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Title:

Towards Automated Psychoacoustic Assessment of Industrial Sounds: An Expert Benchmark Study

Author/s:

Andreas Herweg, Zain Sohail, Nico Reinartz

Abstract:

Psychoacoustic assessment of industrial sounds usually requires expert judgement. We established an assessment baseline with eight experienced practitioners, five industrial sounds and reference values calculated from the same recordings. The experts assessed the sounds using ArtemiS SUITE and agreed on 12 relevant psychoacoustic constructs. We then evaluated an AI agent that had access to calculation results for a subset of the ArtemiS SUITE methods and interpreted them together with model-based recommendations and sound descriptions. The agent identified 11 constructs as important, mentioned the remaining construct as a minor aspect and overlooked none. All 63 psychoacoustic values it reported matched the reference results within 5%. The complete agent run, including the calculations, required 38–71 s per sound, compared with a median of 17 min for the logged expert assessments. The results support its use as a rapid first assessment before expert review.

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HEAD acoustics GmbH
Ebertstraße 30a
52134 Herzogenrath, Germany

Andreas Herweg
Mail: info@head-acoustics.com
Telephone: +49 2407 577-0