Analysis and Evaluation of Sound and Reverberance in Indoor Sound Field

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Research Fields	Architectural acoustics
Keywords	Indoor sound field, Subjective evaluation

● Research Outline

I mainly analyze and evaluate a sound and reverberation in the sound field of the architectural space. I hope to contribute to the creation of a better space by correctly analyzing and evaluating the acoustic conditions in the space from both physical and psychological aspects.

Analysis and evaluation of reverberance

The space surrounded by walls, floors, and ceilings creates reverberance according to the volume and room surface materials. The characteristics vary depending on the space, and physical analysis and evaluation can be carried out by measuring the impulse response signal and calculating the acoustic index value. However, since the appropriate acoustic state varies depending on the room use and the sound generated in the space, it may be difficult to evaluate the sound uniformly using only physical index such as reverberation time.

Therefore, by measuring subjective evaluation through questionnaires, I clarify the characteristics of reberverance as seen from the psychological aspects that were not revealed by physical analysis.

◆ Examples of my research on this field

• Audio-visual impressions received from VR spaces

• The sound field evaluation in spaces where music is performed

Analysis and evaluation of sound

It is said that the characteristics of a sound are determined mainly by three factors: loudness, pitch, and timbre. The loudness and the pitch is the physical index strongly related to the sound pressure level and frequency. The timbre is related to the waveform of sound waves. However, psychological evaluation is important, especially for musical sounds and noise because individual difference in preferences are extremely large.

Therefore, like sound, I clarify the characteristics of the sound from the psychological aspect by measuring subjective evaluation.

◆ Examples of my research on this field

• Evaluation of music performance

• The effective application of speech privacy system

• The effectiveness of voice guidance and sound sign in public spaces