

# Hengtao He

Department of Electronic & Computer Engineering  
Hong Kong University of Science and Technology  
E-mail: eehthe@ust.hk

## Education

---

- 2021-      Hong Kong University of Science and Technology (HKUST)  
*Postdoctoral Research Fellow in Dept of Electronic & Computer Engineering*  
**Supervisor: Prof. Khaled B. Letaief** *Member of US National Academy of Engineering and New Bright Professor of Engineering in HKUST*
- 2018-2020   Georgia Institute of Technology (Gatech)  
*Visiting Scholar in Dept of Electronic & Computer Engineering*  
**Supervisor: Prof. Geoffrey Ye Li** *Professor, Dept of Electronic & Computer Engineering*
- 2017.3-2017.5   National Sun Yat-Sen University (NSYSU)  
*Visiting Scholar in Institute of Communications Engineering*  
**Supervisor: Prof. Chao-Kai Wen** *Professor, Institute of Communications Engineering*
- 2015-2020   Southeast University (SEU)  
*Ph.D. in Information and Communications Engineering*  
**Supervisor: Prof. Shi Jin** *Professor, College of Information Science and Engineering*
- 2011-2015   Nanjing University of science and technology (NJUST)  
*B.Eng. in Communications Engineering*

## Research interests

---

- Machine learning for wireless communications.
- MmWave and cell-free massive MIMO.
- Integrated communication and sensing.
- Message passing algorithms.

## Honors and Awards

---

- 2022      Excellent Dissertation Award at the SEU
- 2015      Outstanding Graduate Student in NJUST

## Research Publications

---

- [B1] **H. He**, H. Ye, S. Jin, and G. Y. Li, "Machine Learning based Channel Estimation and Signal Detection" in *Machine Learning and Wireless Communications*, Cambridge University Press, 2022.
- [J1] **H. He**, S. Jin, C.-K. Wen, F. Gao, G. Y. Li, and Z. Xu, "Model-driven deep learning for physical layer communications", *IEEE Wireless Communications*, vol. 26, no. 5, pp. 77-83, Oct. 2019. (*IEEE ComSoc Best Readings, ESI Highly Cited Paper*)

