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BLIND MODELLING OF SPEECH INTELLIGIBILITY AND LISTENING EFFORT IN BINAURAL LISTENING CONDITIONS

Thomas Brand [1*] **Saskia Röttges** [1] **Christopher F. Hauth** [1]
Jana Roßbach [2] **Rainer Huber** [2] **Bernd Meyer** [2] **Jan Rennies** [3]
[1] Medizinische Physik, Universität Oldenburg and Cluster of Excellence Hearing4all, Oldenburg, Germany
[2] Communication Acoustics, Universität Oldenburg and Cluster of Excellence Hearing4all, Oldenburg, Germany
[3] Fraunhofer IDMT, Hearing, Speech and Audio Technology and Cluster of Excellence Hearing4all, Marie-Curie-Str. 2, 26129 Oldenburg, Germany

ABSTRACT

This study evaluates a blind Binaural Speech Intelligibility Model (bBSIM) that predicts speech intelligibility (SI) and listening effort (LE) for spatially separated target speech and noise interferers. The model applies a blind binaural front-end [1], which assumes that the interfering noise has different modulation characteristics than speech and which predicts the effects of better-ear-listening and binaural unmasking. This binaural front-end is combined with two different blind back-ends that estimate SI and/or LE based on the output signal of the binaural front-end without any further auxiliary information. These blind back-ends are the non-intrusive Short Time Objective Intelligibility measure (NI-STOI) [2] and an automatic triphone recognizer with an *a posteriori* estimate of the certainty of the recognized triphones [3]. Even a short-term version is available which can be applied to arbitrary unknown speech and which updates SI and LE estimates in close to real time [4]. This offers new fields of application, e.g., in hearing instruments. Therefore, the blind real-time BSIM has been implemented on a research hearing aid [5], where it continuously estimates SI and LE. These estimates can be used, for instance, for informing the selection of hearing aid processing strategies.

Keywords: *speech intelligibility, listening effort, binaural hearing, models, blind.*

[*] ***Corresponding author***: *thomas.brand@uni-oldenburg.de*

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