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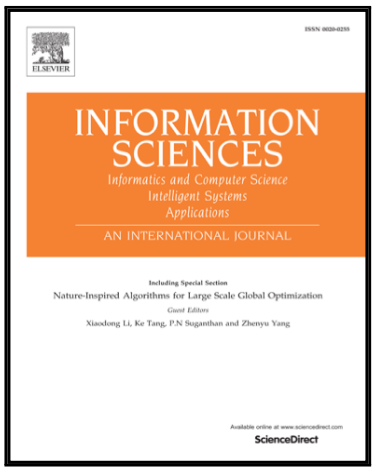

Interactive Active Contour with Kernel Descriptor

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Interactive Active Contour with Kernel Descriptor

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Abstract

Pixel-wise active contour models usually utilize local edge information and/or region statistics. These models are unable to ideally segment real-world objects, especially those in heterogeneous or cluttered images because of a lack of local spatial correlations. To represent the characteristics of the targets precisely, a kernel-descriptor-based active contour model is proposed to address the problem of a lack of local spatial correlations in image segmentation. First, image patch features are extracted and are clustered into several clusters. The initial contour is obtained from user inputs, and then the corresponding template feature sets of the clusters are constructed. Second, we utilize the template feature sets to formulate our energy functional, subject to a constraint on the total length of the region boundaries. Finally, a level set method is employed to estimate the resulting evolution. The proposed method utilizes the kernel descriptor as the high-dimensional feature and performs well on heterogeneous and cluttered images. Experimental results on real images suggest a clear superiority of the proposed method.

Keywords: Active contour model, Kernel descriptor, Level set, Interactive, Image segmentation

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