

# Hang Liu

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## Education

<b>The Chinese University of Hong Kong (CUHK)</b> <i>Ph.D. Candidate in Information Engineering, GPA: 3.96/4.0</i>	<b>Hong Kong</b> 08/2017–2021
◦ Supervisor: Prof. Angela Yingjun Zhang	
<b>CUHK</b> <i>B.Sc. in Mathematics and Information Engineering (Double Major)</i>	<b>Hong Kong</b> 09/2012–05/2017

## Research Interests

My current research interests focus on signal processing and optimization techniques in wireless communications, particularly in

- Massive MIMO;
- Reconfigurable intelligent surface;
- Federated edge learning.

## Working Experiences

<b>Information Engineering Dept., CUHK</b> <i>Teaching Assistant</i>	<b>Hong Kong</b> 08/2017–07/2020
◦ Linear Algebra	◦ C Programming
◦ Microcontrollers & Embedded Systems	◦ Analog & Digital Circuits
◦ Social Media Analytics	
<b>Sierra Wireless Limited</b> <i>Junior Software Validation Engineer</i>	<b>Hong Kong</b> 06/2015–05/2016

## Publications ( [🔗 Google Scholar Profile](#) )

### Papers Under Review.....

[P1] [H. Liu](#), X. Yuan, and Y.-J. A. Zhang. Reconfigurable intelligent surface enabled federated learning: A unified communication-learning design approach. Submitted to *IEEE Transactions on Wireless Communications*, arXiv preprint arXiv:2011.10282. [\[ArXiv Link\]](#)

- [P2] **H. Liu**, X. Yuan, and Y.-J. A. Zhang, "PHY-Layer design challenges in reconfigurable intelligent surface aided 6G wireless networks", in *World's First Book on 6G Mobile Wireless Networks*, under review.
- [P3] Z.-Q. He, **H. Liu**, X. Yuan, Y.-J. A. Zhang, and Y.-C. Liang. Semi-blind channel estimation for reconfigurable intelligent surface aided massive MIMO systems. Submitted to *IEEE Transactions on Signal Processing*.

### Journal Papers.....

- [J1] **H. Liu**, X. Yuan, and Y.-J. A. Zhang. Matrix-calibration-based cascaded channel estimation for reconfigurable intelligent surface assisted multiuser MIMO. *IEEE Journal on Selected Areas in Communications*, 38(11):2621–2636, Nov. 2020.
- [J2] **H. Liu**, X. Yuan, and Y.-J. A. Zhang. Statistical beamforming for FDD downlink massive MIMO via spatial information extraction and beam selection. *IEEE Transactions on Wireless Communications*, 19(7):4617–4631, Jul. 2020.
- [J3] **H. Liu**, X. Yuan, and Y.-J. A. Zhang. Super-resolution blind channel-and-signal estimation for massive MIMO with one-dimensional antenna array. *IEEE Transactions on Signal Processing*, 67(17):4433–4448, Sep. 2019.
- [J4] X. Kuai, X. Yuan, W. Yan, **H. Liu**, and Y.-J. A. Zhang. Double-sparsity learning based channel- and-signal estimation in massive MIMO with generalized spatial modulation. *IEEE Transactions on Communications*, 68(5):2863–2877, May 2020.
- [J5] X. Yuan, Y.-J. A. Zhang, Y. Shi, W. Yan, and **H. Liu**. Reconfigurable-intelligent-surface empowered 6G wireless communications: Challenges and opportunities. To appear at *IEEE Wireless Communications*. ([ComSoc Best Readings in RIS](#))

### Conference Papers.....

- [C1] **H. Liu**, X. Yuan, and Y.-J. A. Zhang. Message-passing based channel estimation for reconfigurable intelligent surface assisted MIMO. In *IEEE International Symposium on Information Theory (ISIT)*, pages 2983–2988, Jun. 2020.
- [C2] **H. Liu**, X. Yuan, and Y.-J. A. Zhang. Beam-selection-based statistical beamforming for FDD massive MIMO: Exploiting spatial reciprocity. In *IEEE Global Communications Conference (GLOBECOM)*, pages 1–6, Dec. 2019.
- [C3] **H. Liu**, X. Yuan, and Y.-J. A. Zhang. Message-passing based blind signal detection for massive MIMO with general antenna arrays. In *IEEE International Conference on Communications (ICC)*, pages 1–7, May 2019.
- [C4] X. Kuai, X. Yuan, W. Yan, **H. Liu**, and Y.-J. A. Zhang. Sparsity learning based blind signal detection for massive MIMO with generalized spatial modulation. In *IEEE/CIC International Conference on Communications in China (ICCC)*, pages 64–69, Aug. 2019.

## Academic Services

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### Journal Reviews.....

- IEEE Transactions on Signal Processing
- IEEE Transactions on Wireless Communications
- IEEE Transactions on Communications
- IEEE Transactions on Cognitive Communications and Networking
- IEEE Journal on Selected Areas in Communications

- IEEE Vehicular Technology Magazine
- IEEE Systems Journal
- IEEE Communications Letters
- IEEE Wireless Communications Letters
- IET Communications

#### **Conference Reviews.....**

- GLOBECOM 2019-20
- ICC 2019-20
- ICC 2019-20
- SAM 2020
- VTC 2020