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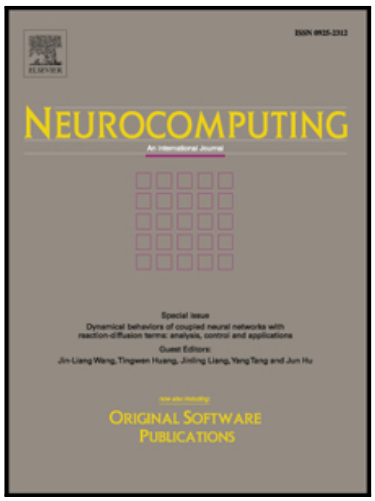

Adaptive leaderless consensus of agents in jointly connected networks

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Adaptive leaderless consensus of agents in jointly connected networks

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Abstract

In this paper, the leaderless consensus problem of multi-agent systems with jointly connected topologies and nonlinear dynamics is considered, in which the nonlinear dynamics are assumed to be non-identical and unknown. The unknown nonlinear dynamics existing in the systems are assumed to be linearly parameterized, and an adaptive design method for leaderless multi-agent systems is presented. By just using the relative position information between each agent and its neighbours, a distributed adaptive consensus control algorithm for the considered systems is proposed, in which the network graphs are jointly connected. Both the global uniform asymptotical stability and the global uniform asymptotical parameter convergence analysis of the adaptive control algorithm are carried out by using adaptive control theory, Lyapunov theory and algebraic graph theory. Finally, an example is given to illustrate the validity of our theoretical results.

Keywords: Adaptive consensus, Decentralized control, Parameter convergence, Jointly connected topology, Multi-agent system

1. Introduction

Distributed cooperative control of multi-agent systems has been taken much attentions by many researchers in automatical control and multi-robot coordination. Its broad applications include in various fields, such as, multi-

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