ABSTRACT

Fuzzy Logic Controller Conversion to Neural Network Controller for DC Motor Angle Position Control

Position control is one of the control systems used to control the position of an object. The position control used is angle position control, so that the angular position of the DC motor is regulated. To control an object's angular position, a good level of sensor accuracy is needed so that the system's output will match the given input.

In the process of controlling a good control method is needed to control the angular position of the DC motor. The control methods used are fuzzy logic controller (FLC) and neural network controller (NNC). The system will first run using FLC, then data will be obtained in the form of errors, errors, and system output from FLC. The data will be used as a training set for system training using the NNC control method. In the training process NNC will use the back propagation algorithm. Back propagation is a supervised learning algorithm for multilayer neural network feedforward.

This device is made to implement the back propagation algorithm on Arduino UNO. The system response using the FLC method resulted in a steady state error of <2%, an overall average overshoot <25%, and an overall average settling time of <1.6 seconds. The NNC simulation produces an average steady state error of learning outcomes <3%.

Keyword : Position Control, Fuzzy Logic Controller, Neural Network Controller, Back Propagation.