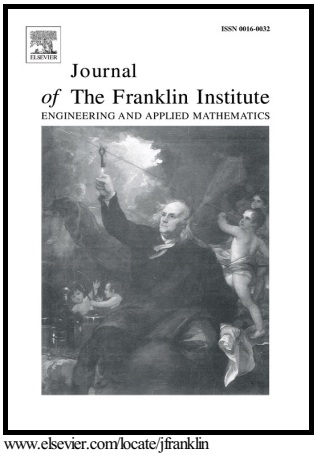
Author's Accepted Manuscript



www.elsevier.com/locate/jfranklin

Robust finite-time dissipative control subject to randomly occurring uncertainties and stochastic fading measurements

Jun Song, Yugang Niu, Shaobo Wang

PII: S0016-0032(16)30262-9
DOI: http://dx.doi.org/10.1016/j.jfranklin.2016.07.020
Reference: FI2677

To appear in: *Journal of the Franklin Institute*

Received date: 29 September 2015
Revised date: 5 June 2016
Accepted date: 30 July 2016

Cite this article as: Jun Song, Yugang Niu and Shaobo Wang, Robust finite-time dissipative control subject to randomly occurring uncertainties and stochastic fading measurements, *Journal of the Franklin Institute* http://dx.doi.org/10.1016/j.jfranklin.2016.07.020

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

Robust finite-time dissipative control subject to randomly occurring uncertainties and stochastic fading measurements

Jun Song[a], Yugang Niu[a*], Shaobo Wang[b]

[a]Key Laboratory of Advanced Control and Optimization for Chemical Process (East China University of Science and Technology), Ministry of Education, Shanghai 200237, China

[b]Automation Division of Shanghai Electric Group Co., Ltd., Shanghai, China

This study considers the finite-time dissipative control problem for a class of discrete stochastic systems under the circumstance of wireless communication networks, in which both randomly occurring uncertainties and stochastic fading measurements are involved. A modified stochastic Rice fading model with *disturbance-dependent Gaussian noise* is put forward to better reflect the fading phenomena in complex wireless communication networks. By introducing a novel concept of *finite-time stochastic exponential dissipative*, this work designs a state-feedback controller such that the closed-loop system is finite-time stochastic bounded with a prescribed exponential dissipativity performance. Moreover, some parameters-dependent sufficient conditions on the existence of the finite-time dissipative controller are derived and the corresponding computation algorithm is given. An numerical example is finally provided to illustrate the effectiveness of the proposed design approach.

Keywords: dissipative control; finite-time boundedness; randomly occurring uncertainties; stochastic fading measurements; stochastic systems

Accepted manuscript

1. Introduction

In today's pervasive networked environments, more information is transmitted via wired/wireless communication links. Due to limited bandwidth, the network load may randomly fluctuate and the signal transmission may suffer from unpredictable networked-induced phenomena. Among them, in order to cope with the uncertainties of system may occur in a random way, the concept of randomly occurring uncertainties (ROUs) was introduced in [1]. To date, the occurrence of ROUs has gained some particular research interest, see, e.g., [2] and [3]. Meanwhile, another special phenomenon typically induced by wireless communication networks, namely, channel fading, has been paid more and more attentions by many researchers [4–6]. Generally speaking, when a signal is transmitted over a wireless channel, it is inevitably subject to some special physical phenomena

* *Corresponding author.* E-mail: acniuyg@ecust.edu.cn (Y. Niu); jun_song@mail.ecust.edu.cn (J. Song).

Download English Version:

https://daneshyari.com/en/article/4974306

Download Persian Version:

https://daneshyari.com/article/4974306

Daneshyari.com