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学术探讨

利用遗传模拟退火算法优化神经网络结构

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摘要 常用的神经网络是通过固定的网络结构得到最优权值，使网络的实用性受到影响。引入了一种基于方向的交叉算子和变异算子，同时把模拟退火算法引入了遗传算法，结合遗传算法和模拟退火算法的优点，提出了一种优化神经网络结构的遗传——模拟退火混合算法，实现了网络结构和权值的同时优化。仿真实验表明，与遗传算法和模拟退火算法相比，该算法优化的神经网络收敛速度较快、预测精度较高，提高了网络的处理能力。

关键词 遗传算法 模拟退火算法 神经网络 优化

分类号

Application genetic and simulated annealing algorithm for optimization of neural network structure

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Abstract

A conventional neural network often optimizes the weights through invariable network structure which has limited the extensive use of the neural network.The crossover operator based on direction and mutation are introduced.This paper puts forward genetic and simulated annealing algorithm to train the neural networks，combining the merits of genetic algorithm and that of simulated annealing algorithm，which makes weights and structure of artificial neural networks be optimized together.The result shows that the neural network optimized by the presented algorithm has the advantages of quicker convergence rate and higher precision compared with genetic algorithm and simulated annealing algorithm，and that the processing ability of networks is raised.

Key words genetic algorithm simulated annealing neural networks optimization

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