

应用

基于粒子滤波的Turbo盲均衡

李浩 彭华 丁金忠

信息工程大学信息工程学院, 河南

摘要:

粒子滤波是一种基于贝叶斯估计的算法, 在信道盲辨识和盲均衡问题上具有快收敛、抗深衰信道等优势。Turbo盲均衡在低信噪比条件下有较好的误码性能。为了在深衰信道下使通信具有良好的误码性能, 对粒子滤波盲均衡算法进行改进, 改进算法的重要性采样函数利用了粒子的先验信息, 得到一种软输入软输出的粒子滤波盲均衡算法。依据Turbo盲均衡的框架结构实现了一种基于粒子滤波的Turbo盲均衡算法, 该算法利用信道编码带来的编码增益, 提高了均衡和信道辨识的性能。仿真结果表明相比粒子滤波盲均衡算法本文提出算法的误码率性能提高1dB左右, 误帧率性能则提高了3dB以上, 经分析可知在信道系数估计较为准确的条件下, 系统数据帧几乎没有误码。

关键词: 信道盲辨识; 盲均衡; 粒子滤波; Turbo盲均衡

Turbo Blind Equalization Based on Particle Filter

LI Hao, PENG Hua, DING Jin-Zhong

Institute of Information System Engineering, Information Engineering University, Zhengzhou

Abstract:

Particle filter (PF), which is based on the Bayesian theory, is particularly useful in dealing with the blind channel identification and blind equalization for its fast convergence and its outstanding performance of resisting multiple-path fading channels. Under the low SNR conditions the bit error rates (BER) of Turbo blind equalization are much lower. In order to get good BER performance in multiple-path fading channels, the particle filter algorithm for blind equalization is modified. The important sampling function of particle filtering exploits the prior information of the particles and the soft input soft output (SISO) particle filter equalization algorithm is proposed. Considering the structure of Turbo blind equalization, a new Turbo blind equalization based on particle filter is proposed, which makes use of the channel coding gain. Therefore, the performance of equalization and channel identification are improved. The simulation result shows that compared to the particle filter equalization algorithm, the bit error rates (BER) of the proposed algorithm have a gain of about 1dB, and the frame error rates (FER) have a gain of above 3dB. By analyzing, there are hardly error bits under the condition of accurate estimation of the channel coefficients.

Keywords: blind channel identification blind equalization particle filter Turbo blind equalization

收稿日期 2012-02-15 修回日期 2012-08-29 网络版发布日期 2012-09-25

DOI:

基金项目:

国家自然科学基金资助项目(61072046)

通讯作者:

作者简介:

作者Email: leo.lihao@163.com

参考文献:

本刊中的类似文章

文章评论

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(789KB)
- ▶ [HTML全文]
- ▶ 参考文献[PDF]
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 信道盲辨识; 盲均衡; 粒子滤波; Turbo盲均衡

本文作者相关文章

- ▶ 李浩
- ▶ 彭华
- ▶ 丁金忠

PubMed

- ▶ Article by Li, G.
- ▶ Article by Bang, H.
- ▶ Article by Ding, J. Z.

反馈人	<input type="text"/>	邮箱地址	<input type="text"/>
反馈标题	<input type="text"/>	验证码	<input type="text" value="1789"/>

Copyright by 信号处理