

Ph.D. candidate at the Department of Computer Science, University of Virginia, Charlottesville, Virginia, United States.
My research focuses on **human-computer interaction** in AR/VR, haptic devices, computer vision, and robotics.

RESEARCH

- 3D Directional Haptic Feedback Using Asymmetric Vibration for XR Interaction

Feb 2025 — Now

 - Developed a handheld device that creates 3D directional force illusion using asymmetric vibration.
 - Enabled intuitive hand guidance and spatial feedback for remote collaboration and virtual training in XR.
- Teleoperated Robotic Hands with Haptic Feedback for Precise Control

Nov 2024 — Now

 - Developed a teleoperated robotic hand with real-time haptic feedback for 3D scene exploration and enhanced user control.
- A Dynamic Shape Display for Enhanced On-Surface Interactions in VR

Dec 2022 — Oct 2024

 - Built a foldable shape-changing device that uses shape approximation and visuo-haptic illusions to render VR surfaces.
 - Studies showed the system improved realism, control, and performance in 3D modeling tasks over tablet and mid-air input.
- Efficient and Ergonomic Hand Interactions through Self-Haptics in Virtual Reality

Jan 2023 — Apr 2024

 - Created a hand touchpad supporting efficient VR window interactions using a ML model with 92% touch detection accuracy.
 - Built applications enabling comfortable, productive knowledge-work tasks performed directly with the hands in VR.
- Effects of Different Haptic Feedback on Precise Bimanual Interactions in VR

Mar 2021 — Nov 2022

 - Compared visual-only feedback, tactile+kinesthetic feedback, and physical feedback in various precision-required tasks in VR.
 - The physical surface improved selection accuracy, tracing precision, and sketch quality over other haptic conditions.
- On-Body Haptic Wearable for Immersive Gym Experiences (WHC'21 Best Interaction)

Jan 2021 — July 2021

 - Developed a wearable haptic device that replicates gym equipment feedback using flex, force, and vibration sensors.
 - Integrated music-synced vibrations to boost user motivation, workout endurance, and accessibility for diverse users.

EXPERIENCE

- Research Assistant

Sep 2020 — Now

UVA Ultimate User Interface Lab | With Prof. Seongkook Heo

Charlottesville, VA, USA

 - System design/prototyping, computer vision, machine learning, signal processing, user studies, data analysis in HCI.
- Teaching Assistant

Aug 2021 — May 2024

University of Virginia | Department of Computer Science

Charlottesville, VA, USA

 - 2021, 2023:** Human Computer Interaction (CS 6501)
 - 2022, 2024:** Engineering Interactive Technologies (CS 4501/6501)
- Research Assistant

Sep 2019 — Jan 2021

UVA McIntire School of Commerce | With Prof. Lanfei Shi

Charlottesville, VA, USA

 - Used deep learning for dating app matching, and data analysis to detect sponsorships in YouTube videos.

EDUCATION

- University of Virginia, Master/Ph.D., USA

GPA: 3.89/4.00

Sep 2018 — Now
- Zhejiang University, Bachelor, China,

GPA: 3.70/4.00

Sep 2014 — Jun 2018

TECHNICAL SKILLS

Hardware	Interaction Technologies, Haptic Systems, Circuit/PCB Design, 3D Modeling and Printing
Software	Unity, Meta Oculus, Autodesk Fusion 360, Arduino, OptiTrack Tracking, Generative AI
Programming	Python, PyTorch, Java, Javascript, C#, R, C/C++, RoS, Matlab

PUBLICATIONS

- Ying, W.** & Heo, S. Enhancing VR Sketching with a Dynamic Shape Display (**Best Paper Honorable Mention**). *ACM Symposium on Virtual Reality Software and Technology* (October 9-11, 2024).
- Zhang, P., **Ying, W.**, Riggs, S., *et al.* MoiréTag: A Low-cost Tag for High-precision Tangible Interactions Without Active Components (**Honorable Mention**). *ACM Interactive Surfaces and Spaces Conference* (October 27-30, 2024).
- Hu, E., Grønbaek, J. E. S., **Ying, W.**, *et al.* ThingShare: Ad-Hoc Digital Copies of Physical Objects for Sharing Things in Video Meetings. *Proceedings of the CHI Conference on Human Factors in Computing Systems* (April 23-28, 2023).
- Ying, W.** & Heo, S. VRScroll: A Shape-Changing Device for Precise Sketching in Virtual Reality (**Best Poster**). *IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops* (March 25-29, 2023).
- Hildebrandt, C., **Ying, W.**, Heo, S., *et al.* Mimicking Real Forces on a Drone Through a Haptic Suit to Enable Cost-Effective Validation. *IEEE International Conference on Robotics and Automation* (May 29-June 2, 2023).