Wentao Yu

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Research Interests

My research interests include **machine learning** and **signal processing** for wireless systems, with a recent focus on next-generation MIMO technologies, integrated sensing and communication, and analog RF computing enabled ubiquitous edge intelligence.

Education

The Hong Kong University of Science and Technology (HKUST) *Sept 2021 – Aug 2025*
Ph.D. in Electronic and Computer Engineering

- Advisor: Prof. Khaled B. Letaief
- Awarded Hong Kong Ph.D. Fellowship Scheme (HKPFS)

Massachusetts Institute of Technology (MIT) *Sept 2024 – Jul 2025*
Visiting Ph.D. Student in Electrical Engineering and Computer Science

- Advisor: Prof. Lizhong Zheng

Nanjing University (NJU) *Sept 2017 – Jun 2021*
B.Eng. in Electronic Science and Engineering

- Advisor: Prof. Shaowei Wang
- Outstanding Graduate, Ranking: 3/193, awarded China National Scholarship

Work Experience

The University of British Columbia (UBC) *Sept 2025 – Now*
Postdoctoral Research Fellow

- Host: Prof. Vincent W.S. Wong
- Awarded NSERC Canada Postdoctoral Research Award (Ranked #4 among all applicants in Canada)

Honors and Awards

- 2026 Nomination for IEEE Signal Processing Society's Young Author Best Paper Award Paper
- 2026 NSERC Canada Postdoctoral Research Award
- 2024-2025 IEEE Signal Processing Society's Annual Top 25 Downloaded Article Paper
- 2024 Exemplary Reviewer of IEEE Wireless Communications Letters
- 2024 HKUST ECE Senior Teaching Assistant Fellowship
- 2024 HKUST Overseas Research Award
- 2023-2024 IEEE Signal Processing Society's Annual Top 25 Downloaded Article Paper
- 2021 HKUST Redbird Ph.D. Scholarship
- 2021 Hong Kong Ph.D. Fellowship Scheme (HKPFS)
- 2021 Outstanding Graduate of Nanjing University
- 2019 The Interdisciplinary Contest in Modeling (ICM), Outstanding Winner (Top 0.14%)
- 2019 Outstanding Student Leaders of Jiangsu Province
- 2019 Baosteel Scholarship
- 2018 China National Scholarship

Teaching

I am honored to receive the **HKUST ECE Senior Teaching Assistant Fellowship**, which *"recognizes RPg students who have demonstrated excellent performance and dedication in serving as a teaching assistant."*

The Hong Kong University of Science and Technology *Hong Kong SAR, China*
Teaching Assistant *Sept 2021 – Aug 2024*

- EESM 5536 Digital Communications (2023 Spring, 2022 Fall)
- ELEC 4901 Final Year Undergraduate Thesis (2023 Fall)
- ELEC 3100 Signal Processing and Communications (2022 Spring)
- ELEC 2600 Probability and Random Processes in Engineering (2023 Fall, 2022 Fall)

In addition, I am prepared to teach a broad range of courses in Electrical and Computer Engineering, particularly those in Signal Processing, Communications, and Machine Learning.

Publications

Journal

[J11] **Wentao Yu**, Vincent W.S. Wong, "Analog RF computing: A new paradigm for energy-efficient edge AI over MU-MIMO systems," *IEEE Transactions on Wireless Communications*, in revision.

[J10] Zeyu Hao, **Wentao Yu**, Lutz Lampe, Vincent W.S. Wong, "Look before you move: Multimodal sensing-aided trajectory and beamforming design for 6DMA," *IEEE Journal on Selected Areas in Communications*, under review.

[J9] Ruoxiao Cao, **Wentao Yu**, Zixin Wang, Shenghui Song, Jun Zhang, Yi Gong, Khaled B. Letaief, "Sensing-assisted channel estimation for flexible-antenna systems: A unified framework," *IEEE Transactions on Wireless Communications*, under review.

[J8] Yang Li, Hengtao He, **Wentao Yu**, Jing Zhang, Chao-Kai Wen, Shi Jin, "Deep learning-based sensing with deterministic pilots and random data payloads," *IEEE Wireless Communications Letters*, vol. 15, pp. 5025-5029, 2026.

[J7] Kai Zhang, **Wentao Yu**, Hengtao He, Shenghui Song, Jun Zhang, Khaled B. Letaief, "Multimodal mixture-of-experts for ISAC in low-altitude wireless networks," *IEEE Journal of Selected Topics in Signal Processing*, accepted, May 2026, DOI: 10.1109/JSTSP.2026.3696558.

[J6] **Wentao Yu**, Khaled B. Letaief, Lizhong Zheng, "Sensing for free: Learn to localize more sources than antennas without pilots," *IEEE Journal on Selected Areas in Communications*, vol. 44, pp. 3285-3301, 2026.

