

Curriculum Vitae

Sungho Lee

Personal Info

Affiliation Ph.D. candidate, Music and Audio Research Group, Seoul National University.

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Research Interest Inverse problems; differentiable processing and generative models; audio post-production.

Publications

Journal Articles

- [J1] Differentiable Acoustic Radiance Transfer
Sungho Lee, Matteo Scerbo, Seungu Han, Min Jun Choi, Kyogu Lee, and Enzo De Sena
IEEE Transactions on Audio, Speech, and Language Processing (TASLPRO), 2026 [arXiv](#)
- [J2] Reverse Engineering of Music Mixing Graphs with Differentiable Processors and Iterative Pruning
Sungho Lee, Marco A. Martínez-Ramírez, Wei-Hsiang Liao, Stefan Uhlich, Giorgio Fabbro, Kyogu Lee, and Yuki Mitsufuji
Journal of Audio Engineering Society (JAES), 2025 [jaes](#) [arXiv](#)
- [J3] Differentiable Artificial Reverberation
Sungho Lee, Hyeong-Seok Choi, and Kyogu Lee
IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP), 2022 [demo](#) [arXiv](#)

Conference Papers

- [C1] Rethinking Speech Representation Aggregation in Speech Enhancement: A Phonetic Mutual Information Perspective
Seungu Han, Sungho Lee, and Kyogu Lee
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2026 [arXiv](#)
- [C2] Few-step Adversarial Schrödinger Bridge for Generative Speech Enhancement
Seungu Han, Sungho Lee, Juheon Lee, and Kyogu Lee
ISCA Interspeech (Best student paper award nominee), 2025 [arXiv](#)
- [C3] TokenSynth: A Token-based Neural Synthesizer for Instrument Cloning and Text-to-Instrument
Kyungsu Kim, Junghyun Koo, Sungho Lee, Haesun Jeong, and Kyogu Lee
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2025 [demo](#) [arXiv](#) [code](#)
- [C4] Searching for Music Mixing Graphs: A Pruning Approach
Sungho Lee, Marco A. Martínez-Ramírez, Wei-Hsiang Liao, Stefan Uhlich, Giorgio Fabbro, Kyogu Lee, and Yuki Mitsufuji
International Conference on Digital Audio Effects (DAFx) (Best show & tell award), 2024 [demo](#) [arXiv](#) [code](#)
- [C5] Emosical: An Emotion-Annotated Musical Theatre Dataset
Hayoon Kim, Ahyeon Choi, Sungho Lee, Hyunjin Jung, and Kyogu Lee
Conference on Empirical Methods in Natural Language Processing (EMNLP), Findings, 2024 [ACL](#) [code](#)
- [C6] Yet Another Generative Model for Room Impulse Response Estimation
Sungho Lee, Hyeong-Seok Choi, and Kyogu Lee
IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA), 2023 [demo](#) [arXiv](#)
- [C7] Blind Estimation of Audio Processing Graph
Sungho Lee, Jaehyun Park, Seungryeol Paik, and Kyogu Lee
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2023 [demo](#) [arXiv](#)
- [C8] Exploiting Time-Frequency Conformers for Music Audio Enhancement
Yunkee Chae, Junghyun Koo, Sungho Lee, and Kyogu Lee
ACM International Conference on Multimedia (ACM MM), 2023 [demo](#) [arXiv](#) [code](#)
- [C9] Global HRTF Interpolation via Learned Affine Transformation of Hyper-Conditioned Features
Jin Woo Lee, Sungho Lee, and Kyogu Lee
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2023 [demo](#) [arXiv](#) [code](#)

Workshop & Demo Papers

- [W1] **GRAFX: An Open-Source Library for Audio Processing Graphs in PyTorch**
Sungho Lee, Marco A. Martínez-Ramírez, Wei-Hsiang Liao, Stefan Uhlich, Giorgio Fabbro, Kyogu Lee, and Yuki Mitsufuji
International Conference on Digital Audio Effects (DAFx), Demo, 2024 [arXiv code](#) [documentation](#)
- [W2] **Wavespace: A Highly Explorable Wavetable Generator**
Hazounne Lee, Kihong Kim, Sungho Lee, and Kyogu Lee
International Society for Music Information Retrieval Conference (ISMIR), Late-Breaking Demo, 2024 [arXiv code](#)
- [W3] **Beat-Aligned Spectrogram-to-Sequence Generation of Rhythm-Game Charts**
Jayeon Yi, Sungho Lee, and Kyogu Lee
International Society for Music Information Retrieval Conference (ISMIR), Late-Breaking Demo, 2023 [demo](#) [arXiv code](#)

