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论文与报告

基于粒子滤波算法的混合系统监测与诊断

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摘要
利用粒子滤波算法具有同时估计连续状态和离散状态的特点, 提出一种可用于混合系统状态监测与诊断的新方法. 给出了该方法的理论推导和设计步骤, 讨论了在诊断应用中粒子滤波器所遇到的问题, 并给出了改善的措施. 仿真结果证明用粒子滤波器对混合系统进行监测与诊断是可行的, 所提的方法对估计结果有比较好的改善.

关键词 状态估计 混合系统 粒子滤波器 故障诊断

分类号 TP202

Hybrid System Monitoring and Diagnosing Based on Particle Filter Algorithm

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Abstract
State estimation of hybrid system, which consists of discrete state estimation and continuous state estimation, is a critical issue in hybrid system study. Utilizing the advantage of particle filter, which can estimate the discrete and continuous states simultaneously, we propose a new approach for monitoring and diagnosing of hybrid system. After giving the derivation of algorithm and design steps, we discuss the issues arising from algorithm implementation and propose an improved algorithm. The result of simulation shows the feasibility of particle filter in hybrid system monitoring and diagnosing, and it also demonstrates that the proposed improved algorithm can achieve better result.

Key words State estimation hybrid spstem particle filter fault diagnosis

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