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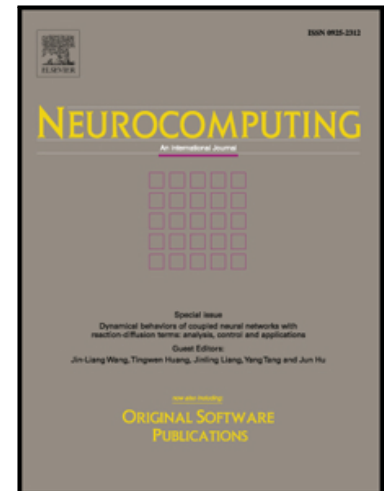
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Improved Stability and Stabilization Criteria for Uncertain Discrete-time Switched TS fuzzy Systems with Time-varying Delays

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Abstract

This paper investigates the robust asymptotic stability analysis and the output feedback stabilization problems for a class of uncertain discrete-time switched TS fuzzy systems with immeasurable states and time-varying delays. By utilizing Generalized *JSH*-transformation and Rouchés' theorems, delay-sufficient conditions are developed for achieving the mission of reducing conservatism and to break with existing ones which are formulated in terms of linear matrix inequalities (LMIs). Then, a switched TS fuzzy state observer is designed to obtain the estimations of the unmeasured states. Lastly, one comparative example and a practical example are given to illustrate the effectiveness of the proposed results.

Keywords: Switched TS fuzzy systems; Robust asymptotic stability; Switched fuzzy state observer; Polytopic uncertainties; Rouchés' theorems; Time-varying delays.

1. Introduction

As an important class of hybrid systems, switched systems arise in many practical processes that cannot be described by exclusively continuous or exclusively discrete models, such as manufacturing, communication networks,

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