NEURAL NETWORK SIMULATION
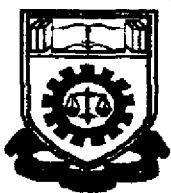## (Character Recognition)
USING MATHEMATICA

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ABSTRACT

In this project Backpropogation technique has been chosen to train data and to test the data. This technique is selected because it is the most common technique in Artificial Neural Network simulation. The studies that had been carried out in this project is to simulate neural network using BPN (Backpropagation network) to recognize the capital letters and numbers. The BPN is a layered, feedforward that is fully interconnected by layers. There is no feedback connections and no connections that bypass one layer to go directly to a later layer. Because it is so powerful, the backpropagation network has become an industry standard. Among the advantages of backprop are its ability to store numbers of patterns far in excess of its built-in vector dimensionality.

The network sometimes may fail when trying to solve real problems, where it fail to converge after a large number of training set. When this phenomenon occurs, changes has to be made by adjusting the weight initialization, learning rate, and adding extra parameter such as momentum.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

For decades people had tried to create computer programs that can learn like human-Artificial Intelligence. For example how do person teach a child to recognize a car ? Firstly, the child has to be taught or trained to recognize a car by showing him or her example of a car and telling him or her that "This is a car and That is not a car" until the child learn the concept of what the car is. In this stage, the child can look at the examples that we show and answer correctly whether this is a car or not, providing that the child has given enough positive and negative examples. The most complex part of the human anatomy is the brain which consists of small sensitive cells that are called neurons. The signals being transmitted from one part of the brain to the others through neurons. Human brains is capable of storing new data and also recalling and processing the existing data. This type of ability is very important for future application especially in the science field. The development of Androids is not far from possible with the Neural Networks.