ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Issue 4, April 2018

Breast Cancer Classification Using Mammographic Imaging

D. Ram Kumar#1, J. Sangeetha#2, G.M.Indhu#3,S. Dhiravida Janani#4
#1 Associate professor (Department of ECE), BharathNiketanEngineering College.
#2 Assistant professor (Department of ECE), BharathNiketan Engineering College.
#3 PG Scholar (Department of ECE), BharathNiketan Engineering College.
#4 PG Scholar (Department of ECE), BharathNiketan Engineering College.

Abstract: Breast cancer is the most common female cancer worldwide representing nearly a quarter (23%) of all cancers in women the global burden of breast cancer is expected to cross 2million by the year 2030 with growing proportions from developing countries. This paper proposes a method to detection of tumors in highly dense breast cancer detection. application of clustering concept in mammographic imaging for the discovery and restriction of various tumors in very thick bosoms are exhibited. The proposed strategy is a novel contour based segmentation and detection technique to obtain accurate tumor location with reduced computational burden.

Keywords: Breast cancer, Detection, Classification, CAD, PNN,MIAS

I. INTRODUCTION

Cancer is a illiness of the body's own cells. our bodies are comprised of billions of cells and everyone has a particular part to play. We are intricate creatures and here are a wide range of kinds of cell liver cells, cerebrum cells, and platelets et cetera. Regularly these phones are held ithin proper limits so they just develop and partition when they are advised to, for example, when old cells require sup- planting or an organ needs reairing. In disease these sub-atomic are broken so cells are never again kept under strict control. This can cause them to divide uncontrollably ultimately leading to a mass of cells known as a tumour the physical manifestation of the disease we call cancer.

This can make them isolate wildly at last prompting a mass of cells known as a tumor the physical indication of the infection we call disease. The reasons for disease are intricate yet the hidden organic reason is transformations or slip-ups to the hereditary code contained inside a cell's DNA. These mutations are caused by a variety of factors including things from inside and outside the body, as well as just by chance when a cell is going about its normal routine. A portion of the ecological or outside elements that can cause these transformations are notable, for example, tobacco smoking or an excess of sun exposur. Inside the body, certain chemicals delivered through typical organic procedures can likewise add to transformations in the hereditary code.

II. RELATED WORK

A.BREAST CANCER:

Breast cancer is a malignant tumour a collection of cancer cells arising from the cells of the breast. Although cancer disease prevalently happens in ladies, it can likewise influence men.This article manages bosom tumor in ladies. Cancer disease and its intricacies can influence all aspects of the body.

B.TYPES OF BREAST CANCER:

Ductal carcinoma in situ: The most widely recognized sort of non-obtrusive cancer malignancy is ductal carcinoma in situ. this kind of tumor has not spread and subsequently generally has a high cure rate. Invasive ductal carcinoma: this tumor begins in a channel of the cancer and develops into the encompassing tissue. It is the most widely recognized type of bosom malignancy. Around 80% of obtrusive cancer diseases are intrusive ductal carcinoma.

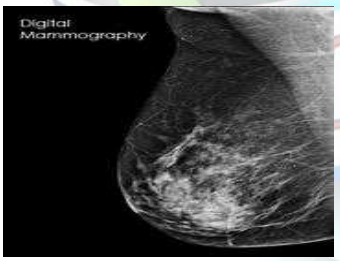
ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Issue 4, April 2018

Obtrusive lobular carcinoma: This bosom disease begins in the organs of the breast that create milk.
Approximately 10% of intrusive cancer diseases are obtrusive lobular carcinoma. Incendiary cancer growth : This tumor influences the skin of the breast to seem red and feel warm giving it the presence of a disease. These progressions are because of the blockage of lymph vessels by tumor cells.

C.MAMMOGRAPHY

A mammogram is a low dose x-beam of each cancer that is painstakingly assessed by radiologist mammography can uncover both innocuous and harmful developments when they are too little to be felt by you or your doctor. In advanced mammography, x-beam pillars are caught on a uniquely planned computerized identifier.
This finder at that point changes over the x-beam shafts into electronic signs, which are then exchanged to a PC. Digital mammography can provide decreased radiation dose of 30-40%. The computerized image is then available for the radiologist to review on a specialized high resolution monitor.
Images might be controlled by the radiologist utilizing the PCs instruments, for example, amplifying, veiling of light, inversing negative of the picture, and correlation with earlier mammograms. /Digital Mammography



Digital Mammography

D.MEDICAL IMAGING

Medical imaging is the system and procedure of making visual portrayals of the inside of a body for clinical investigation and medicinal intercession, and additionally visual portrayal of the capacity of a few organs or tissues.

Medical imaging seeks to reveal internal structures hidden by the skin and bones, as well as to diagnose and treat disease. Medical imaging also establishes a database of typical life structures and physiology to make it conceivable to recognize variations from the norm. In spite of the fact that imaging of evacuated organs and tissues can be performed for medicinal reasons, such techniques are uaually considered piece of pathology rather than therapeutic imaging.

