# Wentao Yu

Room 4031, Fred Kaiser Building, 2332 Main Mall, Vancouver, BC, Canada

wentaoyu@ece.ubc.ca https://wyuaq.github.io/

## Research Interests

My research explores the intersection of **machine learning** and **signal processing** to design advanced algorithms for next-generation **wireless communication and sensing systems**.

## Education

**The Hong Kong University of Science and Technology** *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** *Sept 2024 – Jul 2025*
*Visiting Ph.D. Student in Electronic Engineering and Computer Science*

- Advisor: Prof. Lizhong Zheng
- Awarded HKUST Overseas Research Award

**Nanjing University** *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** *Sept 2025 – Now*
*Postdoctoral Research Fellow*

- Host: Prof. Vincent W.S. Wong

## Publications

### Ongoing Work

[O1] **Wentao Yu** et al., "Physical layer foundation models for ultra-massive MIMO systems," *IEEE Transactions on Wireless Communications*, in preparation, 2025.

### Journal

[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*, in revision, Sept. 2025.

[J5] **Wentao Yu**, Hengtao He, Shenghui Song, Jun Zhang, Linglong Dai, Lizhong Zheng, Khaled B. Letaief, "AI and deep learning for THz ultra-massive MIMO: From model-driven approaches to foundation models," *Engineering*, to appear, Jul. 2025.

[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. **(Popular article of IEEE JSTSP)**

[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. **(IEEE Signal Processing Society's annual top 25 downloaded article from Sept. 2023 to Sept. 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**

[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.

## Presentations

"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 Reviewer for**

- IEEE Journal on Selected Areas in Communications (JSAC)
- 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 Vehicular Technology (OJVT)
- IEEE Wireless Communications Letters (WCL)
- IEEE Communications Letters (CL)
- IEEE Access
- Physical Communications
- Journal of Information and Intelligence

**Conference Reviewer for**

- IEEE Global Communications Conference (Globecom)
- IEEE Wireless Communications and Networking Conference (WCNC)
- IEEE Vehicular Technology Conference (VTC)
- International Symposium on Wireless Communication Systems (ISWCS)

**Conference TPC Member for**

- 2026 IEEE WCNC, Track 3: Resource Allocation and Machine Learning
- 2024 IEEE WCNC, Workshop on Model-Driven Deep Learning for 6G

## Miscellaneous

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

**Volunteer Work:** Served as the leader of the Youth Volunteer Organization of the School of Electronic Science and Engineering of Nanjing University, regularly organizing volunteer projects for the community.

**Hobbies:** Table Tennis, Photography, Basketball, Squash, Erhu