

论文

一种有效的MIMO-OFDM系统MAP信道估计

许鹏^①, 汪晋宽^①, 祁峰^②

^①东北大学信息科学与工程学院 沈阳 110004; ^②天主教鲁汶大学通信与微波研究所 比利时 B-3001

收稿日期 2009-4-24 修回日期 2009-11-23 网络版发布日期 2010-4-26 接受日期

摘要

对于MIMO-OFDM系统, 最大后验概率(MAP)信道估计算法可通过期望最大化(EM)算法降低计算复杂度, 但将产生误差平底(error floor)现象。并且, 系统的数据传输效率受限于发送端天线的数目。针对这些问题, 该文提出了一种有效的MAP信道估计算法, 并分析了算法的性能。所提算法在利用EM算法减小MAP算法计算复杂度的基础上, 利用角域内信道间的独立性降低估计误差。为改善系统数据传输效率及估计性能, 通过多个OFDM符号进行联合的信道估计。仿真实验验证了所提算法拥有更好的估计性能和数据传输效率。

关键词 [多输入多输出](#) [正交频分复用](#) [信道估计](#) [期望最大化](#) [最大后验概率](#) [角域](#)

分类号 [TN92](#)

An Effective MAP Channel Estimation for MIMO-OFDM Systems

Xu Peng^①, Wang Jin-kuan^①, Qi Feng^②

^①School of Information Science & Engineering, Northeastern University, Shenyang 110004, China; ^②ESAT-TELEMIC, Katholieke Universiteit Leuven, Leuven 3001, Belgium

Abstract

For Multiple-Input Multiple-Output with Orthogonal Frequency Division Multiplexing (MIMO-OFDM) systems, Maximum A posteriori Probability (MAP) channel estimation algorithm uses expectation maximum (EM) algorithm to reduce complexity, but it will lead to error floor phenomenon. The data transmission efficiency of systems is subject to the number of transmit antennas. According to these problems, in this paper, an effective MAP algorithm is proposed and its performance is analyzed. The proposed algorithm lowers the estimated error depending on the spatial independence of MIMO channels in angle domain on the basis of making use of EM algorithm to decrease the complexity. To improve the data transmission efficiency and the performance of estimation, joint estimation is carried out over multiple OFDM symbols. Simulation results indicate the proposed algorithm obtains better estimated performance and higher data transmission efficiency.

Key words [Multiple Input Multiple Output \(MIMO\)](#) [Orthogonal Frequency Division Multiplexing \(OFDM\)](#) [Channel estimation](#) [Expectation Maximum \(EM\)](#) [Maximum A posteriori Probability \(MAP\)](#) [Angle domain](#)

DOI: 10.3724/SP.J.1146.2009.00614

通讯作者 许鹏 xp024@126.com

作者个人主

页

扩展功能
本文信息
▶ Supporting info
▶ PDF (262KB)
▶ 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
相关信息
▶ 本刊中 包含“多输入多输出”的相关文章
▶ 本文作者相关文章
· 许鹏
· 汪晋宽
· 祁峰