

A STUDY OF DC-DC BUCK-BOOST CONVERTER USING FUZZY LOGIC CONTROLLER

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Bachelor of Electrical Engineering (Hons.)

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ABSTRACT

This paper presents a study of Fuzzy Logic Controller (FLC) on Buck-Boost Converter (BBC). The objective is to improve the dynamic performance by using MATLAB-SIMULINK. The model circuit of Buck-Boost converter with FLC has been derived to analyze the effectiveness of the control methodology. The controls methodology is then verified by number of simulations and the advantages good response time in term of shortest rise time, settling time, smaller overshoot, less voltage deviations and robustness are indicated in comparison FLC with an open loop system. Simulation is held in MATLAB- SIMULINK environment.

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CHAPTER 1

INTRODUCTION

1.0 BACKGROUND

Lately, the control systems for many power electronic appliances have been increasing widely. Crucial with these demands many researcher or designer have been struggle to find most economic and reliable controller. The idea to have control system in DC-DC converter is to ensure desire voltage output can be produce efficiently to meet the demand need. Basically, feedback controller compares the output of the power processor unit with a reference value, and the error between the two is minimized by the controller. Figure 1.1 shows a power electronic system block diagram[1].

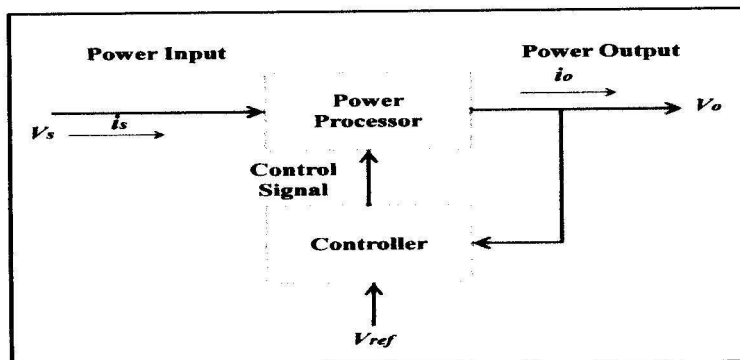


Figure 1.1: Block Diagram of Power Electronic System

Conventionally, PI, PD and PID controller are most popular controllers and widely used in most power electronic appliances but disadvantage of PID that is requires complex mathematical model of the control process or may be costly in terms of computer processing power and memory, and a system based on rules based likes FLC may be more effective. DC-DC converters have been dominating controlled by analogue integrated circuit technology and linear system control design techniques [1].