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Modelling Monaural and Binaural Audio Quality

Stephan D. EWERT[1]; Jan-Hendrik Fleßner[2]; Thomas Biberger[3]

[1] Medizinische Physik & Cluster of Excellence Hearing4All

[2] HörTech gGmbH

[3] Medizinische Physik & Cluster of Excellence Hearing4All

ABSTRACT

In today's entertainment, communication, and hearing rehabilitative applications numerous signal degradations, ranging from linear to nonlinear (monaural) to spatial (binaural) distortions, can occur affecting the perceived audio quality. For many applications tools for instrumental quality prediction are desirable. To cope with the large variety of different signal distortions, recently the monaural generalized power-spectrum model for quality [GPSMq, Biberger et al., JAES, 66, 578 (2018)] and the binaural auditory-model-based quality prediction [BAM-Q, Flessner et al., JAES, 65, 929 (2017)] have been suggested. Here the underlying auditory perception principles utilized in the models are outlined and the two models are combined investigating how monaural and binaural quality aspects contribute to overall audio quality. In a listening experiment, the effect of different monaural and binaural distortions on music, speech, and noise, applied either in isolation or in combination, was examined. The resulting database was used for assessing different methods for combining GPSMq and BAM-Q to joint overall audio predictions for monaural and binaural signal distortions. The results indicate that overall audio quality depends on the lower quality aspect, either monaural or binaural. Neither monaural nor binaural quality aspects dominated overall quality per se.

Keywords: Audio quality, Auditory model, Psychoacoustics

[1] stephan.ewert@uni-oldenburg.de

[3] thomas.biberger@uni-oldenburg.de