[J5] **Wentao Yu**, Hengtao He, Shenghui Song, Jun Zhang, Linglong Dai, Lizhong Zheng, Khaled B. Letaief, "AI and deep learning for terahertz ultra-massive MIMO: From model-driven approaches to foundation models," *Engineering*, vol. 56, pp. 14-33, Jan. 2026. **(Highlight paper of the special issue on 6G)**

[J4] **Wentao Yu**, Yifan Ma, Hengtao He, Shenghui Song, Jun Zhang, Khaled B. Letaief, "Deep learning for near-field XL-MIMO transceiver design: Principles and techniques," *IEEE Communications Magazine*, vol. 63, no. 1, pp. 52-58, Jan. 2025.

[J3] **Wentao Yu**, Hengtao He, Xianghao Yu, Shenghui Song, Jun Zhang, Ross Murch, Khaled B. Letaief, "Bayes-optimal unsupervised learning for channel estimation in near-field holographic MIMO," *IEEE Journal of Selected Topics in Signal Processing*, vol. 18, no. 4, pp. 714-729, May 2024.
(IEEE Signal Processing Society's annual top 25 downloaded article from 2024 to 2025)

[J2] **Wentao Yu**, Yifei Shen, Hengtao He, Xianghao Yu, Shenghui Song, Jun Zhang, Khaled B. Letaief, "An adaptive and robust deep learning framework for THz ultra-massive MIMO channel estimation," *IEEE Journal of Selected Topics in Signal Processing*, vol. 17, no. 4, pp. 761-776, Jul. 2023.
(Nominated for IEEE Signal Processing Society's Young Author Best Paper Award in 2026)
(IEEE Signal Processing Society's annual top 25 downloaded article from 2023 to 2024)

[J1] **Wentao Yu**, Tianyu Wang, Shaowei Wang, "Multi-label learning based antenna selection in massive MIMO systems," *IEEE Transactions on Vehicular Technology*, vol. 70, no. 7, pp. 7255-7260, Jul. 2021.

Conference

[C11] **Wentao Yu**, Vincent W.S. Wong, "Analog RF computing for integrated data and AI flows over wireless networks," in *Proc. IEEE Global Communications Conference (Globecom) Workshops*, Macau S.A.R., China, Dec. 2026.

[C10] Junhao Zhou, Hengtao He, Fangyu Liu, Weijie Jin, **Wentao Yu**, Shi Jin, "Parallel-measurement interpolant flow matching for massive MIMO channel estimation," in *Proc. IEEE Global Communications Conference (Globecom) Workshops*, Macau S.A.R., China, Dec. 2026.

[C9] Ruoxiao Cao, **Wentao Yu**, Yi Gong, Khaled B. Letaief, "Low-complexity gridless single-snapshot DoA estimation via truncated Hankel Newton-MUSIC," in *Proc. IEEE Conference on Integrated Sensing and Communications (ISAC)*, Lisbon, Portugal, Nov. 2026. **(Invited paper)**

[C8] Kai Zhang, **Wentao Yu**, Hengtao He, Shenghui Song, Jun Zhang, Khaled B. Letaief, "Multimodal deep learning-empowered beam prediction in future THz ISAC systems," in *Proc. IEEE International Symposium on Personal, Indoor, Mobile Radio Communications (PIMRC)*, Istanbul, Turkey, Sept. 2025. **(Invited paper)**

[C7] **Wentao Yu**, Hengtao He, Xianghao Yu, Shenghui Song, Jun Zhang, Ross Murch, Khaled B. Letaief, "Learning Bayes-optimal channel estimation for holographic MIMO in unknown EM environments," in *Proc. IEEE International Conference on Communications (ICC)*, Denver, CO, USA, Jun. 2024.

[C6] Yifan Ma, **Wentao Yu**, Xianghao Yu, Jun Zhang, Shenghui Song, Khaled B. Letaief, "Lightweight and flexible deep equilibrium learning for CSI feedback in FDD massive MIMO," in *Proc. IEEE International Conference on Machine Learning for Communication and Networking (ICMLCN)*, Stockholm, Sweden, May 2024.

[C5] Ruoxiao Cao, **Wentao Yu**, Hengtao He, Xianghao Yu, Shenghui Song, Jun Zhang, Yi Gong, Khaled B. Letaief, "Newtonized near-field channel estimation for ultra-massive MIMO systems," in *Proc. IEEE Wireless Communications and Networking Conference (WCNC)*, Dubai, UAE, Apr. 2024.

[C4] Hongru Li, **Wentao Yu**, Hengtao He, Jiawei Shao, Shenghui Song, Jun Zhang, Khaled B. Letaief, "Task-oriented communication with out-of-distribution detection: An information bottleneck framework," in *Proc. IEEE Global Communications Conference (Globecom)*, Kuala Lumpur, Malaysia, Dec. 2023.

[C3] **Wentao Yu**, Hengtao He, Xianghao Yu, Shenghui Song, Jun Zhang, Khaled B. Letaief, "Blind performance prediction for deep learning based ultra-massive MIMO channel estimation," in *Proc. IEEE International Conference on Communications (ICC)*, Rome, Italy, May-Jun. 2023.