Patents

- [P1] **Multi-modal Guitar Performance Transcription Apparatus and Method for the same**
Kyogu Lee, Sungho Lee, Chang-Bin Jeon, Jiwon Kim, Jongho Choi, Hayoon Kim, Yong-Ho Kim, and Jang-Woo Lee
Domestic Patent, 2025 [doi](#)

Preprints & Under Review

- [R1] **Exploring the Design Space of Representation Learning for Audio Transformations**
Sungho Lee, Marco A. Martínez-Ramírez, Junghyun Koo, Wei-Hsiang Liao, Kyogu Lee, and Yuki Mitsufuji
- [R2] **UNISE: Speech Enhancement via Noise-Invariant Learning for Improved Content Preservation**
Seungu Han, Sungho Lee, Eungbum Kim, Seaone Ok, and Kyogu Lee
- [R3] **Actionable Pronunciation Feedback via Disentangled Speech Representations**
Hayoon Kim, Sungho Lee, and Kyogu Lee
- [R4] **LipCoder: Voice-Enabled Coding Toolkit**
Hayoon Kim, Sungho Lee, Juwhi Kim, Bongwon Suh, and Kyogu Lee
- [R5] **Solving Blind Non-linear Forward and Inverse Problem for Audio Applications**
Jaehyun Park, Sungho Lee, Hayoon Kim, and Kyogu Lee

Experiences

Education

1. Seoul National University, *Integrated M.Sc. & Ph.D.* Fall 2020–Spring 2026
Department of Intelligence and Information.
Thesis: *Solving Inverse Problems of Audio Systems with Differentiable Processing and Generative Modeling*
Advisor: Kyogu Lee kglee@snu.ac.kr
2. Pohang University of Science and Technology, *B.Sc.* Spring 2016–Spring 2020
Department of Creative IT Engineering.

Industry

1. Meta Reality Labs. *Research intern.* Summer 2026
Intelligent mixing for multichannel audio.
- 2a. Sony AI. *Research intern.* Spring 2026
Representation learning for audio transformations. [\[R1\]](#)
- 2b. Sony AI. *Research intern.* Summer 2023
Differentiable signal processing for music mixing. [\[J2\]](#), [\[C4\]](#), [\[W1\]](#)
3. Supertone. *Research intern.* Spring 2023
Impulse response estimation for audio post-production. [\[C6\]](#)
Product: Supertone Air (research, model training & product design). [page](#)

Funded Projects

1. Supertone. *Research lead.* 2024
Universal speech enhancement on full-band audio. [\[C2\]](#)

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| 2. MCST, Korean Gov. <i>Applicant</i> .
Deep learning methods for post-production of musical audio. | 2022–2023
[C7] , [C8] |
| 3. IITP, Korean Gov. <i>Applicant</i> .
Sound event detection and localization; room acoustics analysis. | 2021–2023
[J3] |
| 4. Nexen Tire. <i>Research lead</i> .
Analysis and learning of noise, vibration, and harshness (NVH) characteristics. | 2022 |
| 5. Stra. <i>Research lead</i> .
Real-time audiovisual guitar tablature transcription. | 2022
[P1] |

Invited Talks

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| 1. Institute of Sound Recording (IoSR), University of Surrey.
Solving Inverse Problems of Audio Systems with Differentiable Processing and Generative Modeling. | Aug. 3, 2026 |
| 2. Music and AI Lab, National Taiwan University.
Inverse Problems in Audio Post-production. | Oct. 7, 2024 |
| 3. Center for Digital Music (C4DM), Queen Mary University of London.
Deep Learning Meets Audio Processing Graphs. | Nov. 16, 2023 |

Teaching

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| 1. Data Science Program, Samsung. <i>Teaching Assistant</i> . | 2021–2022 |
| 2. Machine Listening, Seoul National University. <i>Teaching Assistant</i> . | 2021 |

Reviews

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| 1. IEEE Transactions on Audio, Speech, and Language Processing (TASLPRO) | 2025– |
| 2. EURASIP Journal on Audio, Speech, and Music Processing (JASM) | 2025– |
| 3. Journal of Audio Engineering Society (JAES) | 2025– |
| 4. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) | 2025– |
| 5. IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA) | 2025– |
| 6. IEEE International Joint Conference on Neural Networks (IJCNN) | 2025– |
| 7. International Conference on Digital Audio Effects (DAFx) | 2026 |
| 8. International Society for Music Information Retrieval Conference (ISMIR) | 2026 |
| 9. ISCA Interspeech | 2026 |
| 10. IEEE Spoken Language Technology Workshop (SLT) | 2026 |
| 11. Korean Society for Music Informatics Conference (KSMI) | 2026 |