



Málaga, September 2012

Executive Summary

TITLE: **D3.1.1: Multicore design strategies and implementations of metaheuristics**

PAPERS RELATED:

- Alba, E., Luque, G., and Nesmachnow, S. (2013). **Parallel metaheuristics: recent advances and new trends**. *International Transactions in Operational Research*, 20(1), 1-48.

ABSTRACT:

The field of parallel metaheuristics is continuously evolving as a result of new technologies and needs that researchers have been encountering. In the last decade, new models of algorithms, new hardware for parallel execution/communication, and new challenges in solving complex problems have been making advances in a fast manner. We aim to discuss here on the state of the art, in a summarized manner, to provide a solution to deal with some of the growing topics. These topics include the utilization of classic parallel models in recent platforms (such as grid/cloud architectures and GPU/APU). However, porting existing algorithms to new hardware is not enough as a scientific goal, therefore researchers are looking for new parallel optimization and learning models that are targeted to these new architectures. Also, parallel metaheuristics, such as dynamic optimization and multiobjective problem resolution, have been applied to solve new problem domains in past years. In this deliverable, we review these recent research areas in connection to parallel metaheuristics, as well as we identify future trends and possible open research lines.

GOALS:

1. Study recent publications in the parallel metaheuristics fields.
2. Identify new strategies for developing parallel algorithm using new technologies such as multicore platforms.
3. Identify future trends and possible open research lines.

CONCLUSIONS:

1. Creating algorithms that profit from the hardware architecture is a must in the future on this field.
2. Speedup and gains come ultimately from hardware, and fitting the algorithm to it is a way to go when efficiency is the goal.
3. Also, creating compilers to translate existing parallel metaheuristics to new architectures is a very interesting line of research, to be able of directly using them with a low effort.

RELATION WITH PAST
DELIVERABLES:

PRE: none

POST: D3.1.2 and D3.3.1 (advisable reading)