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Editorial Note

Machine Learning based CAD for Breast Cancer Detection

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Introduction

Breast cancer is the second most driven reason for the deaths among women, globally. Breast cancer is a category of cancer that develops in the breast tissue with the main observable symptom that is a lump which feels irregular from the remaining tissues. According to the reports, this cancer is affecting 2.2 million women every year [1]. In this disease life threatening (malignant) cells in the breast multiply out of hands, making it the second most fatal type of cancer in women widely. Hence, to diminish the mortality rate and increase the chances of survival, it is crucial to uncover it as early as attainable. There have been numerous researches addressing breast cancer using machine learning and its subset techniques. Researchers claim that their algorithms are faster, simpler, and more precise than others are. This study is based on computer aided systems (CAD) and machine learning algorithms that aim to construct a framework to precisely distinguish between benign and malignant breast tumors in a screening mammogram [2].

Motivation & Method

The background motive of this research was to enhance the accuracy of distinguishing tumors. In this frame of the subject, various classifiers to select the best features and accurate parameter values of the screening mammogram in the given dataset are implemented. In one of our projects, objects to compare the different classifiers which support vector machines, naïve bayes, and K-nearest neighbor algorithms using the CBIS-DDSM dataset [3]. The target of implemented computer aided system is to combine these classification techniques with image pre-processing methods in order to compare their performance to find out the most satisfactory approach. The crux is to use the advantages of these techniques to obtain maximum performance. For the comparative study, the digital mammogram of breast is passed to histogram equalization model for image pre-processing which enhances the necessary feature while removing noise which is present in the mammogram, the refined mammogram is then passed to wavelet transformation to extract all the important features necessary for the classification. These extracted features are used to train the classification models to provide the desired outcome as cancer is detected or not detected [4].

Conclusion

Despite the fact that the mortality rate is the second highest among women due to cancer, early detection of the disease enormously improves the probability of survival. Therefore, it is essential to advance new and efficient as ever techniques for breast cancer screening. Our study shows that SVM is a robust system with more accuracy to find features in the extracted image of mammogram that would recognize ordinary examples from those containing tumors than the other classifiers. This can be used by the radiologist in proper classification of breast lesions further to reduce the false results.

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