

论文

Delta 算子不确定系统的滑模变结构控制

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摘要:

研究?? 算子系统滑模变结构控制的综合问题. 首先, 利用线性矩阵不等式方法给出了切换面存在的充分条件, 分析了 δ 算子变结构控制系统的到达条件, 将连续系统和离散系统统一到?? 算子系统. 基于指数趋近律, 给出滑模变结构控制一般方法. 其次, 给出一类 δ 算子不确定系统的滑模控制器设计, 分析了准滑动模态的渐近稳定性, 使得系统具有良好的动态性能. 最后, 用一个仿真实例说明在采样周期取值非常小的前提下, 该方法设计的滑模变结构控制仍具有可行性和有效性.

关键词: δ 算子; 变结构控制; 趋近律; 线性矩阵不等式

Sliding mode variable structure control for uncertain Delta operator systems

Abstract:

The synthesis problem of designing sliding mode variable structure control(VSC) is considered for Delta operator systems. First of all, a sufficient condition for the existence of linear sliding surface in terms of linear matrix inequality(LMI) approach is given, and the proposed approach brings previous related conclusions of continuous systems and discrete-time systems into unified Delta operator systems. Sliding mode VSC strategy for Delta operator systems is obtained by employing exponential reaching law. Then, variable structure controller for a class of uncertain Delta operator systems with internal parameter perturbation and external disturbance is designed, and the asymptotic stability of quasi-sliding mode is proved. Good dynamic properties can be obtained at the same time. Finally, under the premise of the very small sampling period, the simulation result shows the feasibility and effectiveness of the proposed approach.

Keywords: delta operator; variable structure control(VSC); reaching law; linear matrix inequality (LMI)

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