

**evoapplications\***

**25th European Conference  
on the Applications of Evolutionary  
and bio-inspired Computation**

part of **evo\* 2022**

[www.evostar.org](http://www.evostar.org)

20–22 April 2022

**evoapps\***

special session on

# Parallel and Distributed Systems

Evolutionary algorithms — and meta-heuristics in general — are strongly intertwined with distributed and parallel systems. Essentially a meta-heuristic can be represented, most of the time, as a complex system where the interacting components can be treated as parallel processes and analyzed from the perspective of their complex emergent behavior. One may think, for example, on the ongoing interactions in a population of individuals in an evolutionary algorithm.

Being aware of these and other aspects of complexity at design time is crucial for building more efficient strategies and increase the overall performance of an algorithm. That can be reflected, for instance, in an improvement of the running times (e.g. with a parallel version of the algorithm), or in terms of improving the quality of the solutions (e.g. if we establish a niching strategy in multi-modal optimization), or, why not, in both cases (e.g. using a parallel approach which acts, at the same time, as a niching strategy). In many cases, the algorithms used in a concurrent, distributed environment will have to be rethought from the ground up to leverage all the capabilities of the environment. And in all cases, the algorithm and the parallel platform will interact in unpredictable ways, having an influence in the performance that needs to be measured and assessed.

Therefore, the aim of this special session is to foster the discussion about parallelism in the field of metaheuristics but also to encourage the analysis of what can metaheuristics offer in the different optimization problems related to parallel infrastructures. Topics of interest include but are not limited to:

- \* Parallel / distributed / concurrent implementations of metaheuristics
- \* Metaheuristics applied to parallel infrastructures problems such as scheduling, pricing or energy efficiency.
- \* Massively parallel architectures such as volunteer computing or P2P systems
- \* Emergent technologies: blockchain, 5G, GPGPU, Cloud Computing, Internet Computing...
- \* Parallel metaheuristics applied to real-life problems
- \* Self-organizing distributed systems
- \* Complex population structures

#### **Organizers**

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More info at:

<http://www.evostar.org/2022/evoapps/dps>