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Acoustic Signal Enhancement in a Distributed Microphone Environment

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Recently, information retrieval based on acoustic signals has caught great attention. In real-world scenarios, acoustic signals are easily distorted by additive or convolutional noises or recording devices, which constrain the achievable information retrieval performance. To address this issue, numerous acoustic signal enhancement (ASE) algorithms have been derived in order to improve the distorted acoustic signals and are widely used as a preprocessor in acoustics-related applications. Most of these approaches consider the condition where only one microphone (channel) is available to capture the acoustic signals. With the recent advances of hardware and communication technologies, it is believed that there will be multiple channels available for acoustic information retrieval in the near future. Therefore, ASE methods with considering multiple channels is an emerging research topic in the acoustic signal processing field. In this talk, we present a novel fully convolutional ensemble learning networks (FCEN) for multichannel ASE in the time domain. The proposed FCEN is formed by a dilated convolution and skip-connection structure with three ensemble inputs. Experimental results confirm the outstanding denoising capability of the proposed FCEN model on a ASE task where distributed microphones are available as compared to existing methods.

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