

论文与报告

非线性 H^∞ 控制的粘性解及近似逼近分析

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收稿日期 1996-5-23 修回日期 网络版发布日期 接受日期

摘要

讨论非线性(在鞍点条件成立时) H^∞ 控制的(干扰抑制问题的)粘性解法. 此方法基于对策论和Hamilton-Jacobi-Isaacs (HJI) 不等式. 主要结果分三个方面. 首先, 是将所求的关于HJI不等式的解推广到不可微的粘性解情形. 随后, 讨论了此情形下的 H^∞ 状态控制器对被控系统的镇定问题. 最后给出了求解该问题的近似逼近的理论依据和算法的初步讨论.

关键词 [非线性 \$H^\infty\$](#) [鞍点条件](#) [粘性解](#) [近似逼近](#)

分类号

Viscosity Solutions and Approximate Algorithm Analysis of Nonlinear H^∞ Control

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Abstract

The H^∞ problem of nonlinear control systems is studied in the sense of viscosity solution. The motivation on the study of viscosity solution of nonlinear H^∞ control with the saddle point condition is due to the difficulty in the analysis of smooth solutions in some cases. The method is based on the game theory and Hamilton-Jacobi-Isaacs (HJI) inequality. The main results are composed of three parts. The solution of HJI inequality of disturbance attenuation has been extended to the case without any assumption of smoothness. A control law in the light of the viscosity optimal solution is given, with a proof of the system stabilization when external disturbance vanishes. At last, some analyses on approximate algorithms are proposed for the nonlinear H^∞ problems and a draft approximate polynomial algorithm is described.

Key words [Nonlinear \$H^\infty\$](#) [saddle point](#) [viscosity solution](#) [approximate algorithm](#)

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