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Title: Modeling the LU Factorization on SMP clusters

Abstract: In this talk we target the problem of modeling the LU factorization in the context of a 2-D block-cyclic distribution. Modeling the LU factorization is an important challenge as it can help to understand the scalability of the algorithm and helps the user to compute both the best block size and the optimal processor grid-size. Modeling the LU factorization has been addressed in several prior works. However, none of this work take into account the SMP clusters architecture where each processor can be grouped on a multi-processor node. In order to address the above problem we propose a model that has three environment parameters per subroutine. As it takes into account the grid-size, it is able to derive the optimal grid shape in most of the cases. Moreover, we propose a simple and fast method to compute the model parameters. Finally we show how to enhance our model for multiprocessor clusters.

Affiliation: Emmanuel Jeannot is currently full-time researcher at INRIA (Institut National de Recherche en Informatique et en Automatique) and is doing its research at the LORIA laboratory. From sept. 1999 to sept. 2005 he was associate professor at the Université Henry Poincaré, Nancy 1. He got his PhD and Master degree of computer science (resp. in 1996 and 1999) both from Ecole Normale supérieure de Lyon. His main research interests are scheduling for heterogeneous environments and grids, data redistribution, grid computing software, adaptive online compression and programming models.