
An EPTAS for scheduling fork-join task graphs with communication delays

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Abstract

In this talk we present an EPTAS for the scheduling of fork-join task graphs with communication delay on homogeneous processors, P—fork-join,c.ij—C_max. The EPTAS uses an integer program that selects configurations of task placements which satisfy a given makespan and covers all tasks. The integer program is a feasibility test that is repeated over the range of possible optima in a binary search to find a solution, which is guaranteed to be within a $1 + \epsilon$ factor of the optimum. Communication costs are dealt with effectively for this fork-join graph structure. A simpler version can be used on a fork or join DAG only. It is shown that these run in time exponential in terms of $1/\epsilon$ and polynomial in terms of the input size.

Keywords: scheduling, task graph, fork, join, EPTAS

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