

Adaptive position tracking control of a BLDC motor using a recurrent
wavelet neural network

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Abstract

An adaptive position tracking control (APTC) system, which is composed of a neural controller and a robust controller, is proposed in this paper. The neural controller uses the recurrent wavelet neural network structure to online mimic an ideal controller, and the robust controller is designed to achieve tracking performance with desired attenuation level. The adaptive laws of APTC system are derived based on the Lyapunov stability theorem and gradient decent method. Finally, the proposed APTC method is applied to a brushless DC (BLDC) motor. Experimental results verify that a favorable tracking response can be achieved by the proposed APTC method even under the change of position command frequency after training of RWNN.

Keyword : Lyapunov stability theorem, brushless DC (BLDC) motor