

HAO ZHOU

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RESEARCH OVERVIEW

My research lies in the span of **mobile sensing**. By **various modalities** (Ultra-wideband, IMU, Vision, Acoustics, etc.), I aim to bring insights to human lives in domains such as **motion tracking, mobile health, and accessibility**.

EDUCATION

The Pennsylvania State University

State College, PA, USA

Doctor of Philosophy in Computer Science and Engineering

2021 - Present

Advisor: Dr. Mahanth Gowda

The University of Mississippi

Oxford, MS, USA

Master of Science in Computer Science

2019 - 2021

Bachelor of Science in Computer Science

2016 - 2019

SELECTED PUBLICATIONS

♠ *Rethinking Orientation Estimation with Smartphone-equipped Ultra-wideband Chips*

Hao Zhou, Kuang Yuan, Mahanth Gowda, Lili Qiu, Jie Xiong

ACM MobiCom 2024

♠ *Know Your Heart Better: Multimodal Cardiac Output Monitoring using Earbuds*

Hao Zhou with Digital Health Lab at Samsung Research America

IEEE ICASSP 2025

♠ *Optimizing Biomarkers from Earbud Ballistocardiogram: Calibration and Calibration-Free Algorithms for Accelerometer Axis Selection and Fusion*

Yunzhi Li, ..., **Hao Zhou** and Digital Health Lab at Samsung Research America

IEEE ICASSP 2025

♠ *BallistoBud: Heart Rate Variability Monitoring using Earbud Accelerometry for Stress Assessment*

Md Saiful Islam, ..., **Hao Zhou** and Digital Health Lab at Samsung Research America

ACM CHI 2025

♠ *ASLRing: American Sign Language Recognition with Meta-Learning on Wearables*

Hao Zhou, Taiting Lu, Kenneth DeHaan, and Mahanth Gowda

ACM/IEEE IoTDI 2024 (Now Part of SenSys)

♠ *SmartDampener: An Open Source Platform for Sport Analytics in Tennis*

Runze Liu, Taiting Lu, Shengming Yuan, **Hao Zhou**, and Mahanth Gowda

ACM IMWUT/UbiComp 2024

♠ *SignQuery: A Natural User Interface and Search Engine for Sign Language with Wearable Sensors*

Hao Zhou, Taiting Lu, Kristina McKinnie, Joseph Palagano, Kenneth DeHaan, and Mahanth Gowda

ACM MobiCom 2023

♠ *An Open Source Smartring Platform for Finger Motion Analytics and Healthcare Applications*

Hao Zhou, Taiting Lu, Yilin Liu, Shijia Zhang, Runze Liu, and Mahanth Gowda

ACM/IEEE IoTDI 2023 (Now Part of SenSys)

🏆 **Best Paper Award for Edge IoT**

- ♠ *I am an Earphone and I can Hear my Users Face: 3D Facial Reconstruction using Smart Earphones*
Shijia Zhang, Taiting Lu, **Hao Zhou**, Yilin Liu, Runze Liu, and Mahanth Gowda
ACM Transactions on Internet of Things 2023
- ♠ *Backdoor Threats from Compromised Foundation Models to Federated Learning*
Xi Li, Songhe Wang, Chen Wu, **Hao Zhou**, and Jiaqi Wang
NeurIPS 2023 Workshop
- ♠ *Learning on the Rings: Self-Supervised 3D Finger Motion Tracking using Wearable Sensors*
Hao Zhou, Taiting Lu, Yilin Liu, Shijia Zhang, and Mahanth Gowda
ACM IMWUT/UbiComp 2022

INDUSTRIAL EXPERIENCE

- Samsung Research America**, hosted by Digital Health Lab May 2024 - Aug 2024
 - Developed multimodal health monitoring systems for digital biomarkers (e.g., cardiac output, blood pressure, heart rate variability) with Samsung devices.
- Microsoft Research Asia**, hosted by Prof. Jie Xiong May 2023 - Aug 2023
 - Utilized ultra-wideband (UWB) on consumer-level electronics for device orientation, respiration sensing.
 - Explored 3D Vision (LiDAR) for mobile health.