*, vol. 55, no. 19, pp. 5083-5095, Oct. 2015. (Journal Impact Factor: 5.230)
- J10 **L. Liu**, S. Bi, and R. Zhang, “Joint power control and fronthaul rate allocation for throughput maximization in OFDMA-based cloud radio access network,” *IEEE Trans. Commun.*, vol. 63, no. 11, pp. 4097-4110, Nov. 2015. (Journal Impact Factor: 5.690)
- J11 H. Xing, **L. Liu**, and R. Zhang, “Secrecy wireless information and power transfer in fading wiretap channel,” *IEEE Trans. Veh. Technol.*, vol. 65, no. 1, pp. 180-190, Jan. 2016. ([ESI Highly Cited Paper](#); Journal Impact Factor: 5.339)

- J12 **L. Liu**, and R. Zhang, “How to diagonalize a MIMO channel with arbitrary transmit covariance?” *IEEE Wireless Commun. Lett.*, vol. 5, no. 4, pp. 352-355, Aug. 2016. (Journal Impact Factor: 3.546)
- J13 **L. Liu**, and W. Yu, “Cross-layer design for downlink multi-hop cloud radio access networks with network coding,” *IEEE Trans. Signal Process.*, vol. 65, no. 7, pp. 1728-1740, Apr. 2017. (Journal Impact Factor: 5.230)
- J14 **L. Liu**, and W. Yu, “Massive connectivity with massive MIMO-Part I: Device activity detection and channel estimation,” *IEEE Trans. Signal Process.*, vol. 66, no. 11, pp. 2933-2946, Jun. 2018. (**ESI Highly Cited Paper**; Journal Impact Factor: 5.230)
- J15 **L. Liu**, and W. Yu, “Massive connectivity with massive MIMO-Part II: Achievable rate characterization,” *IEEE Trans. Signal Process.*, vol. 66, no. 11, pp. 2947-2959, Jun. 2018. (Journal Impact Factor: 5.230)
- J16 **L. Liu**, and W. Yu, “A D2D-based protocol for ultra-reliable wireless communications for industrial automation,” *IEEE Trans. Wireless. Commun.*, vol. 17, no. 8, pp. 5045-5058, Aug. 2018. (Journal Impact Factor: 6.394)
- J17 **L. Liu**, P. Patil, and W. Yu, “Channel diagonalization for cloud radio access,” *IEEE Wireless Commun. Lett.*, vol. 7, no. 4, pp. 622-625, Aug. 2018. (Journal Impact Factor: 3.546)
- J18 **L. Liu**, E. G. Larsson, W. Yu, P. Popovski, C. Stefanovic, and E. de Carvalho, “Sparse signal processing for grant-free massive IoT connectivity,” *IEEE Signal Process. Mag.*, vol. 35, no. 5, pp. 88-99, Sep. 2018. (**ESI Highly Cited Paper**; Journal Impact Factor: 7.602)
- J19 Q. Wu, **L. Liu**, and R. Zhang, “Fundamental trade-offs in communication and trajectory design for UAV-enabled wireless network,” *IEEE Wireless Commun.*, vol. 26, no. 1, pp. 36-44, Feb. 2019. (**ESI Highly Cited Paper**; Journal Impact Factor: 11)
- J20 H. Xing, **L. Liu**, J. Xu, and A. Nallanathan, “Joint task assignment and resource allocation for D2D-enabled mobile-edge computing,” *IEEE Trans. Commun.*, vol. 67, no. 6, pp. 4193-4207, Jun. 2019. (Journal Impact Factor: 5.690)
- J21 **L. Liu**, S. Zhang, and R. Zhang, “CoMP in the sky: UAV placement and movement optimization for multi-user communications,” *IEEE Trans. Commun.*, vol. 67, no. 8, pp. 5645-5658, Aug. 2019. (Journal Impact Factor: 5.690)
- J22 **L. Liu**, S. Zhang, and R. Zhang, “Multi-beam UAV communication in cellular uplink: cooperative interference cancellation and sum-rate maximization,” *IEEE Trans. Commun.*, vol. 18, no. 10, pp. 4679-4691, Oct. 2019. (Journal Impact Factor: 6.394)
- J23 Z. Wang, **L. Liu**, and S. Cui, “Channel estimation for intelligent reflecting surface assisted multiuser communications: framework, algorithms, and analysis,” submitted to *IEEE Trans. Wireless Commun.* [Available] Online: <https://arxiv.org/abs/1912.11783>.

