

Novel Image Processing Pipeline for Dermoscopic Images

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Dermoscopy is widely used to diagnose skin lesions, but the accuracy of this technique largely depends on the dermatologist's experience. Hence, image processing techniques are demanded in order to make less subjective and time consuming. The ABCD rule, which is based on the asymmetry, border, color and diameter of the lesion, is commonly accepted to classify the lesion as a melanoma or not. The application of this rule is usually divided into three main steps: identification of the lesion in the input image, i.e. lesion segmentation, feature extraction and classification. Here, we propose a new image processing pipeline developed to assist this procedure.

In the pipeline developed, an approach based on a deformable model [1] and on fusion of the information attained from different color channels is used to segment the lesion under analysis. Then, with the boundary of the lesion detected, the shape and color of the lesion is analyzed and quantitative measures based on the ABCD rule are computed. The classification step is carried out using computational classifiers; in particular, support vector machine and neural network based classifiers.

Three datasets containing significant numbers of representative dermoscopic images acquired under different imaging conditions have been used to validate the pipeline proposed and compare the classifiers used. The experimental results obtained are very promising.

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References

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