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BREAST CANCER DETECTION USING ANN CLASSIFIER

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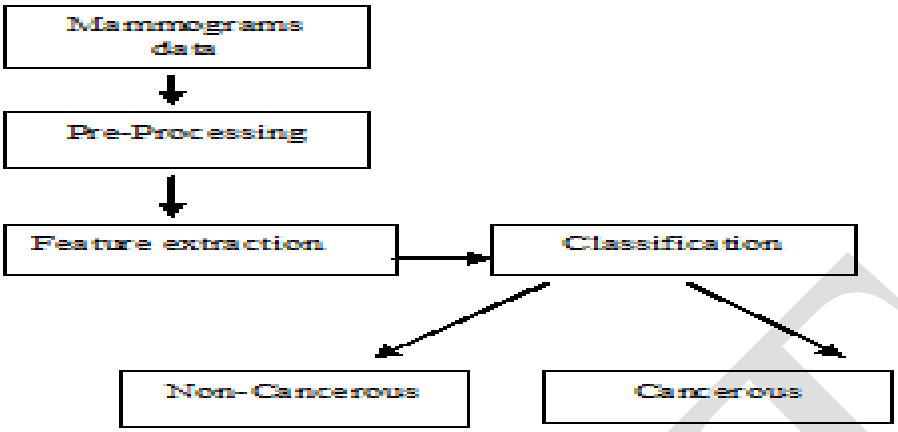
ABSTRACT:
Breast cancer has become common cancer which is seen in most of womens. To decrease the related mortality cancer must be treated early. But it is hard to detect and diagnose tumor at an early stage. It will take lot of time if we go for manual detection and it is very inefficient. Hence there is need for efficient method that diagnoses the cancer with less time and high accuracy. So in our project we are using technique called ANN as a decision making tool in field of breast cancer. Image Processing plays important role in cancer detection when input data is in the form of images. Feature extraction of image is important in mammogram classification. Features are extracted by using image processing. Different feature extraction methods used for classification of normal and abnormal patterns in mammogram. This method will give maximum accuracy at a high speed. The parameter include in feature extraction is Mean and Entropy. This parameters are inputs to ANN which will diagnose and give the result whether image is cancerous and non-cancerous.

KEYWORDS: Artificial neural network, Image processing, Statistical parameter**.**

INTRODUCTION

The uncontrolled growth of cells in an organ is called tumors that can be cancerous. There are two kinds of tumors, benign and malignant. Benign or non-cancerous tumors are not spreading and not even expanding .In the other hand, malignant or cancerous tumor are expanding and life threatening. Malignant breast cancer is defined when the growing cells are in the breast tissue. Breast cancer is one of the most common cause of death among women between 40 and 55 ages. Hence early detection of Breast cancer is needed. Breast image analysis can be performing in many ways. Primary prevention in the early stage of the disease become complex as the causes remain almost unknown. However, some typical signatures of this diseases, such as masses and micro calcification appearing on mammograms, can be used to improve early diagnostics techniques, which is critical for women's quality of life. X-ray mammography is the main test used for screening and early diagnosis, and its analysis and processing are the keys to improving breast cancer diagnosis. Digital Mammography is the most widely used method of breast cancer detection. Manual diagnosis done by Oncologist does not give result with maximum accuracy. It is time consuming. This paper give the automatic detection of Breast cancer using Image processing techniques and artificial neural network .Image processing includes various techniques to make the digital mammogram image perfect for artificial neural network. The input image undergoes through many processes which include preprocessing, image segmentation, feature extraction. The statistical parameter is important step in mammogram classification. The Statistical parameters include entropy, mean. This parameter will be given as input to Classifier. There are different classifiers used for analysis of digital image applications. Artificial neural network is the leading classifier use nowadays. ANN is used for classification between cancerous and noncancerous image. The design and implementation of the proposed algorithm is done in MATLAB using advance image processing toolbox.

BLOCK DIAGRAM DESCRIPTION



A. INPUT DATASET:

In this paper, we have used 51 Digital Mammogram X-ray Images Dataset (MIAS) .The dataset has 19 cancerous images and 32 non cancerous images. The biomedical images are normally damaged by number of noises, which affect the originality of image.

