

论文

基于压缩感知重构信号的说话人识别系统抗噪方法研究

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摘要:

基于语音信号在离散余弦基下的近似稀疏性, 本文对语音信号采用压缩感知(Compressed Sensing)技术进行压缩和重构, 即将语音信号投影到随机高斯观测矩阵, 并采用线性规划(Linear Program)方法进行重构, 研究了重构误差与观测矢量点数的关系, 分析了噪声环境下重构信号的频谱变化情况。针对噪声环境下压缩感知重构信号比原始信号频谱变化小的特性, 提出了一种基于压缩感知重构信号的说话人识别系统抗噪方法, 给出了不同信噪比下获得最高识别率时压缩感知观测矢量的最佳点数。

关键词: 压缩感知 离散余弦变换 线性规划 单纯形法 说话人识别 高斯混合模型

Research on Antinoise Method of Speaker Recognition System Based on Compressed Sensing Reconstruction Signal

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Abstract:

Based on the approximate sparsity of Speech Signal in Discrete Cosine basis, Compressed Sensing theory is applied to compress and decompress speech signal in this paper, that is, Speech Signal is projected to a random Gauss measurement matrix and reconstructed by Linear Program, the relationship between reconstruction error and numbers of measurement vector is studied, also, the vary of spectrum of reconstruction signal is analysed. According to the less vary of spectrum of Compressed Sensing reconstruction signal than original signal in noise conditions, a method based on Compressed Sensing reconstruction signal to prove the performance of Speaker Recognition system in noise conditions is proposed. The optimal numbers of measurement vector are given to achieve the highest recognition accuracy in different SNR conditions.

Keywords: Compressed Sensing Discrete Cosine Transform Linear Program Simplex Method Speaker Recognition Gaussian Mixture Model

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