Conference Paper

- C1 **L. Liu**, R. Zhang, and K. C. Chua, “A new approach to weighted sum-rate maximization for the K-user gaussian interference channel,” in *Proc. IEEE International Conference on Wireless Communications and Signal Processing (WCSP)*, Nanjing, China, 2011. (**Best Paper Award**)
- C2 **L. Liu**, R. Zhang, and K. C. Chua, “Wireless information transfer with opportunistic energy harvesting,” in *Proc. IEEE International Symposium on Information Theory (ISIT)*, Cambridge, MA, America, 2012.
- C3 **L. Liu**, R. Zhang, and K. C. Chua, “Secrecy wireless information and power transfer with MISO beamforming,” in *Proc. IEEE Global Communications Conference (Globecom)*, Atlanta, America, 2013.
- C4 J. Xu, **L. Liu**, and R. Zhang, “Multiuser MISO beamforming for simultaneous wireless information and power transfer,” in *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Vancouver, BC, Canada, 2013.

- C5 H. Xing, **L. Liu**, and R. Zhang, “Secrecy wireless information and power transfer in fading wiretap channel,” in *Proc. IEEE International Conference on Communications (ICC)*, Sydney, Australia, 2014.
- C6 **L. Liu**, and R. Zhang, “Downlink SINR balancing in C-RAN under limited fronthaul capacity,” in *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Shanghai, China, 2016.
- C7 **L. Liu**, P. Patil, and W. Yu, “An uplink-downlink duality for cloud radio access network,” in *Proc. IEEE International Symposium on Information Theory (ISIT)*, Barcelona, Spain, 2016.
- C8 **L. Liu**, and W. Yu, “Joint sparse beamforming and network coding for downlink multi-hop cloud radio access networks,” in *Proc. IEEE Global Communications Conference (Globecom)*, Washington D.C., America, 2016.
- C9 **L. Liu**, and W. Yu, “Massive device connectivity with massive MIMO,” in *Proc. IEEE International Symposium on Information Theory (ISIT)*, Aachen, Germany, 2017.
- C10 H. Xing, **L. Liu**, J. Xu, and A. Nallanathan, “Joint task assignment and wireless resource allocation for cooperative mobile-edge computing,” in *Proc. IEEE International Conference on Communications (ICC)*, Kansas, America, 2018.
- C11 **L. Liu**, S. Zhang, and R. Zhang, “Cooperative interference cancellation for multi-beam UAV uplink communication: A DoF analysis,” in *Proc. IEEE Global Communications Conference (Globecom) Workshops*, Abu Dhabi, the United Arab Emirates, 2018.
- C12 **L. Liu**, S. Zhang, and R. Zhang, “Exploiting NOMA for multi-beam UAV communication in cellular uplink,” in *Proc. IEEE International Conference on Communications (ICC)*, Shanghai, China, 2019.
- C13 Z. Wang, **L. Liu**, and S. Cui, “Channel estimation for intelligent reflecting surface assisted multiuser communications,” to appear in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, 2020. [Available] Online: <https://arxiv.org/abs/1911.03084>.
- C14 L. Cheng, **L. Liu**, and S. Cui, “A covariance-based user activity detection and channel estimation approach with novel pilot design,” to appear in *Proc. IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, 2020.
- C15 Z. Wang, **L. Liu**, and S. Cui, “Intelligent reflecting surface assisted massive MIMO communications,” to appear in *Proc. IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, 2020. [Available] Online: <https://arxiv.org/abs/2002.05899>.

GRANT RECORD

- Start-Up Fond, 300,000 HKD, PI, “Machine-Type Communications for Future Internet of Things and Industry 4.0”, 2019-2022.

TEACHING

- ENG2003 Information Technology, Fall 2019.
- ENG2003 Information Technology, Spring 2020.

PROFESSIONAL SERVICES

Guest Editor

- IEEE Wireless Communications Special Issue on Massive Machine-Type Communications for IoT

Reviewer

- IEEE Journal on Selected Areas in Communications.
- IEEE Wireless Communications Magazine.
- IEEE Transactions on Signal Processing.
- IEEE Transactions on Wireless Communications.
- IEEE Transactions on Communications.

Technical Program Committee Member

- Vehicular Technology Conference (VTC) 2015 Fall.
- IEEE Globecom 2015 Workshop on Heterogeneous and Small Cell Networks.
- IEEE ICC 2016 Wireless Communications Symposium.
- IEEE ICC 2016 Workshop on Wireless Physical Layer Security.
- IEEE Globecom 2016 Workshop on Emerging Technologies for 5G Wireless Cellular Networks.
- IEEE Globecom 2016 Workshop on Full Duplex Wireless Communications.
- IEEE Globecom 2017 Workshop on Emerging Technologies for 5G and Beyond Wireless and Mobile Networks.
- IEEE ICC 2017 Wireless Communications Symposium.