

基于依参数分离算子的鲁棒可靠滤波器设计

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摘要

针对凸面体不确定系统并考虑传感器发生故障的情况, 基于二次型分离算子进行了鲁棒可靠滤波器设计的研究. 利用不确定系统鲁棒镇定时的拓扑解释, 采用分离算子将不含故障描述的系统矩阵与故障描述矩阵进行解耦, 从而获得对故障不敏感的鲁棒可靠滤波器. 为进一步降低设计的保守性, 文中还给出了一种依参数分离算子的滤波器存在条件, 并将滤波器设计转化为线性矩阵不等式 (LMIs) 表述的凸优化问题. 仿真实例验证了文中所提出设计方法的有效性.

关键词 [鲁棒可靠滤波器](#) [拓扑分离](#) [依参数分离算子](#) [线性矩阵不等式](#)

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Parameter-dependent Separator-based Robust Reliable Filter Design

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Abstract

Based on a quadratic separator, a robust reliable filter design method for a class of systems with polytopic type uncertainty is presented against sensor failures. By making use of interpretation of system robust stabilization from the topological separation viewpoint, the matrix meaning plant can be decoupled from the matrix expressing faults via the quadratic separator, and a satisfactory robust reliable filter, which is less sensitive to the sensor failures, can be obtained. In order to reduce the design conservativeness, a condition for the existence of a parameter-dependent separator is proposed, and further the filter design can be converted into the optimization problem involving linear matrix inequalities (LMIs). An example is given to illustrate the effectiveness of the proposed method.

Key words [Robust reliable filter](#) [topological separation](#) [parameter-dependent separator](#) [linear matrix inequalities](#)

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