A Novel Evolutionary Approach to Detect Microcalcifications in Mammogram Image

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Abstract

This paper describes a new approach for detection of Microcalcification using Evolutionary algorithms. The proposed system consists of two steps: First, the mammogram images are enhanced using median filter, normalized the image, pectoral muscle region is removed and the border of the mammogram is detected for both left and right images. Second, using the border points and nipple position as the reference the mammogram images are aligned and subtracted to extract the suspicious region. The Artificial Bee Colony Optimization Algorithm (ABC) algorithm is used to detect breast border and nipple position. In bilateral subtraction, the asymmetries between corresponding left and right breast images are considered for extracting the suspicious region from the background tissue. The textural features are extracted from the segmented mammogram image to classify the microcalcifications into benign, malignant or normal. Textural analysis methods such as Spatial Gray Level Dependency Matrix (SGLDM) and Gray-Level Run-Length Method (GLRLM) are used to extract the fourteen Haralick features from the segmented image. The normalized feature values are given as input to a three-layer BPN to classify the microcalcifications into benign, malignant or normal. The BPN classifier is validated using Jack-Knife Method.

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References


Index Terms

Computer Science

Image Processing
Keywords

Microcalcification    Artificial Bee Colony Optimization Algorithm    Swarm Intelligence
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