



# Seokhyun Hwang

- ▣ Human Computer Interaction
- ▣ VR / AR
- ▣ Haptic interface
- ▣ Wearable Device

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## EDUCATION

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- ▣ University of Washington, United States (Expected) September 2024 – Present  
*Doctor of Philosophy (Ph.D.) (Advisor: Jacob O. Wobbrock)*
  - Information Science, Information School
- ▣ Gwangju Institute of Science and Technology, Korea September 2021 – August 2023  
*Master of Science (M.S.) (Advisor: SeungJun Kim)*
  - Intelligent Robotics, School of Integrated Technology
- ▣ Boston University, United States June 2018 – August 2018  
*Exchange Student for Summer Session*
- ▣ Gwangju Institute of Science and Technology, Korea March 2017 – August 2021  
*Bachelor of Science (B.S.)*
  - Department of Mechanical Engineering


## RESEARCH EXPERIENCE

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- ▣ ACE Lab, United States (University of Washington) September 2024 – Present  
*Ph.D. (Advisor: Jacob O. Wobbrock)*
- ▣ Human-Centered Intelligence Systems Lab, Korea (GIST) September 2023 – August 2024  
*Research Associates*
- ▣ Human-Centered Intelligence Systems Lab, Korea (GIST) September 2021 – August 2023  
*M.S. (Advisor: SeungJun Kim)*
- ▣ Human-Centered Intelligence Systems Lab, Korea (GIST) January 2021 – August 2021  
*Research Intern (Advisor: SeungJun Kim)*
- ▣ Intelligent Medical Robotics Lab, Korea (GIST) June 2020 – December 2020  
*Research Intern (Advisor: Jungwon Yoon)*
- ▣ BA Energy Lab, Korea December 2019 – February 2020  
*Industrial-Academic Intern*


## CONFERENCES & PUBLICATIONS

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- [w.4] "Proposal of a Framework for Enhancing Teleoperation Experience with Biomechanical Simulation-Based Electrical Muscle Stimulation in Virtual Reality"  
Hwang, S., Kang, S., Oh, J., Park, J., Shin, S., Yiyue Luo, Joseph DelPreto, Wojciech Matusik, Daniela Rus, and Kim, S.  
*UbiComp/ISWC '24 Adjunct* (Accepted)
- [w.3] "Adaptive In-Vehicle Virtual Reality for Reducing Motion Sickness: Manipulating Passenger Posture During Driving Events"  
Elsharkawy, A., Ataya, A., Yeo, D., Seong, M., Hwang, S., Joseph DelPreto, Wojciech Matusik, Daniela Rus, and Kim, S.  
*UbiComp/ISWC '24 Adjunct* (Accepted)
- [c.7] "TimelyTale: A Multimodal Dataset Assessing Passenger's Demands for Explanations in Highly Automated Vehicles"  
Kim, G., Hwang, S., Seong, M., Yeo, D., Daniela Rus, and Kim, S.  
*Proceedings of the ACM on IMWUT* (Accepted)
- [w.2] "Intelligence Walker: A Seamless Mobility Assist Device for the Elderly."  
Choi, Y., Yeo, D., Hwang, S., Seong, M., Moon, J., Yiyue Luo, Wojciech Matusik, Daniela Rus, and Kim, K.  
*2024 IEEE ICRA Workshop on Wearable*
- [w.1] "Dual-sided Peltier Elements for Rapid Thermal Feedback in Wearables."  
Kang, S., Kim, G., Hwang, S., Park, J., Elsharkawy, A., and Kim, S.  
*2024 IEEE ICRA Workshop on Wearable*
- [c.6] "WatchCap: Improving Scanning Efficiency in People with Low Vision through Compensatory Head Movement Stimulation."  
Jo, T., Yeo, D., Kim, G., Hwang, S., and Kim, S.  
*Proceedings of the ACM on IMWUT*
- [j.2] "Evaluation of Visual, Auditory, and Olfactory Stimulus-Based Attractors for Intermittent Reorientation in Virtual Reality Locomotion."  
Lee, J., Hwang, S., Ataya, A., and Kim, S.  
*Virtual Reality*
- [c.5] "ErgoPulse: Electrifying Your Lower Body With Biomechanical Simulation-based Electrical Muscle Stimulation Haptic System in Virtual Reality."  
 **Honorable mention**

Hwang, S., Oh, J., Kang, S., Seong, M., Elsharkawy, A., and Kim, S.

