计算机应用 2006 26 (08): 1943-1946 ISSN: 1001-9081 CN: 51-1307/TP

人工智能

自适应人工免疫算法在数据挖掘中的应用

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收稿日期 2006-3-6 修回日期 2006-4-19 网络版发布日期 2006-8-1 接受日期

摘要 免疫聚类算法中网络刺激与抑制阈值参数决定了聚类精度和网络的可伸缩性，现有的免疫聚类算法中这些阈值选择采取定值策略，根据问题的特性和操作者的经验确定，算法的泛化能力较差。提出了一种自适应免疫聚类算法，阈值从动态变化的网络结构特征中获取，在网络进化过程中，阈值始终跟随网络内在结构变化而自适应调整，因而获得的最终网络结构更符合原始数据的内在特性，并很好地解决了算法对问题的依赖性问题，提高了算法的泛化能力。仿真实验表明了该算法的有效性。

Abstract In the artificial immune algorithm for clustering analysis, its suppression and stimulate thresholds determine cluster precision and network population scale. Theses thresholds adopt fixed value that is decided according to the problem characteristic itself and user's experience. However, this modus operandi results in narrow application situation and is dependent heavily on problem characteristic itself. Therefore, an adaptive artificial immune algorithm for clustering was proposed. This algorithm could achieve final network structure well matching the crude data feature and relieve the dependence on problem characteristic itself, because its thresholds were obtained from the dynamic immune network structure and were adapted well to the entire network structure during the process of evolution. Experimental results demonstrate its effectiveness.

关键词 数据挖掘 人工免疫系统 聚类分析 自适应

Key words data mining;artificial immune system;clustering analysis;adaptability

分类号

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