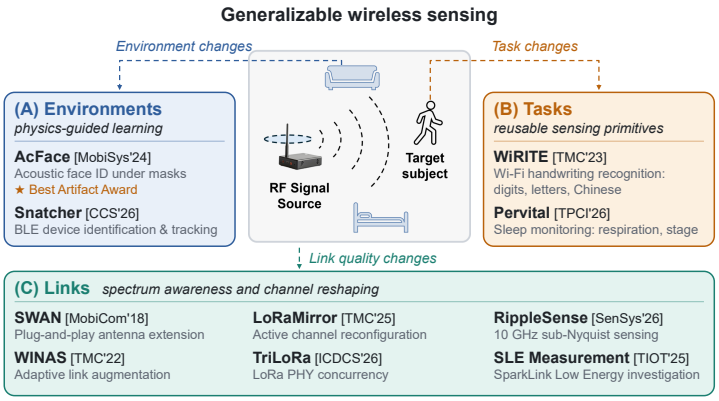
Yanbo Zhang, Ph.D.

Post-doctoral Fellow, The Hong Kong University of Science and Technology (HKUST)

yanbozhang AT ust DOT hk +852 60774702 https://yanbozhang003.github.io/

My research builds **generalizable wireless sensing systems** that provide reliable performance when the environment, the task, or the link quality changes. Specifically, I develop sensing frameworks that combine signal propagation physics with machine learning, and link enhancement techniques that keep the underlying wireless signals dependable. These systems perceive people and their surroundings through wireless signals, from activities (e.g., handwriting) and identity (e.g., face recognition) to physiological states (e.g., respiration, sleep), enabling applications such as indoor localization, user authentication, and smart healthcare. My research is full-stack and system-oriented, spanning radio hardware, signal processing, and learning algorithms, with an emphasis on prototypes that work in real-world deployments.



Work experience

Apr. 2025 - Present	**Post-doctoral Fellow** *Department of Computer Science and Engineering,* The Hong Kong University of Science and Technology (HKUST)	*Hong Kong*
May 2024 - Mar. 2025	**AIoT Scientist** *R&D,* Better IoT Solutions PTE. LTD.,	*Singapore*
May 2023 - May 2024	**Postdoctoral Research Fellow** *School of Computer Science and Engineering,* Nanyang Technological University	*Singapore*
Dec. 2017 - Jul. 2019	**Research Assistant** *School of Computer Science and Engineering,* Nanyang Technological University	*Singapore*

Education

Sep. 2019 - Jan. 2023	**PhD in Computer Science** *College of Computing and Data Science,* Nanyang Technological University	*Singapore*
Sep. 2013 - Jul. 2017	**Bachelor in Communication Engineering** *School of Electronics and Information Engineering,* Harbin Institute of Technology	*Harbin, China*

Publication

ACM CCS 2026
Snatcher: Apple Find My Network Exposes Your Lost Devices To Strangers,
Zhenyu Ren*, **Yanbo Zhang***, Boya Liu, Mo Li (* co-first authors)
ACM Conference on Computer and Communications Security (CCS'26), November 2026

IEEE ICDCS 2026
TriLoRa: Improving LoRa PHY Data Rate for High-Density LoRaWAN,
Yanbo Zhang, Qirui Liu, Songfan Li, Mo Li,
IEEE International Conference on Distributed Computing Systems (ICDCS'26), June 2026

ACM SENSYS 2026
RippleSense: Scalable and Efficient Wideband Spectrum Sensing,
Andreas Kuster, **Yanbo Zhang**†, Mo Li († corresponding author)
ACM/IEEE International Conference on Embedded Artificial Intelligence and Sensing Systems (SenSys'26), May 2026

CCF TPCI 2026
Pervital: Scenario-Adaptive Wi-Fi Sensing for Pervasive Home Vital Signal Monitoring,
Yanbo Zhang, Haoyu Deng, Mo Li
in CCF Transactions on Pervasive Computing and Interaction, Accepted

ACM TIOT 2025
Unveiling SparkLink Low Energy: a Comparative Measurement Study,
Boya Liu, Zhenyu Ren, **Yanbo Zhang**†, Mo Li, Jiaxin Liang, Bin He, Jie Li, Hao Wu, Jingbin Zhou († corresponding author)
in ACM Trans. Internet Things, https://doi.org/10.1145/3776559

IEEE TMC 2025
LoRaMirror: Illuminating Blind Spots in Urban LPWAN with Reflective Smart Surfaces,
Songfan Li, **Yanbo Zhang**, Jansen Christian Liando, Li Lu and Mo Li,
in IEEE Transactions on Mobile Computing, Early Access, 2025, doi: 10.1109/TMC.2025.3587057.

