

# 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
<ul style="list-style-type: none"><li>○ Supervisor: Prof. Angela Yingjun Zhang</li><li>○ Expected to graduate in July 2021</li></ul>	
<b>CUHK</b> <i>B.Sc. (Hons.) 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/intelligent reflecting surface;
- Federated edge learning.

## Working Experiences

<b>Dept. of Information Engineering, CUHK</b> <i>Teaching Assistant</i>	<b>Hong Kong</b> 08/2017–07/2020
<ul style="list-style-type: none"><li>○ Linear Algebra</li><li>○ Microcontrollers &amp; Embedded Systems</li><li>○ Social Media Analytics</li><li>○ C Programming</li><li>○ Analog &amp; Digital Circuits</li><li>○ Final Year Project</li></ul>	
<b>Dept. of Information Engineering, CUHK</b> <i>Summer Research Intern</i>	<b>Hong Kong</b> 05/2016–08/2016
<ul style="list-style-type: none"><li>○ Advisor: Prof. Chandra Nair</li><li>○ Conducted researches on tensorization for product broadcast channels</li></ul>	
<b>Sierra Wireless Limited</b> <i>Junior Software Validation Engineer</i>	<b>Hong Kong</b> 06/2015–05/2016

## Student Supervision

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- Mr. Zehong Lin (Ph.D. candidate at CUHK)
- Mr. Daoyuan Chen (UG final year student at CUHK)
- Mr. Longhui Yin (Visiting UG student from Tsinghua University)

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

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### 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. Joint Communication-Learning Design for RIS-Assisted Federated Learning. Submitted to *IEEE ICC '2021*.
- [P3] **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.
- [P4] 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 2019-21
- ICC 2019-20
- SAM 2020
- VTC 2020