

# Ziqi Wang

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## EDUCATION

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**University of California, Los Angeles (UCLA)** Los Angeles, US  
Ph.D. in Electrical and Computer Engineering, Advisor: Mani B. Srivastava 2020–2024  
M.S. in Electrical and Computer Engineering, Signal and System Area, GPA: 3.90/4.00 2018–2020  
- Thesis: “Towards Robust and Secure Audio Sensing Using Wireless Vibrometry and Deep Learning”

**Fudan University** Shanghai, China  
B.Eng. in Electronics and Information Science and Technology 2014–2018  
- Minor in Data Science  
- Thesis: “Signal AoA Estimation and Human Fall Detection Using Wi-Fi Channel State Information”

## EXPERIENCE

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**Qualcomm** San Diego, CA  
Intern for Wireless R&D 2023.6–2023.9  
Created an end-to-end deep learning system for device-free object localization using wireless signals

**Samsung Research America** Mountain View, CA  
Research Intern for Knox – AI / Mobile / Privacy 2022.6–2022.9  
- Designed a time-synchronized multi-sensor data collection platform for non-contact vital signal sensing  
- Created a multi-person dataset of UWB radar-measured human respiration and heartbeat along with ground truth  
- Investigating an approach combining signal processing and deep learning to compensate for handheld radar motion

## PROJECTS

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**Multimodal Sensing Platform and Dataset**  
- Tech Stack: Python, PyTorch, ROS  
- Constructed a multi-modal multi-node sensor data collection platform using LiDAR, mmWave, stereovision camera, and microphone arrays.  
- Created a 10+ hour dataset for indoor object tracking using multimodal data  
- Designed deep learning models for efficient cross-node multimodal sensor information fusion

**Situational Awareness Construction Using Multimodal Sensor Fusion**  
- Tech Stack: C/C++, Python, MATLAB, ROS, Scikit-learn  
- Implemented a multimodal sensing system combining LiDAR, camera, and UWB radar  
- Designed a pipeline to label the type, location, and vibration states of the objects in the environment  
- Organized device drivers, processing algorithms, and information flow into ROS nodes and topics  
- Reduced UWB radar processing algorithm complexity significantly using information from a LiDAR camera

**On-hand Tapping Recognition for Smartwatch Interactions**  
- Tech Stack: Python, PyTorch, Deep Learning Domain Adaptation  
- Implemented a system using smartwatch IMU data to recognize the user’s tapping on hand knuckles as an extended smartwatch interaction interface  
- Designed a backbone convolutional neural network for accurate tapping recognition  
- Improved the robustness of the model with domain adversarial training to battle user diversities

## Audio Vibration Sensing from Multiple Targets Using Impulse-Radio Ultra-Wideband Radar

- Tech Stack: C/C++, MATLAB, PCB Design
- Implemented an IR-UWB radar system that can isolate target sounds from a noisy background
- Derived a theoretical analysis on performing audio sensing using impulse-based wireless signals
- Modified the driver code to re-purpose a XeThru X4M05 radar to sense audio-related vibrations
- Built a statistical signal processing pipeline to locate sound events and separate multiple sound sources

## SELECTED PUBLICATIONS

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- [1] W. Chen, **Z. Wang**, P. Quan, Z. Peng, S. Lin, M. Srivastava, W. Matusik, and J. Stankovic, “Robust finger interactions with cots smartwatches via unsupervised siamese adaptation”, *The 2023 ACM Symposium on User Interface Software and Technology (UIST)*, Oct. 2023.
- [2] C. Samplawski, S. Fang, **Z. Wang**, D. Ganesan, M. Srivastava, and B. M. Marlin, “Heteroskedastic geospatial tracking with distributed camera networks”, *Proceedings of the 39th Conference on Uncertainty in Artificial Intelligence (UAI)*, Aug. 2023.
- [3] J. Wu, **Z. Wang**, A. Sarker, and M. Srivastava, “Acuity: Creating realistic digital twins through multi-resolution pointcloud processing and audiovisual sensor fusion”, in *Proceedings of the 8th ACM/IEEE Conference on Internet of Things Design and Implementation (IoTDI)*, 2023, pp. 79–92.
- [4] S. Fang, A. Sarker, **Z. Wang**, M. Srivastava, B. Marlin, and D. Ganesan, “Design and deployment of a multi-modal multi-node sensor data collection platform”, *Proceedings of the Fifth International SenSys+BuildSys Workshop on Data: Acquisition To Analysis (DATA)*, Nov. 2022.
- [5] S. S. Saha, S. Sandha, S. Pei, V. Jain, **Z. Wang**, Y. Li, A. Sarker, and M. Srivastava, “Auritus: An open-source optimization toolkit for training and development of human movement models and filters using earables”, *Proceedings of the ACM on Interactive Mobile Wearable and Ubiquitous Technologies*, vol. 6, p. 34, Jun. 2022.
- [6] **Z. Wang**, A. Sarker, J. Wu, D. Hua, G. Dong, A. D. Singh, and M. Srivastava, “Capricorn: Towards real-time rich scene analysis using rf-vision sensor fusion”, *Proceedings of the 20th ACM Conference on Embedded Networked Sensor Systems (SenSys)*, Nov. 2022.
- [7] **Z. Wang**, Z. Chen, A. D. Singh, L. Garcia, J. Luo, and M. Srivastava, “UWHear: Through-wall Extraction and Separation of Audio Vibrations Using Wireless Signals”, in *Proceedings of the 18th ACM Conference on Embedded Networked Sensor Systems (SenSys)*, ACM, 2020, pp. 1–14.
- [8] M. Alzantot, **Z. Wang**, and M. B. Srivastava, “Deep Residual Neural Networks for Audio Spoofing Detection”, in *Proceedings of the 20th Annual Conference of the International Speech Communication Association (INTERSPEECH)*, 2019, pp. 1078–1082.
- [9] R. Liu, **Z. Wang**, L. Garcia, and M. Srivastava, “Remediot: Remedial actions for internet-of-things conflicts”, in *Proceedings of the 6th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys)*, ACM, 2019, pp. 101–110.
- [10] **Z. Wang**, Z. Gu, J. Yin, Z. Chen, and Y. Xu, “Syncope detection in toilet environments using wi-fi channel state information”, in *Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers (Ubicomp)*, ACM, 2018, pp. 287–290.

## SKILLS

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**Programming Languages:** Python, MATLAB, C/C++, Assembly, VHDL

**Tools:** Git, PyTorch, TensorFlow, ROS

## SCHOLARSHIPS AND AWARDS

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- Best Paper Award for IoT Digital Twins, ACM/IEEE IoTDI Conference 2023
- Best Poster Honorable Mention Award, UCLA ECE Annual Research Review 2019
- Outstanding Graduates in Shanghai (Top 5% in the EE Department) 2018
- First-class scholarship for outstanding students in Fudan University 2016, 2017, 2018
- The Second Prize in National Undergraduate Electronic Design Contest, Shanghai Area 2017