
Improving nested task-parallelism in the LU Factorization of H-Matrices

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Abstract

Hierarchical matrices (H-matrices) lie in-between dense and sparse scenarios. Therefore, it is natural to tackle the LU factorization of H-Matrices via a task-parallel approach, which has recently reported successful results for related linear algebra problems. In this work, we will describe how to discover the data-flow parallelism intrinsic to the operation at execution time, via the analysis of data dependencies based on the memory addresses of the tasks' operands. This is especially challenging for H-matrices, as the data structures dimensions vary during the execution.

Keywords: Hierarchical linear algebra, nested task, parallelism, multicore processors, LU factorization

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