

A Comparison of Type 1 and Type 2 Fuzzy Logic Controller for DC Motor System



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Abstract In today's modern world application, there are high-level uncertainties that are faced and affecting every kind of operation in various industries. Thus, researchers, today are on the rise to find solutions that will able help to reduce these uncertainties in many types of situations especially control system applications. The type-1 Fuzzy Logic Controller is shown not to be able to handle a high level of uncertainties and the new type-2 Fuzzy Logic Controller is now being said to be able to do a better performance than the type-1 especially in controlling a DC motor system. This can be seen by the simulation graph that clearly observes the comparison of both types. The result where FLC type 2 outperforms FLC type 1 with reduced settling time and rising time can be seen. In conclusion, the new type-2 FLC is now able to overcome the limits of what type-1 FLC are able to do and this will give birth to better and improved performance of new Fuzzy Logic Controllers that is well suited as controllers for DC motor system. This paper will briefly discuss the comparison between both of these types of FLC and the benefits.

Keywords Fuzzy Logic Controller · FLC type 1 · FLC type 2 · DC motor system and control system

1 Introduction

Particularly in today's modern industry, direct current or DC motor is still a relevant option, although it is regarded as one of the oldest electric motor designs [1]. This confirms that even when opposed to modern engine models today, the DC motor has a great deal of benefits. The great controllability of the DC motor is one of the key benefits that can be seen when the DC motor is powered by only a change in the input voltage or reversing the leads [2]. Thus, every mechanism which could regulate the direction, speed, or torque of a DC-driven motor in its system and also allows its user to set it according to their will is a DC motor control system. There are several

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