Certain Investigations on Melanoma Detection using Non-Subsampled Bendlet Transform with Different Classifiers

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Abstract

Skin is the largest organ and outer enclosure of the integumentary system that protects human body from pathogens. Among various cancers in the world, skin cancer is one of the most commonly diagnosed cancer which can be either melanoma or non-melanoma. Melanoma cancers are very fatal compared with non-melanoma cancers but the chances of survival rate are high when diagnosed and treated earlier. The main aim of this work is to analyze and investigate the performance of Non-Subsampled Bendlet Transform (NSBT) on various classifiers for detecting melanoma from dermoscopic images. NSBT is a multiscale and multidirectional transform based on second order shearlet system which precisely classifies the curvature over other directional representation systems. Here two-phase classification is employed using k-Nearest Neighbour (kNN), Naive Bayes (NB), Decision Trees (DT) and Support Vector Machines (SVM). The first phase classification is used to classify the images from PH2 database into normal and abnormal images and the second phase classification classifies the abnormal images into benign and malignant. Experimental result shows the improvement in classification accuracy, sensitivity and specificity compared with the state of art methods.

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