Wentao Xie

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Research

My research solves human-centric physical world problems with **ubiquitous computing** approaches. Specifically, my research designs ubiquitous sensing systems and robust AI models to lower the barrier to measuring and interpreting human activities, ranging from physiological (respiration, EXG) to physical (gestures, motions) activities, enabling applications such as **home-based healthcare** and **HCI with resources-constrained devices**. My research is highly interdisciplinary where I work closely with domain experts such as health professionals and UX/UI designers to identify physical world problems, and solve them using ubiquitous sensing methods.

Appointment

Sep 2024– **The Hong Kong University of Science and Technology**, Hong Kong
Department of Computer Science and Engineering
Research Assistant Professor

Education

2019–2024 **The Hong Kong University of Science and Technology (HKUST)**, Hong Kong
Ph.D., Computer Science and Engineering
Thesis: *Understand Human Behaviours with IoT Sensors: From Physical to Physiological Sensing*
Supervisors: Prof Qian Zhang and Dr Jin Zhang

2015–2019 **Southern University of Science and Technology (SUSTech)**, Shenzhen, China
B.Eng., Computer Science and Engineering

Achievements and Awards

Oct 2023 Research Travel Grants, HKUST
Feb 2023 Research Travel Grants, HKUST
Aug 2022 HKUST RedBird Academic Excellence Award, HKUST
Oct 2021 HKTIIT Post-Graduate Excellence Scholarship, Hong Kong Telecom Institute of Information Technology (HKTIIT)
Aug 2019 Distinguished Final-year Thesis, SUSTech
2017, 2018 University Academic Scholarship, SUSTech

Teaching

Spring 2025 **Instructor**, *COMP4021 - Internet Computing*, HKUST
Students will learn full-stack web application programming skills, including web languages such as HTML, JavaScript, and PHP, and common libraries/frameworks such as jQuery, AJAX, Express, etc. Course modules contain lectures, labs, and projects.
Student feedback rating: 4.4/5, department average: 4.15, university average: 4.05

Fall 2022 **Teaching Assistant**, *COMP4621 - Computer Communication Networks I*, HKUST
Delivered lab tutorials and designed the course project

Fall 2022 **Teaching Assistant**, *COMP4531 - Mobile Computing and Smart Sensing*, HKUST
Prepared course lab materials and designed the course project.

Fall 2022 **Teaching Assistant**, *COMP4021 - Internet Computing*, HKUST
Delivered lab tutorials and graded lab assignments.

Supervision and Mentorship

Spring 2025– **Yixuan Liu**, *Undergraduate research intern*, HKUST

Spring 2025– **Lambo Qin**, *Undergraduate research intern*, HKUST

Spring 2025– **Yankai Zhao**, *Visiting Master's student*, SUSTech
One UIST'25 paper in submission

Fall 2024– **Akshat Agarwal, Sukruti Rai**, *Final-year Project students*, HKUST
Project title: *Stock Exchange Simulator*

Fall 2024– **Yizhen Zhang**, *Mentored PhD student*, HKUST
One paper in preparation

Fall 2023– **Chi Xu**, *Mentored PhD student*, HKUST
One UbiComp'24 paper and one MobiCom'25 paper

Professional Services

Conference Organizing
ACM MobiCom Competition Co-chair, *2025*

Technical Program Committee
ECCAI Workshop @ ACM CoNEXT, *2025*
ACM MobiHoc, *2025*
ACM ISWC, *2025*
IEEE GLOBECOM, *2025*

Reviewer
ACM IMWUT (2 Recognitions for Outstanding Reviews), *2022, 2023, 2024, 2025*
ACM Transactions on Computing for Healthcare, *2025*
IEEE Transactions on Mobile Computing, *2025*
ACM Multimedia, *2025*
ACM ISWC, *2023*

Publications

(* denotes co-primary authors)

[15] Yanbin Gong, **Wentao Xie**, Chi Xu, Qian Zhang, and Shifang Yang, "SputumLocator: Enhancing Airway Clearance with Auscultation-Based Sputum Localization, " to appear in *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), vol. 9, no. 2, 2025.* (**UbiComp 2025**)

[14] Meng Xue, Yinan Zhu, **Wentao Xie**, Zhixian Wang, Yanjiao Chen, Kui Jiang, and Qian Zhang, "MobHAR: Source-free Knowledge Transfer for Human Activity Recognition on Mobile Devices, " *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), vol. 9, no. 1, 2025.* (**UbiComp 2025**)

