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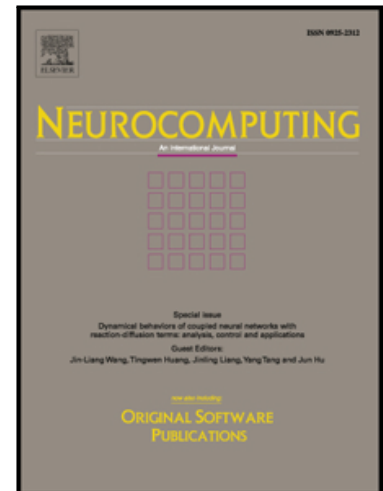
Shidong Zhai, Min Xiao, Qingdu Li

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Synchronization analysis of coupled identical linear systems with antagonistic interactions and time-varying topologies

Shidong Zhai^{a,*}, Min Xiao^a, Qingdu Li^{a,**}

^aResearch Center of Analysis and Control for Complex Systems, and Key Laboratory of Industrial Internet of Things & Networked Control, Ministry of Education, Chongqing University of Posts and Telecommunications, 400065 Chongqing, China

Abstract

The paper investigates bipartite synchronization (BS) and bounded bipartite synchronization (BBS) of a network of identical linear systems with antagonistic interactions and time-varying topologies. When at each time instant all agents can be divided into two hostile camps, and the members of two hostile camps are unchanged as time goes on, we obtain some sufficient conditions for bipartite synchronization under mild assumption that the signed graph is uniformly quasi-strongly connected. When the members of hostile camps are changed as time goes on, or at some time instants all agents cannot be divided into two hostile camps, we consider this network as a perturbation of a particular network which can achieve bipartite synchronization. We obtain some sufficient conditions such that the network achieves bounded bipartite synchronization. Finally, we present two numerical examples to illustrate the effectiveness of the obtained results.

Keywords: Bipartite synchronization, bounded bipartite synchronization, signed graphs, linear systems

1. Introduction

Consensus or synchronization phenomenon is the main research topic in multi-agent systems and complex networks. This striking phenomenon

*E-mail address: zhaisd@cqupt.edu.cn

**E-mail address: liqd@cqupt.edu.cn

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