

Programming assignment 2

Heuristic Optimization Techniques, 2017WS

November 30, 2017

Population-Based Methods + Hybrids [30 points]

The second programming assignment is to develop a population-based meta-heuristic and a hybrid for the K -page crossing number minimization problem. The subtasks for this exercise are:

1. Implement one of the following:
 - Genetic Algorithm (GA)
 - Ant Colony Optimization (ACO)
2. Use one of your previously (in the first exercise or in this exercise) developed metaheuristics and hybridize it with another optimization technique e.g. GA + Local Search. The hybridization should address a shortcoming of the algorithm e.g. exploration vs. exploitation.
3. Run experiments and write a report as discussed in the problem description.
4. Upload your best solution for each instance and each algorithm in TUWEL.

For the development and the report consider the following points:

- You can reuse your existing code from the first assignment.
- When implementing a GA, define at least one suitable operator for
 - *selection*,
 - *recombination*, and
 - *mutation*of solutions.
- When implementing an ACO, define at least one suitable
 - structure for the *construction graph*,
 - *pheromone model*, and
 - a concept for *heuristic information*to guide the decisions during the construction of solutions.

- Think about what values you use for your parameters. You optionally can use **irace**¹ to tune your parameter values.

Hand in your report via TUWEL until *2018-01-15, 23:55*. For further questions send an e-mail to: **heuopt@ac.tuwien.ac.at**

¹The tool can be found at <http://iridia.ulb.ac.be/irace>