Taehei Kim

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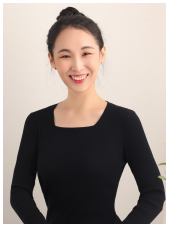
https://hayleymol.github.io/



Research Statement

My research investigates how spatial optimization, synthesis methods, and users' interactivity enable collective activities in mixed reality environments that merge multiple physical spaces. As such, I design and implement end-to-end telepresence systems using HMD-based platforms, developing both the environmental configurations and interaction pipelines. My current focus is to extend my research beyond telepresence systems with real physical users to AI-mediated, spatially grounded environments where AI-generated content and agents blend naturally within multi-user interactions.

Education

2021 – 2026 **Ph.D. Candidate, Korea Advanced Institute of Science & Technology (KAIST)** Cultural Technology

2018 – 2021 **M.S., Korea Advanced Institute of Science & Technology (KAIST)** Cultural Technology

2013 – 2018 **BA., Yonsei University** Asian Studies & Computer Science

Research Projects

2024 – 2025 **Korea Radio Promotion Association (RAPA).** Mixed Reality Telepresence System Research.

2023 – 2024 **National Research Foundation of Korea.** Study on Mixed Reality Scene in Heterogeneous Spaces.

2022 – 2023 **National Research Foundation of Korea.** Study on Perception Toward Motion Adaptation for Avatars in Heterogeneous Spaces.

2021 – 2022 **Korea Institute for Advancement of Technology (KIST).** Virtual and Augmented Reality Expert Foster Project.

2020 – 2021 **Agency for Defense Development, Korea (ADD).** Development of quadrupedal robot system technology for monitoring, reconnaissance, and search missions.

Research Publications

— *Two papers currently under review*

1 **T. Kim**, J. Shin, H. Kim, H. Jang, J. Kang, and S.-H. Lee, "Voronoi rooms: Dynamic visibility modulation of overlapping spaces for telepresence," *ACM Trans. Graph.*, vol. 45, no. 2, Dec. 2025, To appear in ACM TOG (issue April 2026), ISSN: 0730-0301. DOI: 10.1145/3777900.

2. J. Shin, H. Kim, E. Lee, D. Shin, K. Lee, **T. Kim**, H. Kim, J. An, and S.-H. Lee, "Situated embodied xr agents via spatial reasoning and prompting," Oct. 2025, pp. 933–934. DOI: 10.1109/ISMAR-Adjunct68609.2025.00255.

3. J. Kang, **T. Kim**, H. Kim, and S.-H. Lee, "Real-time translation of upper-body gestures to virtual avatars in dissimilar telepresence environments," *IEEE Transactions on Visualization and Computer Graphics*, vol. 31, no. 10, pp. 8711–8725, 2025. DOI: 10.1109/TVCG.2025.3577156.

4. **T. Kim**, H. Kim, J. Lee, and S.-H. Lee, "Evaluating user perception toward physics-adapted avatar in remote heterogeneous spaces," *Computers & Graphics*, vol. 128, p. 104 185, 2025.

5. **T. Kim**, J. Shin, H. Kim, H. Jang, J. Kang, and S.-H. Lee, "Visibility modulation of aligned spaces for multi-user telepresence," in *2024 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct)*, IEEE, 2024, pp. 626–627.

6. D. Yang, J. Kang, **T. Kim**, and S.-H. Lee, "Visual guidance for user placement in avatar-mediated telepresence between dissimilar spaces," *IEEE Transactions on Visualization and Computer Graphics*, vol. 30, no. 12, pp. 7558–7570, 2024.

7. J. Kang, D. Yang, **T. Kim**, Y. Lee, and S.-H. Lee, "Real-time retargeting of deictic motion to virtual avatars for augmented reality telepresence," in *2023 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, IEEE, 2023, pp. 885–893.

8. H. Jang, **T. Kim**, S. Oh, J. Lee, S. Lee, and S. H. Yoon, "Sense of embodiment inducement for people with reduced lower-body mobility and sensations with partial-visuomotor stimulation," in *ACM SIGGRAPH 2022 Emerging Technologies*, 2022, pp. 1–2.

9. H.-I. Kim, **T. Kim**, E. Song, S. Y. Oh, D. Kim, and W. Woo, "Multi-scale mixed reality collaboration for digital twin," in *2021 IEEE international symposium on mixed and augmented reality adjunct (ISMAR-Adjunct)*, IEEE, 2021, pp. 435–436.

10. **T. Kim** and S.-H. Lee, "Quadruped locomotion on non-rigid terrain using reinforcement learning," *arXiv preprint arXiv:2107.02955*, 2021.

Skills

Programming Languages	I mainly use C# and Python to build my systems.
Tools and Hardware	I mainly build systems using Unity and VR devices.
Languages	Korean (Native), English (Fluent)

Miscellaneous Experience

Startup

2025 - current — **BerryHi**. I am a founding member of the MR telepresence application company BerryHi. Our product can be found here: https://www.meta.com/experiences/parameterroom/24417022141334169/.

Awards and Achievements

- 2025 — **Excellence Award**, Metaverse Developer Contest, RAPA.
- 2024 — **Best Demo Honorable Mention**, "Visibility Modulation of Aligned Spaces for Multi-User Telepresence," ISMAR.
- 2021-2025 — **Fully Funded Fellowship**, KAIST.
- 2021 — **Tenacity Scholarship**, KAIST.
- **First Place**, 'Hello, World!: new playground', Art Center NABI.

Miscellaneous Experience (continued)

2018-2021 **Fully Funded Fellowship**, KAIST.

Metaverse Consultant Experience

2021 - 2023 **Metaverse Consultant**. I worked with several organizations including Dangjin Cultural Foundation, Daejeon Culture and Arts Foundation, Hanwha Galleria Department Store, 3PROTV to support metaverse event and projects.

References

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