Hybrid Non-Intrusive QoE Assessment of VoIP Calls Based on an Ensemble Learning Model

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Abstract

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- **Authors**
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- Metrics
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Abstract:

While the Mean Opinion Score (MOS) is the most well-known way to quantify Quality of Experience (QoE), it only provides average insight. In this paper, we will demonstrate that instead of only relying on the MOS value, predicting users' perceived quality through probabilistic metrics provides service providers with more accurate insight to improve their network decisions, relying on more accurate measures of how many of them are satisfied or not with the provided service. Furthermore, a hybrid non-intrusive ensemble learner based on the selection of multiple base learners is designed to estimate the QoE of the VoIP signal. The performance of our proposed model is compared to that of individual learners, demonstrating that the proposed scheme outperforms earlier schemes. In addition, in contrast with earlier schemes that relied on their own laboratory-generated dataset, another key advantage of our approach is that it extracts a wide variety of different system parameters, such as noise type and echo delay, and signal parameters, such as fundamental frequency, only from the degraded signal. Finally, we show how the more accurate predicted QoE values can be used by service providers to properly modify network parameters to get closer to the required QoE levels.

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