عنوان مقاله:
On Analytical Study of Self-Affine Maps

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خلاصه مقاله:
Self-affine maps were successfully used edge detection, image segmentation, and contour extraction. They belong to the general category of patch-based methods. Particularly, each self-affine map is defined by one pair of patches in the image domain. By minimizing the difference between these patches, the optimal translation vector of the self-affine map is obtained. Almost all image processing methods, developed by using self-affine maps, take advantage of either the attracting or repelling behaviors which have been, only, experimentally investigated. In this paper, we analytically stuy the propertis of self-affine maps and prove their attracting and repelling behaviors. Furthermore, the new corner/edge pointing behavior is also proposed for contractive self-affine maps. We show that the conventional cost function of self-affine maps may cause critical uncertainty due to providing multiple equivalent optimal translation vectors. Thus, a new cost function is suggested to effectively tackle this problem. For evaluation, it is used with the self-affine snake (SAS) for contour extraction. Experimental results demonstrated that the enhanced SAS provides better performance compared to a number of different active contour methods in terms of both solution quality and CPU time.

کلمات کلیدی:
Patch-Based Image Processing, Self-Affine Map, Analytical study, Image Segmentation, Contour Extraction