# Image segmentation based on fuzzy clustering with neighborhood information

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Keywords

image segmentation, clustering, fuzzy *c*-means, membership function

Abstract

In this paper, an improved fuzzy *c*-means (IFCM) clustering algorithm for image segmentation is presented. The originality of this algorithm is based on the fact that the conventional FCM-based algorithm considers no spatial context information, which makes it sensitive to noise. The new algorithm is formulated by incorporating the spatial neighborhood information into the original FCM algorithm by *a priori* probability and initialized by a histogram based FCM algorithm. The probability in the algorithm that indicates the spatial influence of the neighboring pixels on the centre pixel plays a key role in this algorithm and can be automatically decided in the implementation of the algorithm by the fuzzy membership. To quantitatively evaluate and prove the performance of the proposed method, series of experiments and comparisons with many derivates of FCM algorithms are given in the paper. Experimental results show that the proposed method is effective and robust to noise.

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