

A Sparse Representation Speech Denoising Method Based on Adapted Stopping Residue Error

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Abstract : A sparse representation speech denoising method based on adapted stopping residue error was presented in this paper. Firstly, the cross-correlation between the clean speech spectrum and the noise spectrum was analyzed, and an estimation method was proposed. In the denoising method, an over-complete dictionary of the clean speech power spectrum was learned with the K-singular value decomposition (K-SVD) algorithm. In the sparse representation stage, the stopping residue error was adaptively achieved according to the estimated cross-correlation and the adjusted noise spectrum, and the orthogonal matching pursuit (OMP) approach was applied to reconstruct the clean speech spectrum from the noisy speech. Finally, the clean speech was re-synthesised via the inverse Fourier transform with the reconstructed speech spectrum and the noisy speech phase. The experiment results show that the proposed method outperforms the conventional methods in terms of subjective and objective measure.

Keywords : speech denoising, sparse representation, k-singular value decomposition, orthogonal matching pursuit

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