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# 一种实时异构嵌入式系统的任务调度算法

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## Abstract

Heterogeneous computing environments have been widely used in real-time embedded systems. Efficient task scheduling is essential for achieving high performance in the synthesis of embedded systems. The problem has been proved to be NP-complete and mainly heuristic algorithms which often have room for improvement exist. In this paper, an algorithm called the dynamic BLevel first (DBLF) has been presented. The DBLF algorithm selects the ready task with a maximum Blevel (ni) at each step and assigns the selected task to a processor in an insertion mode. The task is assigned to the suitable processor that satisfies the precedence sequence and has the minimum earliest-finish-time (EFT) of the task. When the EFT costs are equal, the task is firstly assigned to the processor which has the least utilization. Compared with the related work, the result shows that the DBLF algorithm significantly surpasses the previous approaches in scheduling length.

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## 摘要

异构分布式系统已被广泛应用在实时嵌入式系统中,而调度算法是在进行嵌入式系统综合时,确保系统实现性能目标的一个关键问题,这是一个NP-完全问题.现有的算法主要是启发式算法,性能还有待提高.提出了一个异构分布式系统的动态BLevel优先(dynamic BLevel first,简称DBLF)算法,算法选择就绪任务中动态BLevel值最大的任务进行调度,用插入法为任务分配处理器,遵循以下3个插入原则:满足任务先后顺序关系;任务的最早完成时间(earliest-finish-time,简称EFT)最小;在EFT相等时,优先分配到利用率较低的处理器的上.与现有算法比较可以看出,DBLF算法可以有效降低调度长度.

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