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Implementation on Breast Cancer Detection Using Mammographic Images

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ABSTRACT: Cancer is most leading causes of death in the world.There is no effective way to prevent breast cancer.Early detection is the first crucial step towards breast cancer diagnosis and treatment.In medical diagnosis,X-ray mammography is currently common technique used in medical practice due to its low cost and accessibility. It shows reliability on dense breast of young women. It provides high sensitivity on fatty breast. Detection rate of mammogram analysis radiologists is 76%-94%, which is considerably higher than the 57%-70% detection rate for a clinical breast examination.

KEYWORDS: mammography,radiologists.

I. INTRODUCTION

In bio-medical diagnosis, X- rays are used in mammography technique for the examination of human breast. These examinations are recorded as specialized images.These images are observed by radiologists for any possible abnormality in human breast. Mammography radiologists are able to correctly identify that a women does not have breast cancer in over 90% of cases.Mammography is one of the most affordable examination technique used in breast cancer detection. It gives 96% to 98% performance and accuracy in output of this system.

II. LITERATURE SURVEY

In this, paper is based on Mammography technique for the detection of breast diseases. Due to mammograms are low-contrast and noisy images, the most diagnostic signs such as micro calcifications and masses are difficult to detect. This paper proposed aalgorithm for image demising and enhancement based upon dyadic wavelet processing. Adenoising phase is depending uponlocal iterative noise variance estimation. [1]

Computer-aided diagnosis of masses in mammograms is important to the prevention of breast cancer. Many approaches tackle this problem through content-based image retrieval techniques. However, most of them fall short of scalability in the retrieval stage, and their diagnostic accuracy is, therefore, restricted. To overcome this drawback, we propose a scalable method for retrieval and diagnosis of mammographic masses. Specifically, for aquery mammographic region of interest (ROI), scale-invariant feature transform (SIFT) features are extracted and searched in a vocabulary tree, which stores all the quantized features of previously diagnosed mammographic ROIs. [2]

A computer-aided detection and diagnosis system for breast cancer, the most common form of cancer among women, using mammography. The system relies on the Multiple-Instance Learning (MIL) paradigm, which has proven useful for medical decision support in previous works from our team. In the proposed framework, breasts are first partitioned adaptively into regions. Then, features derived from the detection of lesions (masses and microcalcifications) as well as textural features, are extracted from each region and combined in order to classify mammography examinations as “normal” or “abnormal”. Whenever an abnormal examination record is detected, the regions that induced that automated diagnosis can be highlighted. [3]

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III.SYMPTOMS OF BREAST CANCER

- A lump in breast
- A change in the size or shape of the breast.
- Dimpling of the skin or thickening in the breast tissue.
- A rash on the nipple.
- Discharge from a nipple.
- Swelling or o lump in the armpit.
- Pain or discomfort in the breast that doesn't go away.

IV.DIFFERENT FORMS OF BREAST ABNORMALITIE

There are many forms of abnormality that may affect breast tissue. These abnormalities are often classified into three types: Aopacities, micro calcifications and architectural distortions:

- Masses: These are space occupying lesions; they are seen on two different impacts. They are characterized by their shape i.e round, oval, irregular, their contour like circumscribed, micro lobulated, obscured, indistinct, speculated and density i.e high, medium, low fat.
- Micro calcifications: They are classified into three categories: typically benign i.e vascular, staghorn, sticks, suspicious- It is also called dusty amorphous or heterogeneous and with high probability of malignancy
- There are many other types of breast abnormalities found in breast such as asymmetric tubular structure, the intra-mammary lymph node, the overall asymmetry of the breast tissue and the focal asymmetric density. The various abnormalities are often founded with visible signs; these signs are skin retraction, a nipple retraction, skin thickening. These are the abnormalities found in breast cancer.

