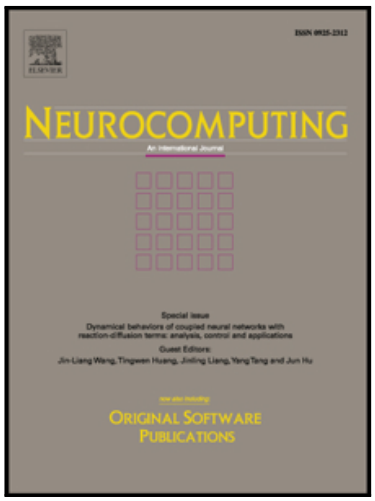

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Distributed Multi-robot Formation Control in Switching Networks☆

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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

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