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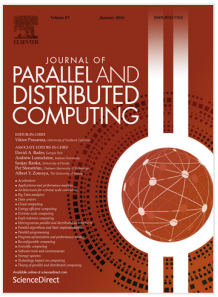

Accelerating an algorithm for perishable inventory control on heterogeneous platforms

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Accelerating an algorithm for perishable inventory control on heterogeneous platforms

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Abstract

This paper analyses and evaluates parallel implementations of an optimization algorithm for perishable inventory control problems. This iterative algorithm has high computational requirements when solving large problems. Therefore, the use of parallel and distributed computing reduces the execution time and improves the quality of the solutions. This work investigates two implementations on heterogeneous platforms: (1) a MPI-PTHREADS version; and (2) a multi-GPU version. A comparison of these implementations has been carried out. Experimental results show the benefits of using parallel and distributed codes to solve this kind of problems.

Furthermore, the distribution of the workload among the available processing elements is a challenging problem. This distribution of tasks can be modelled as a Bin-Packing problem. This implies that the selection of the set of tasks assigned to every processing element requires the design of a heuristic capable of efficiently balancing the workload statically with no significant overhead. This heuristic has been used for the parallel implementations of the optimization for perishable inventory control problem.

Keywords: Perishable inventory control, GPU computing, Heterogeneous

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