

论文与报告

具有预期闭环极点区域的稳定控制器的 H^∞ 优化设计方法

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摘要

本文从工程应用角度出发, 提出了一种将闭环极点设置于预期稳定区域的稳定控制器的 H^∞ 优化设计方法, 即实参数优化求解控制器的方法. 这种方法综合考虑了闭环动态性能、抗干扰、鲁棒性以及控制器本身的稳定性. 实例表明, 与现有的 H^∞ 设计方法相比, 用本文方法设计的控制系统在不显著增大抗干扰和鲁棒性指标情况下, 具有闭环动态性能良好及控制器稳定等优点, 因此具有工程应用价值.

关键词 [闭环极点区域](#) [稳定控制器](#) [\$H^\infty\$ 优化设计](#)

分类号

A H^∞ Optimal Design of Stable Controller Ensuring Assigned Region of Closed-Loop Poles

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Abstract

In this paper, an H^∞ optimal design method of stable controllers ensuring assigned region of closed-loop poles is presented. A method of obtaining controllers is described using real parameter optimization. The method fulfils engineering requirements on closed-loop behaviour, disturbance rejection and robustness as a whole. It is worth to mention that the method always gives a stable controller. This is important from the engineering point of view. Numerical examples show that a controller designed by the proposed method has good closed-loop behaviour, and that the disturbance rejection and robustness properties are not very much worse than that of any controller designed by the existing H^∞ methods. Hence this method is applicable to practical problems.

Key words [Closed-loop region](#) [stable controller](#) [\$H^\infty\$ optimal design](#)

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