III. DATABASE

The mammography picture investigation society is an association of UK inquire about gatherings which have delivered an advanced mammography database.

The images are in grey scale format PGM. The original MIAS database digitized as 50 micron pixel edge has been decreased to 200 micron pixel edge and cut/cushioned with the goal that each picture is 1024 pixels x 1024 pixels known as smaller than usual MIAS database. It is utilized on the grounds that it contains finish data about abnormalities of each mammographic image.

IV. PROPOSED METHOD

A.PREPROCESSING

Removal of noise: Done utilizing median filter. The median filter is a nonlinear digital filtering technique, often used to remove noise.
It preserves edges while removing noise. Removal of label: the connected component technique is used to remove the label. The biggest portion is the breast region and all other smaller regions are eliminated. The yield from pre-preparing stage is utilized as contribution to discover the ROI which is finished utilizing area developing procedure.
To find the ROI the highest intensity value in the image has been chosen as seed point S which will be the tumour region what's more, suitable edge esteem T.C. Highlight Extraction and determination .

B.CURVETLET TRANSFORM

Curve let is a multiscale and multidirectional transform that is known for its preservation of edges of the objects.

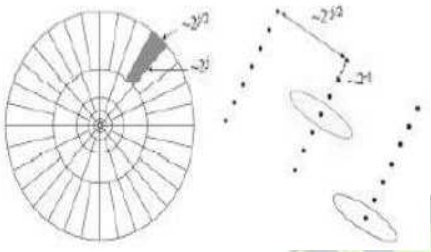
It uses the coefficients to represent the curves. To play out the CT, initial a 2-dimensional (2D) quick fourier change (FFT) of the picture is taken. After that the 2D fourier recurrence plane is partitioned into wedges. The wedges have an allegorical shape as a

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Issue 4, April 2018

result of isolating the fourier plane into spiral and precise allotments.

Finally, inverse FFT is applied to each wedge to find thecurve let coefficients.



Curvelet for fourier frequency

Curve lets differ with wavelets in the following aspects:

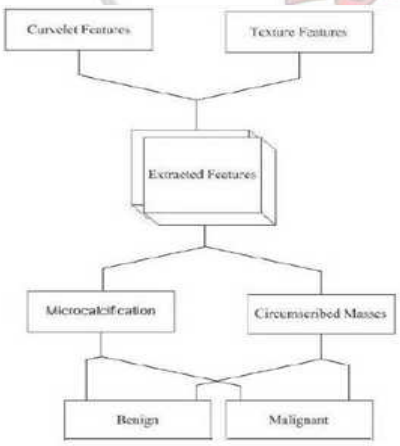
1. Optimally sparse representation of objects with edges.
2. Optimally sparse representation of wave propagators.
3. Optimally image reconstruction in severely ill-posed

C.TEXTURE ANALYSIS

Gray level co-event network (GLCM) is utilized to extricate surface data from picture.

How frequently different combinations of gray levels co-occur in an image section is clearly tabulated using GLCM. The GLCM features mainly include energy, entroly, contrast, and correlation.

D.CLASSIFICATIONS



Classification stages for cancer treatment methods

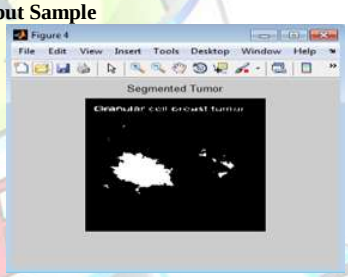
D.CLASSIFICATION:

Classification stages for cancer treatment methods in this stage the features obtained from previous stage are converted to feature vector. These highlight vectors are utilized for separating between a smaller scale clarification and an encompassed mass and they are likewise additionally grouped into kindhearted or harmful or typical case. Grouping is finished utilizing a PNN classifier. Computational load in the preparation stage is exchanged to the assessment stage which is the primary recognizing highlight of PNN.

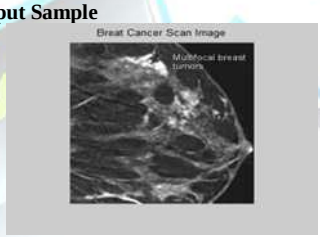
The training in PNN is instaneous, easy and faster compared to back propagation networks, PNN has an input layer, pattern layer, summation layer and output layer. PNN enables multi classification.

V. RESULT

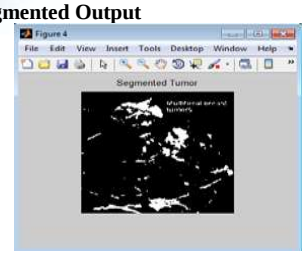
Benign Output Sample



Malignant Input Sample



Malignant Segmented Output



ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Issue 4, April 2018

VI. CONCLUSION

We can conclude that ther are several techniques that deal with preprocessing, enhancement, segmentation, feature extraction and classification of diagnosing images that gave different accuracies. The proposed method using curve let features and texture features improves the accuracy of CAD system for detection of early stage breast cancer. PNN classifier provides more accurate and unique results. So the combination of curve let and PNN will give a good result with higher efficiency. We also found that the mammographic images are giving better accuracy than ultra-sound images, MRI images etc.

