# NEURAL NETWORK PREDICTION OF SPM ACHIEVEMENT

A thesis submitted to the Graduate School in partial fulfillment of the requirements for the degree Master of Science (Information Technology), Universiti Utara Malaysia

By Robizah Binti Haji Sudin October 2000

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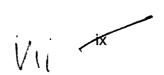
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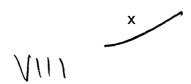
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To my mom and dad. You have always been a source of inspiration

To Sofea, Hafiz, and Hakim. Allah blessed me with wonderful kids

And to the memory of my beloved husband, Mohd Zawawi Mat Nor 25<sup>th</sup> June 1970 – 19<sup>th</sup> May 1999

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### ABSTRACT (BAHASA MALAYSIA)

Tujuan kajian ini adalah untuk membentuk sebuah model rangkaian neural bagi meramal pencapaian pelajar-pelajar sekolah menengah di Malaysia di dalam peperiksaan SPM. Rangkaian neural yang dibentuk menggunakan perceptron multi aras yang melibatkan algoritma "backpropagation" serta tangen sigmoid sebagai fungsi pindahan. Kajian ini bukan sahaja mengambil kira gred yang diperolehi oleh pelajar di dalam matapelajaran teras yang di ambil di dalam SPM tetapi juga mengambil kira jantina mereka. Berdasarkan kepada keputusan yang diperolehi dari model tersebut, prestasi sebenar pelajar boleh diramal. Kajian ini menunjukkan bahawa rangkaian neural boleh dilatih dengan data-data yang berkait dengan pelajar untuk meramal pencapaian mereka di dalam peperiksaan SPM.

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### ABSTRACT (ENGLISH)

The purpose of this study is to build a neural network model for prediction of SPM achievement for the students in a Malaysian secondary school. The neural network model uses multi-layer perceptron involving a backpropagation algorithm and the tangent sigmoid as the transfer function. This study does not only consider the students' grades for the core subjects that they take in the SPM but also the student gender. Based on the model results, the real exam performance is to be predicted. This study shows that neural network can be trained with students' data to predict their achievement in the SPM examination.

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**Chapter One: Introduction** 

1.1. The context of the study

Forecasting, at least intelligent forecasting, is predicting future events

based on historical data (Blum, 1992). Predicting for the future is a

very common problem in human life. Though, it is a very tough task

(Angstenberger, 1996). In spite of that, with neural networks - also

called artificial neural networks, or ANN - models, effective predictive

applications can be developed (Ding et al, 1996).

It has been found from many studies that neural network is capable of

forecasting and giving better results compared to statistical and

traditional analytical methods (Adya et al, 1998; Muzaffer et al, 1999;

Mahmood et al, 1999; Aiken, 1999; and Indro et al, 1999). In addition.

as stated by Law (1998), what makes a neural network superior to

traditional statistical methods in forecasting is that a neural network is

better able to recognize the high level features, such as the intra-

correlation or serial correlation, of a training set.

1

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