

Image Thresholding Based on Bacterial Foraging and Pareto Multiobjective Optimization

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Abstract

Social foraging behavior of Escherichia coli bacteria has recently been explored to develop a novel algorithm for distributed optimization and control. This paper exploits the metaphor of natural foraging of bacteria in the context of image segmentation. We adapt the bacteria chemotaxis multi-objective optimization algorithm to optimize simultaneously two segmentation criteria (Between-class variance criterion and entropy criterion) to improve the quality of the segmentation. The proposed method was evaluated on various types of images. The obtained results show the robustness of the method, and its non dependence towards the kind of the image to be segmented.

Keywords : Bacterial Foraging, Image Segmentation, Image Thresholding, Multiobjective Optimization, Pareto Approach.

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