IDENTIFICATION OF DYNAMICAL SYSTEM BASED ON CHEBYSHEV RECURRENT WAVELET NEURO-FUZZY NETWORK

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Abstract

In this study, Chebyshev Recurrent Wavelet Neuro-Fuzzy network, (CRWNF), based on the structure of TSK neuro-fuzzy model, uses Chebyshev Recurrent Wavelet Neural networks as inferring mechanisms. Wavelet basis functions have the ability to localize both in time and frequency domains. The outputs of Chebyshev Recurrent Wavelet Neural network have the previous outputs of its own which make it as a dynamical mapping mechanism. Hence, CRWNF with dynamical mapping functions can identify nonlinear dynamical system effectively. In this paper, the ball-screw-driving system is used as a nonlinear frictional dynamic system. According to the simulation results, the proposed CRWNF, comparing the effectiveness of the models ANFIS and RNN, has impressive generalization ability.

Key Words: Chebyshev、wavelet、neuro-fuzzy network、recurrent neural network

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