

## [2009-0693] Feedback Control for the Discrete-time Linear Switching Systems with State and Control Bounds in the Presence of Disturbances

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摘要

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## [2009-0693] Feedback Control for the Discrete-time Linear Switching Systems with State and Control Bounds in the Presence of Disturbances

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Abstract

The main contribution of this paper is to present some stability synthesis results for a subclass of hybrid systems, which is the discrete-time linear switching systems whose changes in the dynamics are determined by exogenous, uncontrollable events, and resets are present. In the presence of additive bounded disturbances, also with state and control input constraints, the linear state feedback controller design which can stabilize the system is investigated in the sense of input to state stability (ISS). The concept of controlled D-invariance is introduced for this class of hybrid systems, and a necessary and sufficient condition to test the controlled D-invariance of a hybrid region is given. After this, a procedure for the computation of the feedback matrices which can stabilize the disturbed linear switching systems and also satisfy the state and control input constraints is proposed. Finally, a numerical example made up of two subsystems is given to show the applicability of the technique.

Key words

[Switching systems](#) [disturbances](#) [constraints](#) [stabilization problem](#) [input to state stability \(ISS\)](#)

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