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under Mixed Topologies

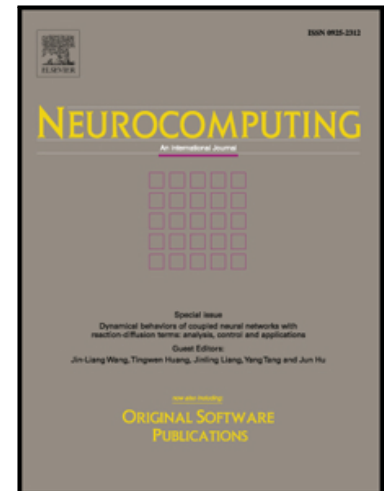
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Synchronization Criterion of Complex Networks with Time-delay under Mixed Topologies

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Abstract

Two kinds of synchronization issues are studied in this paper. First, the synchronization problems of complex network with time-delay are investigated using pinning control. A type of original mixed topologies with time-delay is proposed, which contains directed networks and undirected networks. The pinning controllers are constructed to make the networks synchronization. Second, the synchronization problems between two different complex dynamical networks with time-delay are investigated using Taylor expansion. The two different complex networks have various topological structures. Finally, simulation examples illustrate that the theoretical methods are effective.

Keywords: Complex networks, Taylor expansion, synchronization, mixed topologies, time-delay.

1. Introduction

Complex dynamical networks are broadly used to simulate lots of systems, like the electricity grid, communication network, social networks, that attracted many people's attention [1-12]. Synchronization, as a very important phenomenon, has often appeared in papers [10-21,25,28-30]. The consensus of multiagent systems is a similar topic to synchronization. Thus, some

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