

应用

引用范数的双曲正切函数变步长LMS算法

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摘要: 传统 LMS算法的特点是计算简单, 易于实现, 但是性能方面存在收敛速度和稳态均方误差的矛盾。为了解决这个矛盾, 提出一种引用范数的双曲正切函数变步长最小均方误差 (HT-VSS) LMS算法, 通过理论分析和实验仿真, 从收敛速度、跟踪性能、稳态均方误差以及抗干扰性能等四个方面展开, 其它变步长LMS算法进行比较。实验表明, 不管在高信噪比还是低信噪比的情况下, 本文算法性能优于其它变步长算法, 即能同时获得较快的收敛速度、跟踪性能以及较小稳态均方误差。

关键词: 最小均方算法; 变步长; 信道均衡; 自适应

Variable Step LMS Algorithm Using Norm Of The Hyperbolic Tangent Function

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Abstract: Traditional LMS algorithm not only has simple calculation, but also is easy to implement. But Traditional LMS algorithm has the contradiction between convergence speed and steady-state mean square error in performance. A variable step size least mean square (LMS) algorithm, which is based on hyperbolic tangent function of using norm, has been proposed to solve this problem. During the experiment, the convergence rate, tracking performance, steady-state mean square error and anti-jamming performance has become the four main research aspects, with the help of theoretical analysis and experimental simulation. Also, the novel algorithm is compared with other variable step size LMS algorithm. Simulation results show that the proposed algorithm is superior to other variable step size algorithm during the above aspects, in the case of a high signal-to-noise ratio or low signal-to-noise ratio.

Keywords: Least mean square algorithm Variable step size Channel Equalization Self-adaptation

收稿日期 2013-05-29 修回日期 2013-08-14 网络版发布日期 2014-01-25

DOI:

基金项目:

江苏省自然科学基金 (BK2011789) 资助课题

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