

Balance Algorithm – A New Approach to Solving the Mapping Problem on Heterogeneous Systems

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Abstract: A fundamental issue affecting the performance of a parallel program is the assignment of tasks to processors in order to get the minimum completion time. Most of state-of-the-art approaches consider homogeneous MIMD multiprocessor systems, in which all communication channels have the same bandwidth and all processors are equally powerful. These algorithms do not run efficiently on heterogeneous systems. In this paper, we present a new approach for the mapping problem on arbitrary systems. The main idea is based on the "global load balancing, local cut size optimization" principle. This approach has achieved encouraged results that are verified by experiments for various random graphs and processor numbers.

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