ACM MOBISYS 2024
Face Recognition In Harsh Conditions: An Acoustic Based Approach,
Yanbo Zhang, Panrong Tong, Songfan Li, Yaxiong Xie and Mo Li,
Proceedings of the 22nd Annual International Conference on Mobile Systems, Applications and Services, pages 1–14, doi: 10.1145/3643832.3661855

IEEE TMC 2023
WiRITE: General and Practical Wi-Fi Based Hand-Writing Recognition,
Yanbo Zhang, Weiping Sun and Mo Li,
in IEEE Transactions on Mobile Computing, doi: 10.1109/TMC.2023.3265988.

IEEE TMC 2022
Channel Adapted Antenna Augmentation for Improved Wi-Fi Throughput,
Yanbo Zhang, Weiping Sun, Yidong Ren, Sung-Ju Lee and Mo Li,
in IEEE Transactions on Mobile Computing, vol. 22, no. 11, pp. 6297-6310, 1 Nov. 2023, doi: 10.1109/TMC.2022.3195453.

ACM MobiCom 2018
SWAN: Stitched Wi-Fi ANtennas,
Yaxiong Xie, **Yanbo Zhang**, Jansen Christian Liando, and Mo Li,
In Proceedings of the 24th Annual International Conference on Mobile Computing and Networking (MobiCom '18), 51–66. https://doi.org/10.1145/3241539.3241572.

Research Highlights

2025 - 2026
The Construction and Application of Multi-modal Sleep Sensing Dataset
Constructs a synchronized PSG-mmWave-Wi-Fi-audio multi-modal sleep dataset where clinical polysomnography (including EEG, EMG, EOG and ECG) provides gold-standard physiological reference. Enabling contactless sleep monitoring and intervention methods that generalize across users, devices, and environments, supporting real-time sleep condition assessment for sleep quality improvement and intervention.

2024 - 2025 **Scenario-Adaptive Wi-Fi Sensing for In-Home Vital Sign Monitoring**
Proposes a contactless vital sign monitoring system on commodity Wi-Fi that adapts to diverse home scenarios. Distills respiration and body motion into reusable sensing primitives that stay reliable under multipath, occlusion, and hardware noise, and recomposes them for tasks from respiration tracking to whole-night sleep staging.

2023 - 2024 **See-Through Mask Face Recognition with Acoustic Sensing**
Proposes an acoustic-based facial recognition system leveraging near-field obstacle penetration. Designs an acoustic facial spectrum for 3D face representation and a discriminator-recognizer network (RD-Net) for robust recognition under mask blockage and varying distances. Open-source: https://zenodo.org/records/11094213

2022 - 2023 **Wi-Fi based Handwriting Recognition with Enhanced Task Generalizability**
Proposes a Wi-Fi handwriting recognition system with commodity APs, designed to be application-transferable, environment-agnostic, and user-independent. Integrates domain adaptation with tailored signal processing to minimize training overhead across diverse users, environments, and applications. Open-source: https://github.com/yanbozhang003/WiRITE

2021 - 2022 **Improving Wi-Fi Throughput with LSTM based Channel Quality Prediction**
Builds a Wi-Fi antenna augmentation system using a pre-trained LSTM network that predicts real-time channel quality variations across antenna configurations, enabling intelligent antenna selection for optimal throughput. Experiments verify substantially improved downlink performance. Open-source: https://github.com/yanbozhang003/WINAS

Industrial Collaboration and Technology Transfer

2026 - Present
Huawei Technologies **SparkLink Full-Scenario Collaborative Resource Scheduling**
Led protocol performance benchmarking and QoS optimization for SparkLink Low Energy, a next-generation short-range connectivity protocol for HarmonyOS ecosystem. Designed multi-device concurrent scheduling and topology-adaptive resource allocation algorithms to improve service fulfillment under heterogeneous traffic. Awarded "Huawei Spark Award" by Huawei.

2024 - 2025
Huawei Technologies **Wi-Fi Sensing for In-home Health Monitoring**
Designed and delivered a contactless vital sign monitoring system using commodity Wi-Fi. Developed respiratory sensing achieving $>$95% estimation accuracy in LOS/NLOS settings, a dual-person respiration separation framework, and a U-Net/BiLSTM sleep staging model with $>$75% accuracy across diverse environments. Awarded "Outstanding Collaboration Project" by Huawei.

