

# ChangHeon Han

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## Research Interests

Multimodal Learning, Signal Processing, Natural Language Processing, Music Information Retrieval

## Professional Experience

### **Chalmers University of Technology | Ph.D. Student**

01 2026 - Present

- Affiliated with WASP-HS (Wallenberg AI, Autonomous Systems and Software Program – Humanity and Society)
- Research focus: learned cultural representation spaces in generative AI for creative domains
- Advisor: Kivanc Tatar (Associate Professor)

### **Singapore Management University | Research Engineer**

10 2025 - 12 2025

- Career Trajectory Analysis using Dynamic GNN
- Advisor: Ee-peng Lim (Professor), Palakorn Achananuparp (Senior Research Scientist)

### **SONY Europe | Research Intern**

08 2024 - 01 2025

- Researched fine-grained instrument music source separation using text queries, leveraging a text-audio multimodal encoder to enable zero-shot separation with hierarchical instrument representations
- Advisor: Giorgio Fabbro (Engineer, Sony), Axel Marmoret (Maître de conférences, IMT Atlantique)

### **Hanyang University | Research Assistant**

02 2023 - 07 2024

- Built a preprocessing pipeline for polysomnography audio recordings for sleep apnea diagnosis using respiratory sound patterns
- Explored caption augmentation techniques for Text-to-Audio generation models to synthesize ASMR content with improved semantic alignment
- Advisor: Minsam Ko (Associate Professor)

### **GIST (Gwangju Institute of Science and Technology) | Research Intern**

01 2023 - 02 2023

- Researched symbolic domain generation based on a four-quadrant emotion model, tailored to the current emotions of video game players
- Advisor: Kyung-Joong Kim (Professor)

### **Coupaing | Data Analyst**

04 2020 - 04 2022

- Managed a team of 5 to cleanse misdelivered address data, collaborating with the development team to create an address override system
- Led a team of 3 to develop a cleansing process for preventing personal information breaches in the system, including ongoing training and management

### **Music Producer | Music Producer / Singer-Songwriter**

01 2018 - 2022

- Worked as a producer on Hyundai Motor Group official media and the Seezn Original Series Hope or Dope, producing 10 tracks for 5 artists and registering 33 copyrighted works
- As an artist, released music featured in Spotify K-pop Editorial Playlists (4 tracks), reaching over 800K streams across 96 countries

## Publication

**ChangHeon Han** and SuHyun Lee, "Optimizing Music Source Separation in Complex Audio Environments Through Progressive Self-Knowledge Distillation", *Technical Report of 2024 IEEE International Conference on Acoustics, Speech, and Signal Processing Workshops (ICASSPW)* [\[pdf\]](#) [\[code\]](#) [\[presentation-ppt\]](#)

**ChangHeon Han**, Jaemyung Shin and Minsam Ko, "ASMR Sound Generation through Attribute-based Prompt Augmentation", *Korea Computer Congress 2024 (KCC)* [\[pdf\]](#) [\[poster\]](#)

**ChangHeon Han**, SuHyun Lee and MinSam Ko, "Track Role Prediction of Single-Instrumental Sequences", *Late Breaking/Demo (LBD) of 24th International Society for Music Information Retrieval Conference (ISMIR)* [\[pdf\]](#) [\[code\]](#) [\[poster\]](#)

SuHyun Lee, **ChangHeon Han**, Woohwan Jung and Minsam Ko "STAR: Strategy-Aware Refinement Module in Multitask Learning for Emotional Support Conversations", *In Proceedings of the Fourth Workshop on NLP for Positive Impact, Association for Computational Linguistics* [\[pdf\]](#) [\[code\]](#)

SuHyun Lee, **ChangHeon Han** "Sentimatic: Sentiment-guided Automatic Generation of Preference Datasets for Customer Support Dialogue System", *In Proceedings of the 2025 Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics* [\[pdf\]](#) [\[code\]](#)

## Projects

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### **Hybrid Demucs with Self-Knowledge Distillation** | Python, Signal Processing, HRTF

- Applied Progressive Self-Knowledge Distillation (PS-KD) to fine-tune the Hybrid Demucs baseline model on stereo-mixed music with HRTF characteristics for the Cadenza Challenge 2024; ranked in the Top 5 globally.

### **MIDI-Metadata-Extractor** | Python, music21, PrettyMIDI, Mido

- This tool segregates break down a multi-track MIDI file into individual instrument tracks, extract detailed metadata for each track, and provides the flexibility to truncate and save tracks based on a specified number of measures.

### **NSynth-MIDI-Renderer for massive MIDI dataset** | Python, NSynth, MIDI-Synthesizer

- This project, done as an open-source contribution, involves a given MIDI sequence undergoing a process of finding and assigning candidates in the NSynth dataset to lock in a single preset from the beginning to the end of the sequence.

### **Respiration Count Algorithm Utilizing Peak Detection** | Python, PSG-Audio, Signal Processing

- Implemented a code that calculates breath count by creating a power envelope from the amplitude values of a spectrogram with noise filtering. The method expresses inhalation and exhalation as a single curve through Gaussian filter smoothing.

### **Soothing Sound White Noise Generator** | copyrighted with the Korea Copyright Commission

- Developed a soothing sound audio generation program, featuring a noise creation tool with five distinct noise colors and three weighting filters.

## Activities

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### **Munich Music Labs** | Manager

11 2025 – Present

- Served as Partnership Manager, supporting research collaborations and industry partnerships.

### **Hanyang University** | Teaching Assistant

03 2024 – 06 2024

- Creative Programming for Engineers: Assisted engineering students with their Python coding practices.

## Education

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### **Chalmers University of Technology** | Ph.D. in Computer Science and Engineering

01 2026 – Present

### **Hanyang University** | Master of Artificial Intelligence

03 2023 – 02 2025

### **Korea SMEs and Startups Agency** | ML/AI Training Program

04 2022 – 12 2022

### **SoongSil University** | Bachelor of Laws

2011 – 2020

## Honors and Awards

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**Hanyang University**: Fully funded Master's position, including conference travel support.

**Korea SMEs and Startups Agency**: Received full tuition support for a 10-month program.

## References

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**Kivanc Tatar** Associate Professor, Chalmers University of Technology, [tatar@chalmers.se](mailto:tatar@chalmers.se)

**Minsam Ko** Associate Professor, Hanyang University, [minsam@hanyang.ac.kr](mailto:minsam@hanyang.ac.kr)

**Axel Marmoret** Maître de conférences, IMT Atlantique, [axel.marmoret@imt-atlantique.fr](mailto:axel.marmoret@imt-atlantique.fr)

**Giorgio Fabbro** Engineer, SONY, [Giorgio.Fabbro@sony.com](mailto:Giorgio.Fabbro@sony.com)

**Ee-peng Lim** Professor, SMU, [eplim@smu.edu.sg](mailto:eplim@smu.edu.sg)

**Palakorn Achananuparp** Senior Research Scientist, SMU, [palakorna@smu.edu.sg](mailto:palakorna@smu.edu.sg)