

A Fuzzy Logic Controller for Position Control of a Stepper Motor Using MATLAB and Simulink

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1 INTRODUCTION

This is a report for the design of a Fuzzy Logic Controller using Simulink and MATLAB. This controller is for the position control of different motors. I have chosen a DC Motor, Stepper Motor and a Picomotor for the purposes of Simulation. Any motor can be incorporated in the design. The differentiating characteristics of every motor is clearly depicted in this report. For a stepper motor, one of the most important parameter is its step angle. Common step sizes are 1.8° , 2.5° , 7.5° , 15° . In this work I have chosen the step size as 1.8° .

There are various methods offered in literature for controlling motors. Most Common being PID Controllers. However it is seen that PID like fuzzy controllers perform better than the conventional controllers. It is also shown that even without knowing the details of the control system we can construct a Fuzzy Logic Controller based on the experience about the Position Controller. Recently much more emphasis is given to the designing of PID like Fuzzy controllers.

1.1 OVERVIEW OF THE SYSTEM

In this system our aim is to keep the motor in the same position as given by the PSD (Position Sensor). This implies that the error has to be reduced to zero as the system moves towards its desired posit

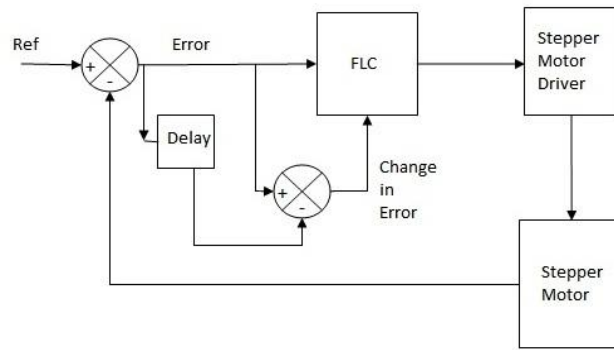


Figure 1.1: Block Diagram of the Proposed System

1.1.1 HEADING ON LEVEL 3 (SUBSUBSECTION)

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2 LISTS

2.1 EXAMPLE FOR LIST (3*ITEMIZE)

- First item in a list
 - First item in a list
 - * First item in a list
 - * Second item in a list
 - Second item in a list
- Second item in a list

2.2 EXAMPLE FOR LIST (ENUMERATE)

1. First item in a list
2. Second item in a list

3. Third item in a list