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Detection of Breast Cancer in the Bio Medical Image using Supervised Machine Learning

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Abstract: ***The detection of disease for diagnosis in the medical image becomes easier, when the machine learning concept is used. In this article, the Breast cancer is detected from the biomedical image using supervised machine learning technique. The bio medical image is acquired from the image sensors and that acquired image is pre processed for further processing. From that pre-processed image, the object detection is performed. The next processes are segmentation and feature extraction. Finally, the supervised learning is implemented in the image for image classification. With the help of machine learning, the different cases of cells are also detected, differentiated and spotted for the further diagnosis.***

Key terms: Breast cancer detection, Image classification, image segmentation, Supervised Machine learning

I. INTRODUCTION

The detection of cancer cells in the bio medical images is simple, when the neural network or the machine learning techniques are used. In machine learning, there is a further classification of supervised learning and unsupervised learning is available. For bio medical applications and the image classification techniques, the supervised learning is very much suitable for the exact diagnosis of the disease. So, here, the supervised learning concept is used to spot the cancer cells in the acquired bio medical image. The supervised machine learning should able to detect and differentiate the weak cells, damaged cells, injured cells as well as cancer affected cells from the acquired bio medical image for the accurate diagnosis of the cancer spot and for further treatment of those cells.

II.RELATED WORK

Dr.E Mohan et.al. (2014) proposed the image segmentation and image classification for brain tumor detection using neural network and Bayesian classifier.

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R.Sugumaran et.al. (2014) also proposed the image segmentation and image classification using fuzzy c means clustering. Thambu Gladstan et.al. (2014) implemented the object detection using wave atom transform and also proposed (2017) the same using SVM classifier. Dr.E Mohan et.al. (2018) implemented the bio medical image segmentation as well as dual clustering approach. With the help of above literature reviews, the proposed model is successfully implemented. The different approaches are reviewed and the best of all models is chosen and processed for this implementation.

III.PROPOSED METHODOLOGY

First of all, the biomedical image should be captured with the help of bio medical sensors which includes infrared spectroscopy diffusion for accurate image acquisition. The acquired image should be exact for detecting and diagnosing the improper cells in that image. The next step of process is image pre processing, which includes image resizing, image dimensioning, parallax image correction, image resolution correction and retrieval of image data sets. After preprocessing, the object detection is performed as a sequential step of image classification. The next sequential step of image classification is image segmentation. The image segmentation is the pre process for the image feature extraction. Finally, the image classification is performed using supervised machine learning to detect the exact location and dimension of the cancer cells.

