Abstract

Computer Aided Diagnosis (CAD) systems have improved diagnosis of abnormalities in mammogram images. The principal feature within the breast region is the breast contour. Extraction of the breast region and delineation of the breast contour allows the search for abnormalities to be limited to the region of the breast without undue influence from the
background of the mammogram. After performing an essential pre-processing step to suppress artifacts and accentuate the breast region, the exact breast region as the region of interest (ROI), has to be segmented. In this paper we present a fully automated segmentation and boundary detection method for mammographic images. In this research paper we have proposed a new homogeneity enhancement process namely Binary Homogeneity Enhancement Algorithm (BHEA) for digital mammogram. This is followed by a novel approach for edge detection (EDA) and finally obtaining the breast boundary by using our proposed Breast Border Boundary Enhancement Algorithm. This composite method have been implemented and applied to mini-MIAS, one of the most well-known mammographic database consisting of 322 medio-lateral oblique (MLO) view obtained via a digitization procedure. To demonstrate the capability of our segmentation algorithm it was extensively tested on mammograms using ground truth images and quantitative metrics to evaluate its performance characteristics. The experimental results indicate that the breast boundary regions were extracted accurately characterize the corresponding ground truth images. The algorithm is fully autonomous, and is able to preserve, skin and nipple (if in profile), a task very few existing mammogram segmentation algorithms can claim.

Reference

Accurate Breast Contour Detection Algorithms in Digital Mammogram


Index Terms

Computer Science
Medical Imaging

Key words
Mammogram Segmentation
Contrast Limited Adaptive Histogram Equalization (CLAHE)
Binary Homogeneity Enhancement Algorithm (BHEA)
Edge Detection Algorithm (EDA)
Breast Boundary Detection Algorithm (BBDA)