Paper Review

"Symmetric Indefinite Linear Solver Using OpenMP Task on Multicore Architectures"

1. Summary

This paper proposed a software package using OpenMP Task for parallel optimization. By using OpenMP instead of QUARK, it achieves multi-platform competibility including Broadwell, AArch64 and PPC64.

After OpenMP launched Task pragma, this paper migrate from QUARK to OpenMP and get a portable implementation for multi-process program. QUARK supports fewer architectures compared to OpenMP, so it can use the advantages of different architectures such as CISC and RISC to archive a choice of performance, cost and specific-programed acceleration.

PLASMA uses a special matrix layout to exploit the memory hierarchy of modern computers and to generate enough independent tasks conforming to the OpenMP standard. The optimization includes storing the matrix in tiles, triangulate symmetric matrix and band matrix to get architectural affinities.

Plasma introduces plenty of parallel algorithms for acceleration. The experiment results showed its good performance in some architectures such as AArch64 since related works do not optimized for these architectures.

2. Advantages

+ Competibility for multi-architectures
+ Take the advantages of properties of architectures

3. Disadvantages

– Lack GPU and specific-hardware supports

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