V.BLOCK DIAGRAM

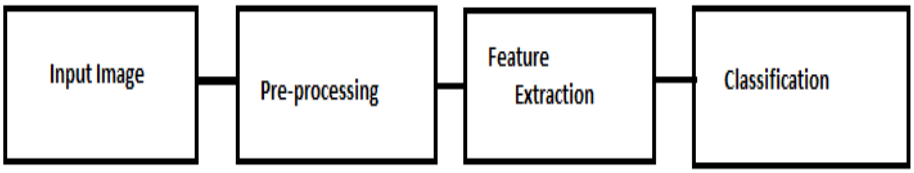

Fig.1. Block Diagram

- Input Image: First we take a picture of a human breast. This picture is in the form of x-ray images. This picture applied as input image to system.
- Pre-Processing: Pre-Processing helps to improve image quality by removing or reducing part which is not related to the background of the mammogram images. MammogramsImages are medical images that complicated to interpret. So pre-processing is used to improve the quality. This method will prepare the mammogram for the next processi.efeature extraction. Filters remove the noise and high frequency component. The common characteristic of medical images like as unknown noise, poor image contrast, in homogeneity, weak boundaries. This problem rectified by pre-processing technique. In pre-processing we use many filter to remove the problem

There ismuch type of filters

Mean filter, Median filter, and Adaptive Median filter.

- Mean filter: The main objective of the mean filters used to improve the quality of images for human viewers. In thisprocess, mean filter replaced each pixel with the average value of the intensities in the neighborhood. It mainly reduced the variance of images and easily producesthe output.

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- Median filter: A median filter is a nonlinear filter. it is efficient in removing salt and pepper noise median tends to keep the sharpness of image edges while removing noise.
- Adaptive Median filter: Adaptive Median filtering used to smooth the non repulsive noise from two-dimensional signals without blurring edges and preserved images. This filter makes it suitable for enhancing mammogram images. The pre-processing techniques used in mammogram for orientation, label, enhancement and segmentations.

- Feature Extraction: In machine, Pattern recognition and image processing, start from sets of measured data. For Feature Extraction MATLAB is used. This process is helpful to represent base image in a reduced form. Feature extraction is related to dimensionality reduction. In this Algorithms are used to detect and isolate various desired portion or shapes of digitized image. Do not use the word "essentially" to mean "approximately" or "effectively."
- Classification: Classification of the objects is an easy task for human, but it is challenging for the machine. Classification system consists of a different database that contains predefined patterns that compare with an object to classify to particular category. Image Classification is an important method in various fields such as biometry, biomedical images. Using classification method, we can classified images into two type. According to images we recognize either the breast is cancer infected or not.
  The Image Classification methods are:
  1. Support Vector Machine:
  2. Artificial Neural Network (ANN):
  3. Decision Tree:

  In above classification method, we use decision tree in our project
  - Decision tree – It is a tree like agraph of decisions. Each branch represents the decisions to be made graphically. It is a non-parametric supervised approach. It partition input into uniform classes. This method permits the acceptation and rejection of class label at each intermediate stage. This method gives the set of rules after classification that should be understood.

VI.FLOW CHART

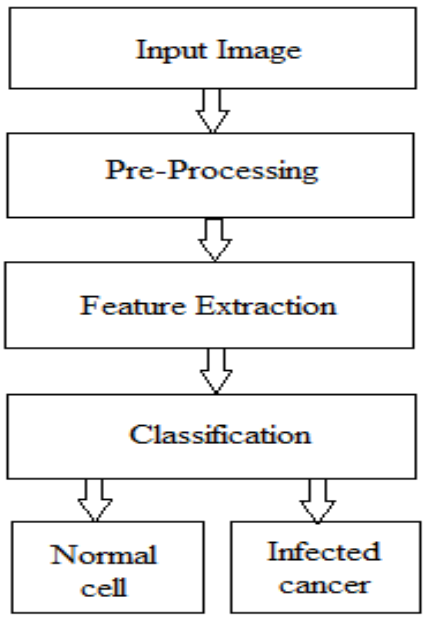

Fig.2. Flow chart

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VII.EXPECTED TEST AND RESULT