B. PRE-PROCESSING:

Biomedical images are normally affected by various types of noises. Removal of these various noises without destroying the desired information is often a significant challenge. Pre-processing images commonly involves removing low frequency from background noise; this normalizing the intensity of the individual particle images. Digital Image preprocessing is the techniques of enhancing data images prior to computational processing. The output is said to been preprocessed from the input data. Preprocessing methods use a small neighborhood of a pixel to get a new brightness value in output image. Such preprocessing operation is called Filtration. The input image may be color image so first the image is converted to gray image. This gray image taken as input to proposed system, then noise will be removing. This image converted into enhanced image, which will be more accurate image to analyze in next step. The input image has been resized to ideal size for which the program has developed. Noise remove by using Median filter, this filtering method reduce 'salt and pepper' noise, remove the noise and preserve the edges. Direction of image is decided to any one side every time input image has taken as some images are of right side and some are of left side.

C. SEGMENTED IMAGE:

Segmentation is the process of changing a digital image into multiple segments that is set of pixel also refer as super pixel. Segmentation is to simplify and change the representation of an image into something that is more meaningful and easier to analyze. The suspected objects are separated from background (lines and curves)objects and boundaries in image. It has been observed that after the segmentation process, the white shaded portions i.e. the abnormalities present in the breast region will appear. It include the background subtraction process. After that advance thresholding is used. Gray threshold chooses the threshold to minimize the intraclass variance of the thresholded black and white pixels.

D. STATISTICAL PARAMETER:

Statistical parameter is the best method to help radiologists to get more accurate diagnoses of breast cancer. Statistical parameter analysis is the advance method of detection of cancer. When the input data to an algorithm is too large to be processed and it is suspected to be notoriously redundant the input data will be transformed into a reduced representation set of features .Transforming the input data into the set of features is called features extraction which is nothing but the statistical parameters. Statistical parameters are a

method of capturing visual content of an image. A set of features are extracted in order to allow a classifier to distinguish between normal and abnormal pattern. Extracted features are used in neural classifier to train it for the recognition of particular class either normal or abnormal. The ability of the classifier to assign the unknown object to the correct class is dependent on the extracted features. This will give maximum accurate result. We have calculated the following statistical parameter in the proposed system which will act as a input to neural network, sufficient for the classification purpose.The standard deviation is a parameter closely associated with the mean. These refer to the dispersion of values in a digital mammographic image around the mean value. The SD is,

Standard deviation= √mean

- **MEAN**

The mean value gives the average intensity value of an image. Mammographic image that contain micro-calcification have a higher mean than those of normal images. Where mean calculated from the given image,

$$\text{Mean} = \frac{\text{no. of pixel}}{\text{Total no. of pixels}}$$

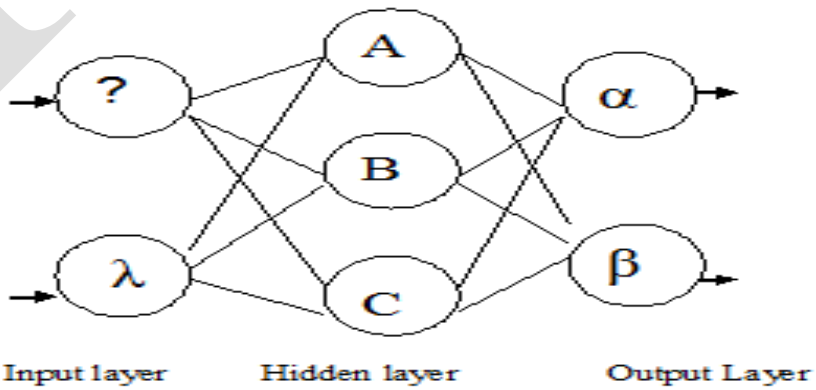
- **ENTROPY**

The amount of disorder in a mammographic image is called as entropy. The entropy value is high in micro Calcification. This is because the variation in intensity values in the image is high due to the presence of white calcification spots. Entropy is given as,

