

通信与网络

基于BICM-ID系统的单通道混合信号盲恢复算法

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摘要:

针对非协作通信中单通道同频线性调制混合信号盲恢复问题, 基于比特交织编码调制迭代译码 (bit interleaved code modulation iterative decoder, BICM-ID) 算法思想, 建立单通道混合基带接收系统模型, 提出一种联合解调和译码实现单通道混合信号中源信息盲恢复算法。通过分析和推导, 给出一种混合信号解映射的方法。该算法不需要对混合信号分离, 而可以直接从混合信号中估计出各路源信号, 且复杂度低。理论分析和仿真结果表明, 对于无码间干扰和有码间干扰的加性高斯白噪声 (additive white Gaussian noise, AWGN), 算法都能得到较低的误比特率 (bit error rate, BER), 而且算法对等功率混合信号和不等功率混合信号同样适用。

关键词: 盲分离 单通道 基于比特交织编码调制迭代译码 成对载波多址

Blind data recovery of single-channel mixed signals based on BICM-ID

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Abstract:

This paper focuses on blind separation and data recovery of multiple co-frequency linear modulation signals in single-channel which is an important and touchy issue in uncooperative communications. A novel method based on bit-interleaved code modulation iterative decoder (BICM-ID) algorithm is proposed, which combines demodulation with decoding and can recover multiple source signals from a single-channel mixed signal. Based on theoretical analysis and mathematical derivation, an algorithm for demapping of mixed signals is provided. Theoretical analysis and simulation results show that the new algorithm can directly recover all the source signals in a single-channel mixed signal without the need of separating the mixed signal. The algorithm of the advantages of low computational complexity and lower bit error rate (BER) for both non-inter symbol interference (ISI) and ISI additive white Gaussian noise (AWGN) channels, is suitable for the situations of equivalent as well as non-equivalent power mixed signals.

Keywords: blind separation single-channel bit-interleaved code modulation iterative decoder (BICM-ID) paired carrier multiple access (PCMA)

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