ARIA
APPLIED RESEARCH IN ACTION

Towards Broadcast-Quality Audio: Enhancement of Conference Microphones and Exploration of Objective Evaluation Techniques

Merging Deep Learning and Established Metrics for Accurate Audio Quality Assessment

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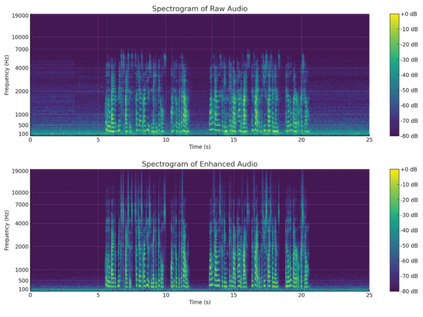

	PESQ[1]	STOI[2]	SRMR[3]	Composite[4]	NISQA[5]	DNSMOS[6]
SIG	0.19	0.07	0.19	0.48	0.79	0.84
BAK	0.07	0.05	0.03	0.07	0.58	0.35
OVRL	0.19	0.01	0.22	0.46	0.77	0.80

Table 1: Estimated correlation coefficients for six objective measures

PROJECT SUMMARY

Modern audiences demand high-quality audio in speech content to ensure listener engagement and satisfaction. Yet, recordings from consumer-grade equipment often exhibit quality degradations, including noise, reverberation, and equalization distortion. While traditional enhancement methods are adept at addressing specific issues, they often fall short in achieving optimal speech quality.

This study investigates the combination of various speech enhancement techniques, aiming to emulate professional broadcast microphone output using audio from conference microphone systems. In addition, emphasis is placed on the exploration of objective metrics for assessing the enhanced audio quality. Many benchmarked quality measures, although designed for specific domains, are often employed beyond their intended scope. This mismatch can result in unreliable quality estimations. Our research contrasts traditional metrics frequently referenced in academia with more recent deep-learning-based methods. By consolidating these objective measures through linear and nonlinear regression analysis, we aim to derive a metric with improved correlation that better aligns with human-perceived audio quality. This represents a pivotal step towards an automated evaluation process that parallels Mean Opinion Scores from human listening panels.

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