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IR-UWB系统中基于信道缩短的信道估计

张先玉, 刘郁林

重庆通信学院DSP实验室, 重庆 400035

Channel estimation based on channel shortening for IR-UWB systems

ZHANG Xian-yu, LIU Yu-lin

DSP Lab, Chongqing Communication Institute, Chongqing 400035, China

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摘要 针对脉冲无线电超宽带(IR-UWB)系统,提出一种基于信道缩短的信道估计算法.首先基于最小信道缩短方差(MSCSE)准则,利用接收导频序列提出一种信道缩短算法,然后利用信道缩短均衡器输出序列估计出复合信道,最后利用反卷积求出原信道参数.仿真表明,信道长度不大于符号宽度时,缩短前后估计信道的均方误差(MSE)接近;信道长度大于符号宽度时,缩短后MSE比缩短前至少低4.3dB.

关键词: 超宽带 信道缩短 最小信道缩短方差 信道估计

Abstract: A novel channel estimation algorithm based on channel shortening for IR-UWB system is proposed. Firstly, a new channel shortening equalization is proposed based on minimum shortening channel square error (MSCSE) criterion adapting the received pilot sequence. Then the combined channel is estimated by using the signals that have been equalized by the channel shortening equalization. Finally, the deconvolution is exploited to get the original channel information. Simulations are presented to demonstrate the validity of the algorithm. The mean square error (MSE) of the estimated channel is similar after using the channel shortening equalization when the channel duration isn't longer than the symbol interval. If the channel duration is longer, there is at least 4.3 dB improvement in MSE performance by adopting channel shortening equalization.

Key words:

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通讯作者: 刘郁林(1971-),男,教授,博士,主要从事盲信号处理、认知无线电、无线传感器网络等方面的研究.

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\$author.xingMing_EN,\$author.xingMing_EN. Channel estimation based on channel shortening for IR-UWB systems[J]. , 2009, 31(4): 358-363 .

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电话: 0871-5033829(传真) 5031498 5031662 E-mail: yndxxb@ynu.edu.cn yndxxb@163.com