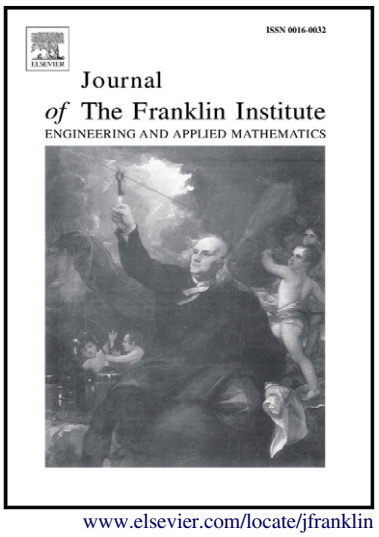
Author's Accepted Manuscript



www.elsevier.com/locate/jfranklin

Guaranteed cost consensus for multi-agent systems with time delays

Zhong Wang, Jianxiang Xi, Zhiyong Yu, Guangbin Liu

PII: S0016-0032(14)00333-0
DOI: http://dx.doi.org/10.1016/j.jfranklin.2014.11.017
Reference: FI2175

To appear in: *Journal of the Franklin Institute*

Received date: 23 June 2014
Revised date: 22 September 2014
Accepted date: 20 November 2014

Cite this article as: Zhong Wang, Jianxiang Xi, Zhiyong Yu, Guangbin Liu, Guaranteed cost consensus for multi-agent systems with time delays, *Journal of the Franklin Institute,* http://dx.doi.org/10.1016/j.jfranklin.2014.11.017

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Guaranteed cost consensus for multi-agent systems with time delays

Zhong Wang, Jianxiang Xi[☆], Zhiyong Yu, and Guangbin Liu

High-Tech Institute of Xi'an, Xi'an, 710025, People's Republic of China

Abstract

Guaranteed cost consensus problems for multi-agent systems with time delays are considered. The idea of guaranteed cost control is introduced into consensus problems for multi-agent systems with time delays, where a guaranteed cost function is proposed to simultaneously consider the consensus regulation performance and the energy consumption. For fixed topologies and switching topologies, some sufficient conditions for guaranteed cost consensus are given respectively by the state space decomposition approach and the Lyapunov method. Moreover, an upper bound of the guaranteed cost function and the consensus value are determined respectively for the two cases. Numerical simulations are presented to demonstrate the effectiveness of theoretical results.

Key words: Multi-agent system; guaranteed cost consensus; time delay; fixed topology; switching topology

1. Introduction

Consensus problems for multi-agent systems have been studied extensively (see the survey papers [1–4] and references therein) during the last ten years. Generally speaking, consensus refers to a group of agents asymptotic reaching an agreement on a certain interesting state. Many researchers have considered consensus problems from different viewpoints including the dynamics of agents, the structure of the interaction topology, exchanging information among agents and the convergence rate.

In practice applications, the communication time delay among agents is ubiquitous in the process of exchanging information [5] and the input time delay is often inside the sys-

[☆]Corresponding author: Jianxiang Xi (e-mail: xijx07@mails.tsinghua.edu.cn)

Accepted manuscript

Download English Version:

https://daneshyari.com/en/article/4974759

Download Persian Version:

https://daneshyari.com/article/4974759

Daneshyari.com