

Fuzzy Logic Controller Based Speed Control of Separately Excited DC Motor

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Abstract: DC Motors are widely used in industries for various purposes. It is a doubly fed system. Many situations demand change in the speed of the DC Motor. This makes it a necessity to employ a method to effectively control the speed of a separately excited DC motor. Many methods are available to regulate the speed of a separately excited DC motor such as PID control, Fuzzy Logic Control, Neural Network Method. The Fuzzy method gives a human like intuition to the control strategy and is self-tolerant to inputs which are not so precise. The Fuzzy Logic Controller contains different components like Fuzzification, Defuzzification and Fuzzy Rule inference. The Objective is to understand the Fuzzy Rule base and inference methods and employ them in controlling the speed of the motor. It is very efficient where the precision required is not too high. It is a robust, easily controllable strategy. It is capable of realizing multiple inputs and producing different numerous outputs. Here, we discuss the Fuzzy Logic Control of the speed of DC Motor. We make use of this strategy to achieve a flexible control of the speed of the Separately Excited DC Motor. Error in speed and the derivative of Error are taken as the inputs to the Fuzzy controller and by selecting suitable membership functions we control the output of the Fuzzy controller which is subtracted from the armature supply and then supplied to the armature. In this way the speed of the DC motor is controlled by regulating the armature supply voltage.

Keywords: Fuzzy Logic Controller, Neural Network, PID control.

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