

Jiexin Ding

<https://djx06.github.io/>

Email : jxding17@gmail.com

Mobile : +1-206-383-4296

EDUCATION

University of Washington

Ph.D. in Electrical & Computer Engineering

Master of Science in Technology Innovation

Seattle, WA

Start at Sept. 2024

Sept. 2022 – March 2024

Tsinghua University

Master of Engineering in Data Science and Information Technology

Bachelor of Engineering in Computer Science and Technology

Beijing, China

Sept. 2021 – March 2024

Sept. 2017 – June 2021

RESEARCH INTERESTS

Human Computer Interaction, Ubiquitous Computing

Wearable Sensing, Assisting Reading by LLM, Wireless, Acoustic Ranging

PUBLICATIONS

* denotes equal contributions.

- [1] (Under Review) **Ding, J.***, Zhao, B.* et al. 2025. : EnWord: Unknown Word Detection for English as a Second Language (ESL) Learners Using Gaze and Pre-trained Language Models. CHI Conference on Human Factors in Computing Systems (CHI 25).
- [2] (Under Review) Chatterjee, I.*, **Ding, J.*** et al. 2025. FlowRing: Integrating Microgestures and Surface Interaction for Seamless XR Input. CHI Conference on Human Factors in Computing Systems (CHI 25).
- [3] **Ding, J.**, Chatterjee, I. et al. 2023. Demo of FlowRing: Seamless Cross-Surface Interaction via Opto-Acoustic Ring. Adjunct Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology (UIST 24 Adjunct).
- [4] (**Best Demo**) Waghmare, A., **Ding, J.** et al. 2023. Demo of Z-Ring: Context-Aware Subtle Input Using Single-Point Bio-Impedance Sensing. Adjunct Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology (UIST 23 Adjunct).
- [5] **Ding, J.***, Zhao, B.* et al. 2023. GazeReader: Detecting Unknown Word Using Webcam for English as a Second Language (ESL) Learners. Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems (CHI EA 23).
- [6] Wang, Y.*, **Ding, J.*** et al. 2022. FaceOri: Tracking Head Position and Orientation Using Ultrasonic Ranging on Earphones. CHI Conference on Human Factors in Computing Systems (CHI 22).

EXPERIENCE

NEWT Lab, University of Washington

Research Assistant, Advisor: Prof. Akshay Gadre

Seattle, WA

Sept. 2024 – Present

- Conduct research in using **millimeter wave** radar to tracking human activity.
- Build hardware prototypes to transmit and receive the millimeter wave and use synthetic-aperture radar (SAR) to generate images.

AnalyticDB, Alibaba Cloud

Software Engineer

Beijing, China

June. 2024 – Sept. 2024

- Developed a churn prediction model and a payment prediction model of game users based on **Behavior Sequence Transformer** with the accuracy of 71.3%, potentially saving millions of dollar for game company.
- Trained the model distributively using **DeepSpeed**. Deployed the model and inferenced the prediction results using **Triton**. Processed game log data using Spark.

Ubicomp Lab, University of Washington

Research Assistant, Advisor: Prof. Shwetak Patel

Seattle, WA

Sept. 2022 – March 2024

- Built a **ring prototype** with a contact microphone and an optic flow sensor and connected it to the PC by **BLE**.
- Designed and trained an opto-acoustic **multimodal model** to detect microgestures and on-surface interaction.

- Developed a music player demo to show that the ring can enable **context-aware interactions**.

Pervasive HCI Lab, Tsinghua University

Beijing, China

Research Assistant, Advisor: Prof. Yuanchun Shi, Prof. Yuntao Wang

June 2020 – June 2024

- Proposed and implemented the idea of detecting unknown words for English learners by a gaze-text multimodal model and using a **language model** to improve the accuracy on noisy data collected by a webcam. [5]
- Solved calibration issue in **distributed acoustic ranging** by synchronizing time among nodes using **Bluetooth**.
- Improved the **acoustic ranging** accuracy in low SNR scenarios when tracking head orientation using earbuds. [6]

SELECTED PROJECTS

ReadEasy: an LLM-based Academic Reading Assistant

Sept. 2023 - Present

- Led the development and definition of ReadEasy, an **LLM**-based app that assists academic reading by providing personalized word explanation and summary using **OpenAI Assistants API**.
- Built a **transformer-based model** to detect unknown words using gaze and text data with 97.6% accuracy.
- Developed an web-based PDF viewer using **React** and **PDF.js** with personalized word explanation and summary.

FlowRing: Integrating Microgestures and Surface Interaction for XR Input

June 2023 – Nov. 2023

- Detected in-air gestures and on-surface interaction with a ring using **CNN+LSTM** and achieved 92.7% accuracy.
- Transmitted data via **BLE** and read acoustic data from the contact microphone using interrupt on Sseed Xiao.
- Used **CUDA** to train the model on GPUs and built a **multithreaded** app to operate a music player by gestures.

GazeReader: Unknown Word Detection Using Gaze and Language Model

Jan.2023 – Sept.2023

- Implemented a transformer-based model to detect unknown words in which the positional data of gaze and text is embedded using an **encoder-decoder model** and the textual information is embedded using **RoBERTa**. The accuracy is 97.6% and the F1-score is 71.1%.
- Demonstrated the robustness of our method on less-precise webcam-based gaze data and achieved the accuracy of 97.3% and the F1-score of 65.1%.

AcousLink: Distributed Ultrasonic Ranging Method and Applications

Apr. 2022 – Present

- Implemented the **FMCW**-based ultrasonic ranging module with a 100kHz sampling rate on Nordic Semi nRF52840-DK using the tweeter and high sensitivity microphone using **C**.
- Enabled calibration-free ranging by leveraging **Bluetooth** for the time synchronization between two boards.
- Achieved 2.5 cm tracking accuracy in the range of 5 m.

FaceOri: Tracking Head Position and Orientation Using Acoustic Ranging

July 2020 – Sept. 2021

- Calculated the real-time distance between the speaker and the microphones embedded in the commodity earbuds using the **FMCW**-based acoustic ranging method to detect face orientations.
- Conducted user study and achieved a median absolute error of 10.9 mm in the distance, 3.7° in yaw, and 5.8° in pitch, better than AirPods Pro.
- Enabled the attention detection with 93.5% accuracy and built an **Android** app with auto-screen-lock function.

TECHNICAL SKILLS

Languages: C/C++, Python, JavaScript, TypeScript, React, Node.js, HTML/CSS, Java

Technologies: Pytorch, Tensorflow, Android, Unity, Linux, Firebase, CUDA, Git, Django, Azure

Electrical engineering skills: oscilloscope, function generator, logic analyzer, multimeter, soldering

Wireless: Bluetooth, BLE