Dajin Lee

Ph.D. Candidate, Department of Computer Science and Engineering
Pohang University of Science and Technology (POSTECH), Republic of Korea

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Research Interests

Multisensory Interaction, Computational Haptics, and Human-Centered AI. I design, model, and evaluate multisensory interfaces that merge touch, sound, and vision to enhance human perception, immersion, and decision-making across physical, mobile, and spatial computing environments.

- **Spatial Computing & Multisensory Perception:** Modeling crossmodal thresholds (audio–tactile JNDs, phantom sensations) and developing real-time rendering algorithms for XR navigation and situational awareness. [TVCG'25] [WHC'25] [CHI'27a Under Review]
- **Mobile Systems, Media, & Eyes-Free Interaction:** Designing tactile and multimodal feedback for accessible mobile security, media discovery, and exploratory decision-making under cognitive constraints. [UIST'26] [ToH'24] [CHI'27b Under Review]
- **Embodied, Social, & Physiological Touch:** Investigating tangible interfaces and physiological/social haptics to support affective communication, informal learning, and user state modulation. [CHI'26] [UIST'24] [IJHCS'25]

Education

2021.03 – 2027.02 (Expected) **Ph.D. in Computer Science and Engineering**
Pohang University of Science and Technology (POSTECH), Republic of Korea
Interaction Laboratory • Advisor: Prof. Seungmoon Choi
Dissertation: *Perceptual Modeling and Optimization of Vibrotactile and Multisensory Feedback: From Spatial Perception to Exploratory Decision-Making*

2020.02 **B.S. in Industrial Management and Engineering**
Pohang University of Science and Technology (POSTECH), Republic of Korea

Grants and Fellowships

2026 **Korea–Canada Research Training Program Grant**
National Research Foundation of Korea (NRF)
Sole applicant and principal investigator; supports a visiting research period at the University of Waterloo.

Selected Honors and Awards

2026 **Special Recognition for Outstanding Review**, ACM SIGCHI
2026 **First Prize**, POSTECH Metaverse Contents Contest
2025 **Honorable Mention**, ICT Challenge, IITP
2024 **Best Paper Award**, Korea Haptics Conference (KHC)
2024 **Best Paper Award Finalist**, IEEE Haptics Symposium
2023 **Honorable Mention**, Hyundai Student Innovation Challenge, KHC

Publications

∗ Author names in **bold** indicate the author of this CV. ACM CHI and UIST are the premier venues in human–computer interaction. IEEE Transactions on Haptics (ToH), IEEE World Haptics Conference (WHC), and IEEE Haptics Symposium are the premier venues in haptics.

Refereed Journal Articles

[J4] **Dajin Lee**, Daehyeon Nam, and Seungmoon Choi. "Augmenting Outdated Museum Exhibits with Embodied and Tangible Interactions for Prolonged Use and Learning Enhancement." *International Journal of Human-Computer Studies (IJHCS)*, 2025.
[Paper] [Demo Video]

[J3] **Dajin Lee** and Seungmoon Choi. "Perceptual Alignment of Spatial Auditory and Tactile Stimuli for Effective Directional Cueing." *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2025. Also presented at IEEE VR 2025.
[Paper] [Presentation Video]

[J2] **Dajin Lee**, Daehyeon Nam, Jinhyuk Yoon, Dukchan Yoon, Seokwon Jeong, Keehoon Kim, and Seungmoon Choi. "A Comparative Study of Physical and Haptic Exhibits in an Informal Learning Environment." *IEEE Transactions on Haptics (ToH)*, 2024. Also presented at IEEE World Haptics Conference 2025.
[Paper] [Demo Video]

[J1] **Dajin Lee**, Gyeore Yun, and Seungmoon Choi. "Effects of Contact Force on Vibrotactile Perceived Intensity Across the Upper Body." *IEEE Transactions on Haptics (ToH)*, 2024. Also presented at IEEE Haptics Symposium 2024; **Best Paper Award Finalist**.
[Paper] [Slides]

Refereed Conference Papers

[C7] Duhong Kweon, **Dajin Lee**, Seulbae Kim, and Seungmoon Choi. "HAPTCHA: Eyes-Free Haptic CAPTCHA in Mobile Environments — Design Principle, Security Evaluation, and User Experience." *ACM Symposium on User Interface Software and Technology (UIST)*, 2026. Conditionally accepted; acceptance rate 20.1%.

