

短文

## 一类具有未知死区MIMO系统的自适应模糊控制

张天平, 裔扬

扬州大学信息工程学院计算机系 扬州 225009

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摘要

针对一类具有未知死区并具有下三角函数控制增益矩阵的不确定MIMO非线性系统, 根据滑模控制原理, 并利用Nussbaum函数的性质, 提出了一种自适应模糊控制器的设计方案. 该方案取消了函数控制增益符号已知和死区模型参数上界、下界已知的条件. 通过引入积分型李亚普诺夫函数及最优逼近误差与死区扰动上界的自适应补偿项, 证明了闭环系统是稳定的, 跟踪误差收敛到零. 仿真结果表明了该方法的有效性.

关键词 [死区](#) [模糊控制](#) [自适应控制](#) [滑模控制](#) [Nussbaum函数](#)

分类号

## Adaptive Fuzzy Control for a Class of MIMO Nonlinear Systems with Unknown Dead-zones

ZHANG Tian-Ping, YI Yang

1. Department of Computer, College of Information Engineering, Yangzhou University, Yangzhou 225009, P. R. China

2. Research Institute of Automation, Southeast University, Nanjing 210096, P. R. China

Abstract

A design scheme of adaptive fuzzy controller for a class of uncertain MIMO nonlinear systems with unknown dead-zones and a triangular control structure is proposed in this paper. The design is based on the principle of sliding mode control and the property of Nussbaum function. The approach does not require a priori knowledge of the signs of the control gains and the upper bounds and lower bounds of dead-zone parameters to be known a priori. By introducing the integral-type Lyapunov function and adopting the adaptive compensation term of the upper bound of the optimal approximation error and the dead-zone disturbance, the closed-loop control system is proved to be semi-globally stable in the sense that all signals involved are bounded, with tracking errors converging to zero.

Key words [Dead-zone](#) [fuzzy control](#) [adaptive control](#) [sliding mode control](#) [Nussbaum function](#)

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通讯作者 张天平 [tpzhang@yzu.edu.cn](mailto:tpzhang@yzu.edu.cn)

作者个人主页 张天平; 裔扬

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