

图形、图像、模式识别

模糊C均值聚类图像分割的改进遗传算法研究

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收稿日期 2009-5-7 修回日期 2009-6-24 网络版发布日期 2009-12-4 接受日期

摘要 基于模糊C均值(FCM)聚类算法, 并利用遗传算法全局随机搜索的特点, 提出了一种图像分割的改进遗传算法。该算法首先采用一种初值化算法确定合适的遗传算法的初始搜索范围, 然后对遗传算法中的编码方式、交叉算子、变异算子等参数进行了一些适当改进, 进而给出了该算法的理论推导和算法的具体实现步骤。该算法除了解决模糊C均值聚类算法在医学图像分割中容易陷入局部最优解的问题, 而且采用的初值化算法比标准的遗传模糊C均值聚类算法能确定更合适的遗传算法的初始搜索范围, 从而加速了遗传算法的收敛过程。实验表明, 该方法相对于标准的遗传模糊C均值聚类算法, 效果要好得多。

关键词 [模糊C均值聚类](#) [模糊C均值\(FCM\)聚类算法](#) [遗传算法](#)

分类号 [TP39](#)

Research of improved genetic algorithm for image segmentation based on fuzzy C-means clustering

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Abstract

Based on the fuzzy C-means clustering algorithm, taking advantage of genetic algorithm with the feature of global random search, a novel improved algorithm combining genetic algorithm and FCM clustering algorithm is proposed. First of all, the method adopts an initial algorithm to assure the initial searching scope of genetic algorithm. Then improvements are appropriately made on parameter. Lastly step of the new algorithm is proposed. The method solves the limitation of converging to the local infinitesimal point in medical image segmentation, and adopts the initial algorithm to assure the initial searching scope of genetic algorithm which is better accommodable than standard genetic algorithm with fuzzy C-means clustering, speeding up the convergence of genetic algorithm. Contrast with results of experiment, the method is better than standard genetic algorithm fused with fuzzy C-means clustering.

Key words [fuzzy C-means clustering](#) [Fuzzy C-Means \(FCM\) clustering algorithm](#) [genetic algorithm](#)

DOI: 10.3778/j.issn.1002-8331.2009.33.058

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