METHOD FOR SOLVING THE PERMUTATION PROBLEM OF FREQUENCY-DOMAIN BLIND SOURCE SEPARATION USING REFERENCE SIGNAL

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ABSTRACT

This paper presents a method for solving the permutation problem. This is a problem specific to frequency domain blind source separation within the framework of independent component analysis. Towards this problem, we propose a method which uses reference signals. For each frequency bin, the permutation alignment is fixed by calculating correlation coefficients between the reference signal and the separated signal. Reference signals are obtained as signals corresponding to each individual original source. The reference signals are chosen or obtained subjectively, and do not need to be separated well. For example, the conventional beamforming technique gives suitable reference signals. The experimental results of double talk recognition with 20K vocabulary show that the proposed method is effective to achieve 20% error reduction rate compared with the established DOA-based approach.