

# SILC: A Flexible and Environment-Independent Interface for Matrix Computation Libraries

Tamito KAJIYAMA<sup>1,2</sup>, Akira NUKADA<sup>1,2</sup>, Hidehiko HASEGAWA<sup>3,1</sup>,  
Reiji SUDA<sup>2,1</sup>, and Akira NISHIDA<sup>2,1</sup>

<sup>1</sup> CREST, Japan Science and Technology Agency, Saitama 332-0012, Japan

<sup>2</sup> The University of Tokyo, Tokyo 113-8656, Japan

{kajiyama, nukada, reiji, nishida}@is.s.u-tokyo.ac.jp

<sup>3</sup> University of Tsukuba, Tsukuba 305-8550, Japan

hasegawa@slis.tsukuba.ac.jp

**Abstract.** We propose a new framework, named Simple Interface for Library Collections (SILC), that gives users access to matrix computation libraries in a flexible and environment-independent manner. SILC achieves source-level independence between user programs and libraries by (1) separating a function call into data transfer and a request for computation, (2) requesting the computation by means of mathematical expressions in the form of text, and (3) using a separate memory space to carry out library functions independently of the user programs. Using SILC, users can easily access various libraries without any modification of the user programs. This paper describes the design and implementation of SILC based on a client-server architecture, and presents some experimental results on the performance of the implemented system in different computing environments.