[13] Meng Xue*, **Wentao Xie***, Huizi Yizuo, Shumao Wu, Zhilong Zhang, Yinan Zhu, Qian Zhang, and Changzheng Chen, "Home-based Dry Eye Assessment via Blink Kinematics Using mmWave and Clinical Knowledge Distillation, " to appear in *Proceedings of the 31th Annual International Conference on Mobile Computing and Networking, Hong Kong, Nov. 2025.* (**MobiCom 2025**)

[12] Yetong Cao, Dong Ma, **Wentao Xie**, Qian Zhang, and Jun Luo, "ESPIRO: Natural Pulmonary Function Monitoring via Earphone-Acquired Speech," *Proceedings of the 31th Annual International Conference on Mobile Computing and Networking (MobiCom '25), Hong Kong, Nov. 2025.* (**MobiCom 2025**)

[11] Chi Xu*, **Wentao Xie***, Baichen Yang, Yizhen Zhang, Yanbin Gong, Jin Zhang, Wei Li, Shifang Yang, and Qian Zhang, "EasySpiro: Assessing Lung Function via Arbitrary Exhalations on Commodity Earphones, " *Proceedings of the 31th Annual International Conference on Mobile Computing and Networking, Hong Kong, Nov. 2025.* (**MobiCom 2025**)

[10] Tao Sun*, Yankai Zhao*, **Wentao Xie**, Jiao Li, Yongyu Ma, and Jin Zhang, "EyeGesener: Eye Gesture Listener for Smart Glasses Interaction Using Acoustic Sensing, " in *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), vol. 8, no. 3, 2024.* (**UbiComp 2024**)

[9] **Wentao Xie***, Chi Xu*, Yanbin Gong, Yu Wang, Yuxin Liu, Jin Zhang, Qian Zhang, Zeguang Zheng, and Shifang Yang, "DeepBreath: Breathing Exercise Assessment with a Depth Camera," in *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), vol. 7, no. 4, 2024.* **UbiComp 2024**

[8] Yanbin Gong, **Wentao Xie**, Qian Zhang, and Shifang Yang, "Hypergradient Descent Based Multi-Task Learning on Auscultation Point Guided Respiratory Sound Classification," in *2024 IEEE 20th International Conference on Body Sensor Networks, Chicago IL, USA, Oct. 2024.* (**BSN 2024**)

[7] Linfei Ge, **Wentao Xie**, Jin Zhang, Qian Zhang, "BLEAR: Practical Wireless Earphone Tracking under BLE Protocol", in *The Proceedings of 2023 IEEE International Conference on Pervasive Computing and Communications, Biarritz, France, Mar. 2024.* (**PerCom 2024**)

[6] **Wentao Xie**, Huangxun Chen, Jing Wei, Jin Zhang, Qian Zhang, "RimSense: Enabling Touch-based Interaction on Eyeglass Rim using Piezoelectric Sensors", in *The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), vol. 7, no. 4, 2023.* (**UbiComp 2024**)

[5] Baichen Yang, Qingyong Hu, **Wentao Xie**, Xinchen Wang, Wei Luo, Qian Zhang, "PDAssess: A Privacy-preserving Free-speech based Parkinson's Disease Daily Assessment System", in *Proceedings of the 21st ACM Conference on Embedded Networked Sensor Systems, Istanbul, Turkiye, Nov. 2023.* (**SenSys 2023**)

[4] **Wentao Xie**, Qingyong Hu, Jin Zhang, Qian Zhang "EarSpiro: Earphone-based Spirometry for Lung Function Assessment" in *The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), vol. 6, no. 4, pp. 1–27, 2022.* (**UbiComp 2022**)

[3] **Wentao Xie**, Jin Zhang, Qian Zhang "Poster: Transforming Eyeglass Rim into Touch Panel Using Piezoelectric Sensors" in *Proceedings of the 28th Annual International Conference on Mobile Computing and Networking, Sydney NSW Australia, Oct. 2022.* (**MobiCom 2022**)

[2] **Wentao Xie**, Qian Zhang, Jin Zhang, "Acoustic-based Upper Facial Action Recognition for Smart Eyewear" in *The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), vol. 5, no. 2, pp. 1–28, 2021.* (**UbiComp 2021**)

[1] **Wentao Xie**, Runxin Tian, Jin Zhang, Qian Zhang, "Noncontact Respiration Detection Leveraging Music and Broadcast Signals" in *IEEE Internet of Things Journal, vol. 8, no. 4, pp. 2931-2942, 2021.* (**IoTJ 2021**)