Yunkee Chae

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Personal Data

Address Address 18-211, 1 Gwanak-ro, Gwanak-gu, Seoul (Postal code: 08827)
Birth 19th Sep, 1995, in Republic of Korea
Nationality Korea, Republic of

Education

Seoul National University **Mar 2014 – Feb 2021**
Bachelor of Science in Mathematical Sciences

Seoul National University **Mar 2021 –**
Master's and Ph.D. Integrated Course of Engineering
Interdisciplinary Program in Artificial Intelligence
Music and Audio Research Group (MARG)
Supervisor: Prof. Kyogu Lee

Research Interest

Deep learning / Machine learning

Audio Enhancement / Restoration

- Live performance audio enhancement
- Unsupervised audio enhancement

Source Separation

- Visual query-based source separation
- Source separation via generative modeling

Audio Compression

- Variable Bitrate Neural Audio Codec

Publications

First Author

Towards Bitrate-Efficient and Noise-Robust Speech Coding with Variable Bitrate RVQ **2025**
Yunkee Chae and Kyogu Lee
Accepted to Proceedings of the INTERSPEECH 2025

- Introduced a dynamic bitrate adjustment framework optimizing rate-distortion trade-offs by prioritizing critical speech components and suppressing noise, outperforming constant bitrate RVQ.
- Integrated feature denoiser to enhance robustness, achieving superior compression efficiency and perceptual quality in noisy environments.
- [*Paper*] [*Demo*]

Song Form-aware Full-Song Text-to-Lyrics Generation with Multi-Level Granularity **2025**
Yunkee Chae, Eunsik Shin, Suntae Hwang, Seungryeol Paik, and Kyogu Lee
Accepted to Proceedings of the INTERSPEECH 2025

- Proposed a method for generating lyrics with precise control over syllable counts at the paragraph, line, phrase, and word levels, conditioned on a text prompt and song form structure.
- First work to generate comprehensive lyrics with song forms and syllable conditions.
- [*Paper*] [*Demo*]

2025-042025 **2024**

Yunkee Chae, Woosung Choi, Yuhta Takida, Junghyun Koo, Yukara Ikemiya, Zhi Zhong, Kin Wai Cheuk, Marco A. Martínez-Ramírez, Kyogu Lee, Wei-Hsiang Liao, and Yuki Mitsufuji

Accepted to Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2025) (Oral presentation)

Accepted to NeurIPS 2024 Workshop on Machine Learning and Compression

- The first work to propose training framework for variable bitrate compression within the residual vector quantization.
- Improved the rate-distortion tradeoff performance for state-of-the-art RVQ codecs.
- Work done during the internship at Sony AI, Tokyo.
- [*Paper (ICASSP ver.)*] [*Paper (NeurIPS workshop ver.)*] [*Code*] [*Samples*]

A **2023**

Yunkee Chae, Junghyun Koo, Sungho Lee, and Kyogu Lee

Accepted to Proceedings of the 31th ACM International Conference on Multimedia (ACM MM 2023)

- Proposed a system for enhancing degraded musical recordings based on the Conformer architecture.
- Capable of perform music enhancement with multi-track mixtures, which has not been examined in previous work.
- [*Paper*] [*Code*] [*Samples*]

Co-First Author

Self-refining of Pseudo Labels for Music Source Separation with Noisy Labeled Data **2023**

Junghyun Koo*, **Yunkee Chae***, Chang-Bin Jeon, and Kyogu Lee

Accepted to Proceedings of the 24nd International Society for Music Information Retrieval Conference (ISMIR 2023)

- Introduced an automated technique for refining the labels in partially mislabeled dataset.
- Proposed a training framework for music source separation with multi-labeled data.
- Participated in Sound Demixing Challenge 2023, Music Demixing Track A (*link*)
- [*Paper*]

Debiased Automatic Speech Recognition for Dysarthric Speech via Sample Reweighting with Sample Affinity Test **2023**

