

Documents

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Segmentation of melanoma skin lesions using anisotropic diffusion and adaptive thresholding

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Abstract

Segmentation is the first and most important task in the diagnosis of skin cancer using computer-aided systems and due to complex structure of skin lesions, the automated process may lead to a completely different diagnosis. In this paper, a novel segmentation method of skin lesions is proposed which is both effective and simple to implement. Smoothing of skin lesions in original image plays a pivotal role to secure an accurate segmented image. Anisotropic Diffusion Filter (ADF) is used in the initial stage to smooth images with preserved edges. Adaptive thresholding is then applied to segment the skin lesion of the image by binarizing it. The morphological operations are applied for further enhancement and final segmented image is obtained by applying proposed boundary conditions in which objects are selected on basis of distance. The proposed technique is tested on over 300 images and averaged results are compared with existing methods like L-SRM, Otsu-R, Otsu-RGB and TDLS. The proposed method achieved an average accuracy of 96.6%. Visual results for selected images also depicted better performance of proposed method even in the presence of bad illumination and rough skin lesions in the image. © 2018 Association for Computing Machinery.

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