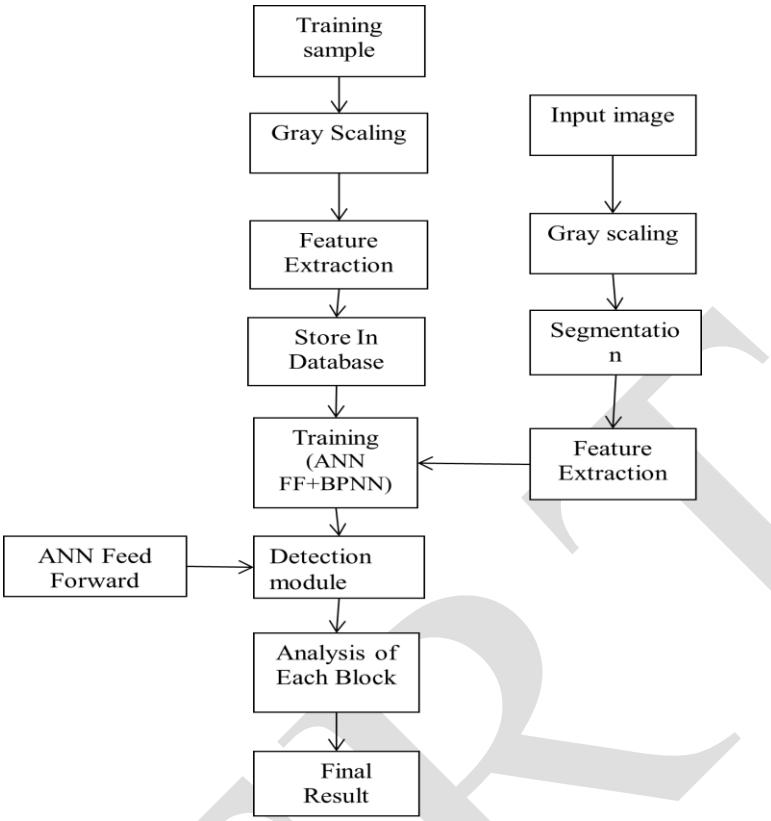
$$\text{Entropy} = \Sigma_{i=0}^{1} x(n) \log x(n)$$

METHODOLOGY

The project used a three layer artificial neural network. The proposed system uses the supervised technique for training the network. The schematic representation of neural network with 'n' inputs, 'm' hidden units and one output unit. The main task of the classifier is to categorize the segmented image by considering the statistical parameters. The extracted features are considered as input to the neural classifier. A neural network is a set of connected input/output units in which each connection has a weight associated with it. The neural network trained by adjusting the weights so as to be able to predict the correct class. The network take the two important parameter, one is data feature and second is data class. Data features are the features which have been calculated in the previous section and data class are cancerous and noncancerous. The desired output was specified as 1 for cancerous and -1 for non cancerous. The reason why ANN is selected for classification is it has good capacity of generalization, it is highly robust and work well with images .The classification process is divided into the training phase and the testing phase. In the training phase known data are given. In the testing phase, unknown data are given and the classification is performed using the classifier after training. The accuracy of the classification depends on the efficiency of the training.



FLOWCHART



CONCLUSION

We have tried Artificial neural network(ANN) classifier for the classification of the image. It gives 87% result accuracy. ANN is effective classifier for breast tumor abnormality detection.

REFERENCES

1) W.Schulz Molecular Biology of Human Cancers.New York,USA springer,2007

2) Cancer facts And figures 2012 American cancer society,Inc.

3) Gonzalez Woods, Digital Image Processing, third edtion.

4) A Review on Preprocessing Techniques for Digital Mammography images by Aziz Makandar Professor, Department of Computer Science, Karnataka State Women's University, Vijayapur, 2015.

5) A Novel Method for Breast Cancer Prognosis Using Wavelet Packet Based Neural Network by A. Sepehr M.H.Jamarani, 2005.

6) www.Birds.com

7) www.Who.com