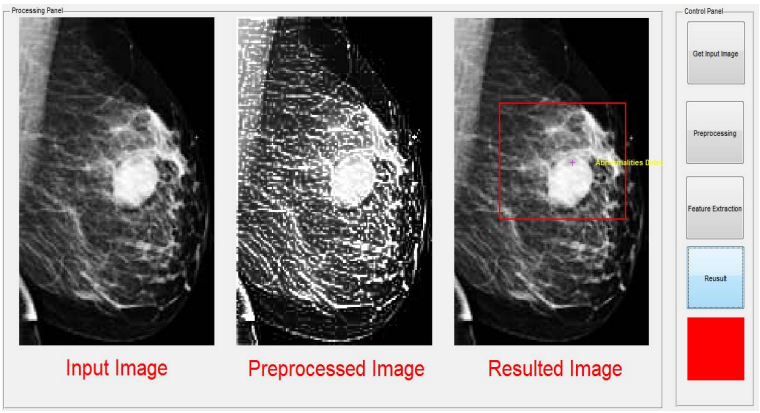

IMAGE I

In this image, image(a) is X-ray image. Image (b) is extracted image. Using this both image we can determine the cancer of human breast. Human breast is infected with cancer so result shows in red color.

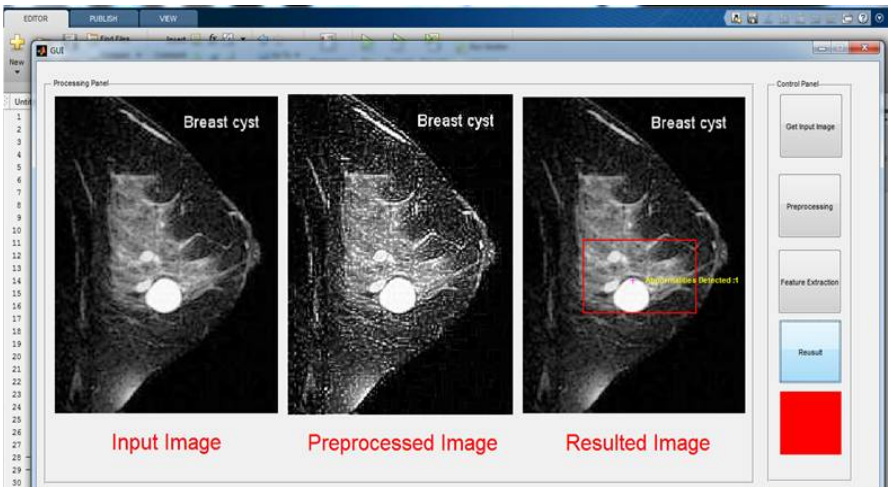

Image II

In this image, image(a) is X-ray image. Image (b) is extracted image. Using this both image we can determine the cancer of human breast. Human breast is infected with cancer so result shows in red color.

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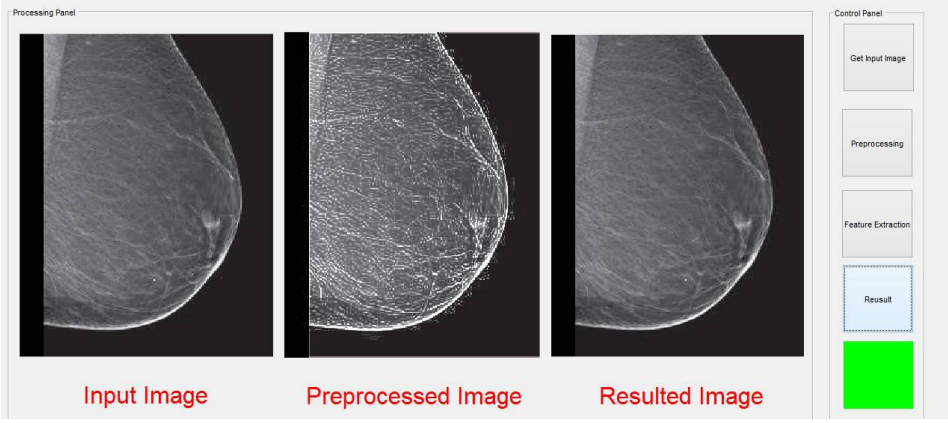

Image III

In this image, image(a) is X-ray image. Image (b) is extracted image. Using this both image we can determine the human breast is not infected with cancer. Human breast is infected with cancer so result shows in green color.

- Using this there images, we can successfully determined the human breasts are cancer infected or not.
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