Melanoma Detection using Statistical Texture Distinctiveness Segmentation

Abstract

Melanoma is the most dangerous form of skin cancer. It must be detected in the initial stage to increase the survival rates. In medical field, Melanoma detection is usually done by clinical analysis and biopsy tests. These methods are time consuming, expensive and have many side effects. Thus, an automated melanoma detection system is better to assess a patient’s risk of melanoma in the initial phase with high accuracy. Existing automated melanoma detection systems make use of thresholding, statistical region merging and Otsu’s method for segmentation. These segmentation methods do not include texture analysis, so the accuracy is less. Accuracy of segmentation and melanoma detection can be improved by examining the textural features of skin lesion. Computer aided melanoma detection system using image processing techniques is proposed for accurate and early detection of melanoma. This system has different stages which include preprocessing for image enhancement, segmentation of skin lesion using textural features to improve accuracy, feature extraction and classification. The input image is preprocessed using contrast stretching for image enhancement. The enhanced image is segmented using Texture Distinctiveness Lesion Segmentation (TDLS) algorithm to
extract the lesion area from the background skin. Feature extraction is done using graylevel cooccurrence matrix. The system is trained with the extracted features using a good classifier to classify the lesion as malignant or benign melanoma. Accuracy of the proposed system is computed and compared with other segmentation and classification algorithms.

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Keywords

Melanoma; Skin Cancer; Statistical region Merging; TDLS.