

Accurate Computations of Matrix Multiplication with Level 3 Operation in BLAS

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Abstract

This talk is concerned with accurate computation of a product of two matrices whose entries are represented by floating-point numbers as defined by IEEE 754. Recently, we developed an error-free transformation of matrix multiplication [1]. This transforms the product of two matrices into a sum of several floating-point matrices by using only floating-point arithmetic. It is very useful to obtain an accurate approximation of the matrix multiplication. Moreover, since level 3 fraction (the relative amount of matrix multiplication in a given algorithm) is very high, the method can achieve high performance with high parallelism. In this talk, we succeeded to improve the error-free transformation and give a validation method with diagonal scaling. The details of the method and numerical results will be presented in the presentation.

Keyword: floating-point arithmetic; matrix multiplication; accurate computations.

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References

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