Docket #: S24-358

Calibration System, Method, and Applications for an Acoustic Enhancement System

Stanford researchers have developed a calibration method for Stanford inventions (S18-504 and S18-504B) that improves acoustic experience by calibrating the CAVIAR (Chamber for Augmented Virtual and Interactive Audio Realities) system so that it remain effective as temperature and/or humidity fluctuate over time and by enhancing the simulated acoustics for quiet sound sources. This is achieved by generating cancellation filters based on loudspeaker-microphone impulse responses and adjusting the filters based on changing room conditions using imperceptible test signals, and by changing the dynamic range of sound sources in auralizations beyond levels that would typically cause feedback. These methods are critical for enhancing auralizations (interactive acoustics simulations) in a variety of use cases.

Stage of Development
Proof of Concept: the calibration system was simulated numerically and tested using a commercial music processing application called Max by Cycling 74. Research is ongoing.

Applications

- Acoustics for music performances, recording, and production
- Acoustics for gaming, virtual and augmented reality
- Videoconferencing and virtual meetings

Advantages

- Limits feedback and maintains system calibration under changing conditions for an even more realistic, immersive, high quality, customizable, shared acoustic space
- Limits feedback when simulating extremely reverberant spaces
- Enhances simulated acoustics for music/sound with a large dynamic range, in particular for quiet sound sources

Patents

- Published Application: WO2026073138

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