博士论坛

基于IEEE 802.11a的改进帧同步算法

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摘要　 帧同步是OFDM的关键技术之一, 传统的基于短训练符号周期帧同步算法互相关函数波动范围大。相关函数进行改进, 利用互相关区间内所有信号的能量对相关函数进行归一化。通过改进互相关函数, 明显减小了自相关函数的波动范围, 且在高斯信道下, 消除了帧检测方差的地板效应。然后利用接收符号和本地短训练符号的互相关性更准确地检测分组的到来。仿真结果显示, 当指数衰减信道rms时延为50 ns以及低信噪比的情况下改进的算法SNR性能可提高4 dB左右。

关键词　 OFDM　帧同步　训练符号

分类号

Improved frame synchronization algorithm for IEEE 802.11a

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Abstract

  Frame synchronization is one of the key technologies of OFDM based systems.The traditional frame synchronization algorithm dependent on the periodicity of the short training symbols has a rapid fluctuation of the cross-correlation function,which can significantly affect the performance of involved systems.In his paper,we propose an improved method which can reduce the fluctuation of the cross-correlation function and eliminate the floor effect of the variance of the packet edge significantly,by normalizing the function with all the signal energy during the cross-correlation window.The new technique can estimate the arrival of the packet more accurately by using the cross-correlation of the received signal and the local short training symbols.Numerical simulation shows that the presented method can lead to performance enhancement by 4 dB when the rms delay of the exponential decayed channel is 50 ns in the case of low SNR.

Key words　 OFDM　frame synchronization　training symbols

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