

# A Review of Detection of Breast Cancer using Mammography

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**Abstract**—Breast cancer, leading cancer mostly found in females than males because male chests contain no glands and having no power to produce milk. The early detection method for exposing breast cancer is mammography which exposes the breast cancer earlier than any other method. In our proposed work, we have applied median filtering for removing the noise .In mammography based research work; we have used Digital Image processing research work with MAT LAB. In this proposed work, we have applied all techniques to expose benign and malignant cancer. We have taken DDSM/MIAS database images and then apply pre-processing technique and image enhancement technique. Image segmentation technique is also applied to segment the images. Lastly SVM Classifier is used to classify benign or malignant cancer. In this proposed work, GLCM features are also extracted. They are Contrast, Correlation, Energy and Homogeneity.

**Keywords**- Pre-processing; image enhancement; SVM Classifier; Image segmentation; GLCM features extraction;

## I. INTRODUCTION

A cancer is a type of disease having source is the abnormal growth of the cells. Breast cancer known as breast disease having starting point is breast tissues and it can extend over an large area of the ducts or lobes of the breast. When limitations of the breast cells are not proper, they divide and appear in the form of lumps or tumour that is called breast tumor/cancer. Breast cancer, the second most common cancer .It is the second leading cause of the death. Breast Cancer mostly happen in females than males because of having smaller and strong chest of males than females. The second reason is that male chest has no glands and having no power produce milk.

### *I.I Types of Breast Cancer*

There are different types found of breast cancer. Mainly two types of Breast cancer are:

1. Non invasive breast cancer
2. Invasive breast cancer

*In Non-invasive breast cancer*, Cancer that has abnormal/cancerous cellslive in the breast lobules or ducts. The second name of this cancer is Pre-invasive cancer. Benign is non-invasive breast cancer which cannot spread outside the breast but inhibits in the breast lobules or ducts. In **Invasive breast cancer**, The cancer having cancerous cells which have power to move externally to the breast and increaseto the other parts of the body. It starts from milk ducts or lobules and encloses breast tissues.Malignant is invasive breast cancer which spreads outside the breast. There are many groups of tests which are utilized for controlling of breast cancer:

Surgerical test, Imaging test, Blood test, Genetic test, Additional test. Surgerical tests involve biopsy whereas image tests require ultrasound, MRI and Mammography and blood test requires Complete Blood Count (CBC) and Serum. Mammography is the screening tool which exposes the breast cancer earlier.

### *I.II Mammography*

Mammography is the screening agenda for exposingand identificating the breast cancer. This process is utilized for the advance exposé of the breast cancer. Mammogram is the X-ray exam which is utilized to expose and identify theadvance breast cancer. It seizes the changes in the breast which are not desirable. A mammogram can expose the breast cancer when cancer is very small to notice it. The mammogram having good standard and it can expose 80-90% breast cancer andthere is no screening tool which is 100% fruitful.

## II. LITERATURE REVIEWS

*Dr. Narain Ponraj et al* [1] has observed that cancer is due to abnormal growth of breast cells. It occurs both in men and women and found that the abnormalities in the breast are either micro-calcification and masses. He has observed that there are two regions in mammogram. First is exposed breast region and second is unexposed breast region. He found that identification of breast region is necessary and removing of non-exposed breast region is also necessary. The problem of this solution is Pre-processing techniques.

*Armen Sahakyan et al* [2] found that for efficient and accurate breast region segmentation still is the problem in the mammography. He has proposed an automatic technique for mammogram segmentation. That technique uses morphological pre-processing algorithm. The use of this algorithm is to remove digitization noise and separate background region from breast profile region.

*Monika Sharma et al* [3] has observed the pattern recognition problem in the image processing. The solution of this problem is feature extraction because the accuracy of classification depends on feature extraction. She has extracted textural, structural and statistical features.

*Pawar B.V. et al* [4] has presented a method of detection tumor in breast. He has given a method to detect the breast tumor and that method is pixel based mass detection and has used the template matching procedure. He has also used median filtering to enhance the mammogram images before template matching procedure. He has observed that high pass filtering is used to enhance edge and edge detection method is used to detect edges and also found that only circular shape early stage tumor is detected.

*Dr. Annopa Maria Sabu et al* [5] has presented a paper on mass detection and micro calcification in mammography. He has found the result for the detection of these by using textural analysis that characterize spatial variation within the image by extracting information and also obtained the textural features obtained.

*Aswini Kumar Mohanty et al* [6] has presented a paper for the classification of Benign and malignant breast cancer. He has observed that only 15-30% of masses referred for surgical biopsy are actually malignant. The solution of this is to propose an approach to develop a computer-aided classification system for cancer detection from digital mammogram. This proposed system has three steps: first is ROI extraction, second is feature extraction in which GLCM and GLRLM (Gray level Run Length Matrix) features are extracted which can distinguish benign and malignant cancer. The third step is classification process in which association Rule mining classifier is used.

*Robert. M. Harallick et al* [7] has described some easily computable textural features based on gray tone spatial dependencies and also illustrated their applications in category identification tasks for three different types of data photomicrograph of five kind of sand stones, panchromatic aerial photograph and ERTS multispectral images. He has given the solution that textural features are the solutions for wide variety of image classification applications.

*Pradeep N et al* [8] has found the problem of uncontrolled growth of breast cells and the most common abnormalities are masses and micro-calcification. The solution of this problem is the secondary tool, CAD (Computer Aided Detection) System to radiologists for segmentation and features extraction for the diagnosis of breast cancer.

*P. Mohanaiah et al* [9] has observed that primitive or low level image features can either be generic features or domain specific features. He has given an approach called GLCM approach to extract second order statistical textural features for motion estimation of images.

## III. PROCEDURE FOR PROPOSED WORK

In this research the authors have proposed work considering various database images are taken and apply methods to expose the cancerous image. Those methods are Pre-Processing technique, Image segmentation process, SVM Classifier, GLCM Feature Extraction. These mentioned techniques are proposed to make better the quality of images by separating the noise and by taking large data set of images enhance the image by CLAHE method and classified by SVM classifier.

## IV. CONCLUSION

In this review we have conclude that classification of benign and malignant cancer is done using SVM Classifier having more accuracy than KNN Classifier because of accuracy and SVM works better than KNN classifier

We also extracted the four GLCM features of original and cancerous images and compare the features of original images and their cancerous images. We have concluded that except correlation other features have more values of original images as compared to cancerous images. The features extracted are correlation, contrast, energy and homogeneity.

To detect the breast cancer, Image pre-processing technique is applied for noise reduction and enhancing the image. Image segmentation process is also applied to segment the image and for classification SVM classifier is utilized.

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