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A Survey 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 a 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. This images are observed by radiologists for any possible abnormality in human breast. It consists of two methods. First is K-Mean Clustering Algorithm and second is Fuzzy C-Mean Algorithm. 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. LITRATURE SURVEY

Arianna Mencattini[1]: Mammography is the effective method for the early detection of human breast diseases. However, the typical diagnostic signs such as micro calcifications and masses are difficult to detect because mammograms are low-contrast and noisy images. In this paper, a novel algorithm for image denoising and enhancement based on dyadic wavelet processing is proposed. The denoising phase is based on local iterative noise variance estimation.
MenglinJiang [2]: 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 a query mammographic region of interest, scale-invariant feature transform features are extracted and searched in a vocabulary tree, which stores all the quantized features of previously diagnosed mammographic ROIs.

GwenoléQuellec[3]: A computer-aided detection for breast cancer is the most common methodfor cancer detection 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 into regions.Features derived from the detection of lesions 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.

R. Guzmán-Cabrera [4]: Breast cancer is the most common cause of death in women and the second leading cause of cancer deaths worldwide. Primary prevention in the early stages of the disease becomes complex as the causes remain almost unknown. The main signs of this disease, such as masses and micro calcifications appearing on mammograms,

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can be used to improve early diagnostic 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 prognosis.

Tobian Christian Cahoon[5]: We describe the use of segmentation with fuzzy models and classification by the crisp k-nearest neighbor algorithm for assisting breast cancer detection in digital mammograms. Our research utilizes images from the digital Database for Screening Mammography. We show that supervised and unsupervised methods of segmentation, such as k-nn and fuzzy c-means.In Digital Mammograms Will Have High Misclassification Feature. Adding window means and standard deviations to the feature suite improves segmentations produced by the k-nn rule. While our results are encouraging, other methods are needed to detect pathologies such as micro calcification.

MussaratYasmin[6]:Breast cancer is the oldest known type of cancer in human. The oldest identification and definition of cancer was recorded in Egypt in around 1600 BC. Science then this disease has been researched and studied to avoid outcomes caused by it but still this disease is considered as one of the most deadliest disease of all times, as deaths caused by breast cancer only in US in 2012 reached 40,000.In the modern medical science there are plenty of newly devised methodologies and techniques for the timely detection of breast cancer. Most of these techniques make use of highly advanced technologies such as medical image processing. This research study is an attempt to highlight the available breast cancer detection technique based on image processing and provides an overview about the affordability, reliability and outcomes of each technique.
Vishnukumar k. Patel [7]: Digital image enhancement techniques provide a multitude of choices for improving the visual quality of images. A frequency domain smoothing-sharpening technique is proposed and its impact is assessed to beneficially enhance mammogram image. This technique aims to gain the advantages of enhance and sharpening process that aims highlight sudden changes in the image intensity, it is usually applied to remove random noise from digital images. The already developed technique also eliminates the drawbacks of each of the two sharpening and smoothing techniques resulting from their individual application in image processing field. The selection of parameters is almost invariant of the type of background tissues and severity of the abnormality, giving significantly improved results even for denser mammographic images. The proposed technique is tested breast X-ray mammograms. The simulated results show that the high the high potential to advantageously enhance the image contrast hence giving extra aid to radiologists to detect and classify mammograms of breast cancer.

BoulehmiHela, [8]: Breast cancer is the most common cancer among women over 40 years. Studies have shown that early detection and appropriate treatment of breast cancer significantly increase the chances of survival. They have also shown that early detection of small lesions boosts prognosis and leads to a significant reduction in mortality. Mammography is in this case the best diagnostic technique for screening. However, the interpretation of mammograms is not easy because of small differences in densities of different tissues within the image. This is especially true for dense breasts.
This paper is a survey of the automatic early detection of breast cancer by analyzing mammographic images. This analysis could provide radiologists a better understanding of stereotypes and provides, if it is detected at an early stage, a better prognosis inducing a significant decrease in mortality.
ChaitaliDhaware[9]: Classification system consists of a database that contains predefined patterns that compare with an object to classify to appropriate category. Image Classification is an important task in various fields such as remote sensing, biometry, biomedical images, and robot navigation. In Image classification different methods are used: Decision Tree, Artificial Neural Network (ANN) and Support Vector Machine (SVM).

R Ramani[10]:breast cancer detection is a very important role for worldwide women to save the life. Doctors and radio logistic can miss the abnormality due to inexperience in the field of cancer detection. The preprocessing is the most important step in the mammogram analysis due to poor captured mammogram image quality. Pre-processing is very important to correct and adjust the mammogram image for further study and processing. There are Different types of filtering techniques are available for preprocessing. This filters used to improve image quality, remove the noise, preserves the edges within an image, enhance and smoothen the image. In this paper, we have performed various filters namely, average filter, adaptive median filter, average or mean filter, and wiener filter.

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III. CONCLUSION

- In this study, it can be concluded that using mammographic images we can detect the breast cancer.In this study, we can utilizes morphological operators for segmentation and clustering for clear identification of abnormalities such as masses and micro calcifications. The main benefit of it is affordable, reliable. Based on the survey, we can use mammographic imagesto detect breast cancer in its earliest stage.

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