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Neural Classifier for the diagnosis of Breast Cancer using Computational Intelligence Techniques

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Abstract— Breast cancer is the most important cause of cancer death for women. Breast Cancer, the dreaded disease is one of the dominant causes of sufferings and death in modern world. Cancer is due to the uncontrolled proliferation of the body's cells resulting in an abnormal growth or disruption of the body's auto-regulation. Its cure rate and prognosis of the patient depends mainly on the early detection and diagnosis of the disease. Detection of Breast cancer in the body of the patient reveals through early symptoms in most of the cases. This study is aim to find out the feasibility of Breast cancer detection by systematic study of the risk factors. An expert system is developed based on supervisory neural network based learning approach, where in initially the input parameters and the output is mappable.

Keywords— Signal & Image processing, neural network, Transformed domain techniques, MATLAB, Microsoft Office Excel, CT scan images ,Different domain Technique like DCT,FFT etc.

INTRODUCTION

Breast Cancer disease is a new growth of tissue resulting from a continuous proliferation of abnormal cells that have the ability to invade and destroy other tissues. Cancer, which may arise from any type of cell and in any body tissue, is not a single disease but a large number of diseases classified according to the tissue and type of cell of origin. In the Indian scenario Breast Cancer disease has become a one of the vital cause of death for women's. Cancer deaths could be controlled to a large extent if this disease is diagnosed at an early stage and proper treatment is given to the patient. Knowledge-based expert systems, or expert systems, use human knowledge to solve problems that normally would require human intelligence. These expert systems represent the expertise knowledge as data or rules within the computer. These rules and data can be called upon when needed to solve problems. Mathematical models have been developed to predict output variable on the basis of input variable. The traditional approach involve simultaneous multiple linear regression analysis and backward elimination of variable to discriminate the most appropriate model. In contrast, new Artificial intelligence models, namely artificial neural networks, can solve problems of classification and estimation even in the presence of non-linear relationship between dependent and independent variable, or of a large database with numerous non-homogeneous variables, or both. The tumor is two types malignant and benign .A tumor does not invade the surrounding tissue called benign tumor. If tumor is invade and damage the surrounding of tumor called malignant tumor of cancer. Our objective was to develop a Computational Intelligence Techniques for distinguishing between benign and malignant pulmonary nodules by use of features extracted from CT Scan Images.

Here, The CT scan images of benign and malignant tumor.

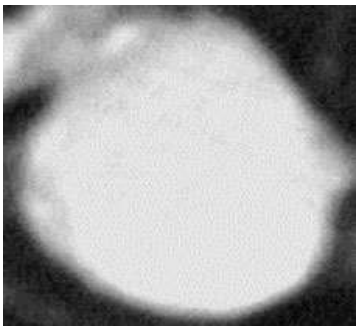


Figure a: Benign Tumor

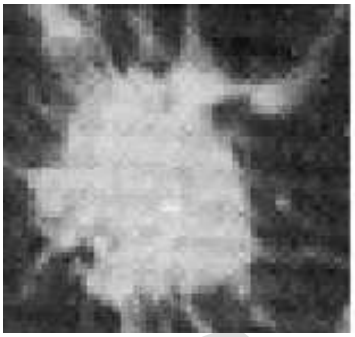


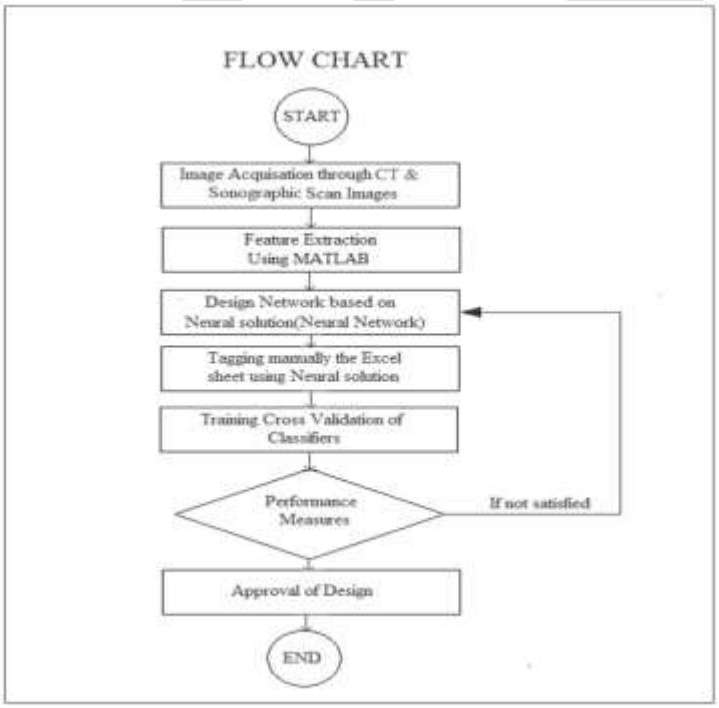
Figure b: malignant tumor

RESEARCH METHODELOGY

It is proposed to study Efficient Classification of Breast Tumor using Neural Classifier. Data acquisition for the proposed classifier designed for the diagnosis of Breast Cancer shall be in the form of CT Scanned and sonographic images. Image data will be collected from the different- different hospitals of the country .The most important uncorrelated features as well as coefficient from the images will be extracted .In order to extract features, statistical techniques, image processing techniques, transformed domain will be used.

For detection of Breast cancer following technique will be used

Statistics, Image processing, Transformed domain techniques. The research work Software's such as Matlab, Neuro solutions, XL Stat will be used.



RESEARCH OBJECTIVE

1] To maintain the correctness & accuracy in the diagnosis of Breast cancer.

2] To increase the accuracy for the diagnosis of Breast cancer.

3] To reduce confusion between of benign tumor, malignant tumor.

LITERATURE SURVEY

1] Artificial Neural Networks classifiers have been used in a variety of applications ranging from industrial automation to medical diagnosis. Because of its characteristics like fast learning, adaptability, fault tolerance, solving complex non linear problems efficiently, good recognition Neural Networks are being used in the medical domain to benefit the medical fraternity and patient's community alike, as opposed to the conventional methods. In the present paper we have conducted a survey which includes a detailed review of the various applications where Neural Networks have been used in Breast Cancer diagnosis in the recent years. Neural Networks classifiers have been used in a medical diagnosis because of its characteristics like fast learning.

2] A three-layer, feed-forward, artificial neural network with a back-propagation algorithm. And its outcome of research is this scheme has improved the diagnostic accuracy of radiologist who is differentiating benign from malignant pulmonary nodules on high-resolution CT.

3] Neural-digital computer intelligence technique system based on a parameterized two-level convolution neural network and on a special multi label output encoding procedure. In this Receiver Operating characteristic (ROC) method with area under the ROC(Az)as the performance index. And its outcome of research It is proven to be promising and to be extensible, problem-independent and applicable to other medical diagnostic task in 2-D image environment

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CONCLUSION

Use of the proposed Efficient Classification of Breast Tumor using Neural Classifier and Computational Intelligence Techniques will be result in more accurate and reliable diagnosis of Breast cancer disease.

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