[C2] **Wentao Yu**, Hengtao He, Xianghao Yu, Shenghui Song, Jun Zhang, Khaled B. Letaief, "Hybrid far- and near-field channel estimation for THz ultra-massive MIMO via fixed point networks," in *Proc. IEEE Global Communications Conference (Globecom)*, Rio de Janeiro, Brazil, Dec. 2022.

[C1] Tianyu Wang, **Wentao Yu**, Shaowei Wang, "Inter-slice radio resource management via online convex optimization," in *Proc. IEEE International Conference on Communications (ICC)*, Montreal, Canada, Jun. 2021.

Talks

"Holographic MIMO communications: Fundamental limits, signal processing, and learning-aided design"

- IEEE Signal Processing Society's invited webinar, Virtual, scheduled for Dec. 1, 2026.

"AI-native wireless networks: Integrating communication, sensing, and computing"

- School of Electronic and Information Engineering, Soochow University, Dec. 22, 2025.
- School of Intelligent Software and Engineering, Nanjing University, Dec. 27, 2025.

"Sensing for free: Learn to localize more sources than antennas without pilots"

- School of Information Science and Engineering, Southeast University, Sept. 9, 2025.

"AI for THz UM-MIMO: From model-driven deep learning to foundation models"

- IEEE Signal Processing Society's invited webinar, Virtual, Feb. 25, 2025.

"Learning Bayes-optimal channel estimation for holographic MIMO in unknown EM environments"

- Monthly faculty meeting of the Hong Kong 6G area of excellence scheme, Hong Kong, May 23, 2024.
- IEEE International Conference on Communications (ICC), Denver, CO, USA, Jun. 11, 2024.

"Blind performance prediction for deep learning based ultra-massive MIMO channel estimation"

- IEEE International Conference on Communications (ICC), Rome, Italy, May 30, 2023.

"An adaptive and robust deep learning framework for THz ultra-massive MIMO channel estimation"

- IEEE Global Communications Conference (Globecom), Virtual, Dec. 5, 2022.
- IEEE Hong Kong 6G Wireless Summit, Hong Kong, Sept. 13, 2023.
- Monthly faculty meeting of the Hong Kong 6G area of excellence scheme, Hong Kong, Nov. 14, 2023.

Academic Services

Journal Editor for

- Entropy, Special Issue on "MIMO Wireless Communications: Information Theory Perspectives" (co-editing with Prof. Lizhong Zheng from MIT)

Conference Organizer for

- 2027 IEEE ICC, TPC Co-chair, Workshop on Analog Computing for Wireless Communications
- 2026 IEEE ISAC, Co-chair, Special Session on Advanced Signal Processing for Reconfigurable Antenna-Enabled ISAC Systems

Conference TPC Member for

- 2027 IEEE ICC, Machine Learning for Communications and Networking Track
- 2027 IEEE ICASSP, Machine Learning for Signal Processing Technical Committee
- 2027 IEEE WCNC, Track 3: Resource Allocation and Machine Learning
- 2026 WCSP, Symposium 6: Edge Intelligence, Computing, and Caching
- 2026 ACM International Conference on Nanoscale Computing and Communication (NanoCom)
- 2026 IEEE Globecom, Machine Learning for Communications and Networking Track
- 2026 IEEE ICMLCN, Workshop on Multi-Modal Semantic Communications for Future Wireless Networks
- 2026 IEEE ICC, Wireless Communications Track
- 2026 IEEE WCNC, Track 3: Resource Allocation and Machine Learning
- 2024 IEEE WCNC, Workshop on Model-Driven Deep Learning for 6G

Journal Reviewer for

- IEEE Journal on Selected Areas in Communications (JSAC)
- IEEE Journal of Selected Topics in Signal Processing (JSTSP)
- IEEE Journal of Selected Topics in Electromagnetics, Antennas and Propagation (JSTEAP)
- IEEE Transactions on Wireless Communications (TWC)
- IEEE Transactions on Communications (TCOMM)
- IEEE Transactions on Machine Learning for Communications and Networking (TMLCN)
- IEEE Transactions on Vehicular Technology (TVT)
- IEEE Transactions on Cognitive Communications and Networking (TCCN)
- IEEE Transactions on Intelligent Transportation Systems (T-ITS)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Circuits and Systems II – Express Briefs (TCAS-II)
- IEEE Communications Magazine (MCOM)
- IEEE Open Journal of the Communications Society (OJ-COMS)
- IEEE Open Journal of Vehicular Technology (OJVT)
- IEEE Wireless Communications Letters (WCL)
- IEEE Communications Letters (CL)
- IEEE Access
- npj Wireless Technology
- Physical Communications

- Journal of Information and Intelligence
- Artificial Intelligence Review

Miscellaneous

Languages: Chinese (Native), English (Full Professional Proficiency)