

改进 PSO-BP 算法在函数拟合中的应用

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摘 要: 提出一种基于粒子群的改进 BP 算法, 该算法在网络的学习过程中首先利用粒子群算法的全局搜索性, 引入非线性惯性系数找到最优权值, 其次重新给部分粒子参数赋值, 增加粒子多样性, 从而避免早熟收敛, 进一步完善了原有粒子群算法. 建立非线性函数的 BP 神经网络模型, 并利用 MATLAB 软件对其进行拟合. 仿真结果表明, 改进算法对于非线性函数有良好的拟合能力, 拟合误差相对减小.

关键词: 神经网络; BP 算法; PSO 算法; 惯性权重; 函数拟合

The Application of Improved PSO-BP Algorithm in

Nonlinear Function Approximating

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Abstract: An improved BP algorithm based on PSO is proposed. The algorithm in the network learning process using particle swarm algorithm global search, nonlinear inertial coefficient to find the optimal weights, then back to the part of the particle parameter assignment, so as to avoid premature convergence, further improve the original particle swarm optimization algorithm. The BP neural network model is constructed based on the dimensional nonlinear function. The simulation results show that the improved algorithm has good fitting ability to two dimensional nonlinear function and fitting error is improved.

Key words: neural network; BP algorithm; PSO algorithm; inertia weight; function approximate

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