

Breast Cancer Detection using Convolution Neural Network

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Abstract: Breast cancer is very common in women's nowadays. It initially starts when cells in the breast begin to grow out of control. These cells usually form a tumor that will often be observed on an x-ray or felt as a lump. Cells in nearly any part of the body can become cancer and can spread to other areas of the body. There are almost 6 stages of breast cancer. It is always found that the detection of cancer at the first stage can cure it. A sample image is taken as an input and compared with the images already stored in database detected with cancer. If the detection is found successful then corresponding treatment is suggested. The stage of cancer is been demonstrated and respective treatment is been advised to the patient. Stage wise treatment and medicines are given to cure that cancer.

Keywords – Cells, Cancer, Lump, Database

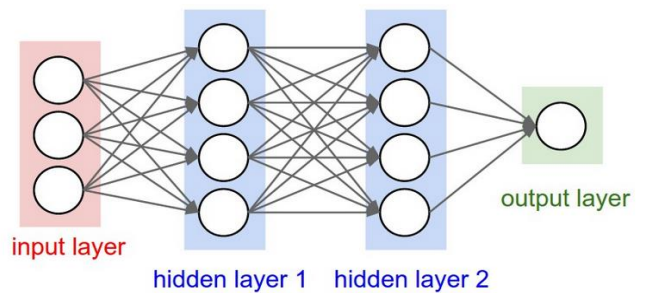
1. INTRODUCTION:

Breast cancer is uncontrolled growth of breast cells. It is not only found in breast cells but also in many parts of the body. It forms lumps in the ducts which carry milk. A small number of cancers start in other tissues in the breast. There are almost 6 stages of breast cancer. It is always found that the detection of cancer at the first stage can cure it. A sample image is taken as an input and compared with the images already stored in database detected with cancer. Pre-processing is done on that image. If the detection is found successful then corresponding Treatment is suggested. The stage of cancer is been demonstrated and respective treatment is been advised to the patient. Stage wise treatment and medicines are given to cure that cancer. Algorithms like CNN (Convolutional Neural Network) in which the connectivity pattern between its neurons is inspired by the organization of the animal visual cortex are implemented. So, a sample image is taken and using machine learning system is given instructions to perform like humans so that it can compare and detect cancer, its stages and treatment are.

1. Proposed Approach

Recent developments in deep learning for image recognition in natural images have encouraged a surge of interest in applying this technique to medical images.

Computer-aided diagnosis of breast cancer is potentially useful for reducing the numbers of grazes are missed by the radiologists at a reasonable cost. A convolution neural network (CNN) is used for classification of masses and normal tissue on mammograms. In a convolutional neural network, each neuron is connected with a few neurons in the previous layer, as shown in the figure below:



Scope:

Proposed software product is the Brest cancer detection. CNN and Deep learning algorithms are used. After applying these techniques a defected part is found which is the final output.

Definition:

CNN:-

A Convolutional Neural Network (CNN) is made up of a number of convolutional layers (often with a subsampling step) and then followed by a number of fully connected layers as in a typical multilayer neural network. The architecture of a CNN is designed to take advantage of the 2D structure of an insight image (or other 2D input such as a speech signal). That is achieved with local connections and tied weights followed by some kind of pooling which results in translation invariant features.

Deep Learning:-

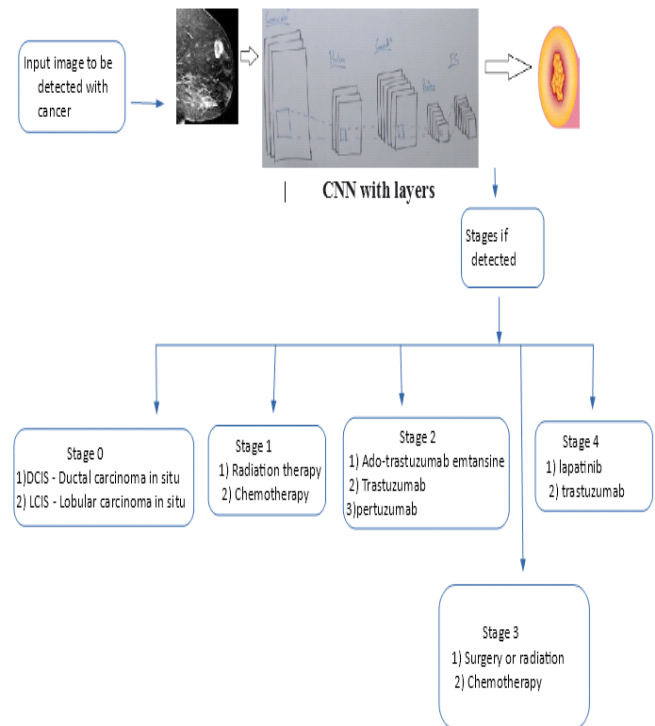
Deep Learning is a new area of Machine Learning research, which has been introduced with the objective of moving Machine Learning closer to one of its original goals: Artificial Intelligence. Deep understanding provides the presumption these layers of facets match

levels of abstraction or composition. Varying number of layers and coating styles could possibly offer different levels of abstraction.

Technologies to be used:-

Image Processing:-

In imaging science, image handling is handling of photographs using mathematical procedures by utilizing any form of signal handling for that the feedback is an image, a series of photographs or a movie, such as a photo or movie frame; image or a couple of features or parameters related to the image. Most image-processing techniques involve isolating the in-patient color planes of an image and treating them as two-dimensional signal and applying standard signal-processing techniques to them. Pictures are also prepared as three-dimensional signs with the third dimension being time or the z-axis. Picture handling generally describes digital image handling, but optical and analog image handling are also possible. This information is all about common methods that use to all or any of them. The exchange of pictures (producing the input image in the initial place) is referred to as imaging.



LITERATURE SURVEY:

Sr. No	AUTHOR	Image Processing Used	Features	Technique Used	Data Set	Result
1.	Breast Cancer Detection Using RBF Neural Network	Yes	9 attributes	RBF neural Networks is used	58 H&E (Hematoxiniln And Eosin stained histopathology images	Accuracy: 73% Precision Recall: 0.72 ROC area: 0.80
2.	Breast Cancer Detection using Two-Fold Genetic Evolution of Neural Network Ensembles	No	10 attributes	Intra-Genetic Algorithm	Wisconsin Breast Cancer data set	Accuracy: 99.90% Sensitivity: 96.34%
3.	Detection of Breast Cancer Using Artificial Neural Networks	Yes	9 attributes	Artificial Neural Networks(MLE (Maximum Likelihood Estimation)	Data of mammogram	Intensity: 34.3779
4.	Brain Tumor Segmentation Using Convolutional Neural Networks in MRI Images	Yes	10 attributes	Convolution Neural networks	BRATS 2013, 2015	Dropout increased to 0.5
5.	Breast Cancer Detection Using Image Processing Techniques	Yes	No attributes	Image Processing techniques	No data set used	reduce the error rate by 5% - 15%
6.	Breast Cancer Detection : A Review On Mammograms Analysis Techniques	Yes	13 attributes	Mammograms Analysis Technique	Cheng et al. attributes	87% to 90% for neural networks classifiers

CONCLUSION:

Conclusion of this system is to detect cancer, demonstrate its stage and accordingly advise the patient to treat it and follow proper medicines given. It is always preferable to detect and treat cancer at early stage.

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