

Segmentation of Breast Cancer from Mammogram Images using Fuzzy Clustering Approach

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Abstract:

Within the field of breast cancer segmentation, abnormalities occur when specific breast characteristics behave abnormally, possibly leading to different levels of cell damage. A variety of segmentation techniques, including K-means, Watershed, and Fuzzy Clustering, are used to examine and identify these anomalies. The purpose of this study is to assess how well various segmentation methods detect breast cancer. Using the INbreast dataset, which consists of images from several sources of breast scans, improves the segmentation process overall. After that, a few preprocessing methods are applied to the images. On preprocessed images, the three selected algorithms—K-means, Fuzzy Clustering, and Watershed—are used for testing and training. The findings show that the accuracy of each method in spotting anomalies in breast images varies. The findings show that the accuracy of each method in spotting anomalies in breast images varies. While segmentation algorithms can detect breast abnormalities, fuzzy clustering proves to be the most successful approach. Watershed segmentation shows noteworthy effectiveness in this regard. K-means outperforms other image processing models even if it yields less desirable results than the other two techniques. The research culminates in a comprehensive evaluation of the fuzzy clustering method, demonstrating accuracy in identifying anomalies and providing significant perspectives on its dependability and efficiency. In all cases, the alignment between the observed presence and ground truth is the same.

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