研究简报

用于MIMO-OFDM无线通信系统的一种新的自适应半盲波束形成算法

杜江,彭启琮,钟俊

电子科技大学通信与信息工程学院,成都,610054

摘要
该文根据MIMO-OFDM物理层结构和无线移动矩阵信道的特性,从神经网络和信息论观点详细推导了一种新的多天线阵列自适应半盲波束形成器算法。与常规的盲估计和导频辅助信道估计算法不同的是,本文提出的新的半盲算法在权矢量自适应更新时,不断地用基于导频估计的权矢量进行修正。最后,用实际的HIPERLAN2协议进行了计算机仿真。结果表明这种算法不增加发射信号功率和不占用额外带宽,能提高天线增益性能和有效地提取出期望的发射信号,在收敛速度和BER性能方面优于常规的导频辅助信道估计算法。该波束形成器能自适应调整权矢量,其更新方式与TDMA和CDMA相似,所以本算法可直接用于有天线阵列的基于OFDM的第三代(3G)和三代后(3G beyond)的无线通信系统。

关键词　矩阵信道　自适应半盲算法　神经网络　波束形成器　MIMO-OFDM　多天线阵列

分类号　TN929.5

A Novel Adaptive Semi-blind Beamforming Algorithm for MIMO-OFDM Wireless Communication Systems

Du Jiang,Peng Qi-cong, Zhong Jun

Inst. of Comm. and Info Eng., UEST of China, Chengdu 610054, China

Abstract
In this paper a novel adaptive semi-blind beamforming algorithm is proposed for OFDM-MIMO systems. First the nonlinear neural networks combined with maximized mutual information rule are used for estimating the coarse weights of beamformer, then the beamforming algorithm adaptively adjusts the vector weights by means of the known pilot tones inserted into the frame structure, thus the channel equalization can be further im-proved. The proposed algorithm is compared to two other channel estimators under various multipath fading environments through simulations and experimental data. The results show that the semi-blind beamforming algorithm has much better overall performance in terms of BER, moreover has high aperture gains with very good directivity in the beamformer pattern.

Key words　Matrix channels　A daptive semi-blind algorithm　Neural network　beam-former　MIMO-OFDM　Multiple antenna arrays

DOI :

通讯作者

作者个人主页　　杜江;彭启琮;钟俊

扩展功能

本文信息

▸ Supporting info
▸ PDF(1281KB)
▸ [HTML全文](0KB)
▸ 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
▸ 复制索引
▸ Email Alert
▸ 文章反馈
▸ 浏览反馈信息

相关信息

▸ 本刊中 包含"矩阵信道"的 相关文章

本文作者相关文章

· 杜江
· 彭启琮
· 钟俊