Xiaoyu Zhang

Contact Information

340 Davis Hall
Department of Computer Science & Engineering
University at Buffalo, SUNY
Buffalo, NY, 14260-2500 USA

Phone: (716) 907-7845
E-mail: zhang376@buffalo.edu
Page: `https://zxy340.github.io/`

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 hightlight 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 — Co-advised by Prof. Wenyao Xu & Yaxiong Xie

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

[**Photoacoustics'25**] Chuqin Huang, Yanda Cheng, **Xiaoyu Zhang**, Ye Zhan, Wenhan Zheng, Isabel Komornicki, Linda M. Harris, Wenyao Xu, Jun Xia, "*Radiomics-Driven Perfusion Prediction in Clinical Photoacoustic Foot Imaging*", Photoacoustics.

[**Sensors'25**] **Xiaoyu Zhang**, Chuhui Liu, Yanda Cheng, Zhengxiong Li, Chenhan Xu, Chuqin Huang, Ye Zhan, Wei Bo, Jun Xia, Wenyao 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, Wenyao 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, Wenyao 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, Wenyao 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, Wenyao 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, Wenyao 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, Wenyao Xu, Ming-Chun Huang, Kui Ren, "*Robust and Secure Multi-modal User Identication 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:

- IEEE Open Journal of Engineering in Medicine and Biology (OJEMB) [2025]
- IEEE Transactions on Mobile Computing (TMC) [2025]
- 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.)