

Xiaoyu Zhang

CONTACT INFORMATION

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RESEARCH INTERESTS

My research interests lie in **Mobile Computing**, **Internet of Things**, **Smart Health**, and **Human-computer Interaction**. My research focuses on designing and evaluating advanced wireless sensing systems for next-generation biomedical and mechanical applications, such as *Skin wound care*, *Material Characterization*, and *Mental health*. Specifically, I explore various technological approaches in the field of mobile computing to effectively extract target attributes such as *composition*, *structure*, and *movement*, in order to enable innovative applications. My highlight research primarily focuses on:

- 1) Non-destructive Human Sensing System:** Exploring non-contact RF-based methods to accurately and reliably capture human biomarker information without causing harm to the body.
- 2) On-the-go Material Characterization:** Hand-held system design for characterization of material properties based on features extracted from the differential response of the material to RF signals, e.g., mmWave-based spatial thermal conductivity distribution sensing system.
- 3) Multi-Modality Interaction:** Enhancing the feature extraction capabilities of low-performance modality models using high-performance modalities enables their application in scenarios where high-performance modalities are not available.

EDUCATION

University at Buffalo, the State University of New York (SUNY) *Sep. 2021 - Present*
Ph.D., Computer Science and Engineering Supervised by Prof. Wenyao Xu

University of Science and Technology of China *Sep. 2017 - Sep. 2020*
Graduate Student, Electronic Engineering and Information Science

Hefei University of Technology *Sep. 2013 - Sep. 2017*
B.Eng., Electronic Information Engineering

WORK EXPERIENCE

China Merchants Bank Software Center *Jul. 2020 - Sep. 2020*
We design a data verification system based on Bootstrap and Django for various data sources, featuring support for online modification, and we develop the front-end display interface and back-end framework to enable dynamic data interaction between the front and back ends.

HONORS AND AWARDS

- Best Paper Candidate Award, 2025
- Graduate Teaching Award, 2024
- Chair's Fellowship, 2021
- The Second Prize Graduate scholarship of USTC, 2018, 2019
- The First Prize Graduate scholarship of USTC, 2017
- The Third-class scholarship of HFUT, 2015, 2016, 2017

TEACHING
EXPERIENCES

1. Algorithm Analysis and Design [Fall 2024]
2. Special Topics (Guest Lecture: Wireless Signal Processing: Making Sense of the Invisible) [Fall 2023]
3. Algorithm Analysis and Design [Fall 2023]
4. Algorithm Analysis and Design [Fall 2022]
5. Algorithm Analysis and Design [Spring 2022]
6. Algorithm Analysis and Design [Fall 2021]
7. Mathematical Logic and Graph Theory [Fall 2018]

MENTORING
EXPERIENCES

I mentored 6 Undergraduate students.

- Abhi Ramtel (Undergraduate Student, CSE@UB)
UI Design of An Over-gauze Wound Assessment System
- Cole Desimone (Undergraduate Student, AE@UB)
3D Model Design of mmWave Sensor Scanning System
- George Gillman (Undergraduate Student, EE@UB)
mmWave Technologies for Medical Applications: A Review
- Weida Jiang (Undergraduate Student, CSE@UB)
Embedded mmWave-based Hand Detection in Raspberry
- Wenxuan Huang & Yiwen Tan (Undergraduate Student, CSE@UB)
Tool Design for Automatic Image Labeling

PUBLICATIONS

I have published 9 research papers in high-impact venues for mobile computing (e.g., IoT, BSN), human-computer interaction (UIST), smart health/bioinformatics (e.g., JBHI, Photoacoustics).

[Sensors’25] **Xiaoyu Zhang**, Chuhui Liu, Yanda Cheng, Zhengxiong Li, Chenhan Xu, Chuqin Huang, Ye Zhan, Wei Bo, Jun Xia, Wen Yao Xu, “*A Comprehensive Survey of Research Trends in mmWave Technologies for Medical Applications*”, Sensors.

[IoTJ’25] **Xiaoyu Zhang**, Zhengxiong Li, Yanda Cheng, Chenhan Xu, Chuqin Huang, Emma Zhang, Ye Zhan, Wei Bo, Jun Xia, Wen Yao Xu, “*mmSkin: An Over-gauze Wound Assessment System using Radio Frequency Technologies*”, IEEE Internet of Things Journal.

