# BREAST CANCER CLASSIFICATION USING ARTIFICIAL NEURAL NETWORK

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In the name of ALLAH, the Most Gracious and the Most Merciful

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May Allah Bless Us,

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## ABSTRACT

Breast cancer has become a major cause of death among women in developed countries. The most effective way to reduce breast cancer deaths is detect it earlier. However, earlier treatment requires the ability to detect breast cancer in early stages. Recently, several researchers have used statistical and artificial intelligence techniques to successfully predict breast cancer. Basically the objective of there prediction techniques is to assign patients to either a *"benign"* group that does not have breast cancer or a *"malignant"* group that has strong evidence of having breast cancer.

An artificial neural network (ANN) was developed to predict breast cancer from mammographic findings. The performance of the neural network structures is Multi-Layer Perceptron (MLP), Artificial Neural Network, Levenberg Marquardt (LM) and Resillient Back Propagation (RP) are examined on the Winconsin breast cancer data (WBCD) in this paper. This is a well used database in machine learning, neural network and signal processing.

This thesis report, study on percentage classification using artificial neural network that apply on breast cancer data. This project scope based using Matlab (R2006a) programming as main software used. This breast cancer database was obtained from the University of Winsconsin Hospitals, Madison From Dr. William H. Wolberg. The database contains 474 data and all data will train and test with two (2) learning algorithm is Levenberg Marquardt (LM) and Resillient Back Propagation (RP).

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# CHAPTER 1

# INTRODUCTION

## 1.1   Overview and Problem Description

Breast cancer is the type of cancer with highest incidence rates in women. It is also the most common cause of cancer death for women in many countries, only exceeded by lung cancer in Asian countries [3]. The early detection of breast cancer is vital to improve its prognosis [13].

Artificial neural networks (ANNs) and support machines have been recently proposed as very effective method for pattern recognition, machine learning and data mining [5].Artificial neural network (ANN) is an intelligent machine learning technique by the way biological nervous systems process information. In theory Neural Network can perform different performance, for different number of data. To study the classifications capability of neural networks Multilayer Perceptron (MLP) was utilized to visualize the condition using two learning techniques namely the Levenberg Marquardt (LM) and Resilient Back Propagation (RP) were implemented. ANN has been used in may application such as medical, electronics, business and engineering. Among those applications are reported in [2 - 6]. The main target of this neural network is to classify Breast cancer. Data set are used test the performance of MLP (multilayer perceptron) network with different combination set of data.

Various researches have been conducted using ANN due to its characteristics of cell nuclei of fine needle aspirate (FNA) of breast mass [7]. By using Genetics Algorithm (GA) these 569 cases were classified by medical experts to 357 (62.75%) benign and 212 (37.25%) malignant [8]. In other study, ANN has also been used for survival analysis on two breast cancer datasets. A three-layer, feedfoward ANN with sigmoid activations is used in this work. The networks were trained using the back-propagation algorithm. There are 30 nuclear features in the input layer. The number

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