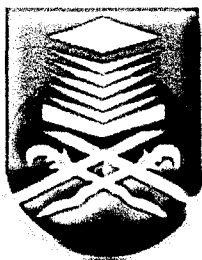


**ANALYSIS OF SPEED CONTROL OF DC MOTOR
(COMPOUND MOTOR) USING MATLAB
(SIMULINK) AND INTERFACE WITH GRAPHICAL
USER INTERFACE (GUI)**

Project Report is presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Honors) of
UNIVERSITI TEKNOLOGI MARA MALAYSIA



**MOHAMMAD BAZLI BIN MOHD AZMAN
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, MALAYSIA
MAY 2010**

ACKNOWLEDGEMENT

In the name of ALLAH, Most Generous and Most Merciful, It is with the deepest sense of gratitude of the Almighty ALLAH who gives strength and ability to complete this final year project as entitled “Analysis of Speed Control of DC Motor (Compound Motor) Using MATLAB (SIMULINK) and Interface with Graphical User Interface (GUI)”. All good aspirations, devotions and prayers are due to ALLAH whose blessing and guidance have helped me throughout the entire project.

I would like to take this opportunity to express my appreciation to my supervisor, Assoc. Prof. Pauziah Binti Mohd Asrad for her valuable guidance, encouragement, support, commitment, ideas and constructive comment along this research of project.

My special appreciation and thanks to my fellow classmate especially to Rizal Izwan Bin Ahmad for their invaluable assistances towards this thesis.

Most of all, I am very grateful to my family Mohd Azman Bin Ismail and for their unflinching encouragement and financial support they have given me over the years. Their blessing gave me the high-spirit and strength to face any problem occurred and to overcome them rightly.

Last but not least I would like to thank each and everyone who helped me directly and indirectly in completing this project.

Thank you again and May Allah blesses all of you.

ABSTRACT

This paper presents the methods of speed control of a DC machine by simulation using MATLAB/SIMULINK. The simulation model will enhance a better understanding of how the actual machines work. The three methods to control speed are armature voltage control, armature resistance control and field control. There are several types of DC motor and compound DC motor was used in this analysis to verify the motor speed by using three methods above. The simulation results using MATLAB showed that the speed will change accordingly when the different type of speed control method has been applied. The evaluation of the output has been carried out by software simulation using MATLAB in the SIMULINK and displayed by using graphical user interface (GUI).

TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE
1	INTRODUCTION	
	1.1 Aim of Thesis	2
	1.2 Modeling and Simulation	2
	1.3 DC Motor	3
	1.4 Scope of Project	3
	1.5 Problem Statement	3
	1.6 Overview of Thesis	3
2	LITERATURE REVIEW	
	2.1 General Machine Background	4
	2.2 Principle of Operation	5
	2.3 DC Machine Classifications	8
	2.3.1 Separately Exited DC Motor	9
	2.3.2 Series Self-Exited DC Motor	9
	2.3.3 Shunt Self-Exited DC Motor	10
	2.3.4 Compound Self-Exited DC Motor	11
	2.4 Speed Control of Compound DC Motor	12
	2.4.1 Field Resistance Control	14
	2.4.2 Armature Voltage Control	15
	2.4.3 Armature Resistance Control	17

CHAPTER 1

INTRODUCTION

The theory of electrical circuits represents one of most important parts of any electrical engineering education. The main aim of this thesis project is to obtain the knowledge of circuit analysis and synthesis and to experience the actual behavior of a DC motor. This requires a powerful software mathematical tool. MATLAB is software package for high performance numerical computation and visualization. The combination of analysis capabilities, flexibility, reliability, and powerful graphics makes MATLAB the premier software package for all electrical engineers. MATLAB has been enhanced by the very powerful SIMULINK program and Graphical User Interface (GUI) Program. SIMULINK is a graphical mouse-driven program for the simulation of dynamic systems. GUI is graphical user interface that develops environment of the layout and controls the DC motor in the SIMULINK program. It enables the user to simulate linear, as well as nonlinear, systems easily and efficiently.

A theory is a general statement of principle abstracted from observation. And a model is a representation of a theory that can be used for control and prediction. For a model to be useful, it must be realistic and yet simple enough to understand and manipulate. These requirements are not easily fulfilled as realistic models are seldom simple and simple models are seldom realistic. Features or behavior that is relevant must be included in the model and those that are cannot be ignored. Modeling refers to the process of analysis and synthesis to arrive at a mathematical description that contains the relevant dynamic characteristics of the particular model [1].