

论文与报告

非线性大系统的分散线性化与分散控制

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摘要

将非线性控制系统的精确线性化方法应用于非线性大系统,提出了非线性大系统的分散线性化方法,并得到了非线性系统可分散线性化的充要条件.按照这个方法,可将难度较大的一类非线性大系统分散控制器的设计转化为易于处理的线性大系统分散控制器的设计.在得到该线性大系统的分散控制器后,可通过分散坐标变换的逆变换将线性大系统的控制器变换为原非线性大系统的控制器.同时,控制器的分散性保持不变.该方法明显地降低了该类非线性大系统分散控制器的设计难度.

关键词 [非线性系统](#) [大系统](#) [分散线性化](#) [分散控制](#)

分类号

Decentralized Linearization and Decentralized Control for Nonlinear Large-Scale Systems

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Abstract

In this paper, the decentralized linearization method is proposed for nonlinear largescale systems, and the sufficient and necessary conditions of decentralized linearization are obtained. We can transform a class of nonlinear large-scale systems into linear large-scale systems, which can be treated relatively easily, through so-called decentralized differentiable homeomorphism. So the decentralization controller design of nonlinear large-scale systems can be transformed into the decentralized controller design of linear large-scale systems. The difficulty of the decentralization controller design of nonlinear large-scale system can be decreased obviously by using this method.

Key words [Nonlinear systems](#) [large-scale systems](#) [decentralized linearization](#) [decentralized control](#)

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