

**AN APPLICATION OF ARTIFICIAL NEURAL NETWORK
FOR CLASSIFICATION OF TIMBER'S DURABILITY**

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ABSTRACT

This project present the application of Artificial Neural Network (ANN) in attempt to identify the timber's durability. MATLAB version 6.5.1 has been used as the software. There are 75 training data and 55 testing data used for this project. The data are from the timber testing that has been carried out in the Wood Technology laboratory in Universiti Teknologi MARA, Shah Alam.

Five factors that affecting the durability of timber are modulus of elasticity (MOE), modulus of rupture (MOR), compression parallel of grain, compression perpendicular of grain and shear strength. This five parameters are use as an input parameters for classification of timber's durability.

Six network functions from Back-Propagation is used, there are `traingd`, `traindx`, `traingdm`, `traingda`, `trainrp` and `trainlm` training function have been compared to obtained the best model for classification of timber's durability. The best result produced will determine the most suitable model for classification of timber's durability.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Timber is a slice of the tree that had been cut off. Important timber properties such as natural durability, strength, workability and decorative value vary widely and it is important that timbers be correctly identified if the best results are to be achieved in their use [1]. Recently, with the latest technology, the properties of timbers is able to be obtained from the testing in physical and mechanical by using the testing machine.

These thesis focus on the durability of the timber. The durability of the tree is commonly known from the rate of growth of the tree. Rate of growth is usually determined at the annual ring of the heartwood of the tree, whereas the ages of the tree can be identified. From the durability, the strength of the timber can be identified. The identification required a lot of time due to timber properties need to be obtained through testing machine.

In order to overcome this problem, the computer intelligence can be implemented to make the work fast and efficient.

1.2 OBJECTIVES

The objectives of this project are:

- i. To apply an Artificial Neural Network (ANN) for classification of timber's durability.
- ii. To obtain the best ANN model for classification of timber's durability.