

论文

基于最小均方误差和稀疏特征的欠定盲源分离

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摘要:

针对欠定条件下的盲源分离问题,即观测信号个数小于信源个数的情况,提出了一种基于最小均方误差和稀疏特征的算法.首先,利用变换后信源的稀疏特征,采用一新的势函数通过聚类算法估计混叠矩阵.然后利用混叠矩阵和信源自身的相关性,通过寻找信源在聚类方向时间点上的精确值,以均方误差最小为准则寻找最佳分离矩阵实现信源的分离,克服了传统的分离算法在寻找最佳分离子矩阵方面的缺点.仿真结果显示使用该方法分离的信号具有更高的信噪比,和其他同类方法相比具有更优越的分离性能.

关键词: 稀疏性 欠定分离 最小均方误差

An algorithm for under-determined blind source separation based on the least-mean-square error and sparse features

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Abstract:

An algorithm was presented based on the least-mean-square error and sparse features for under-determined blind source separation, i.e., observed signal numbers are less than sources numbers., Based on clustering method, the mixing matrix was first estimated by a new potential function using the sparseness of sources. By using the estimated mixing matrix and the self-correlation of sources and searching the accurate values at the source clustering directions, the optimal sub-matrix for separation was obtained according to the least-mean-square error criterion. This can overcome the disadvantages of traditional algorithm in searching the optimal sub-matrix. Simulation results show the separated signals have higher SNR, and the proposed approach has better separation performance compared with the other similar methods.

Keywords: sparseness under-determined separation the least-mean-square error

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