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Titel:

Methods for sound quality evaluation of noises with spectro-temporal patterns

Abstract:

Sound quality evaluation has become a very important task for product design. Customers expect product sounds without disturbing noises, a challenge because spectro-temporal noise patterns (such as modulated signals causing a roughness sensation) must be considered besides frequency-weighted level like dB(A) or loudness. If the sound of a technical product exhibits these characteristics, it is most likely associated with poor quality.

During the last years, a “Hearing Model” was developed explaining and describing many psychoacoustic effects and parameters, such as allowing for roughness calculation in accordance with listening test results. The “Relative Approach” analysis as a pattern-oriented algorithm based on the Hearing Model emphasizes all relevant signal components concerning human auditory perception: tonal and transient signals. The High-resolution Spectral Analysis (HSA) provides a very small time-bandwidth product comparable or even superior to the resolution capabilities of human hearing. HSA is an excellent tool for tracking transient tonal components.

This paper presents different tools to measure and analyze sound quality using various examples.

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