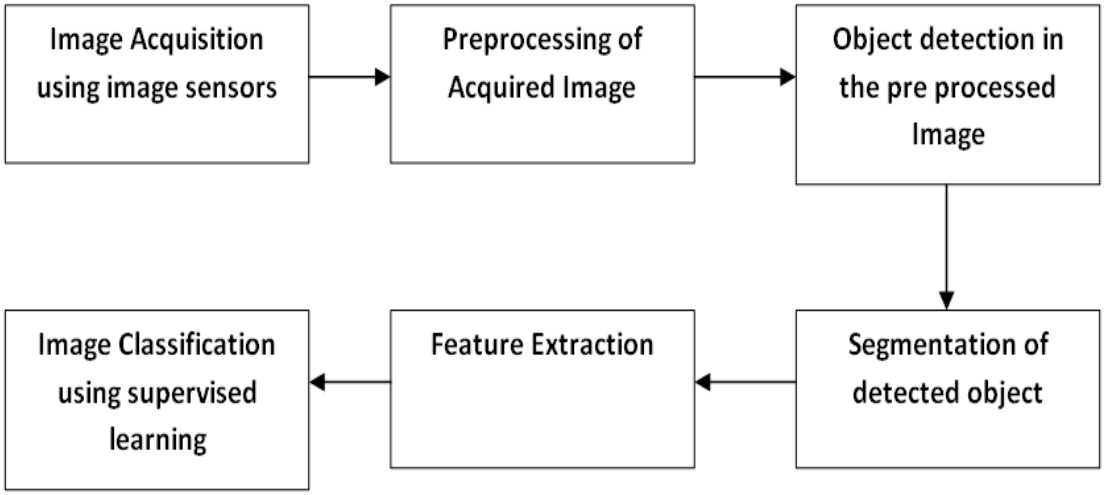

Fig.1. Proposed Implementation

IV.RESULTS AND DISCUSSIONS

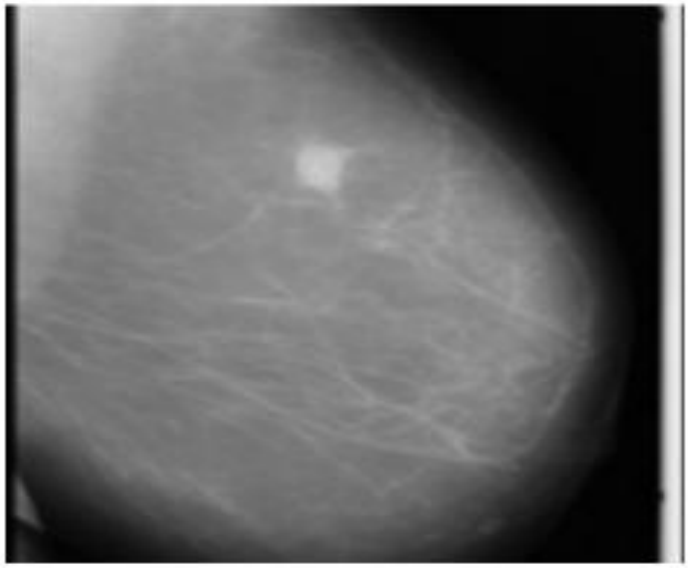

Fig.2. Acquired image from image sensor

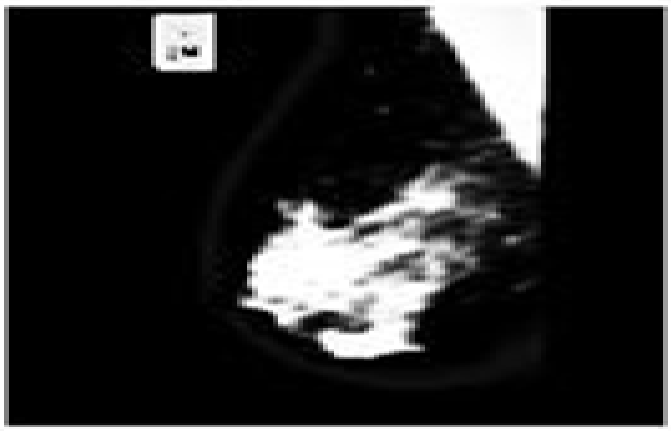

Fig.3. Object Detection and segmentation output of Acquired image from supervised machine learning

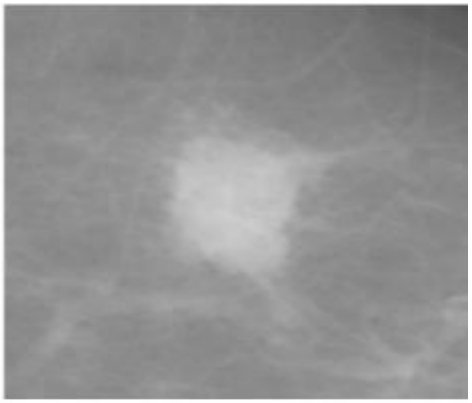

Fig.4. Region of Interest of Acquired image from supervised machine learning

Table 1. Number of images used for training of supervised machine learning

Images	Normal	Abnormal	Benign	Malignant
Training	47	37	25	13
Testing	70	56	37	19

Table 2. Image measuring parameters of supervised machine learning

Scale	Accuracy	Sensitivity	Specificity
1	100	1	1
2	90	0.90	0.90
3	78	0.76	0.70
4	66	0.63	0.63

V. CONCLUSIONS

The implementation of the detecting, differentiating the different types of improper cells and also the cancer cells are spotted and diagnosed for the quality treatment. The object detection technique is used to spot the damaged cells, and the segmentation is used to dimensioning the improper cells and the classification is fulfilled using supervised machine learning for exact outcome.

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