2024 - 2025
Better IoT Solutions **LoRaWAN Collision Avoidance and Reliable Transmission System**
Developed a spectrum sensing and collision avoidance system that raises LoRaWAN data reception rate from 70% to 99.99% while reducing retransmission overhead by 35%. Deployed and field-tested on SPTel's commercial network in Singapore. Core technology exclusively licensed via NTU (TD-2024-005).

2024 - 2025
Better IoT Solutions **SWAN: Wi-Fi Antenna Extension and Network Optimization System**
Developed a plug-and-play RF front-end enhancement system that extends antenna count by 4$\times$ within a single band, achieving 2–4$\times$ throughput gain and sustaining 100–130 Mbit/s under mobile conditions (Wi-Fi 4). Core technology exclusively licensed via NTU (TD-2022-207).

Awards

2024 ACM MobiSys 2024	**Best Artifact Award (The only recipient)** The only award among 43 accepted papers, passing all four evaluation criteria: availability, software completeness, functional correctness, and reproducibility. Open-source: https://zenodo.org/records/11094213, 100+ downloads
2021 Microsoft Research	**Silver Medal (Top 3%)** Wi-Fi Indoor Localization and Navigation Competition
2019 - 2023	Research Scholarship, provided by Alibaba-NTU Joint Research Institute
2019 - 2023	Ph.D Scholarship, provided by Ministry of Education, Singapore

Professional Services

Organizing Committee	Competition Co-Chair, ACM MobiCom 2025
Technical Program Committee	ACM SENSYS 2026 (Demo session) GPC 2026 ACM MobiSys 2026 (Artifact Evaluation) IEEE ICPADS 2025 IEEE ICPADS 2024 ACM MobiCom 2023 (Artifact Evaluation)
Invited Reviewer	IEEE Transactions on Mobile Computing IEEE/ACM Transactions on Networking ACM Transactions on Sensor Networks ACM Transactions on Internet of Things IEEE Transactions on Wireless Communications IEEE Wireless Communication Letters IEEE Open Journal of the Communications Society

Conference Presentations and Invited Talks

June, 2026 Seoul, Korea	**TriLoRa: Improving LoRa PHY Data Rate for High-Density LoRaWAN** Presented at IEEE ICDCS 2026
November, 2025 Hong Kong, China	**Unveiling SparkLink Low Energy: a Comparative Measurement Study** Presented at MobiCom'25 Journal Article Presentations
September, 2025 Changsha, China	**Enhancing Wi-Fi links with Intelligent Antenna Extension** Invited by Open Harmony Technical Conference 2025
July, 2025 Beijing, China	**Enhancing Wi-Fi links with Intelligent Antenna Extension** Invited by Chaspark, Huawei
February, 2025 Guangzhou, China	**Wi-Fi CSI based Smart Sensing Systems** Invited by Guangzhou Institute of Geochemistry, Chinese Academy of Sciences
June, 2024 Tokyo, Japan	**Face Recognition In Harsh Conditions: An Acoustic Based Approach** Presented at ACM MobiSys 2024

Mentoring and Teaching Experience

2025 - Present CCS'26	**Zhenyu Ren**, *Ph.D. student*, HKUST Research direction: short-range network communication and sensing
2025 - Present TIOT'25	**Boya Liu**, *Ph.D. student*, HKUST Research direction: short-range network communication and sensing
2026 - Present	**Xijie Zhang**, *Msc AI student*, HKUST Research direction: Machine learning based short range wireless sensing
2026 - Present	**Kehan Wu**, *Research intern*, HKUST Research direction: wireless sensing for sleep health monitoring
2021 - 2022	**EngHao Ong**, *Final-year Project student*, NTU Project topic: Smart surface for campus LoRaWAN enhancement
	Tan MeiShuang, *Final-year Project student*, NTU Project topic: Enhancing Wi-Fi mesh for high reliability
2020 - 2021	**Lim TengChuen**, *Final-year Project students*, NTU Project topics: Indoor localization with commodity Wi-Fi
Fall 2021	**Teaching Assistant**, *CE3005/CZ3006 - Network-Centric Computing*, NTU Updated course content, delivered tutorials, and graded examinations
Fall 2020	**Teaching Assistant**, *CE3005/CZ3006 - Network-Centric Computing*, NTU Delivered lab tutorials and prepared examination questions
Fall 2019	**Teaching Assistant**, *CE3005/CZ3006 - Network-Centric Computing*, NTU Designed lab experiments and delivered tutorials