Eungbeom Kim*, **Yunkee Chae***, Jaeheon Sim, and Kyogu Lee

Accepted to Proceedings of the INTERSPEECH 2023

- Proposed an automatic speech recognition system robust for dysarthric speech.
- Introduced novel sample reweighting method called sample affinity test.
- [*Paper*]

Co-Author

Show Me the Instruments: Musical Instrument Retrieval from Mixture Audio **2023**

Kyungsu Kim*, Minju Park*, Haesun Joung*, **Yunkee Chae**, Yeongbeom Hong, Seonghyeon Go, and Kyogu Lee

Accepted to Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2023)

- Proposed a novel method for musical instrument retrieval system for mixture audio using single-instrument encoder and the multi-instrument encoder
- [*Paper*] [*Code*] [*Samples*]

(equal contribution)*

Preprints

MGE-LDM: Joint Latent Diffusion for Simultaneous Music Generation and Source Extraction **2025**

Yunkee Chae and Kyogu Lee

Under review

- Developed a unified latent diffusion framework (MGE-LDM) that enables simultaneous music generation, source imputation, and text-driven source extraction via conditional inpainting, without relying on fixed instrument classes.
- Pioneered the use of inpainting in latent diffusion for source extraction, supporting flexible, class-agnostic manipulation across diverse multi-track datasets (e.g., Slakh2100, MUSDB18, MoisesDB).
- [*Paper*] [*Samples*]

Work / Research Experience

Research Intern **Mar 2020 – Sep. 2020**
at Department of Mathematical Science, Seoul National University
- 3D reconstruction of projected grids via projector calibration
- Supervisor: Prof. David Donghoon Hyeon

Software Engineer **Sep 2020 – June 2021**
at Hmachines Inc., Seoul, Korea
- 3D reconstruction of smooth surface via laser scanner using multiple view geometry

Research Intern **Jan 2021 – Jeb 2021**
at Music and Audio Research Group (MARG), Seoul National University
- Source separation of individual guitar strings from polyphonic guitar recordings.

Project Manager **Jul 2023 – Apr 2024**
AI Producer: Developing technological custom music composition
at Music and Audio Research Group (MARG), Seoul National University

Research Intern **May 2024 – Sep 2024**
at Sony AI, Tokyo, Japan
- Variable bitrate residual vector quantization for audio coding
- Paper accepted at ICASSP 2025 & NeurIPS 2024 Machine Learning and Compression Workshop

Research Intern (Expected) **Aug 2025 – Feb 2026**
at MERL (Mitsubishi Electric Research Laboratories), Cambridge, MA, USA
- Expected to conduct research on audio generation and source separation.

Projects

AI Producer **Jul 2022 – Apr 2024**
Developing technological custom music composition
at MARG, in collaboration with Pozalabs and Supertone Inc.
- Developed a comprehensive music creation framework for musicians that generates new music based on reference audio.

Enhancing Cognitive Health through Optimal Hearing (ECHOH) **Oct 2024 – Aug 2025**
Global convergent research on healthcare solution to overcome hearing loss and dementia
at MARG, in collaboration with Ulsan Univ., KIST, Bell Therapeutics, Ewha Womans Univ., and Samsung Medical Center
- Conducted research on EEG-conditioned attended speech extraction.

Others

Poster presentation at Music and Audio Workshop, Seoul (homepage) **Jul 2023**
- Exploiting TF-Conformers for Music Audio Enhancement
- Self-refining of Pseudo Labels for Music Source Separation with Noisy Labeled Data

Oral Presentation at Sound Demixing Workshop, Milan (homepage), (abstract) **Nov 2023**
- Self-refining of Pseudo Labels for Music Source Separation with Noisy Labeled Data

Poster presentation at Korean Society for Music Informatics (hompage) **Apr 2025**
- Lyrics Generation with Song form-aware Syllable Count Control

Millitary Service **May 2016 – Feb 2018**
Korean Army, Honorable Discharge

Skills

Languages: Korean (Native), English (Intermediate), Japanese (Advanced)
Programming: Python, PyTorch, PyTorch Lightning, NumPy, SciPy, Pandas, Scikit-learn
Frameworks/Tools: Jupyter, Git, Docker, Singularity