



Málaga, June 2012

Executive Summary

TITLE: D3.3.1: Updated survey of decentralized metaheuristics in the literature

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. We review these recent research areas in connection to parallel metaheuristics, as well as we identify future trends and possible open research lines for groups and PhD students.

GOALS:

1. An extensive and organized survey of the recent advances in the parallel metaheuristic domain.
2. Discuss new algorithm models and how these techniques can take advantage of the features in the new parallel platforms.
3. Identify and present the most promising open research lines and trends in this field.

CONCLUSIONS:

1. The results of this study is a modern survey of parallel models and implementations of metaheuristics.
2. We have stressed not only the associated algorithmic issues, but also the parallel tools for building parallel metaheuristics.
3. Most important trends have been discussed, yielding what we hope is a unified overview and a useful text.

RELATION WITH PAST DELIVERABLES:

PRE: none.

POST: D3.1.1 and D3.1.2.