Novel Mammograms Classification for Breast Cancer Detection based on Multi-Layer Perceptron

Abstract

According to the World Health Organization, breast cancer is the second most leading cause of cancer in women. In the modern technological era, computer aided diagnosis (CAD) system are widely used to classify the breast tumor based on mammogram screening. Various algorithms have been developed for mammography analysis to obtain better classification efficiency, robustness and accuracy. However for three class classification (malignant, benign and normal), it is still an open research area. In this paper, an improved three class classification technique for mammograms images using a Multi Layer Perception (MLP) is proposed. Initially a two class (abnormal and normal) classification is presented. Then, a three class classification study is carried out by using our proposed model. The mammogram patches are filtered by contrast Limited Adaptive Histogram Equalization (CLAHE). Enhanced patches are further decomposed into four sub bands by using two - Dimensional Discrete Wavelet Transform (2D-DWT). Dense Scale Invariant Feature Transform (DSIFT) method is use to extract the Six rotation and scale invariant features for all the sub bands. By using these sub bands of all the patches a feature matrix is created that is further processed to MLP. The proposed method is tested using the Image Retrieval in Medical Application (IRMA) dataset. Simulation results verify the significance of proposed scheme as compared to state of art existing schemes.