Haokun Wang

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I am a PhD student in the Department of Electrical Engineering at the University of Texas at Dallas, advised by Professor Jin Ryong Kim. My research focuses on **Haptics**, Human-Computer Interaction (**HCI**), and extended reality (**XR**). I specialize in developing novel interaction techniques for XR and wearable interfaces, combining multidisciplinary approaches. My long-term vision is to create **intuitive, high-fidelity, and multi-senory interaction systems** that enhance immersive experiences and have practical applications in medical simulation, training, and everyday human-computer interaction.

Education

2019 – Present	**The University of Texas at Dallas** – Richardson, TX, USA **PhD Student** at Department of Electrical Engineering *Advisor: Dr. Jin Ryong Kim*
2016 – 2018	**University of Pittsburgh** – Pittsburgh, USA **M.S.** in Electrical Engineering *Advisor: Dr. Murat Akcakaya*
2012 – 2016	**Tongji University** – Shanghai, China **B.S.** in Electrical Engineering

Awards

2025	**Best Demo**, IEEE WHC 2025
2024	**Best Demo**, IEEE ISMAR 2024
2024	**Best Demo Honorable Mention**, IEEE Haptic Symposium 2024
2023	**Best Student Demo Award**, ACM SIGGRAPH ASIA 2023
2023	**Best Paper Nominee**, IEEE VR 2023

Journal Publications

J3. **Haokun Wang**, Yatharth Singhal, and Jin Ryong Kim. Let It Snow: Designing Snowfall Experience in VR. *Proc. ACM **IMWUT 2024*** (IF=4.5). DOI: https://dl.acm.org/doi/abs/10.1145/3659587

🏆. J2 Hyungki Son, **Haokun Wang**, Yatharth Singhal, and Jin Ryong Kim. Upper Body Thermal Referral and Tactile Masking for Localized Feedback. *IEEE **TVCG 2023*** (IF: 6.5). DOI: https://ieeexplore.ieee.org/document/10049651

J1.   Tianyu Chen, Carlos Caicedo-Narvaez, **Haokun Wang**, Mehdi Moallem, Babak Fahimi, and Morgan Kiani. Electromagnetic Compatibility Analysis of an Induction Motor Drive With Integrated Power Converter. *IEEE TMAG 2019* (IF: 1.9). DOI: https://ieeexplore.ieee.org/document/8937059

Conference Publications

C6.   **Haokun Wang**, Yatharth Singhal, Hyunjae Gil, and Jin Ryong Kim. Fiery Hands: Designing Thermal Glove through Thermal and Tactile Integration for Virtual Object Manipulation. *Proc. ACM UIST 2024* (Acceptance rate: 24%). DOI: https://dl.acm.org/doi/abs/10.1145/3654777.3676457

C5.   Yatharth Singhal, Daniel Honrales, **Haokun Wang**, and Jin Ryong Kim. Thermal In Motion: Designing Thermal Flow Illusions with Tactile and Thermal Interaction. *Proc. ACM UIST 2024* (Acceptance rate: 24%). DOI: https://dl.acm.org/doi/abs/10.1145/3654777.3676460

C4.   **Haokun Wang**, Hyunjae Gil, and Jin Ryong Kim. Thermal Masking: When the Illusion Takes Over the Real. *Proc. ACM CHI 2024* (Acceptance rate: 26.4%). DOI: https://dl.acm.org/doi/full/10.1145/3613904.3641941

C3.   **Haokun Wang**, Yatherth Singhal, and Jin Ryong Kim. Fabric thermal display using ultrasonic waves. *Proc. IEEE ISMAR 2023* (Acceptance rate: 19.6%). DOI: https://ieeexplore.ieee.org/document/10316365

C2.   Yatharth Singhal, **Haokun Wang**, Hyunjae Gil, and Jin Ryong Kim. Mid-Air Thermo-Tactile Feedback using Ultrasound Haptic Display. *Proc. ACM VRST 2021* (Acceptance rate: 26.2%). DOI: https://doi.org/10.1145/3489849.3489889

