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خلاصه مقاله:

Introduction Breast cancer is the second cause of mortality among women. Early detection of it can enhance the chance of survival. Screening systems such as mammography cannot perfectly differentiate between patients and healthy individuals. Computer-aided diagnosis can help physicians make a more accurate diagnosis. Materials and Methods Regarding the importance of separating normal and abnormal cases in screening systems, a hierarchical classification system is defined in this paper. The proposed system is including two Adaptive Boosting (AdaBoost) classifiers, the first classifier separates the candidate images into two groups of normal and abnormal. The second classifier is applied on the abnormal group of the previous stage and divides them into benign and malignant categories. The proposed algorithm is evaluated by applying it on publicly available Mammographic Image Analysis Society (MIAS) dataset. 288 images of the database are used, including 208 normal and 80 abnormal images. 47 images of the abnormal images showed benign lesion and 33 of them had malignant lesion. Results Applying the proposed algorithm on MIAS database indicates its advantage compared to previous methods. A major improvement occurred in the first classification stage. Specificity, sensitivity, and accuracy of the first classifier are obtained as 100%, 95.83%, and 97.91%, respectively. These values are calculated as 75% in the second stage Conclusion A hierarchical classification method for breast cancer detection is developed in this paper. Regarding the importance of separating normal and abnormal cases in screening systems, the first classifier is devoted to separate normal and tumorous cases. Experimental results on available database shown that the performance of this step is adequately high (100% specificity). The second layer is designed to detect tumor type. The accuracy in the second layer is obtained 75%.

کلمات کلیدی:

Mammography, Breast Cancer, classification, Computer aided diagnosis

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