



航空学报 » 1998, Vol. 19 » Issue (1) :59-62 DOI:

论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索

<< << 前一页 | 后一页 >> >>

一类非线性系统的反馈非线性化镇定

龚诚¹, 卢广山², 王永年²

1. 西北工业大学电子工程系, 西安, 710072; 2. 航空工业总公司电光设备研究所, 洛阳, 471009

STABILIZATION OF A FAMILY OF NONLINEAR SYSTEMS VIA FEEDBACK NONLINEARIZATION

Gong Cheng¹, Lu Guangshan², Wang Yongnian²

Northwestern Polytechnical University, Xi'an 710072; E/O Equipment Technology Research Institute, Luoyang, 471009

摘要

参考文献

相关文章

Download: PDF (262KB) HTML OKB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 给出了一类非线性系统的状态反馈非线性化镇定的方法。首先构造一个人为的输出映射, 使得系统的零动态渐近稳定并具有向量相对阶 $\{1, \dots, 1\}$; 然后构造一类控制器使得零输出流形服从一类指数稳定的非线性动态方程。利用非线性 H_∞ -控制一个基本结果证明了在较弱的条件下, 所得到的闭环系统是局部渐近稳定的。最后以刚体姿态控制为例, 说明了利用上述结果, 可以得到一类仅仅需要知道系统惯性矩阵元素相对值的反馈方案, 从而在一定程度上克服了反馈线性化方法需要精确知道系统参数的弱点。

关键词: 非线性系统 几何方法 姿态控制

Abstract: An approach to stabilize a family of nonlinear systems via feedback nonlinearization is presented. A dummy output mapping is constructed so that the zero dynamics are made asymptotically stable and the system is of relative degree $\{1, \dots, 1\}$; then a group of controllers are designed that guarantee the exponential attractivity of the zeroing output manifold. Using tools in nonlinear H_∞ control theory, it is shown that under mild conditions, the resulting closed loop system is locally asymptotically stable. Finally, these results are used to the attitude control problem for a rigid body to design detumbling controllers that only require knowledge of relative value of the system inertial parameters. This technique seems attractive in that, to a certain extent, it may lessen the need of precise system knowledge required by the feedback linearization technique.

Keywords: nonlinear systems geometric approach attitude control

Received 1997-03-10; published 1998-02-25

引用本文:

龚诚; 卢广山; 王永年. 一类非线性系统的反馈非线性化镇定[J]. 航空学报, 1998, 19(1): 59-62.

Gong Cheng; Lu Guangshan; Wang Yongnian. STABILIZATION OF A FAMILY OF NONLINEAR SYSTEMS VIA FEEDBACK NONLINEARIZATION[J]. Acta Aeronautica et Astronautica Sinica, 1998, 19(1): 59-62.

Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- ▶ RSS

作者相关文章

- ▶ 龚诚
- ▶ 卢广山
- ▶ 王永年