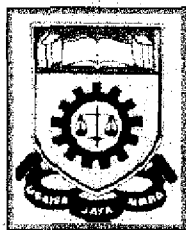


**DESIGN FUZZY LOGIC CONTROLLER
ON BALL AND BEAM SYSTEM**

**This is presented in partial fulfilment for the award of the
Bachelor of Electrical Engineering (Honours)
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ABSTRACT

The purpose of this project is to developed a fuzzy logic controller for ball and beam system. Formerly, PID (Proportional plus Integrative plus Derivative) controller was used and this project will investigate the possibility of applying fuzzy controller in the system.

The aim of the ball and beam experiment in this project is to control the position of the ball along the track by manipulating the angular position of the servo. The rolling ball should be balanced on the beam. The motor controls the beam angle.

The designing of fuzzy logic controller was based on Fuzzy-TECH software. Fuzzy-TECH generated the response of the output by applying as C code or M code that can be generated easily. In this project, the output is generated as M code.

The performance of fuzzy logic controller was also compared with the PID controller. The best controller will be proved in the end of this project.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

1.1.1 History of fuzzy

In the mid 1960s, Lotfi A. Zadeh of the University of California at Berkeley USA, created the theory of fuzzy sets. It is firmly grounded in mathematical theory of fuzzy sets. He argued that more often than not, the classes of objects meet unexpectedly in the real physical world do not have accurate defined criteria for membership.

Ebrahim H. Mamdani, the controller engineer at Queen Mary College in London and another Ph.D. student managed to administered to develop a linguistic self-organizing controller using fuzzy logic in 1909. It was a new controller that was able to learn how to correct wide variety of processes, multivariable and non-linear in a short time.

At 1989 in Japan, Michio Sugeno developed an interesting type of self-learning fuzzy controller. Self learning controllers that drive their own rules automatically are interesting, because they could extremely reduce the effort needed for translating human's specialist in the system of controller.

From 1974 onwards, there have been quite a few simulation studies, laboratory model studies and pilot plant studies. In 1978, the first fuzzy controller was used in industrial application. The fuzzy controller was operating in closed loop on a rotary cement kiln in Denmark.[1]