

Auditory Evaluation of Receive-Side Speech Enhancement Algorithms

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Multiple enhancement signal processing algorithms for receive-side recently are integrated in modern state-of-the-art mobile devices. Such algorithms target on the improvement of listening comfort on the near end. Methods like (artificial) bandwidth extensions or additional noise reduction are already quite common. Additionally, more sophisticated enhancement algorithms manipulate the speech signal with respect to the instantaneous local background noise estimation. The focus here is to improve speech intelligibility. Such methods are also known as speech reinforcement, intelligibility or near-end listening enhancement.

Whenever speech processing is inserted into a conversation, quality aspect must be regarded. So far there are no suitable instrumental methods for the assessment of quality and intelligibility of acoustically captured speech signals in the presence of near-end noise. Thus, auditory assessments are currently the only method for performance evaluation.

This contribution presents a new proposal for the auditory evaluation for this use-case in order to evaluate also the trade-off between speech quality and intelligibility. A large database with different kinds of enhancement algorithms, multiple realistic background noise scenarios and acoustic handset simulation was created for this purpose. Finally, results and findings of this evaluation are presented.