*Proceedings of the 2024 CHI conference on Human Factors in Computing Systems*

- [c.4] "SYNC-VR: Synchronizing Your Senses to Conquer Motion Sickness for Enriching In-Vehicle Virtual Reality."  **Honorable mention**

Elsharkawy, A., Ataya, A., Yeo, D., An, E., Hwang, S., and Kim, S.

*Proceedings of the 2024 CHI conference on Human Factors in Computing Systems*

- [p.4] "GaitWay: Gait Data-Based VR Locomotion Prediction System Robust to Visual Distraction."

Kim, Y., Hwang, S., Oh, J., and Kim, S.

*Extended Abstracts of the 2024 CHI conference on Human Factors in Computing Systems*

- [p.3] "Curving the Virtual Route: Applying Redirected Steering Gains for Active Locomotion in In-Car VR."


Gim, B., Kang, S., Kim, G., Yeo, D., Hwang, S., and Kim, S.

*Extended Abstracts of the 2024 CHI conference on Human Factors in Computing Systems*

- [j.1] "Effect of Optical Flow and User VR Familiarity on Curvature Gain Thresholds for Redirected Walking."


Lee, J., Hwang, S., Ataya, A., and Kim, S.

*Virtual Reality*

- [c.3] "Enhancing Seamless Walking in Virtual Reality: Application of Bone-Conduction Vibration in Redirected Walking."  **Honorable mention**

Hwang, S., Kim, Y., Seo, Y., and Kim, S.

*2023 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*

- [c.2] "Designing Virtual Agent Human–Machine Interfaces Depending on the Communication and Anthropomorphism Levels in Augmented Reality."  **Honorable mention**

Kang, Y., Choi, S., An, E., Hwang, S., and Kim, S.

*Proceedings of the 2023 International Conference on Automotive UI*

- [c.1] "Electrical, Vibrational, and Cooling Stimuli-Based Redirected Walking: Comparison of Various Vestibular Stimulation-Based Redirected Walking Systems."

Hwang, S., Lee, J., Kim, Y., Seo, Y., and Kim, S.

*Proceedings of the 2023 CHI conference on Human Factors in Computing Systems*

- [p.2] "REVES: Redirection Enhancement Using Four-Pole Vestibular Electrode Stimulation."

Hwang, S., Lee, J., Kim, Y., and Kim, S.

- [p.1] "Auditory and Olfactory Stimuli-Based Attractors to Induce Reorientation in Virtual Reality Forward Redirected Walking."

Lee, J., **Hwang, S.**, Kim, K., and Kim, S.

*Extended Abstracts of the 2022 CHI conference on Human Factors in Computing Systems*

## PATENTS & COPYRIGHTED CONTENTS

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- [pa.1] "Method for Supporting Walking in Virtual Environment and System for the Same."

**Hwang, S.**, Lee, J., Kim, Y., Seo, Y., and Kim, S.

*KR Patent App. 2023-0,155,898*

- [cc.2] "Mobility-Linked Virtual Reality-Based Underwater Exploration Immersive Content Game Software (Underwater Exploration & Ocean Trash Collection Game)."

Kim, S., Kang, S., Kang, Y., Kim, K., Seong, M., An, E., Yang, H., Yeo, D., Oh, J., Jeon, H., Jo, T., and **Hwang, S.**

*Copyright for Computer Program Works C-2022-050134*

- [cc.1] "Mobility-Linked Virtual Reality-Based Underwater Exploration Immersive Content Game Software (Underwater Exploration & Underwater Gem Collection Game)."

