

Upper Bounds of Performances Guided Robust Hybrid Controller

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Abstract: In this paper the multiple models and switching controllers is used for control of system with unmodeled dynamics. The analog part of the system is described by finite set of continuous models with unmodeled dynamics. As a set of controllers is used a finite set of LQ controllers with the prescribed degree of stability. Using linear matrix inequalities it is derived LQ controllers and upper bounds for index of performances. The set of upper bounds is used for creation of switching sequence. For so given switching system the robust asymptotic stability is proved.

Keywords: Multiple models, unmodeled dynamics, switching controllers, stability

1 Introduction

THE HYBRID dynamical system is a dynamical system that involved the interaction of discrete and continuous dynamics. Continuous variables take the values from the set of real numbers and discrete variables take the values from a finite set of symbols. Analog part of the hybrid system, in this paper, is described with differential equation [1]. The discrete part of hybrid system belongs to the area of discrete event system such as automata, max-plus algebra or Petry nets [2].

From the classical control theory point of view hybrid system can be considered as a switching control between analog feedback loops [3] and [4].

In the area of hybrid control system now we have different approaches. In [5] mixed logical model for hybrid system is proposed. The model is described by linear differential equation subject to linear mixed-integer inequalities. The system with inequality constraints can be described with complementarity class of hybrid

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