

# A Performance Evaluation Model for the SILC Matrix Computation Framework

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**Abstract.** This paper presents a performance evaluation model for estimating speedups achieved by SILC, an easy-to-use framework that allows users to make use of matrix computation libraries in a language- and computing environment-independent manner. The framework is based on a client-server architecture in which a user program is a client of a SILC server running in a remote computing environment. Therefore, use of a fast SILC server may lead to significant speedups, while some overheads are expected due to data transfer between the user program and the SILC server. The performance evaluation model yields an estimated performance ratio of one user program written in the traditional programming style (i.e., directly based on a library-specific application programming interface) to another that carries out the same matrix computations in the SILC framework. The experimental results of 5 test problems proved that the model is capable of accurately estimating performance ratios in such a way that a clear correlation of more than 0.93 is found between the estimated and actual performance ratios.

**Keywords:** matrix computation library, application programming interface, middleware, OpenMP, MPI

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