

机器学习与数据挖掘

一种带克隆选择的粒子群动态聚类算法

范会联¹, 罗跃国², 李献礼²

长江师范学院 1. 数学与计算机学院; 2. 网络信息中心, 重庆 408100

摘要:

针对聚类数不确定的高维、大规模数据聚类问题, 提出以粒子群优化算法为基础、引入克隆选择算子的聚类分析算法。该算法利用粒子群的优化搜索机制搜索聚类中心向量, 并根据适应度高低控制粒子的克隆数量和变异幅度, 达到有效避免陷入局部最优的目的, 并能克服传统聚类算法对初始值敏感的缺点, 提高了算法的稳定性。仿真实验结果表明, 该算法不仅能正确得出聚类簇数, 而且聚类正确率较对比算法提高了至少7.0%。

关键词: 克隆选择 粒子群 聚类有效性 亲合力

A dynamic clustering algorithm based on a particle swarm optimization with clonal selection

FAN Hui-lian¹, LUO Yue-guo², LI Xian-li²

1. School of Mathematics and Computer; 2. Computer Network Information Center, Yangtze Normal University, Chongqing 408100, China

Abstract:

In order to achieve cluster analysis with high dimensional and unknown number of clusters, a new clustering algorithm based on a particle swarm optimization algorithm(PSO) with clonal selection operator was proposed. Directed by the nature of PSO, this new algorithm could randomly search the clusters centers, and control the clone numbers and variation range by affinity. This algorithm could also avoid being trapped in local optima and could overcome being sensitive to initialization. Experimental results on benchmark clustering problems showed that this new algorithm could adaptively determine the amount and the center's positions of clustering. The results also showed that the average correct rate of the new algorithm was higher than the compared algorithm by at least 7.0%.

Keywords: clonal selection particle swarm clustering validity affinity

收稿日期 2010-02-14 修回日期 网络版发布日期

DOI:

基金项目:

重庆市教委科学技术研究资助项目 (KJ091309)

通讯作者:

作者简介: 范会联 (1971-), 男, 重庆石柱人, 副教授, 硕士, 主要研究方向为软件工程、智能信息处理. E-mail: fhlmx@163.com

作者Email:

PDF Preview

参考文献:

本刊中的类似文章

- 1. 刘琼 吴小俊. 一种改进的免疫克隆选择算法[J]. 山东大学学报(工学版), 2009,39(6): 8-12

扩展功能

本文信息

- Supporting info
- PDF(410KB)
- 参考文献[PDF]
- 参考文献

服务与反馈

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 引用本文
- Email Alert
- 文章反馈
- 浏览反馈信息

本文关键词相关文章

- 克隆选择
- 粒子群
- 聚类有效性
- 亲合力

本文作者相关文章

PubMed