Speech Enhancement with Distributed Microphones

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Abstract

Numerous multi-channel speech enhancement (SE) approaches were proposed and conducted on the microphone array. However, the enhancement performance was sensitive to the estimated source energy or the direction-of-arrival information. To address the issue, we employed a deep-learning technique to perform multi-channel SE on a distributed-microphone architecture, wherein all channels are scattered over a large area. In this study, three different deep-learning model structures that consisted of the data processor (DP) and fusion center (FC) stages were applied to construct distributed microphone SE systems. We conducted our experiments on the Taiwan Mandarin version of Hearing in Noise Test (TMHINT) database. Evaluation results suggest that the system containing a residual model structure improves the PESQ score and STOI and thus achieves the highest sound quality and intelligibility of the proposed approach.