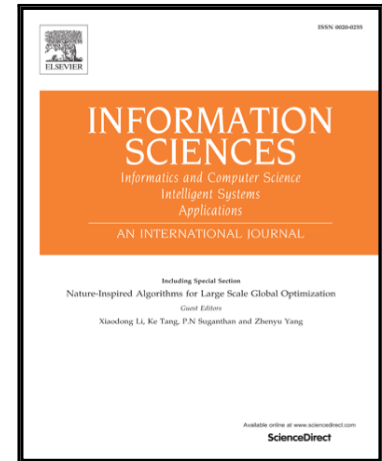


Accepted Manuscript

A new design of sliding mode control for Markovian jump systems based on stochastic sliding surface

Jianyu Zhang, Qingling Zhang, Yingying Wang

PII: S0020-0255(17)30414-0
DOI: [10.1016/j.ins.2017.02.005](https://doi.org/10.1016/j.ins.2017.02.005)
Reference: INS 12728



To appear in: *Information Sciences*

Received date: 28 December 2015
Revised date: 19 August 2016
Accepted date: 2 February 2017

Please cite this article as: Jianyu Zhang, Qingling Zhang, Yingying Wang, A new design of sliding mode control for Markovian jump systems based on stochastic sliding surface, *Information Sciences* (2017), doi: [10.1016/j.ins.2017.02.005](https://doi.org/10.1016/j.ins.2017.02.005)

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.

A new design of sliding mode control for Markovian jump systems based on stochastic sliding surface

Jianyu Zhang^{a,d}, Qingling Zhang^{a,b,*}, Yingying Wang^c

^a*Institute of Systems Science, Northeastern University, Shenyang 110819, PR China*

^b*State Key Laboratory of Synthetical Automation for Process Industries, Shenyang*

^c*College of Information Science and Engineering, Northeastern University, Shenyang*

^d*Guidaojiaotong Polytechnic Institute, Shenyang 110023, PR China*

Abstract

With the jumping transfer matrix unknown, partly unknown or known, the stabilization problems for Markovian jump systems are considered by use of sliding mode control method in this paper. Firstly, a new integral sliding mode surface named stochastic sliding surface (SSS) is introduced. The SSS is characterized that the state trajectories are on the sliding surface all the time even at the time of system switching. So the problem of the state trajectories moving among several sliding surfaces by use of traditional sliding mode control method is settled perfectly. Based on the new sliding mode surface, sufficient conditions for the stability of the sliding mode dynamics are derived. Secondly, sliding mode control (SMC) law is synthesized to avoid the state trajectories escaping from the surface. Finally, some simulations are provided to illustrate the validity of the proposed method.

Keywords: Stochastic sliding surface; Markovian jump systems; Time delay; Integral sliding mode control; Uncertainty.

1. Introduction

In the last years, there has been significant improvements in control field, e.g., stabilization [21], [36], sliding mode control [1], [7], [11], [14], [16], fuzzy

*Corresponding author at: Institute of Systems Science, Northeastern University, Shenyang 110819, PR China.

Email addresses: jy_zhang331@sina.com (Jianyu Zhang), qlzhang@mail.neu.edu.cn (Qingling Zhang), yying_wang@sina.com (Yingying Wang)

Download English Version:

<https://daneshyari.com/en/article/4944506>

Download Persian Version:

<https://daneshyari.com/article/4944506>

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