

عنوان مقاله:

Pre-scheduling and Scheduling of Task Graph on Homogeneous Multiprocessor Systems

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خلاصه مقاله:

Task graph scheduling is a multi-objective optimization and NP-hard problem. In this paper a new algorithm on homogeneous multiprocessors systems is proposed. Basically, scheduling algorithms are targeted to balance the two parameters of time and energy consumption. These two parameters are up to a certain limit in contrast with each other and improvement of one causes reduction in the other one. The problem is to achieve the trade-off between these two parameters. Pre-scheduling algorithms are mainly aimed at modifying the structure of task graph to gain optimal scheduling. In the proposed algorithm the suitable number of processors for scheduling the task graph is computed. The idea of Nash equilibrium is mainly applied to compute the appropriate number of processors in such a way that the idle time of the processors is reduced while their processing power is increased. Also, considering the communication costs and interdependencies, the tasks are merged as their earliest start time is reduced. In this way, the length of the critical path is reduced while the degree of parallelism is increased and ultimately the completion time is reduced. Our experimental result on a number of known benchmark graphs demonstrates the effect of our proposed algorithm.

کلمات کلیدی:

schedule, pre-schedule, task graph, game theory, optimization, Nash equilibrium

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