KyungSu Chun

Researcher in Audio, Music Technology, and Korean Traditional Music

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PROFILE

Researcher and developer working across audio, music technology, embedded systems, and Korean traditional music (gugak). Current work focuses on ornamentation, notation, labeling, and dataset design for Haegeum sanjo, built on engineering experience spanning control systems, musical tools, immersive audio, and industrial sensing.

Originally drawn to analog and digital synthesizers, his work gradually moved toward a broader question: how musical expression can be described, analyzed, and formalized for both humans and machines.

RESEARCH FOCUS

- Computational analysis and representation frameworks for gugak expression
- Methodologies for generating natural gugak performance sounds
- Haegeum sanjo ornamentation and expressive nuance
- Notation design, labeling frameworks, and dataset construction for Haegeum sanjo and gugak expression

EDUCATION

KAIST

Ph.D (on leave), Graduate School of Culture Technology

Mar 2013 - Present

Music and Audio Computing Lab (Advisor: Juhan Nam)

KAIST

M.S., Graduate School of Culture Technology

Feb 2011 - Feb 2013

Human-Robot Interaction Research Center (Advisor: Dong-Soo Kwon)

Kyungpook National University

B.S., Electronics Engineering

Mar 2004 - Feb 2011

EXPERIENCE

ARE

Senior Research Engineer

Nov 2024 - Present

- ANC systems for floor-impact noise and environmental/industrial noise
- Algorithm implementation, system integration, and field deployment

SAI Technologies

Senior Researcher

Sep 2023 - Oct 2024

- Voltage-controlled polarization cameras and control boards
- Technology transfer and maintenance for drowning detection systems
- Firmware for illegal dumping monitoring devices

Jeonju University

Special Researcher

Jan 2020 - Dec 2022

- (2022) Validation and technical direction for a gugak audio/score dataset project
- (2020-2021) Software for demonstrating collected IRs through convolution reverb

Real-time Systems Lab., Kyungpook National University

Undergraduate Research Trainee

Jun 2010 - Oct 2010

- UBINOS API

Dependable Embedded Control System Lab., Kyungpook National University

Undergraduate Research Trainee

Jun 2009 - Aug 2009

- Participated in embedded control systems research.

Software Safety Engineering Lab., Kyungpook National University

Undergraduate Research Trainee

Sep 2008 - Feb 2009

- Verification and validation for UI and TinyOS

Embedded System Software Optimization Lab., Kyungpook National University

Undergraduate Research Trainee

Feb 2008 - Aug 2008

- Automobile diagnosis system

SELECTED WORK

Gugak Representation and Dataset Work

- Haegeum sanjo ornamentation, notation, labeling, and dataset design
- Research support tools and annotation workflow design for expressive music analysis

Musical Tools and Virtual Instruments

- Sampler and virtual instrument prototypes rooted in synthesizer-oriented practice
- Development of the gugak virtual instrument *Samhyeon Yukgak*
- Experimental musical tools for expressive sound interaction

Musical Interfaces and Controllers

- MIDI and custom controller experiments for performance and sound control
- Analog synthesizer modification and control interface experiments

Robotics and Interactive Systems

- Robot sound expression, auditory display, and interactive robot system work
- Projects spanning mobile sculpture, interactive platforms, and motion programming

Immersive Audio, IR, and Spatial Demonstration

- Software for demonstrating collected impulse responses through convolution reverb
- Work on sound field expansion, loudspeaker measurement, and immersive audio workflows

Embedded Systems, Sensing, and Vision

- Embedded firmware, PCB design, automotive diagnostics, and low-level system work
- Voltage-controlled polarization cameras, control boards, and industrial sensing systems

PUBLICATIONS

Thesis

1. KyungSoo Chun. *SynScore: Novel notation for robot sound expression.* Master Dissertation, Graduate School of Culture Technology, KAIST, 2013.

Conference Papers

1. Kyoung-Soo Chun, Seung-Geon Moon, Dong-Soo Kwon. *Robot system as a platform for mobile sculpture.* The 7th Korea Robotics Society Annual Conference (KRoC), p. 268, 2012.
2. Kyoung-Soo Chun, Dong-Soo Kwon. *Auditory Display for Internal State of Robot.* The 7th Korea Robotics Society Annual Conference (KRoC), pp. 626-627, 2012.
3. Seung-Geon Moon, Jong-Bin Lee, Se-Yeon Lee, Hyun-Gi Kim, Kyoung-Soo Chun, Dong-Soo Kwon. *Development of SNS-based Interactive Art Platform Using Robot System.* The 7th Korea Robotics Society Annual Conference (KRoC), pp. 324-326, 2012.
4. Kyoung Soo Chun, Eun-Sook Jee, Dong-Soo Kwon. *Novel Musical Notation For Emotional Sound Expression of Interactive Robot.* The 8th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI), pp. 88-89, 2012.
5. Jaewoo Kim, Kyoung Soo Chun, Dong-Soo Kwon. *Gesture motion programming by applying robot motion hierarchy structure for the educational/entertainment robot Engkey.* Proceedings of the 2012 IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO), 2012.

Posters and Abstracts

1. Kyoungsoo Chun, Jinah Kwak and Juhan Nam. *Characteristics of Non-linguistic Vocalizations as Auditory Emoticons* (abstract). Proceedings of the 14th International Conference on Music Perception and Cognition (ICMPC), 2016.
2. Jeounghoon Kim, Seo Hyun Kim, Minseo Kim, Kyoung Soo Chun. *A Text-to-image Conversion System for Public Service Announcements.* The Brain and Artificial Intelligence symposium (Brain Engineering Society of Korea), 2013.

Last updated: April 20, 2026