Abstract

Computer-assisted diagnosis (CADx) for the characterization of mammographic masses as benign or malignant has a high potential to help radiologists during the critical process of diagnostic decision making. We have developed a new set of features for the characterization of masses which is especially designed to describe the intensity transition from the center of a
mass up to its surrounding tissue. Furthermore, we have investigated the performance of this set with different image quantization (8 bit and 12 bit). The suggested features are based on the idea to characterize the lesion with a predefined number (k) of concentric regions defined by the distance to its margin and to the border of its segmentation, respectively. We evaluated the classification performance for different values of k using the area Az under the receiver operating characteristic (ROC) curve. Our dataset contained 750 lesions from a publicly available mammography database. For each k an optimal feature subset was selected by a genetic algorithm. The Az of these subsets ranged from 0.74 to 0.76 on 8 bit images and from 0.76 to 0.77 on 12 bit images.

References


Index Terms

Computer Science
Image Processing
New Features for the Classification of Mammographic Masses

Keywords

- Breast cancer
- CAD
- Mammography
- Mass
- Classification
- Feature extraction