

Accepted Manuscript

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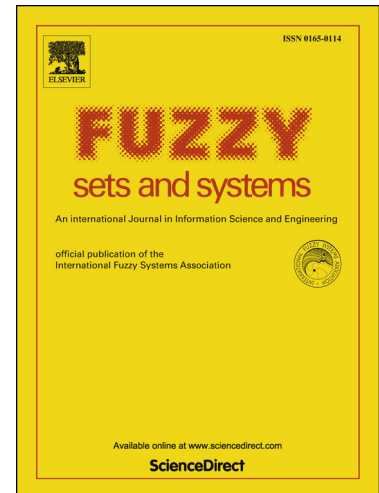
PII: S0165-0114(17)30211-7
DOI: <http://dx.doi.org/10.1016/j.fss.2017.05.011>
Reference: FSS 7227

To appear in: *Fuzzy Sets and Systems*

Received date: 14 December 2015
Revised date: 20 April 2017
Accepted date: 9 May 2017

Please cite this article in press as: S. Maalej et al., Stabilization of Takagi–Sugeno models with non measured premises: Input-to-state stability approach, *Fuzzy Sets Syst.* (2017), <http://dx.doi.org/10.1016/j.fss.2017.05.011>

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Stabilization of Takagi-Sugeno models with non measured premises: Input-to-State Stability approach

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Abstract

This work deals with the observer-based output stabilization problem for Takagi-Sugeno models with non-measured premises. It aims at providing efficient design methods for the controller/observer pair with minimal constrained hypothesis on the model non-linear functions. The main idea is to consider the closed loop and the error dynamic as two interacting subsystems and study them in the Input To State Stability framework. This paper provides also some results about the existence of a stabilizing output feedback for all models of a sub-class of Takagi-Sugeno models. To illustrate the efficiency of the proposed design procedures, illustrative examples and a comparative study with existing results in the literature based on more restrictive hypothesis are presented.

Keywords: Takagi-Sugeno models, non-measured premises, Lyapunov, Input to State Stability, Linear Matrix Inequalities.

1. Introduction

When engineers analyze and design non-linear systems in electrical circuits, mechanical systems, control systems, and other engineering disciplines, they need to absorb a wide range of non-linear analysis tools. One popular solution

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