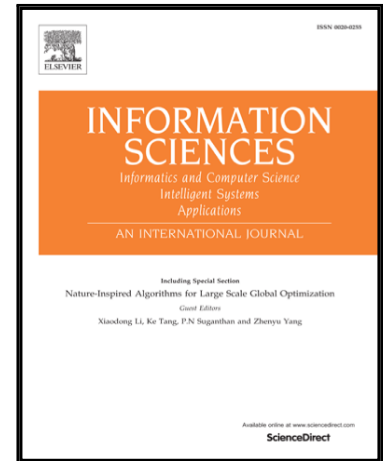


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# Static Output Feedback Control of Nonhomogeneous Markovian Jump Systems with Asynchronous Time Delays

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## Abstract

This paper investigates the problem of static output feedback control for a class of nonhomogeneous Markovian jump system (NMJS) with asynchronous time delays (ATDs). Since the ATDs subject to uncertain transition probabilities (TPs) are taking into account in a practical phenomenon, new approaches are introduced to deal with the ATDs characterized by nonhomogeneous Markov processes. It is assumed that the communication links are not perfect due to its detrimental effect on the performance of systems. Stochastic variables are presented to characterize the data transmission, which are depending on operation modes and satisfying the Bernoulli distribution. Sets of slack variables are adopted to decouple the product terms between system matrices and Lyapunov matrices. Based on an extended Lyapunov function combined with Finsler inequality approach, the robust static output-feedback controller is designed for the closed-loop NMJS. Finally, a numerical example is provided to verify the design method.

*Keywords:* Nonhomogeneous Markovian jump system, asynchronous time delay, output feedback control, discrete-time, time-varying transition probability.

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## 1. Introduction

Over the past few decades, Markovian jump systems (MJSs) have been attracting considerable attention for its strong practical application with random, such as networked control systems, economics systems, communication systems, see [1-5, 40-42] and the references therein. It has been shown that, the random

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