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A New Approach for Controlling Chaos Based on Direct Optimizing Predictive Control

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Abstract: We introduce the predictive control theory into the study of chaos control and propose a direct optimizing predictive control algorithm based on a neural network model. The proposed control system stabilizes the chaotic motion in an unknown chaotic system onto the desired target trajectory. Compared with the existing similar algorithms, the proposed control system has faster response, so it requires much shorter time for the stabilization of the chaotic systems. The proposed approach can control hyperchaos and the algorithm is simple. The convergence of the control algorithm and the stability of the control system can be guaranteed. The theoretic analysis and simulations demonstrate the effectiveness of the algorithm.

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Key words: chaos control, predictive control, chaotic system, neural networks