Kim, S., Kang, S., Kang, Y., Kim, K., Seong, M., An, E., Yang, H., Yeo, D., Oh, J., Jeon, H., Jo, T., and **Hwang, S.**

*Copyright for Computer Program Works C-2022-050133*

## TEACHING EXPERIENCE

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▣ **XR Project Class Teaching Assistant, Korea (GIST)**

2022 Fall Semester – 2023 Spring Semester

Teaching Assistant

- Served as a teaching assistant in a project-based class
- Responsible for teaching, exam preparation, and evaluation of the Unity-based XR project

▣ **2019 GIST Global Science Camp, National University of Laos (NUOL), Laos**

July 2019

Experiment Instructor

- Educational volunteer for college students of the NUOL and Khon, Kaen University of Thailand
- Teaching & Experimental Assist in the production of Dye-Sensitized Solar Cells using Anthocyanin

▣ **2019 GIST Science Camp, Korea (GIST)**

January 2019

Experiment Team Leader, Design Team Leader

- Providing experimental education to elementary and middle school students in the community

## AWARDS & HONORS

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- ▣ **Honorable Mentions, 2024 CHI conference on Human Factors in Computing Systems** May 2024
  - Honorable mention for being in the top 5% of conference papers (*ErgoPulse*)
- ▣ **Honorable Mentions, 2024 CHI conference on Human Factors in Computing Systems** May 2024
  - Honorable mention for being in the top 5% of conference papers (*SYNC-VR*)
- ▣ **Honorable Mentions, IEEE ISMAR** October 2023
  - Honorable mention for being in the top 1% of conference papers
- ▣ **Honorable Mentions, International ACM Conference on Automotive UI** September 2023
  - Honorable mention for being in the top 5% of conference papers
- ▣ **Special Recognitions, ACM UIST** May 2023
  - Special Recognitions for Outstanding Reviews in 2023 UIST
- ▣ **Gwangju Institute of Science and Technology President Award, Korea** August 2020
  - 1st prize in table tennis robot at the 4th GIST Creative Convergence Competition in 2020
- ▣ **Scholarship for Academic Excellence, Korea** September 2020 – December 2020
  - GIST Scholarship for Academic Excellence
- ▣ **Industry-Academic Cooperation Scholarship, Korea** December 2019 – February 2020
  - Industry-Academic Cooperation Scholarship in BA Energy Lab
- ▣ **Scholarship for Overseas Summer Semester Exchange Students, United States** June 2018 – August 2018
  - Boston University Summer Semester Exchange Student Scholarship
- ▣ **GIST Scholarship (Government supported), Korea** March 2017 – August 2021
  - GIST Bachelor's Degree Government Scholarship

## INVITED TALKS

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- ▣ **University of Chicago, Human Computer Integration Lab** January 2024
  - Invited Presentation (hosted by Pedro Lopes).
- ▣ **HCI Korea 2024, ACM SIGCHI** January 2024
  - Invited Presentation in Top-Conference Sessions on Vestibular Stimuli-Based Redirected Walking.

## TECHNICAL STRENGTHS

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### ▣ Modeling & Designing

- Autodesk Inventor
- SolidWorks
- Blender
- KiCad

### ▣ Software & Tools

- COMSOL Multiphysics
- LABVIEW
- MATLAB
- Unity
- Three.js
- Cubase
- Adobe Premiere Pro
- Final Cut Pro

### ▣ Programming Languages

- C, C#, Python, JAVA, MATLAB

## EXTRA-CURRICULAR ACTIVITIES

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### ▣ GIST Society of Automotive Engineers, Korea (GIST)

October 2020 – March 2022

#### Founder

- GIST College Student Self-Created Automobile Club Establishment
- Responsible for designing and manufacturing steering systems

### ▣ GIST Student Creative Activity Support Initiative, Korea (GIST)

March 2020 – November 2020

#### Team Leader

- Support for student clubs in the COVID-19 Era
- Producing and distributing performance/activity videos
- Funded by GIST over 4,500\$

### ▣ GIST Broadcasting Station, Korea (GIST)

March 2019 – November 2020

#### Founder

#### Filming / Editing manager

- Establish a video production station of GIST
- Producing promotional videos for schools, videos of student activities, etc.
- Funded by GIST over 30,000\$.

### ▣ GIST Human Rights Center, Korea (GIST).

December 2018 – March 2019

#### Research Intern (Advisor: Kim, Gunoo)

- Intern of the Human Rights Center on campus
- A study involving law, ethics, morality, and philosophy of law