

# Robust $H_\infty$ Pinning Synchronization for Multiweighted Coupled Reaction-Diffusion Neural Networks

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**Abstract:** This article focuses on the robust  $H_\infty$  synchronization of two types of coupled reaction-diffusion neural networks with multiple state and spatial diffusion couplings by utilizing pinning adaptive control strategies. First, based on the Lyapunov functional combined with inequality techniques, several sufficient conditions are formulated to ensure  $H_\infty$  synchronization for these two networks with parameter uncertainties. Moreover, node-based pinning adaptive control strategies are devised to address the robust  $H_\infty$  synchronization problem. In addition, some criteria of  $H_\infty$  synchronization for these two networks under parameter uncertainties are developed via edge-based pinning adaptive controllers. Finally, two numerical examples are presented to verify our results.

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