Seo Young Oh 오서영

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XR interaction researcher and engineer: *3D hand interaction, virtual object manipulation, and XR interfaces.*

SKILLS

Programming: C#, Python, C++ **XR Development:** Unity, OpenXR, Meta XR SDK, Mixed Reality Toolkit
Devices: Meta Quest 3/Pro/2, Microsoft HoloLens, Magic Leap, Android
Methods: 3D interaction design, XR prototyping, controlled user studies, statistical analysis
Design & Graphics: Illustrator, Photoshop, Premiere Pro **Languages:** Korean (Native), English (Proficient)

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Republic of Korea

Ph.D., *Graduate School of Culture Technology* Aug 2026
"Finger-Driven Semi-Isomorphic Hand Interaction for Fine-Grained 3D Manipulation" Co-advisors: Woontack Woo, Sang Ho Yoon

M.S., *Graduate School of Culture Technology* Feb 2020
"Finger Contact in 3D Gesture Interaction to Improve Temporal Input Accuracy in HMD-based Augmented Reality"

B.S., *Mechanical Engineering* Feb 2014

EXPERIENCE

Postdoctoral Researcher Sep 2026 – Present
SpaceTop Research Center, KAIST Daejeon, Republic of Korea

- Managing a national human resource development project on *Spatial Computing HCI Technology*, spanning cross-lab XR research. (IITP, 2026–present)

Graduate Researcher Mar 2019 – Aug 2026
UVR (Ubiquitous Virtual Reality) Lab, KAIST Daejeon, Republic of Korea

- Led two research projects on virtual object interaction techniques for *Real-time XR Interface Technology*. (IITP, 2024–2026)
- Developed cross-device interfaces spanning XR headsets and handhelds for *WISE AR UI/UX Platform for Smartglasses*. (IITP, 2022–2023)
- Implemented hand and avatar interaction components for remote collaboration systems under *Human Reconstruction for Telepresent Interaction*. (NRF, 2019–2020)

Research Engineer Sep 2016 – Feb 2019
Naru EMS Inc. / SQAnd Inc. Daejeon, Republic of Korea

- Designed and demonstrated a HoloLens-based real-time AR visualization of mid-air sound sources rendered by the company's spatial audio technology. (SQAnd, 2018–2019)
- Ported engineering simulation algorithms to C and implemented the simulator user interfaces. (Naru EMS, 2016–2019)

SELECTED SYSTEMS

GeoCtrl — finger-driven in-hand object rotation for XR Unity/OpenXR, Meta Quest · 2026

- A bare-hand virtual object rotation technique that maps finger configuration to object orientation with speed-adaptive control-display gain, enabling fine-grained manipulation without arm movement.
- *Real-time finger-to-object mapping, per-frame gain estimation, fingertip-based grab/release/clutching.*

ForceCtrl — hand-raycasting with force-driven gain control Unity/Python, Meta Quest & Myo · 2025

- A hand-raycasting technique that modulates control-display gain based on user-defined pinch force, enabling fine-grained distant selection without a handheld controller.
- *Real-time motion-to-ray mapping, EMG-based pinch-force classification, multi-device synchronization.*

SELECTED PUBLICATIONS

Seo Young Oh, Taejun Son, Juyoung Lee, Sang Ho Yoon, and Woontack Woo, 2026. "GeoCtrl: Finger-based Geometric Mapping and Speed-Adaptive Gain for In-Hand Object Rotation in AR/VR," *2026 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*.

Seo Young Oh, Junghoon Seo, Juyoung Lee, Boram Yoon, Sang Ho Yoon, and Woontack Woo, 2025.“ForceCtrl: Hand-Raycasting with User-Defined Pinch Force for Control-Display Gain Application,” *IEEE Transactions on Visualization and Computer Graphics*.

Sunyoung Bang, Hyunjin Lee, **Seo Young Oh**, and Woontack Woo, 2025. “AReading with Smartphones: Understanding the Trade-offs between Enhanced Legibility and Display Switching Costs in Hybrid AR Interfaces,” *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*.

Juyoung Lee, **Seo Young Oh**, Minju Baeck, Hui Shyong Yeo, Hyung-Il Kim, Thad Starner, and Woontack Woo, 2024. “Whirling Interface: Hand-based Motion Matching Selection for Small Target on XR Displays,” *2024 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*.

Hyung-il Kim, Boram Yoon, **Seo Young Oh**, and Woontack Woo, 2023.“Visualizing Hand Force with Wearable Muscle Sensing for Enhanced Mixed Reality Remote Collaboration,” *IEEE Transactions on Visualization and Computer Graphics*.

Boram Yoon, Hyung-il Kim, **Seo Young Oh**, and Woontack Woo, 2020. “Evaluating Remote Virtual Hands Models on Social Presence in Hand-based 3D Remote Collaboration,” *2020 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*.

Full publication list available upon request or via Google Scholar.

HONORS AND AWARDS

Best Implementation Award — Student Design Competition Oct 2022
ACM International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI)

Best Student Volunteer Oct 2025
IEEE International Symposium on Mixed and Augmented Reality (ISMAR)

ACADEMIC SERVICES

- **Teaching Assistant** at KAIST: CTP445 Augmented Reality, GCT565 Augmented Humans, GCT700 Culture Technology AR Project, Undergraduate Research Participation Program
- **Reviewer**: ACM CHI, ACM UIST, CHI Late-Breaking Work, Korea Software Congress
- **Event Assistant**: IEEE ISMAR 2025, KAIST GSCT Post-Metaverse Forum

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