C1.   Yijian Xiang; Malia Kelsey; **Haokun Wang**; Satyabrata Sen; Murat Akcakaya; Arye Nehorai. A Comparison of cognitive approaches for clutter-distribution identification in nonstationary environments. *Proc. IEEE RadarConf18* (Acceptance rate: 57.1%). DOI: https://ieeexplore.ieee.org/document/8378604

Conference Demos

🏆 D16.   **Haokun Wang**, Yatharth Singhal, Hyunjae Gil, and Jin Ryong Kim. Demonstration of Thermal Masking: When the Illusion Takes Over the Real. IEEE *WHC 2025.*

D15.   **Haokun Wang**, Yatharth Singhal, Hyunjae Gil, and Jin Ryong Kim. Demonstrating Fiery Hands: A Thermal–Tactile Thermal Gloves using Thermal Masking. IEEE *WHC 2025.*

D14.   Yatharth Singhal, Daniel Honrales, **Haokun Wang**, and Jin Ryong Kim. Demonstration of Thermal Flow Illusions with Tactile and Thermal Interaction. IEEE *WHC 2025.*

D13.   Jun Sik Shin, Hyunjae Gil, **Haokun Wang**, Ashish Pratap, Shreya Krishnan, Woo Joo Kim, Gangyun Koh, Tae-Heon Yang and Jin Ryong Kim. Demonstrating XRScissor: Magnetorheological Haptic Interface for Realistic Cutting in XR. IEEE *WHC 2025.*

D12. Yatharth Singhal, Daniel Honrales, **Haokun Wang**, and Jin Ryong Kim. Demonstration of Thermal Flow Illusions with Tactile and Thermal Interaction. IEEE ***BHI 2024.***

D11. **Haokun Wang**, Yatharth Singhal, Hyunjae Gil, and Jin Ryong Kim. Demonstration of Fiery Hands: Thermal Gloves through Thermal and Tactile Integration. IEEE ***BHI 2024.***

D10. Yatharth Singhal, **Haokun Wang**, and Jin Ryong Kim. Demonstration of FIRE: Mid-Air Thermo-Tactile Display. IEEE ***BHI 2024.***

🏆 D9. Yatharth Singhal, Daniel Honrales, **Haokun Wang**, and Jin Ryong Kim. Demonstration of Thermal Flow Illusions with Tactile and Thermal Interaction. IEEE ***ISMAR 2024.*** DOI: https://ieeexplore.ieee.org/document/10765288

D8. **Haokun Wang**, Yatharth Singhal, Hyunjae Gil, and Jin Ryong Kim. Demonstration of Fiery Hands: Thermal Gloves through Thermal and Tactile Integration. IEEE ***ISMAR 2024.*** DOI: https://ieeexplore.ieee.org/abstract/document/10765216

D7. Yatharth Singhal, **Haokun Wang**, and Jin Ryong Kim. Demonstration of FIRE: Mid-Air Thermo-Tactile Display. IEEE ***ISMAR 2024.*** DOI: https://ieeexplore.ieee.org/document/10765339

D6. **Haokun Wang**, Yatharth Singhal, Hyunjae Gil, and Jin Ryong Kim. Fiery Hands: Designing Thermal Glove through Thermal and Tactile Integration for Virtual Object Manipulation. *Proc. ACM **UIST 2024 Adjunct.***

D5. Yatharth Singhal, Daniel Honrales, **Haokun Wang**, and Jin Ryong Kim. Thermal In Motion: Designing Thermal Flow Illusions with Tactile and Thermal Interaction. *Proc. ACM **UIST 2024 Adjunct.***

D4. Yatharth Singhal, **Haokun Wang**, and Jin Ryong Kim. FIRE: Mid-Air Thermo-Tactile Display. ACM ***SIGGRAPH 2024.*** DOI: https://dl.acm.org/doi/10.1145/3641517.3664396

