基于自适应果蝇算法的神经网络结构训练

霍慧慧，李国勇
（太原理工大学 信息工程学院，山西 太原 030024）

摘 要：针对模式分类问题，提出基于连接结构的自适应果蝇优化算法（SFOA），用于同时训练神经网络结构和权值. 新算法采用基于连接结构的等长个体编码，后期映射为不同的网络结构；在嗅觉搜索阶段采用自适应步长，实现全局与局部搜索能力的平衡. 最后通过3个经典的模式分类数据库测试其性能，结果表明：新算法实现简单，时间代价小，有效地删除冗余连接，提高了神经网络的训练效率及分类能力.

关键词：果蝇优化算法；神经网络；自适应步长；模式分类
中图分类号：TP183 **文献标识码**：A **文章编号**：1000－7180(2016)01－0015－04

A Structure-improving Adaptive Fruit Fly Optimization Algorithm for Neural Network Training

HUO Hui-hui, LI Guo-yong
(College of Information Engineering, Taiyuan University of Technology, Taiyuan 030024, China)

Abstract: A structure-improving adaptive fruit fly optimization algorithm (SFOA) for training artificial neural network was proposed. The new algorithm was successfully applied to pattern classification problems. The method of equal length coding based on link structure which map different network structure was proposed. The strategy of adaptive variable step size were adopted in the smell-based search procedure resulted in the dynamic balance between global and local optimizing capability. Finally, simulation results based on three benchmark testing shows that the new algorithm achieves simply, costs less time, eliminates effectively some redundant structure and improves the training efficiency and classification ability of the neural network.

Key words: fruit fly optimization algorithm; artificial neural network; adaptive variable step size; pattern classification

作者简介：

霍慧慧 女，(1988-)，硕士. 研究方向为预测控制、智能控制理论及应用. E-mail：hui752495255@163.com

李国勇 男，(1963-)，博士，教授. 研究方向为预测控制、智能控制理论及应用.