Some LaTeX template in various forms

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ABSTRACT

Malignant melanoma is the most dangerous type of skin cancer, yet it is the most treatable kind of cancer, conditioned to its early diagnosis. The early prognosis of melanoma is a challenging task for both clinicians and dermatologists. In this regard, Computer Aided Diagnosis systems based on machine learning and image processing techniques have been developed to differentiate melanoma lesions from benign and dysplastic nevi in dermoscopic images. In such systems, preprocessing of the acquired images such as illumination correction and lesion segmentation are critical tasks and have high impacts on the final results. In this paper, we propose to use sparse coding techniques without prior lesion segmentation or illumination correction for melanoma classification. The obtained results indicates that dictionary learning techniques can capture strong structure of dermoscopic images and produce discriminant descriptors for classification. Using Random Forests and three sparse coded features such as SIFT, color histograms and statistics and RGB intensity values our framework achieves outstanding performance. Experiments on publicly available PH^2 dataset with 80% of the data used for training and the rest for testing testing and 10-fold cross-validation, SIFT sparse coded features achieved the highest performance of 100% Sensitivity and 90.3% Specificity, with dictionary size of 800 atoms and sparsity level of 2. Our extensive experiments also shows that the dictionary learned from simple RGB intensity values of dermoscopic images achieved comparative results of 100% Sensitivity and 71.3% Specificity with smaller dictionary size of 100 atoms.