

A preemptive utility accrual scheduling algorithm in adaptive real time system.

ABSTRACT

In this paper, we propose a preemptive utility accrual scheduling(or PUAS) algorithm as an enhancement to General Utility Scheduling (or GUS) algorithm proposed by Peng Li [1]. These scheduling algorithms are designed for adaptive real time system environment where undesirable effects such as overload and deadline misses are tolerable. We consider independent task models that are subject to deadline constraints specified using step time/utility functions (or TUFs). The basic idea of our algorithm is to reduce the number of unnecessary abortion that occurs in GUS by preemption instead of abortion. We consider the scheduling objective of maximizing the utility that is accrued by the completion of all tasks. Simulation results revealed that the proposed algorithm outperforms GUS algorithm. By reducing the total number of task aborted together with lower abortion ratio, this in effect produced a higher utility and reduced the average response time, making it more suitable and efficient in time-critical application domain.

Keyword: Real time system; Utility Accrual Scheduling; Time/Utility Function