

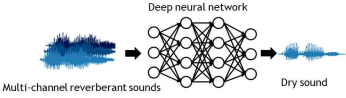
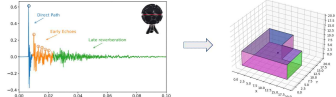



<div></div> <div>Smart Sound Systems Lab</div>		<div>■ Contact information</div> <div>Professor: jwoo@kaist.ac.kr TEL: 042-350-7435</div> <div>Lab.: N24 LG Innovation Hall 2103 TEL: 042-350-7535</div> <div>Website: https://sound.kaist.ac.kr</div>
<div>■ Current state of the Lab. (in 2025 Spring Semester)</div> <div>Postdoctoral Fellows: 1 PhD Students: 5 Master's Student: 5</div>		
<div>■ Research Areas</div> <div>Smart Sound Systems Laboratory pursues better understanding and rendering of spatial audio through AI-based technologies and audio signal processing. We study audio signal processing, AI-based audio scene analysis, diagnosis, and audio generation models to realize truly immersive audio experience. Our research topics cover Metaverse Audio (virtual reality, augmented reality, extended reality audio), and Auditory Scene Analysis such as Speech Enhancement and Separation, Direction-of-Arrival estimation, Room Impulse Response estimation, Room Geometry Inference. Sound-based Anomaly Detection and Fault Diagnosis is another major research topic in our Lab.</div> <div><div><div>[Highlights]</div><div>- SOTA in DNN-based Multichannel Speech Enhancement [DeFTAN-II]</div><div>- 7th place, in 2023 DCASE Sound Event Detection & Localization</div><div>- Inventor of Personal Audio Technology for Automotive Vehicles</div></div><div><div>[Theories]</div><div>- Audio signal processing, Multichannel signal processing</div><div>- Sound propagation, Spatial perception of sound</div><div>- Anomaly detection, Out-of-distribution detection</div></div><div><div>[Applications]</div><div>- Audio Metaverse, Audio AR/VR/XR</div><div>- Speech Enhancement and Separation, DoA Estimation using DNN</div><div>- Sound-based Environmental Parameter Generation and Estimation</div><div>- Beamforming, Sound Event Localization and Detection, Target Sound Extraction</div><div>- Intelligent Audio System with Environmental Awareness</div><div>- Machine Anomaly Detection and Fault Diagnosis with AI</div></div></div> <div><div><p><Metaverse Audio Recording></p><p>Deep neural network</p><p>Multi-channel reverberant sounds Dry sound</p><p><Audio & Speech Signal Processing using AI></p><p><Room shape inference from sound></p></div></div>		
<div>■ Recommended courses & Career after graduation</div> <div>We recommend signal processing based courses (EE202 Signals and systems, EE432 Digital Signal Processing) and deep learning-related courses (AI504 Programming for AI). After graduation, you can further develop your career in industries & academic areas (such as Meta Reality Labs, Samsung Research, ETRI, Naver). You can also work in a wide range of fields.</div>		<div>■ Introduction to other activities besides research</div> <div>Lab members frequently engage in football, badminton, board game, etc. Through the organization of yearly membership training workshops and field trips, we actively facilitate the cultivation of camaraderie among members. Our laboratory fosters a regulation-free environment, striving to empower our members' creativity and self-motivation.</div>
<div>■ Introduction to the Lab.</div> <div>The field of intelligent audio signal processing is a multidisciplinary field that enables the blending of signal processing technologies with machine-learning approaches, sound propagation theories, and insights into human sound perception. The driving force of the lab is the spirit of embracing challenges to explore new ideas guided by a profound intuition for signal processing. Collaborative research on top-notch immersive audio technology is underway, with the support of consistent funding, in partnership with NRF, LIGNex1, ETRI, and Samsung Electronics.</div>		
<div>■ Recent research achievements ('23~'25) (visit https://sound.kaist.ac.kr for full list of publications)</div> <div><div>- D. Lee and J-W. Choi, "DeFT-Mamba: Universal Multichannel Sound Separation and Polyphonic Audio Classification," IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Hyderabad, India, Apr, 2025.</div><div>- D. Choi and J-W. Choi, "Multichannel-to-Multichannel Target Sound Extraction Using Direction and Timestamp Clues," IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Hyderabad, India, Apr, 2025.</div><div>- D. Lee and J-W. Choi, "DeFTAN-II: Efficient Multichannel Speech Enhancement with Subgroup Processing," IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP), Nov, 2024.</div><div>- I. Yeon, I. Jeong, S. Lee, and J-W. Choi, "EchoScan: Scanning Complex Room Geometries via Acoustic Echoes," IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP), Oct, 2024.</div></div>		