

应用

基于子载波消噪和小波变换的频谱池信道估计

陈新永, 杨瑞娟, 李晓柏

空军预警学院, 湖北

摘要:

提出一种基于子载波消噪和小波阈值去噪的多天线频谱池信道估计方法. 多天线接收信号携带的噪声同时分布在禁用子载波和可用子载波上, 为了降低噪声对信道估计带来的影响, 需要分步消除这两部分噪声. 禁用子载波携带的噪声可在频域消除, 可用子载波上的信号可通过小波变换做降噪处理. 在低信噪比和没有信道统计特性的条件下, 将信号转换到频域对禁用子载波做消噪处理, 采用最小二乘(Least square, LS)方法在时域进行信道估计, 并对各支路信道估计进行小波阈值去噪处理, 进一步降低可用子载波噪声对信道估计性能的影响. 最后通过最大比合并(Maximal Ratio Combining, MRC)的方法得到合并信号的最小二乘信道估计. 仿真分析表明, 采用子载波消噪和小波阈值去噪的信道估计方法可有效提高多天线频谱池系统性能.

关键词: 小波变换; 频谱池; 信道估计; 正交频分复用; 导频

Channel Estimation Based on Subcarriers Noise Reduction and Wavelet Transform in Spectrum Pooling

CHEN Xin-Yong, YANG Rui-Juan, LI Xiao-Bai

Air Force Early Warning Academy, Wuhan

Abstract:

Channel estimation based on subcarriers noise reduction and wavelet transform in multiple antennas spectrum pooling is proposed in the paper. The received signals of multiple antennas will bring noise, including the noise of banned subcarriers and the noise of available subcarriers. It needs to reduce the noises to depress the influences for channel estimation. The noise of banned subcarriers can be reduced in frequency domain, and the noise of available subcarriers can be reduced through the wavelet transform. Without the channel statistical characteristics, the noise reduction is done for banned subcarriers through DFT (Discrete Fourier Transform) of received signals. The channel estimation is performed through least square with low signal-to-noise in time domain, and the wavelet threshold noise reduction is achieved for the channel estimation of each branch signal. The influences of noise signals of available subcarriers for channel estimation performance are farther reduced. At last the least square channel estimation of combined signal is worked out through the MRC (Maximal Ratio Combining). The simulation and analysis shows that the channel estimation based on subcarriers noise reduction and wavelet threshold noise reduction can improve the performances for multiple antennas spectrum pooling system.

Keywords: Wavelet Transform Spectrum Pooling Channel Estimation Orthogonal Frequency Division Multiplexing Pilot

收稿日期 2011-12-27 修回日期 2012-07-13 网络版发布日期 2012-10-25

DOI:

基金项目:

装备部研究生创新基金(KJ2010199)

通讯作者:

作者简介:

作者Email: qchenxy@163.com

参考文献:

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(669KB)
- ▶ [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

- ▶ 小波变换; 频谱池; 信道估计; 正交频分复用; 导频

本文作者相关文章

- ▶ 陈新永
- ▶ 杨瑞娟
- ▶ 李晓柏

PubMed

- ▶ Article by Chen, X. Y.
- ▶ Article by Yang, R. J.
- ▶ Article by Li, X. B.

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"/> 7156