[C6] Ayush Bhardwaj, Ashish Pratap, Abbas Khawaja, Yapeng Tian, Uison Ju, **Dajin Lee**, Seungmoon Choi, and Jin Ryong Kim. "Touch with Meaning: A Contextual Analysis of Social Touch." *ACM CHI Conference on Human Factors in Computing Systems (CHI)*, 2026.
[Paper]

[C5] **Dajin Lee**, Soyeon Nam, Minseong Noh, and Seungmoon Choi. "Effects of Frequency and Magnitude on Steering Wheel Vibration Discomfort: A Hierarchical Modeling Approach to Individual Sensitivity." *IEEE Haptics Symposium*, 2026.
[Paper]

[C4] Hyunuk Kim, **Dajin Lee**, and Seungmoon Choi. "Enhancing Body-Penetrating Phantom Sensations Through Multisensory Integration of Sound and Vibration." *IEEE World Haptics Conference (WHC)*, 2025.
[Paper] [Supplementary Video]

[C3] Andreia Valente, **Dajin Lee**, Seungmoon Choi, Mark Billinghurst, and Augusto Esteves. "Modulating Heart Activity and Task Performance Using Haptic Heartbeat Feedback: A Study Across Four Body Placements." *ACM Symposium on User Interface Software and Technology (UIST)*, 2024.
[Paper] [Presentation Video]

[C2] **Dajin Lee**, Jaejun Park, Jeonggoo Kang, Taekun Yun, Dong-Chul Park, and Seungmoon Choi.

"Participatory Design for In-Vehicle Vibrotactile Warnings on the Driver's Seat." *EuroHaptics*, 2024.
[Paper] [Presentation Video] [Demo Video]

[C1] **Dajin Lee**, Seungjae Oh, Seungmoon Choi, and Bum-Jae You. "Vibrotactile Metaphor of Physical Interaction Using Body-Penetrating Phantom Sensations: Stepping on a Virtual Object." *IEEE World Haptics Conference (WHC)*, 2021.
[Paper] [Presentation Video]

Posters, Extended Abstracts, and Demonstrations

[P2] **Dajin Lee** and Seungmoon Choi. "Spatial Tactile Optimizer: Toward Perceptual Optimization for Multi-Point Vibrotactile Cues on the Torso." *ACM CHI*, 2026 (Extended Abstract).
[Paper]

[P1] **Dajin Lee**, Daehyeon Nam, Seokwon Jeong, Keehoon Kim, and Seungmoon Choi. "A Comparative Study of Physical and Haptic Exhibits in an Informal Learning Environment." *IEEE World Haptics Conference (WHC)*, 2023 (Work in Progress).

[D2] Hyunuk Kim, **Dajin Lee**, and Seungmoon Choi. "Body-Penetrating Tactile Phantom Sensations Enhanced by Sound." *IEEE World Haptics Conference (WHC)*, 2025 (Demonstration).
[Paper] [Supplementary Video]

[D1] **Dajin Lee**, Jaejun Park, Jeonggoo Kang, Taekun Yun, Dong-Chul Park, and Seungmoon Choi. "Participatory Design for In-Vehicle Vibrotactile Warnings on the Driver's Seat." *EuroHaptics*, 2024 (Demonstration).
[Paper] [Demo Video]

Domestic Conference Papers (Republic of Korea)

[K4] **Dajin Lee** and Seungmoon Choi. "Differential Thresholds of Azimuth between Auditory and Tactile Stimuli." *Korea Haptics Conference (KHC)*, 2024. **Best Paper Award.**

[K3] **Dajin Lee**, Gyeore Yun, and Seungmoon Choi. "Effects of Contact Force on Vibrotactile Perceived Intensity Across the Upper Body." *Korea Haptics Conference (KHC)*, 2023.

[K2] Daehyeon Nam, **Dajin Lee**, and Seungmoon Choi. "Improving the Design of Science Museum Exhibits Through Digital Augmentation." *Korea Software Congress (KSC)*, 2022.

[K1] Dong Yeong Jeong, Sung H. Han, Seungmoon Choi, Mingyu Lee, Haewoo Kang, Sangyoon Han, Gyeore Yun, Hyo Seung Lee, Jiwan Lee, and **Dajin Lee**. "Motion and Haptic Effects Classification of a 4D Cinema Seat." *Ergonomics Society of Korea*, 2019.

Invited Talks and Tutorials

2025.07 **Incorporating Qualitative Analysis in Haptics Research** (with Seungmoon Choi)
IEEE World Haptics Conference (WHC), Tutorial
[Course Page] [Slides]

Research Experience

2026.06 – 2026.11 **Visiting Graduate Researcher**
Haptic Experience (HX) Laboratory, Department of Management Sciences and Engineering,
University of Waterloo, Canada
Advisor: Prof. Oliver Schneider
Funded by a self-authored NRF grant (see *Grants and Fellowships*).

