

Yanbo Zhang, Ph.D.

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

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My research centers on scene-adaptive intelligent wireless sensing and IoT systems. I develop methods that bridge electromagnetic propagation physics with deep learning to enable robust and generalizable sensing across diverse environments and tasks.

- Wireless sensing: contactless recognition, identification, and health monitoring using Wi-Fi, acoustic, and radar signals
- IoT networking and physical-layer enhancement: reliable data transmission, link quality optimization for heterogeneous wireless networks

Work experience

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

Education

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

Publication

ACM CCS 2026	Snatcher: Apple Find My Network Exposes Your Lost Devices To Strangers , Zhenyu Ren*, <u>Yanbo Zhang</u> *, 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 , <u>Yanbo Zhang</u> , 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, <u>Yanbo Zhang</u> [†] , 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 , <u>Yanbo Zhang</u> , 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, <u>Yanbo Zhang</u> [†] , 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, <u>Yanbo Zhang</u> , 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 , <u>Yanbo Zhang</u> , 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 , <u>Yanbo Zhang</u> , 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 , <u>Yanbo Zhang</u> , 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, <u>Yanbo Zhang</u> , 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 provides gold-standard stage labels for radio-derived respiration and body-motion signals. Enables contactless sleep staging models that generalize across users, devices, and environments, supporting real-time detection for behavioral sleep intervention.
2024 - 2025	Wi-Fi based Sleep Stage Monitoring with U-Net Multi-modal Segmentation Develops a contactless Wi-Fi sleep stage monitoring system that passively tracks whole-night stage transitions using a U-Net inspired deep network fusing multiple signal modalities. Achieves accuracy comparable to commercial wearable devices with robustness across diverse home environments.
2023 - 2024	Enabling LoRaWAN Data Reliability with LLM based Network Management Investigates system imperfections causing frame loss in LoRaWAN and designs an LLM-based downlink control scheme and uplink precoding scheme to ensure reliable reception of both data and control messages. Introduces data priority to LoRaWAN for the first time, unlocking diverse application potential.
2021 - 2022	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
2020 - 2021	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
2019 - 2020	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× within a single band, achieving 2–4× 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
2021 Microsoft Research	Silver Medal (Top 3%) In 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
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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 , <i>Ph.D. student</i> , HKUST Research direction: short-range network communication and sensing
2025 - Present TIOT'25	Boya Liu , <i>Ph.D. student</i> , HKUST Research direction: short-range network communication and sensing
2026 - Present	Xijie Zhang , <i>Msc AI student</i> , HKUST Research direction: Machine learning based short range wireless sensing
2026 - Present	Kehan Wu , <i>Research intern</i> , HKUST Research direction: wireless sensing for sleep health monitoring
2021 - 2022	EngHao Ong , <i>Final-year Project student</i> , NTU Project topic: Smart surface for campus LoRaWAN enhancement Tan MeiShuang , <i>Final-year Project student</i> , NTU Project topic: Enhancing Wi-Fi mesh for high reliability
2020 - 2021	Lim TengChuen , <i>Final-year Project students</i> , NTU Project topics: Indoor localization with commodity Wi-Fi
Fall 2021	Teaching Assistant , CE3005/CZ3006 - <i>Network-Centric Computing</i> , NTU Updated course content, delivered tutorials, and graded examinations
Fall 2020	Teaching Assistant , CE3005/CZ3006 - <i>Network-Centric Computing</i> , NTU Delivered lab tutorials and prepared examination questions
Fall 2019	Teaching Assistant , CE3005/CZ3006 - <i>Network-Centric Computing</i> , NTU Designed lab experiments and delivered tutorials