Classification of Clustered Microcalcifications using Resilient Backpropagation Training Algorithm

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Abstract
Breast cancer continues to be the leading cause of death among women nowadays all over the world. Most frequent type of breast cancer is ductal carcinoma in situ (DCIS) and most frequent symptoms of DCIS recognized by mammography are clusters of Microcalcifications. In this paper, Resilient Backpropagation training algorithm is investigated for automated classification of clustered Microcalcifications (MCCs) as benign or malignant. The classifier is a part of computer aided disease diagnosis (CAD) system that is widely used to aid radiologists in the interpretation of mammograms. The performance of Resilient Backpropagation training
algorithm is compared with a well known Batch Gradient Descent training algorithm. Such methods are explored not only for accuracy point of view but also for computational efficiency for MCCs characterization in mammograms. As input, these methods used mammogram features extracted from MCCs. Such methods are tested using images of mini-MIAS database (Mammogram Image Analysis Society database (UK)). Receiver operating characteristic (ROC) analysis is used to evaluate and compare classification performance of these methods. Experimental results demonstrate that Resilient Backpropagation training algorithm could greatly reduce the computational complexity of Multi layer Feed Forward Backpropagation Artificial Neural Network (MLFFBP-ANN) while maintaining its best classification accuracy. It can produce lower false positives and false negatives than Batch Gradient Descent training algorithm.

Reference

12. D. Kramer and F. Aghdasi, “Classifications of Microcalcifications in Digitized


Index Terms

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