

Automatic Tuning for a Systemic Model of Banking Originated Losses (SYMBOL) Tool on Multicore

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Abstract : Nowadays, the mathematical/statistical applications are developed with more complexity and accuracy. However, these precisions and complexities have brought as result that applications need more computational power in order to be executed faster. In this sense, the multicore environments are playing an important role to improve and to optimize the execution time of these applications. These environments allow us the inclusion of more parallelism inside the node. However, to take advantage of this parallelism is not an easy task, because we have to deal with some problems such as: cores communications, data locality, memory sizes (cache and RAM), synchronizations, data dependencies on the model, etc. These issues are becoming more important when we wish to improve the application's performance and scalability. Hence, this paper describes an optimization method developed for Systemic Model of Banking Originated Losses (SYMBOL) tool developed by the European Commission, which is based on analyzing the application's weakness in order to exploit the advantages of the multicore. All these improvements are done in an automatic and transparent manner with the aim of improving the performance metrics of our tool. Finally, experimental evaluations show the effectiveness of our new optimized version, in which we have achieved a considerable improvement on the execution time. The time has been reduced around 96% for the best case tested, between the original serial version and the automatic parallel version.

Keywords : algorithm optimization, bank failures, OpenMP, parallel techniques, statistical tool

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