

基于混沌序列的压缩感知语音增强算法

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摘要: 利用语音在离散余弦变换域下的稀疏性, 提出一种将混沌序列和符号函数相结合的观测矩阵, 该观测矩阵具有良好的伪随机性, 实现了确定性和随机性的统一. 首先将带噪的语音信号在 DCT 域进行稀疏, 然后利用提出的观测矩阵进行观测, 以保留大部分语音特性, 最后在原有重构算法基础上改进重构算法, 以加快重构速度. 此算法可以使重构语音信号的可懂度和清晰度得到大幅提升, 实现了语音增强.

关键词: 压缩感知; 稀疏表示; 混沌序列; 信号重构

Compressed Sensing Speech Enhancement Algorithm

Based on Chaotic Sequences

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Abstract: In this paper, present a kind of observation matrix which combines the chaotic sequence with the sign function, which has good pseudo randomness. Firstly, the noisy speech signal is sparse in the DCT domain, then the observation matrix is used to preserve most of the speech features, finally based on the original reconstruction algorithm, this paper improves the reconstruction algorithm to speed up the reconstruction. The algorithm proposed in this paper makes the intelligibility and clarity of reconstructed speech signal be greatly improved, and the speech enhancement is realized.

Key words: compressed sensing; sparse representation; chaotic sequence; signal reconstruction

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