SE Project 2019–20 **Master 1 Informatique**

Meta-heuristics in Multi-threading

Meta-heuristics are general-purpose optimization methods, because they can be applied to any kind of optimization problem. An introduction to optimization and meta-heuristics methods will be given during the TD preceding the beginning of the project in TP.

Aim of the project

The project aim is to code in Java a given meta-heuristic for optimization. You'll have to code two versions of your program: a sequential version, and a multi-threading version capable to run on several CPU cores.

Your code is supposed to interact with the two Java classes `Data` and `Objective` that you'll find in the SE *share* directory. While developing your programs for the meta-heuristics, you may consider adding methods in `Data` and `Objective`, if you'll find it coherent. A simple example of implementation of one meta-heuristic (the *Genetic Algorithms*) is in the *share* directory for your reference.

Which is my meta-heuristics

By following the same approach employed in several meta-heuristics, the meta-heuristic to be implemented by every group will be *randomly* selected. This assignment will be performed during the TD where the project will be introduced.

Report

Every group is supposed to submit, together with the developed codes, a report on the project. This report should contain:

- one main bibliographic reference for the selected meta-heuristics (the one from where you were able to get the details that allowed you to implement the algorithm);
- a summary (max 10 lines) of the basic idea behind the algorithm;
- a summary (max 6 lines) of the basic idea behind your multi-threading version;
- a short description of all implemented methods (you may consider writing these descriptions in your Java files);
- some examples of use of your programs.

Project grade

A grade (from 0 to 5) will be assigned to your submitted code and report. The grade will consist of the following 5 points:

- submission by the deadline and report complete (1 point);
- code evaluation (sequential version, 1 point);
- conception evaluation for multi-threading version (1 point);
- understanding of every group member about the project (short interview, 1 point);
- competitiveness wrt the other meta-heuristics (via global comparison, 1 point).

Submission

Please send your programs (Java files) and report (PDF format) by November 10^{th} at midnight (Paris time) to the address:

`antonio.mucherino@irisa.fr`