

Author's Accepted Manuscript

Leader-following consensus of multi-agent system
with a smart leader

Zhengguang Ma, Zhongxin Liu, Zengqiang Chen



PII: S0925-2312(16)30680-4
DOI: <http://dx.doi.org/10.1016/j.neucom.2016.06.042>
Reference: NEUCOM17292

To appear in: *Neurocomputing*

Received date: 19 December 2015
Revised date: 25 March 2016
Accepted date: 15 June 2016

Cite this article as: Zhengguang Ma, Zhongxin Liu and Zengqiang Chen, Leader following consensus of multi-agent system with a smart leader, *Neurocomputing* <http://dx.doi.org/10.1016/j.neucom.2016.06.042>

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.

Leader-following consensus of multi-agent system with a smart leader

Zhengguang Ma^{a,b}, Zhongxin Liu^{a,b,*}, Zengqiang Chen^{a,b}

^aCollege of Computer and Control Engineering, Nankai University, Tianjin 300071, China

^bTianjin Key Laboratory of Intelligent Robotics, Nankai University, Tianjin, 300071, China

Abstract

In line of the research on leader-following consensus, this paper studies the consensus problem for the first-order multi-agent system with a smart leader. Different from previous works where the leader is independent of all the other agents, a kind of leader, called smart leader, is proposed, which can gain and utilize its neighboring followers' position information. Whether such information will be used in adjusting the control algorithm for the smart leader is decided by an event-trigger function. The theory and simulation results show that the proposed model can gain advantage in robustness and fault-tolerance ability with the traditional one. Moreover, a sufficient condition is provided, which can ensure that the position-tracking error and velocity-tracking error are bounded when some actuator faults occur on some of the followers in the framework of the fixed topology. In addition, similar results are also given under switching topology. Finally, some simulation examples are presented for illustration.

Keywords: Leader-following consensus, Multi-agent system, Smart leader, Actuator fault, Event-trigger function.

1. Introduction

There is growing recognition in both science and engineering applications that how the members of the multi-agent system (MAS) can realize the leader-

*Corresponding author

Email address: lzhx@nankai.edu.cn (Zhongxin Liu)

Download English Version:

<https://daneshyari.com/en/article/4948439>

Download Persian Version:

<https://daneshyari.com/article/4948439>

[Daneshyari.com](https://daneshyari.com)