REFERENCES

[1]. A Review on Breast Abnormality Segmentation and Classification Techniques

[2]. Deepa S., Dr. SubbiahBartha V., "Textural Feature Extraction and Classification of Mammogram Images using CCCM and PNN", IOSR Journal of Computer Engineering (IOSR-JCE), Volume 10, Issue 6 (May. - Jun. 2013).

[3]. Deepa J., Albert Singh N., Tamil Solvi S., "Computer-aided detection of breast cancer on mammograms: A swarm intelligence optimized wavelet neural network approach", Journal of Biomedical Informatics 49 (2014) 45–52, 2014 Elsevier Inc.

[4]. Huia Li, Ray Liu K.J. and Shih-Chung B. Lo, "Fractal Modelling and Segmentation for the Enhancement of Micro calcifications in Digital Mammograms", IEEE TRANSACTIONS ON MEDICAL IMAGING, vol. 16, no. 6, December 1997.

[5]. Ireaneus Anna Remain Y., Dr. ThamaraiSolviNoro S., "Early Detection of Breast Cancer Using SVM Classifier Technique", International Journal on Computer Science and Engineering Vol.1 (3), 2009, 127-130.

[6]. Julian Savarin Antony Dr.Ravi S., "A New Approach to Determine the Classification of Mammographic Image Using K-Means Clustering Algorithm", International Journal of Advancements in Research & Technology, Volume 4, Issue 2, February -2015.

[7]. Mohamed MoselyEltoukhy, Ibrahim Faye1, "BrahmiBelhaouari Samir, 'Breast cancer diagnosis in digital mammogram using multiscalecurvelet transform", Computerized Medical Imaging and Graphics 34 (2010) 269–276.

[8]. Neeta Jog, ArvindPandey, "Implementation of Segmentation and Classification Techniques for Mammogram Images", IOSR Journal of Engineering (IOSRJEN), Vol. 05, Issue 02 (February. 2015).

[9]. Oyo J. A., Adepoju T. M., Modiri E. O., Olabiyisi O. S. and Bello O. T, "Pre-Processing Method for Extraction of Pectoral Muscle and Removal of Artefacts in Mammogram", IOSR Journal of Computer Engineering (IOSR-JCE) e-Volume 16, Issue 3, Ver. V (May-Jun. 2014).

[10]. Senthilkumar B. and Umamaheswari G., "Combination of Novel Enhancement Technique and Fuzzy C Means ClusteringTechnique in Breast Cancer Detection",Biomedical Research 2013; 24 (2); 252-256.

[11]. Shanthi S., and MuraliBhaskaran V., "Computer Aided System for Detection and Classification of Breast Cancer", International Journal of Information Technology, Control and Automation (IJITCA) Vol.2, No.4, October 2012.

[12]. Subashini K., Jeyanthi K., "Masses detection and classification in ultrasound images", IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS), Volume 9, Issue 3 Ver. II (May -Jun. 2014), PP 48-51.

[13]. Vijay Kumar Guntur, Amalia Sharma 'Contrast Enhancement of Mammographic Images Using Wavelet Transform', ©2010 IEEE.

BIBILOGRAPHY

Dr. D. Ram kumar did his bachelor of engineering in Electronics and Communication Engineering from the Indian Engineering College and has a Master degree in Applied Electronics with first class with distinction from Anna University .He received his ph.D (Image Processing) from Anna University. Currently he is working as a Associate professor in the department of ECE, Bharath Niketan Engineering College. His area of interest is image processing, biomedical, network and communication.

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Issue 4, April 2018

J. Sangeetha did her bachelor of engineering in Electronics and Communication Engineering from Pavendar Bharathidasan college of Engineering and technology and has a Master degree in Embedded System Technologies from Raja College of Engineering and technology. Currently she is working as a Assistant Professor in the department of ECE, Bharath Niketan Engineering College. Her area of interest is Embedded systems, MP &MC, LIC, Digital electronics and Signals & Systems.

Engineering in Electronics and Communication Engineering from King College of technology under Anna University and has a master degree in Communication systems from Bharath Niketan Engineering College under Anna university. Her area of interest is Image Processing, VLSI and Digital Communication.

S. Dhiravida Janani did her bachelor of Engineering in Electronics and Communication Engineering from Hindusthan college of Engineering and technology under Anna University and has a master degree in Communication systems from Bharath Niketan Engineering College under Anna University. Her area of interest is Image Processing, Networks, EMIC and Digital Communication.