工程与应用

管道流量泄漏在线监测中的模糊调度设计

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摘要　　针对管道流量泄漏和管网突发性的爆管，以管道流量泄漏为应用对象，将模糊调度设计应用于管道流量泄漏监测中，研究具有模糊截止期的多控制任务的实时调度问题，提出奉献度概念和最大奉献优先（LDF）的调度策略。为了减小因任务间频繁切换造成的系统开销，提出基于抢占阈值的最大奉献优先（TLDF）调度策略。最后通过仿真比较LDF和TLDF两种调度策略，实现具有模糊截止期的控制任务调度，能够减少并均衡控制性能的损失，同时提高系统计算资源的使用率。

关键词　　计算机控制系统　控制任务　实时调度　模糊　协同设计

分类号　　TP273

Fuzzy scheduling design in computer on-line monitoring system based on pipeline flux leak

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Abstract

Flow against pipeline leakage and the pipe network sudden burst pipe to pipeline leakage flow for the application objects，fuzzy scheduling design flow used in pipeline leak monitoring.In order to improve the control performance of systems and use the limited computing resource reasonably，it is necessary to consider the collaborative design problem between control and real-time scheduling in computer controlled systems synthetically.In this paper，the real-time scheduling problem of multiple control tasks with fuzzy deadlines is studied.The concept of dedication index and the scheduling policy of Largest Dedication First （LDF） are proposed.In order to relieve the overhead caused by the thrashing among tasks，the threshold-based Largest Dedication First（TLDF） is presented.Finally，two proposed scheduling policies LDF and TLDF are compared by simulation.The scheduling of control tasks with fuzzy deadlines is implemented，and the utilization of computing resource gets increased mean while the control performance cost gets decreased and trade off.

Key words　computer controlled systems　control tasks　real-time scheduling　fuzzy　collaborative design

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