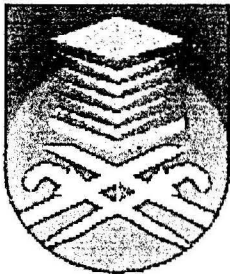


**A SPEED CONTROLLER OF INDUCTION MOTOR USING
ARTIFICIAL NEURAL NETWORK**

Thesis presented in partial of fulfillment for the award of
Bachelor of Electrical (Hons) Engineering

UNIVERSITI TEKNOLOGI MARA



HAYATI NUR BINTI ABDUL AZIZ

Faculty of Electrical Engineering

UNIVERSITI TEKNOLOGI MARA

40450 SHAH ALAM, SELANGOR

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ABSTRACT

Artificial Neural Network has been trained to perform complex functions in various fields of applications including pattern recognition, identification speech, vision and control system. This report presents ANN speed controller for an induction motor which behaves similar to PI (Proportional and integral) controller. The model of induction motor is designed using the relevant equations. A closed-loop system is used for testing. The induction motor speed is control by ANN Technique using samples obtained from the classical technique (PI controller) and Direct Torque Control (DTC) controller. The data for training ANN is generated by simulating a model of the induction motor using SIMULINK. In supervised session, back propagation method will be applied in ANN programs. Comparison is made between classical technique and ANN technique.

TABLE OF CONTENTS

	PAGE
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES	x
LIST OF ABBREVIATIONS	xi

CHAPTER	DESCRIPTION	
1	INTRODUCTION	
	1.1 Introduction	1
	1.2 Objective	2
	1.3 Scope of Work	2
	1.4 Organization of Report	3
2	INDUCTION MOTOR MODELING	
	2.1 Introduction	4
	2.2 Mathematical Model	4
	2.2.1 Modeling the induction motor	
	2.3 Block diagram of modeling the induction motor	10
	2.4 Conclusion	16
3	TYPES OF CONTROLLER	
	3.1 Introduction	17
	3.2 Classical Technique (PID controller)	
	3.2.1 PID controller	17

CHAPTER 1

INTRODUCTION

1.1 Introduction

The field of neural network has a history of some five decades but has found solid application only in the past fifteen years, and the field is still developing rapidly. Computers and humans are good at doing different kind of things. Neural networks have been trained to perform complex functions in various fields of application including pattern recognition, identification, and speech vision and control system [1].

Artificial Neural Network (ANN) are successfully implemented in power electronics and motor drives areas such as in motor control system; early detection of electrical machine faults, digital signal processing of motor's parameter etc. Back propagation method –training algorithm that was introduced by Rumelhart, Hinton, and Williams in 1986 commonly trains the feed forward ANN. The distributed weights in the network contribute to the distributed associative memory property of network. Initially the untrained network, for instance, weights selection in random manner, the output signal pattern will totally mismatch the desired output pattern for a given input pattern the actual output is being compared to the desired output pattern by adjusting the weights, using supervised back propagation algorithm until the pattern matching occurs or the produced pattern error relatively small[1].

The induction machine is used in a wide variety of applications as a means of converting electric power to mechanical work. It is without doubt the