2025.07 – 2025.08 **Graduate Research Intern — Taxonomy of Social Touch**
Multimodal Interaction (MI) Laboratory, Department of Computer Science,
University of Texas at Dallas, USA
Advisor: Prof. Jin Ryong Kim

2020.09 – 2020.12 **Research Intern — EMG-Based Control of Robotic Prostheses**
MARCH Laboratory, Mechanical Engineering, POSTECH
Advisor: Prof. Keehoon Kim

2019.01 – 2019.06
2020.03 – 2020.08 **Research Intern — Motion and Haptic Effects Classification of a 4D Cinema Seat**
Interaction Laboratory, Computer Science and Engineering, POSTECH
Advisor: Prof. Seungmoon Choi

2019.06 – 2019.08 **Research Intern — 3D Graphical User Interface in Virtual Reality**
Center for Intelligent & Interactive Robotics,
Korea Institute of Science and Technology (KIST)
Advisor: Dr. Jung-Min Park

2017.12 – 2018.02 **Research Intern — Ship Routing Problem with Split Delivery and Time Windows**
Logistics Laboratory, Industrial Management Engineering, POSTECH
Advisor: Prof. Byung-In Kim

Participation in Funded Research Projects

2025.01 – Present **Quantifying VOCs through Affective Natural Language Analysis of Steering Wheel Vibrations**
Hyundai Motor Company • *Team Leader*

2022.09 – Present **Semantic Sound-to-Haptic Automatic Conversion: Metaverse, Full-Body Haptic Effects, and Accessibility**
Mid-Career Researcher Program, National Research Foundation of Korea (NRF)

2022.07 – 2023.06 **Function Advancement to Improve the Marketability of Vibration Seats**
Hyundai Motor Company • *Team Leader*

2021.01 – 2022.12 **Development and Validation of Real–Virtual Blended Exhibits for In-Depth Embodied Learning of Scientific Principles**
Science Culture Exhibition Service Program, National Research Foundation of Korea (NRF) • *Team Leader*

2019.01 – 2019.06 **Automatic Authoring of Physical and Perceptual/Affective Motion Effects for Virtual Reality**
Samsung Research Funding & Incubation Center for Future Technology

Teaching Experience

2024.09 – Present **Teaching Assistant**, Introduction to Haptics
POSTECH, Instructor: Prof. Seungmoon Choi

2019.09 – 2021.09 **Teaching Assistant**, Introduction to Statistics for Data Science
POSTECH & POSCO Group University

Mentoring

2025 – 2026 **Undergraduate Research Mentor**, POSTECH
Supervised one undergraduate student from research question formulation through a first-author paper conditionally accepted to ACM UIST 2026 [C7].

Academic Service

Journal Reviewer

2025 – 2026 IEEE Transactions on Haptics (ToH)
2026 International Journal of Human-Computer Studies (IJHCS)
2026 Current Psychology
2026 Frontiers in Psychology

Conference Reviewer

2026 ACM Conference on Human Factors in Computing Systems (CHI)
2026 ACM Symposium on Virtual Reality Software and Technology (VRST)
2026 IEEE International Conference on eXtended Reality (ICXR)
2026 AsiaHaptics
2026 IEEE Haptics Symposium
2024, 2026 EuroHaptics

Skills

Methods	**Perceptual Modeling**: Psychophysics, sensory threshold estimation, crossmodal perception. **Optimization**: Constrained optimization, real-time rendering algorithms. **Statistics & Evaluation**: Qualitative & mixed methods, Bayesian hierarchical modeling, mixed-effects regression. **System Deployment**: In-the-wild mobile deployments, longitudinal user studies, closed-loop systems.
Tools & Code	Python, MATLAB, R, C/C++, C#, Swift, Unity, NI DAQmx
Languages	Korean (native), English (professional working proficiency)

References

Prof. Seungmoon Choi (Doctoral Advisor)
Professor, Computer Science and Engineering, POSTECH
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Prof. Oliver Schneider (Visiting Research Host)
Associate Professor, Management Sciences and Engineering, University of Waterloo
oliver.schneider@uwaterloo.ca

Prof. Jin Ryong Kim (Research Collaborator)
Professor, Computer Science, University of Texas at Dallas
jinryongkim@gmail.com