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A Novel Smart System for Mammographic Image Classification Based on Breast Density

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Background: Breast cancer is a widespread disease in women. Early detection of breast cancer is an important factor in cancer treatment. Mammography is the main screening tool for cancer detection and image classification and retrieval based on masses type and texture can help radiologist for better diagnosis. Accuracy in the feature extraction is an important factor in classification and image retrieval.

Materials and Methods: In this paper, a breast tissue density classification model is studied. In the proposed method, a smart system classifies the similar mammographic images into the same classes. The system can help the radiologists to reduce the diagnose errors. In this system, the two-directional two-dimensional principal component analysis has been used for feature extraction and dimension reduction of the mammographic images and a support vector machine has been used for image retrieval.

Results: The proposed model can be used for mammographic images analysis in the large database. The system can separate the breasts with extremely dense from the normal breasts. Thus, image analysis can be simply done in the various classes.

Conclusion: The model is tested on the Mammographic Image Analysis Society (MIAS) database. The average precision rates of the model are about 90%. The proposed model results are compared with the results of other valid literature in a table for better analysis.

Keywords: Mammographic Images, Mass Density, Feature Extraction and Classification.

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