

论文

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## 一类带有变时滞的广义切换系统的滑模控制

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### 摘要

研究一类具有非匹配不确定性和变时滞的广义切换系统的滑模控制问题。首先, 基于Lyapunov 稳定性理论和线性矩阵不等式(LMI) 技术, 针对每个子系统设计对应的积分型滑模面, 给出了每个滑动模态方程鲁棒渐近稳定的充分条件; 然后, 设计了滑模控制器及切换规则, 使得闭环系统的状态能够达到滑模面上, 产生滑动模态; 最后以仿真实例说明了所提出方法的有效性。

**关键词** : 切换系统, 广义系统, 变时滞, 积分型滑模, 不确定, 线性矩阵不等式

### Abstract :

The sliding mode control problem for a class of singular switched systems with mismatched uncertainty and time-varying delay is studied. Firstly, based on Lyapunov stability theory and linear matrix inequality techniques, integral-type sliding surface is designed for each subsystem, and the sufficient condition of robust asymptotic stability is deduced for each sliding mode dynamic equation. Then sliding mode controller and a set of switching laws are devised to insure the reachability of sliding mode for the closed-loop system, and thus the sliding mode dynamics is resulted. Finally, a numerical example shows the effectiveness of the proposed approaches.

**Key words** : switched systems descriptor system time-varying delay integral-type sliding mode uncertain LMI

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