- [J2] **H. He**, C.-K. Wen, S. Jin, and G. Y. Li, "Model-driven deep learning for MIMO detection," *IEEE Trans. Signal Process.*, vol. 68, pp. 1702-1715, Mar. 2020. (*IEEE ComSoc Best Readings, ESI Highly Cited Paper*)
- [J3] **H. He**, C.-K. Wen, and S. Jin, "Bayesian optimal data detector for hybrid mmWave MIMO-OFDM systems with low-resolution ADCs," *IEEE J. Sel. Topics Signal Processing.*, vol. 12, no. 3, pp. 469-483, June 2018.
- [J4] **H. He**, C.-K. Wen, S. Jin, and G. Y. Li, "Deep learning-based channel estimation for beamspace mmWave massive MIMO systems," *IEEE Wireless Commun. Lett.*, vol. 7, no. 5, pp. 852-855, Oct. 2018. (*IEEE ComSoc Best Readings, ESI Highly Cited Paper*)
- [J5] **H. He**, M. Zhang, S. Jin, C.-K. Wen, and G. Y. Li, "Model-driven deep learning for massive MU-MIMO with finite-alphabet precoding," *IEEE Commun. Lett.*, vol. 24, no. 10, pp. 2216-2220, Oct. 2020.
- [J6] **H. He**, R. Wang, S. Jin, C.-K. Wen, and G. Y. Li, "Beamspace channel estimation in mmWave communications: A model-driven unsupervised learning approach," *IEEE Trans. Wireless Commun.*, under revised, June. 2020.
- [J7] **H. He**, H. Wang, X. Yu, J. Zhang, S.H. Song, and K. B. Letaief, "Cell-Free Massive MIMO Detection: A Distributed Expectation Propagation Approach," *submitted to IEEE Trans. Wireless Commun.*, Nov. 2021.
- [J8] **H. He**, X. Yu, J. Zhang, S.H. Song, and K. B. Letaief, "Cell-free massive MIMO for 6G wireless communication networks," *J. Commun. Inf. Netw.*, vol. 6, no. 4, pp. 321-335, Dec. 2021. (*Invited Paper*)
- [J9] Y. He, **H. He**, C.-K. Wen, and S. Jin, "Model-driven deep learning for massive multiuser MIMO constant envelope precoding," *IEEE Wireless Commun. Lett.*, vol. 9, no. 11, pp. 1835-1839, Nov. 2020.
- [C1] **H. He**, C.-K. Wen, and S. Jin, "Generalized expectation consistent signal recovery for nonlinear measurements," in *Proc. IEEE Int. Symp. Inf. Theory (ISIT)*, Jun. 2017, pp. 2333-2337.
- [C2] **H. He**, C.-K. Wen, S. Jin, and G. Y. Li, "A model-driven deep learning network for MIMO detection," in *Proc. IEEE Glob. Conf. Signal Inf. Process.*, Anaheim, CA, Nov. 2018, pp. 584-588.
- [C3] **H. He**, H. Wang, X. Yu, J. Zhang, S.H. Song, K. B. Letaief, "Distributed expectation propagation detection for cell-free massive MIMO," in *Proc. IEEE Global Commun. Conf. (GLOBECOM)*, Madrid, Spain, 2021.
- [C4] **H. He**, A. Kosasih, X. Yu, J. Zhang, S.H. Song, W. Hardjawana, and K. B. Letaief, "Graph neural network enhanced approximate message passing for MIMO detection," in *submitted to Proc. IEEE Global Commun. Conf. (GLOBECOM)*, Rio de Janeiro, Brazil, 2022.
- [C5] R. Wang, **H. He**, S. Jin, X. Wang, and X. Hou, "Channel estimation for millimeter wave massive MIMO systems with low-resolution ADCs," in *Proc. IEEE Int. Workshop Signal Process. Adv. Wireless Commun. (SPAWC)*, Cannes, France, 2019.
- [C6] J. Zhang, **H. He**, C.-K. Wen, S. Jin, and G. Y. Li, "Deep learning based on orthogonal approximate message passing for CP-free OFDM," in *Proc. IEEE Int. Conf. Acoust., Speech Signal Process. (ICASSP)*, Brighton, U.K., May. 2019, pp. 1-6.
- [C7] J. Zhang, **H. He**, X. Yang, C.-K. Wen, S. Jin, and X. Ma, "Model-driven deep learning based Turbo-MIMO receiver," in *Proc. IEEE Int. Workshop Signal Process. Adv. Wireless Commun. (SPAWC)*, 2020.
- [C8] W. Jin, **H. He**, C.-K. Wen, S. Jin, and G. Y. Li, "Adaptive channel estimation based on model-driven deep learning for wideband mmWave Systems," in *Proc. IEEE Global Commun. Conf. (GLOBECOM)*, Madrid, Spain, Dec. 2021.
- [C9] W. Yu, Y. Shen, **H. He**, X. Yu, J. Zhang, and K. B. Letaief, "Hybrid Far- and Near-Field Channel Estimation for THz Ultra-Massive MIMO via Fixed Point Networks," *submitted to Proc. IEEE Global Commun. Conf. (GLOBECOM)*, Rio de Janeiro, Brazil, 2022.

[C10] R. Cao, **H. He**, X. Yu, J. Zhang, S.H. Song, and K. B. Letaief, "Belief Propagation for Near-Field Cooperative Localization and Tracking in 6G Vehicular Networks," submitted to *Proc. IEEE Int. Mediterranean Conf. Commun. and Networking (MeditCom)*, 2022.

## Invited Talks

---

**H. He**, "Model-Driven Deep Learning for MIMO Detection," IEEE Signal Processing Society Webinar, Apr. 2022.