

Segmentation of melanoma images

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ABSTRACT

Melanoma is the type of aggressive skin cancer; responsible for approximately 75% of deaths in patients with this disease [1]. Early detection and treatment are critical and result in improved patient survival rates [2]. Many publications report on isolated efforts into the direction of automated melanoma recognition by image processing [3]. This paper presents a segmentation approach of melanoma, which is a modification of [4]. This work aims to segment the melanoma Region of Interest (ROI) using color morphological tools followed by a threshold based technique. Figure 1 show this strategy.

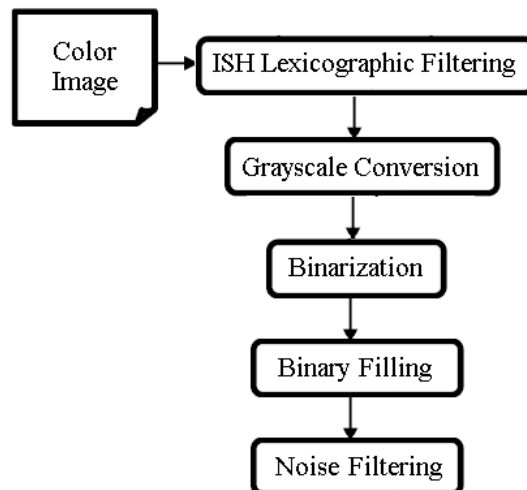


Figure 1: Flowchart of the melanoma segmentation

In [4] Beuren used the Renyi's entropy [5] as thresholding method (Binarization). In [6] there were given the different analyzes of thresholding methods on different grayscale images and channels of color; they concluded that the kittler method [7] is better in most cases comparing to other thresholding methods. For this reason, the thresholding method in [4] was changed, using the kittler method. The approach was tested on two benign and malignant image databases, both containing 100 images, and the results were compared to ground-truth segmentation and to the approach in [4]. Best results were obtained in the metrics of Precision ($96\% \pm 5\%$ of benign and $95\% \pm 5\%$ of malignant segmentation) and Accuracy ($96\% \pm 3\%$ of benign and $95\% \pm 3\%$ of malignant segmentation).

An example of the approach is depicted in Figure 2. In (a) it is shown the original image (benign), in (b) the ground truth image, in (c) the result of our proposed approach, and in (d) the result of the proposed approach in [4]. Numerical results show that image (c) is more similar to ground truth than image (d).



Figure 2: (a) Original image, (b) Ground truth image, (c) Our proposed approach (d) The proposed approach in [4]

Keywords: *Melanoma, Binarization, Segmentation*

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