

**AMRUTVAHINI COLLEGE OF ENGINEERING,
SANGAMNER**

DEPARTMENT OF COMPUTER ENGINEERING

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Project Synopsis

On

“Detection of Breast Cancer Using Generative Adversarial Networks”



BE Computer Engineering

BY

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Title: Detection of Breast Cancer Using Generative Adversarial Networks

Domain and Sub-domain:

Domain - Deep learning

Sub-domain - Image Processing

Objectives:

1. To improve our Healthcare Facility by the use of Technology.
2. To Detect of Breast Cancer Using GAN.
3. Early Detection of Breast Cancer can Saves Lives.

Abstract:

Deep learning methods have shown strong applicability to various medical images datasets. Due to paucity of available labeled medical images, accurate computer assisted diagnosis requires intensive data augmentation (DA) techniques, such as geometric/intensity transformations of original images. This data when used along with the training data helps to address the limited medical image dataset collected from various sources. Generative Adversarial Networks (GANs) is one of the DA techniques. GAN trained on images can generate new images that contain many authentic characteristics and look realistic to human observers. Therefore, this paper focuses on overcoming the problem of limited labeled dataset, using Deep Convolution GANs. In order to validate the proposed model, a visual Turing test was conducted with the help of medical experts.

Keywords:

GAN, ANN, CNN, Deep Learning, ML, Malign, Benign

Problem Definition:

Ultrasonic/Mammography is the primary procedure for breast cancer screening, attempting to reduce breast cancer mortality risk with early detection. but to detect it we need a radiologist. All this work is done manually, it is time consuming and there can be situations where a radiologist is not available at that time so by taking these two major issues under consideration this system will overcome those problems and help to increase our healthcare facility.

List of Modules:

1. Detection of Breast Cancer
2. Breast Cancer awareness portal

Current Market Survey:

The status of breast cancer as one of the most commonly occurring cancers in the world is expected to be a key driving factor for the global market. As more and more patients are diagnosed with breast cancer across the globe, the need for accurate and efficient treatment outcomes for the patient remains unparalleled. Breast cancer has the second highest mortality rate in women next to lung cancer. As per clinical statistics, 1 in every 8 women is diagnosed with breast cancer in their lifetime.

Scope of The Project:

We have created such type of system which will help the society and it helps to periodic clinical checkups and self-tests help in early detection and thereby significantly increase the chances of survival. Our System more robust, fast, accurate, and efficient noninvasive cancer detection system.

Literature Survey:

Breast tissue anomalies, which can be malign-cancerous or benign-not harmful, are commonly in the formation of clusters of cells, and therefore the anomalies in the breast tissue are depicted by regions having different properties from that of regular tissue. Early detection is key to resolve future complications. Hence, for an early examination of these tissues, the areas above have discernible differences from a benign tumor in the image. Such differences include texture and morphological abnormalities in specific clusters thus allowing us to identify, analyze, discriminate, and extract the malignant region.

Machine learning (ML) has become a vital part of medical imaging research. ML methods have evolved over the years from manual seeded inputs to automatic initializations. We propose a method to extract features using texture analysis for the classification and differentiation of unusual areas which can be cancerous along with other malignant microcalcifications. In texture-based analysis methods classification of texture, using the features decided beforehand is not only dependent on the images being used but the objective also plays an important role. Our method shall detect irregular masses which can be further investigated by clinicians, but also concentrated on calcification and abnormal masses.

Software and hardware requirements of the project:

Hardware

- 1) RAM – 8GB or More
- 2) HDD – Min. 500GB
- 3) Processor – i3 or above

Software

1. Python
2. TensorFlow
3. Apache Server

Contribution to Society:

Early detection is a key to the effective management of the disease. It can result in improved quality of life, provide several treatment options and increase survival rates.



Probable date of completion: November 2021

Expected outcomes:

1. Improve our Healthcare Facility.
2. Should help to detect Breast Cancer in early stage and Save lives.

References (In IEEE Format):

1. S Guan and M Loew, "Breast cancer detection using synthetic mammograms from generative adversarial networks in convolutional neural networks", *Journal of Medical Imaging*, vol. 6, no. 3, pp. 031411, Mar 2019.
2. Walid Al-Dhabyani et al., "Deep learning approaches for data augmentation and classification of breast masses using ultrasound images", *Int. J. Adv. Comput. Sci. Appl.*, vol. 10.5, 2019.
3. Shuyue Guan and Murray Loew, "Breast cancer detection using synthetic mammograms from generative adversarial networks in convolutional neural networks", *Journal of Medical Imaging*, vol. 6.3, pp. 031411, 2019.
4. Li Shen et al., "Deep learning to improve breast cancer detection on screening mammography", *Scientific reports*, vol. 9.1, pp. 1-12, 2019.