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Speech Quality Testing - Part II: Performance of Instrumental Assessment Methodologies

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Instrumental assessment methodologies facilitate efficiently testing and developing modern communication systems to ensure that they provide high speech quality irrespective of use case and acoustic environment. Nowadays, these methodologies need to be able to deal with a wide range of degradations like reverberation and low signal-to-noise ratios. These degradations are particularly common for hands-free devices which are increasingly prevalent in today's communication.

For the evaluation of speech quality in telecommunication scenarios, ITU-T Recommendation P.800 has been providing guidelines for subjective testing for decades and is well-established in the industry. However, such auditory experiments are extremely time consuming and therefore costly. For many years, quality prediction models have been developed to provide a comfortable remedy for this purpose.

Based on a comprehensive auditory experiment presented in a companion contribution, the capabilities of several standardized and commonly used speech quality prediction methods were investigated. The realistic telecommunication scenarios comprise the usage of smartphones in different positions as well as vehicle and desktop hands-free devices. In particular, the prediction results for adverse acoustic conditions are analysed in detail. Even though some models claim to accurately predict such degradations according to their scope, several inconsistent results were observed.

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