

论文

一类不确定性非线性系统的状态反馈鲁棒自适应控制器的设计与分析

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摘要:

该文考虑一类具有一般不确定性和部分参数未知的非线性系统(1), 设计出一种用于跟踪参考信号的状态反馈鲁棒自适应控制器, 此控制器对系统参数和状态的不确定性具有鲁棒性, 能保证闭环系统的全局稳定性, 并解决了跟踪问题. 仿真结果表明, 所设计的鲁棒自适应控制系统具有良好的跟踪性能, 而且控制量在容许控制的范围之内.

关键词: 不确定性非线性系统; 状态反馈; 鲁棒自适应控制; 全局稳定性; ϵ 跟踪

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Robust Adaptive State Feedback Controller Design and Analysis of a Class of Uncertain Nonlinear Systems

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Abstract:

In this paper, a class of nonlinear systems (1) with general uncertainties and part unknown parameters is considered, and a robust adaptive state feedback controller is designed for tracking reference signal. The controller is robust to the uncertainties of both the parameter and the state of the system. The global stability of the resulting closed loop system can be guaranteed and the ϵ tracking problem has been solved as well. The good track effect of the adaptive robust controller and the range of the admissible control for used control quantities are presented in the examples of simulation.

Keywords: Uncertain nonlinear systems; State feedback; Robust adaptive control Global stability; ϵ tracking

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