

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING

Website: <https://cde.nus.edu.sg/ece>

Area: Signal Analysis & Machine Intelligence (SAMI)

Host: Asst Prof Wang Xinchao & Dr Yue Xianghu

TOPIC	:	Context-aware Two-step Speech Separation
SPEAKER	:	Mr Wang Wupeng Graduate Student, ECE Dept, NUS
DATE	:	Monday, 25 November 2024
TIME	:	4:00PM-5:00PM
VENUE	:	Join Zoom Meeting https://nus-sg.zoom.us/j/82920788124?pwd=2Xq7yZpig0VFsSUL1WbeTF1Rli62k1.1

ABSTRACT

The speech separation system is designed to extract target speech from complex acoustic environments with multiple speakers. Although conventional systems have achieved notable success in synthetic scenarios of speech separation, their performance degrades when applied to out-of-domain samples, particularly for real-world mixtures. In this work, we introduce a novel context-aware two-stage training method for speech separation models to overcome this challenge. First, we replace the conventional end-to-end speech separation model with a framework that integrates a context extractor and a segregator. We then employ a two-stage training approach to reconstruct the target waveform, emulating the human auditory process. Finally, we conduct domain-adaptation experiments on both synthetic datasets and real-world mixtures. We demonstrate that our proposed method effectively boosts separation quality across synthetic and real mixtures from different domains, as measured by signal quality metrics and word error rate (WER) with various separation models. Additionally, an ablation study on the real test set reveals that context information, including phoneme and word representations from pretrained SSL models, serves as effective domain-invariant training targets for separation models.

BIOGRAPHY

Wang Wupeng received the B.Eng. degree in electronic engineering from University of Electronic Science and Technology of China, Chengdu, China, in 2016, and the M.Sc degree in electronic and computer engineering from the National University of Singapore, Singapore, in 2018. He is currently pursuing his Ph.D. degree. His research interests include source separation, speech extraction, speech enhancement and speech pretraining.

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