[HumanSys’25] **Xiaoyu Zhang**, Zhengxiong Li, Yanda Cheng, Chenhan Xu, Chuqin Huang, Emma Zhang, Ye Zhan, Wei Bo, Jun Xia, Wen Yao Xu, “*Through-dressing Wound Monitoring Based on the mmWave Sensor*”, The Third International Workshop on Human-Centered Sensing, Modeling, and Intelligent Systems. (**Best Paper Candidate**)

[IoTJ’25] **Xiaoyu Zhang**, Zhengxiong Li, Chenhan Xu, Luchuan Song, Huining Li, Hongfei Xue, Yingxiao Wu, Wen Yao Xu, “*mmHand: Towards Pixel-Level-Accuracy Hand Localization Using A Single Commodity mmWave Device*”, IEEE Internet of Things Journal.

[Photoacoustics’25] Chuqin Huang, Emily Zheng, Wenhan Zheng, Huijuan Zhang, Yanda Cheng, **Xiaoyu Zhang**, Varun Shijo, Robert W Bing, Isabel Komornicki, Linda M Harris, Ermelinda Bonaccio, Kazuaki Takabe, Emma Zhang, Wen Yao Xu, Jun Xia, “*Enhanced clinical photoacoustic vascular imaging through a skin localization network and adaptive weighting*”, Photoacoustics.

[JBHI’24] Wei Bo, Suzanne S. Sullivan, **Xiaoyu Zhang**, Mingchen Gao, Wen Yao Xu, “*A Telemedicine Analytic Framework for Fully and Semi-automatic Alzheimer’s Disease Screening using Clock Drawing Test*”, IEEE Journal of Biomedical and Health Informatics.

[UIST’23] Tiantian Liu, Feng Lin, Chao Wang, Chenhan Xu, **Xiaoyu Zhang**, Zhengxiong Li, Wen Yao Xu, Ming-Chun Huang, Kui Ren, “*Robust and Secure Multi-modal User Identification via mmWave-voice Mechanism*”, ACM Symposium on User Interface Software and Technology, San Francisco, USA, October 2023.

[BSN'19] **Xiaoyu Zhang**, Bin Liu, “*A Channel Hopping Strategy Based on the Human Trajectory Similarity for WBANs*”, IEEE-EMBS International Conference on Body Sensor Networks, Chicago, USA, May 2019.

[Bodynets'17] Guan, Chengjie, Bin Liu, Zhiqiang Liu, Y Zhang, **Xiaoyu Zhang**, “*JMMM: A Mobility Model for WBANs Based on Human Joint Movements*”, 19th EAI International Conference on Body Area Networks, Dalian, China, Sep 2017.

COMPETITION **Xiaoyu Zhang**, Chuhui Liu, Jun Xia, Linda M. Harris, Wenyao Xu. Panasci Technology Entrepreneurship Competition (Panasci TEC) 2025, advanced to semifinals.

COMMUNITY
SERVICES &
OUTREACH
ACTIVITIES **Reviewer:**

- ACM Transactions on Computing for Healthcare [2025]
- Smart Health (SH) [2025]
- Smart Health (SH) [2024]
- IEEE-EMBS International Conference on Biomedical and Health Informatics (IEEE BHI) [2024]
- IEEE-EMBS International Conference on Body Sensor Networks (IEEE BSN) [2024]
- IEEE-EMBS International Conference on Body Sensor Networks (IEEE BSN) [2023]

PRESENTATIONS

- Invited Talk: The Third International Workshop on Human-Centered Sensing, Modeling, and Intelligent Systems May. 2025
Through-dressing Wound Monitoring Based on the mmWave Sensor
- Pitch Talk: Panasci TEC Competition March. 2025
WavelyVision: Advanced Through-Gauze Wound Assessment Technology
- Invited Talk: IEEE-EMBS International Conference on Body Sensor Networks May. 2019
A Channel Hopping Strategy Based on the Human Trajectory Similarity for WBANs
- Invited Talk: 19th EAI International Conference on Body Area Networks Sep. 2017
JMMM: A Mobility Model for WBANs Based on Human Joint Movements

PATENTS

- mmHeat: Non-destructive Inspection of Thermal Insulation in Building Envelope.
- A new mmWave system for accurate hand and finger tracking
- Device and Method for Wound Monitoring and Diagnosis using Radio-Frequency Technologies. (Available for licensing or collaboration.)