论文与报告

基于LMI方法的保性能迭代学习算法设计

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摘要
研究基于性能的迭代学习算法设计与优化问题.首先定义了迭代域二次型性能函数,然后针对线性离散系统给出了迭代域最优迭代学习算法;基于线性矩阵不等式(LMI)方法,针对不确定线性离散系统给出了保性能迭代学习算法及其优化方法.对于这两类迭代学习算法,只要调整性能函数中的权系数矩阵,便可很好地调整迭代学习收敛速度.另外,保性能迭代学习算法设计及优化过程,可利用MATLAB工具箱很方便地求解.
关键词　迭代学习控制　保性能迭代学习算法　二次型性能函数　迭代域
分类号

Designing of Guaranteed Cost Iterative Learning Algorithms Based on LMI Method

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Abstract
Performance function based iterative learning algorithms are investigated in this paper. At first, a linear quadric performance function is defined in iteration domain, then an optimal iterative learning algorithm is presented for linear discrete-time systems, and a guaranteed cost iterative learning algorithm and its optimization are developed for linear discrete-time systems with uncertainties. In these algorithms, the convergence speed can be adjusted easily just by the parameters in the performance function, and the designing and optimization of the guaranteed cost iterative learning algorithm are linear matrix inequalities (LMI) based, so can be realized easily using Matlab Toolbox.
Key words　Iterative learning control　guaranteed cost iterative learning algorithms　linear quadratic performance function　iteration domain

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