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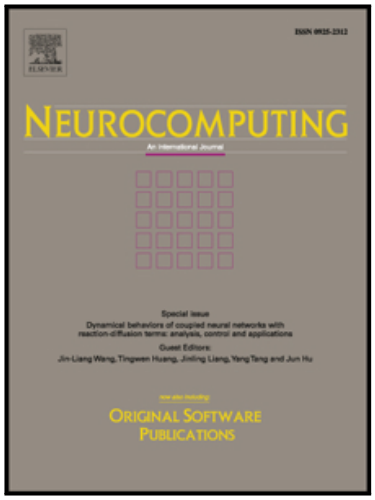

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Analysis and pinning control for passivity of coupled reaction-diffusion neural networks with nonlinear coupling

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Abstract

This paper addresses the passivity and passivity-based synchronization problems of an array model of nonlinearly coupled neural networks (NCNNs) with reaction-diffusion terms. Several sufficient conditions are established to guarantee the passivity of the considered network model by exploiting the Lyapunov functional method and some inequality techniques. Additionally, pinning control is an efficient technique for the investigation of passivity of complex networks. Because of this, the passivity of the proposed model is further studied by designing suitable pinning controller, and some pinning passivity criteria are also presented. On the other hand, the relationship between stability and (pinning) passivity is also analyzed. Several criteria for (pinning) synchronization are established by taking advantage of the relationship between exponential stability and (pinning) passivity. In the last, we

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