Kirak Kim

kirak@kaist.ac.kr | Linkedin | Google Scholar | Website

Research Interests: Generative Models for Spatial Audio, Immersive Auditory Experience in VR

Education

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, South Korea
Ph.D. Student, Graduate School of Culture Technology — *Sep. 2025 –*
Advisor: Sungyoung Kim

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, South Korea
M.S., Graduate School of Metaverse and Graduate School of Culture Technology — *Sep. 2023 – Aug. 2025*
Advisor: Juhan Nam

Sogang University — Seoul, South Korea
Completed Master's Coursework, Department of Art & Technology — *Sep. 2021 – Aug. 2023*
Advisor: Moonryul Jung

Yonsei University — Seoul, South Korea
B.S., School of Integrated Technology — *Mar. 2018 – Feb. 2021*
Advisor: Jongseok Lee

Experience

Research Assistant — Sep. 2025 –
Applied and Innovative Research for Immersive Sound Lab, KAIST

- Leading the spatial audio & AI team, conducting research on AI-driven room acoustics modeling
- Designed an LLM/VLM-based pipeline to caption and curate spatial audio datasets for training a text-conditioned room impulse response (RIR) generation model
- Exploring multimodal LLM-based approaches for spatial audio generation

Visiting Researcher — Jan. 2026 –
Centre for Analytics & AI Engineering, University of Toronto

- Conducting collaborative research with LG Toronto AI Lab on improving Vision-Language-Action (VLA) models
- Investigating Vision-Language Model (VLM) latent representations for long-horizon action prediction using probing and auxiliary loss objectives

Research Assistant — Sep. 2023 – Aug. 2025
Music and Audio Computing Lab, KAIST

- Developed a diffusion-based model with spatio-temporal graph neural networks to generate pianist hand motion from music, in collaboration with YAMAHA
- Collected multimodal piano performance datasets and contributed to audiovisual piano transcription research
- Participated in AI-driven piano performances and exhibitions at venues including Daejeon Arts Center

Research Assistant — Sep. 2021 – Aug. 2023
Korea Electronics Association

- Integrated AI models within virtual environments
- Built a real-time multimodal dialogue system generating emotion-based utterances and facial expressions for virtual humans
- Developed a real-time background music selection system for metaverse conversations using speech emotion regression

Selected Publications

Conference Papers

- **K. Kim**, H. Kim, Y. Choi, J. Nam, and J. Lee. (2025). *VR Music Game for Stress Reduction*. In Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR), pp. 678–685.[paper]
- Y. Kim, J. Park, J. Bae, **K. Kim**, T. Kwon, A. Lerch, and J. Nam. (2025). *PianoVAM: A Multimodal Piano Performance Dataset*. In Proceedings of the 26th International Society for Music Information Retrieval Conference (ISMIR).[paper]
- J. Kim, H. Lee, **K. Kim**. (2025). *Star Upon a Wish: An AI-Transformed Wish-Making Experience*. 30th International Symposium on Electronic/Emerging Art (ISEA) Short Paper.[paper]

Preprint / Under Review

- **K. Kim**, S. Kim. (2026). *Finetuning a Text-to-Audio Model for Room Impulse Response Generation*. Under Review.[paper]

Poster / Demo

- **K. Kim**, H. Kim, S. Bae, J. Lee, S. Kim. (2025). *The Soaring Serenity: an Immersive VR Artwork for Perspective Shift*. 30th International Symposium on Electronic/Emerging Art (ISEA) Poster.[paper]
- J. Bae, H. Cho, **K. Kim**, D. Park, T. Kwon, Y. Choi, H. Hur, S. Kai, Y. Wada, S. Obata, A. Maezawa, J. Park, J. Park, J. Nam. (2025). *Designing a Multimodal Viewer for Piano Performance Analysis - a Pedagogy-First Approach*. Late Breaking Demo of the 26th International Society for Music Information Retrieval Conference (ISMIR) .[paper]
- J. Park, Y. Kim, J. Bae, **K. Kim**, T. Kwon, A. Lerch and J. Nam. (2025). *Two Web Toolkits for Multimodal Piano Performance Dataset Acquisition and Fingering Annotation*. Late Breaking Demo of the 26th International Society for Music Information Retrieval Conference (ISMIR) .[paper]

Honors & Awards

2024 3rd Prize, AI x Art Hackathon, Seoul National University Institute for Culture and Art
2023 2nd Prize, Korea Electronics Association AR/VR Specialist Training Program Research Symposium
2022 1st Prize, Korea Electronics Association AR/VR Specialist Training Program Research Symposium

Academic Services

Conference Organizing

Volunteer Co-Chair, the 26th International Society for Music Information Retrieval Conference (ISMIR 2025)

Technical Skills

Programming: Python, C#
ML Frameworks: PyTorch, HuggingFace Transformers
Tools: Unity 3D, Wwise, Git
Research Skills: Multimodal Generative Modeling (Diffusion Models/Flow Matching), HCI Analysis