

Accepted Manuscript

Distributed Multi-robot Formation Control in Switching Networks

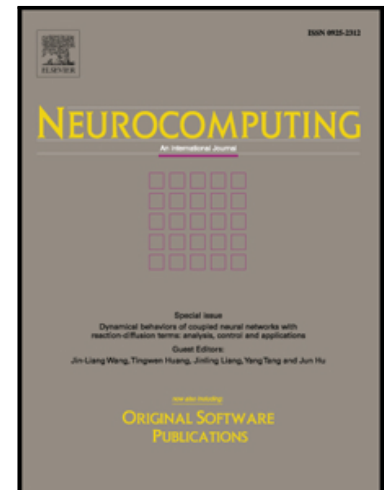
Qin Wang, Zuwen Chen, Peng Liu, Qingguang Hua

PII: S0925-2312(17)31077-9
DOI: [10.1016/j.neucom.2016.12.104](https://doi.org/10.1016/j.neucom.2016.12.104)
Reference: NEUCOM 18578

To appear in: *Neurocomputing*

Received date: 30 May 2016
Revised date: 29 September 2016
Accepted date: 1 December 2016

Please cite this article as: Qin Wang, Zuwen Chen, Peng Liu, Qingguang Hua, Distributed Multi-robot Formation Control in Switching Networks, *Neurocomputing* (2017), doi: [10.1016/j.neucom.2016.12.104](https://doi.org/10.1016/j.neucom.2016.12.104)



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 proof before it is published in its final 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.

Distributed Multi-robot Formation Control in Switching Networks[☆]

Qin Wang^{1,2*}, Zuwen Chen¹, Peng Liu², Qingguang Hua¹

1. School of Information Engineering, Yangzhou University, Yangzhou, 225127, China

2. Southeast University, Nanjing, 210096, China

Abstract

A rigid formation control problem with switching topology is studied in this paper. Then the nonsmooth analysis and nonlinear theory are employed to analyze the stability of the multi-robot formation system. By use of the navigation function method and the adaptive perturbation method, the proposed formation control law can guarantee the global stabilization of the rigid formation and the collision avoidance between communicating robots regardless of the topology switching, as long as the graph topology remains rigid all the time. The effectiveness of the proposed control strategy is verified by simulation examples.

Keywords: globally rigid formation; switching topology; formation-shape control

1. Introduction

In recent years, with the continuous development of mobile robotics and its application technology, the system control complexity and the communication traffic of multiple robots increase, and it is difficult to use traditional algorithms[1, 2] to solve these problems. Thus, multi-agent coordination

[☆]Wang Qin, e-mail: qinwang@yzu.edu.cn. This work is supported by National Nature Science Foundation under grants 61503329 and 61473249, the Natural Science Foundation of Jiangsu Province BK20140490, the Natural Science Foundation of the Jiangsu Higher Education Institutions of China under grant 14KJD120003.

*Corresponding author

Email address: qinwang@yzu.edu.cn (Qin Wang^{1,2})

Download English Version:

<https://daneshyari.com/en/article/4946831>

Download Persian Version:

<https://daneshyari.com/article/4946831>

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