

过程系统工程

用于过程故障诊断的自适应kernel学习网络分类器

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收稿日期 2006-9-18 修回日期 2007-5-24 网络版发布日期 2007-8-20 接受日期

摘要

提出一种统一的最小二乘kernel学习框架, 将自适应kernel学习 (AKL) 网络辨识器推广为分类器, 用于化工过程的故障诊断。推导了AKL分类器在向后缩减和向前增长两种情况下的递推算法, 实现了对记忆样本长度的控制。该分类器无需利用历史故障数据, 即可进行在线学习并建立过程诊断模型。通过对Tennessee Eastman (TE) 过程的5种典型故障的诊断分析, 验证了该方法的有效性。

关键词

[过程诊断](#) [模式分类器](#) [统计学习理论](#)

分类号

Adaptive kernel learning classifier with application to process fault diagnosis

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Abstract

An adaptive kernel learning (AKL) network classifier, as a natural extension of AKL identifier, was proposed based on the unified least-square kernel learning (ULK) framework. The backward decreasing and forward increasing algorithms of AKL classifier were derived, both in recursive forms. The memory length of the classifier was thus under control so as to quickly adapt to the change of process dynamics. The AKL classifier did not require the support from the historical fault database and can learn from the beginning of the process operation. Numerical simulations for diagnosis of Tennessee Eastman (TE) process showed that the proposed ULK framework and the resulting AKL classifier were valid, and satisfying diagnosis performance was observed.

Key words

[process diagnosis](#) [pattern classifier](#) [statistical learning theory](#)

DOI:

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