D3. Yatharth Singhal, **Haokun Wang**, and Jin Ryong Kim. Mid-Air Thermo-Tactile Feedback using Ultrasound Haptic Display. IEEE ***Haptic Symposium 2024.***

🏆 D2. **Haokun Wang**, Yatharth Singhal, Hyungki Son, and Jin Ryong Kim. Demonstrating Upper Body Thermal Referral and Tactile Masking for Localized Feedback. IEEE ***Haptic Symposium 2024.***

🏆 D1. Yatharth Singhal, **Haokun Wang**, and Jin Ryong Kim. FIRE: Mid-Air Thermo-Tactile Display. ACM ***SIGGRAPH 2024.*** DOI: https://dl.acm.org/doi/10.1145/3610541.3614584

Under Peer Review

U1. **Haokun Wang**, Daniel Honrales, Hyunjae Gil, and Jin Ryong Kim. Thermal Masking Across the Human Body: Patterns, Pathways, and Perceptual Boundaries. *Proc. ACM **CHI 2026*** (Acceptance rate: 25.3%). DOI: https://dl.acm.org/doi/abs/10.1145/3772318.3791601

U2. Jun Sik Shin, Hyunjae Gil, **Haokun Wang**, Ashish Pratap, Shreya Krishnan, Woo Joo Kim, Gangyun Koh, Tae-Heon Yang, and Jin Ryong Kim. XRScissor: Magnetorheological Haptic Interface for Realistic Cutting. *IEEE **TVCG 2026*** (IF: 6.5).

Experience

2019 – Present   **The University of Texas at Dallas**
Graduate Research Assistant

- ➤ Engineering haptic actuators and wearables from the ground up to integrate new illusionary-based sensations (Thermal Masking) into daily life & AR/VR.

- ➤ Design &test custom hardware solutions including PCBs (microcontrollers, motor drivers, wireless) and interfaces (chamber, ultrasound display, glove, suit).

- ➤ Performing technical evaluations and psychophysical studies to characterize new devices & user experiences.

- ➤ Modeled motor electromagnetic field distributions analytically and validated accuracy via a Hall sensor array.

- ➤ Communicating research through papers (publishing in the best venues in my field), videos, and demos.

2016 – 2018   **University of Pittsburgh**
Graduate Research Assistant

- ➤ Developed a sparse recovery-based identification technique through batch orthogonal matching pursuit (OMP) algorithm to identify the specific clutter distribution.

2015 – 2016   **Tongji University**
Undergraduate Student

- ➤ Designed a closed-loop IGBT power cycling test bench and utilized a electro-thermal model to estimate junction temperature.

Research & Technical Skills

Qualitative and Quantitative Research Methods
- Null hypothesis significance testing (NHST)
- Classical and adaptive psychophysical methods for threshold detection
- ANOVAs and Regression analysis with Python and MATLAB libraries

Programming
C#, Python, C, MATLAB, Verilog, JavaScript, Applied machine learning/AI

Prototyping
- Unity, Quest HMD, Optitrack, LeapMotion
- React/Next.js, Figma, Adobe Creative Cloud (PS, PR, AF, AI)
- Interaction design/usability

Electrical
- Signal processing
- Printed circuit board (Altium)
- Microcontrollers (Arduino, STM32, RaspberryPi, FPGA)
- Electrical motor control and simulation (Ansys Maxwell, HFSS)

Mechanical
- 3D printing, CAD (Autodesk Fusion 360, Ansys SpaceClaim)
- Simulation (Ansys Mechanical, Fluent, MATLAB Simulink)
- Machining (lathe, mill, drill, welder)
- Thermal transfer (Peltier)
- Haptic actuator (ERM, LRA, Piezo)
- Mid-air haptics (Ultrasonic board)

Service

2023 – Present

Peer Reviewing
I regularly review for conferences and journals. I have reviewed for ACM CHI, ACM ISMAR, ACM DIS, ACM TEI, Journal of Thermal Stresses, IEEE WHC, IEEE EuroHaptics, IEEE Haptic Symposium.

References

Ph.D. Advisor

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M.S. Advisor

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