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Unsupervised Detection of Suspicious Tissue Using Data Modeling and PCA

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Abstract

Breast cancer is a major cause of death and morbidity among women all over the world, and it is a fact that early detection is a key in improving outcomes. Therefore development of algorithms that aids radiologists in identifying changes in breast tissue early on is essential. In this work an algorithm that investigates the use of principal components analysis (PCA) is developed to identify suspicious regions on mammograms. The algorithm employs linear structure and curvilinear modeling prior to PCA implementations. Evaluation of the algorithm is based on the percentage of correct classification, false positive (FP) and false negative (FN) in all experimental work using real data. Over 90% accuracy in block classification is achieved using mammograms from MIAS database.