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论文

基于ICA预处理的ANC参考信号获取

敖翔, 张玉

合肥电子工程学院

摘要:

传统有源降噪(ANC)系统希望将声场的能量全部抵消, 忽略了有用信号的存在。针对这一情况, 本文设计了一种基于独立分量分析(ICA)有噪瞬时混合模型的预处理系统, 利用分离矩阵信息和输出信号峭度值的计算, 解决了排列模糊和尺度模糊问题, 为有源降噪提取出纯净的参考信号。理论分析和仿真结果表明, 在语音信号受干扰影响较小, 其余混合信号信噪比不断恶化的情况下, 仍可以有效并准确地分离出语音信号。

关键词: 独立分量分析 参考信号 有源降噪 峭度

ICA-based preprocessed extraction of reference signal for ANC

AO Xiang, ZHANG Yu

Electronic Engineering Institute, Hefei

Abstract:

Traditional active noise control (ANC) system applied to cancel out the whole energy in the sound field, but ignore that the useful signal is mixed with the noise. Consequently, a new preprocessed system based on noisy version of the instantaneous mixing model defined in independent component analysis (ICA) was proposed to solve this problem. Making use of the information of separation matrix and the kurtosis of separated signals, the novel system can solve both permutation and amplitude ambiguity problems, and provide pure reference signal for ANC system. Theoretical analysis and computer simulations show that, although the SNR of others signal become worse, the system is exactly effective in separating speech signal if speech signal was jammed slightly.

Keywords: independent component analysis(ICA) reference signal active noise control (ANC) kurtosis

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通讯作者:

作者简介:

作者Email:

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