

A NOVEL METHOD TO ENHANCE MAMMOGRAMS FOR ABNORMAL DETECTION

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Breast cancer is recognized as one of the leading causes of death in most of the western countries as well as in Sri Lanka. Recent studies have proved that this is a disease that both women and men could have. However, breast cancers can be cured by detecting them in their early stages. There are two widely used methods to diagnose breast cancers, specifically, Mammography and Sonography. This research focuses only on Mammography which has shown tremendous success in examination of breast cancers compared to Sonography. Radiologists mainly use their professionally trained eyes to detect cancers. But the cancers are hard to detect when they get mammograms with bad image conditions. Recent data suggest that there is a significant miss rate for the detection of cancers during Mammography. This is where the mammogram enhancement is essentially needed.

Although there are some sophisticated enhancement algorithms available, most algorithms are either not suitable for mammogram enhancement or their time complexity is too high. To address these issues, this report proposes a hybrid method towards mammogram enhancement. It uses an adaptive histogram equalization technique followed by Haar wavelet transformation for edge enhancement. The adaptive histogram equalization method is used considering the features of the mammogram images and its low time complexity. Haar wavelet enhancement maximizes the edge details in the mammograms to detect clean contours. Mammograms are further enhanced with a few morphological operations. Finally, the enhanced images are used for the detection of cancerous regions. The effectiveness of the proposed enhancement technique was evaluated by conducting an extensive experimental study. Experimental results showed that the breast cancer detection rate is increased considerably with the new enhancement method.