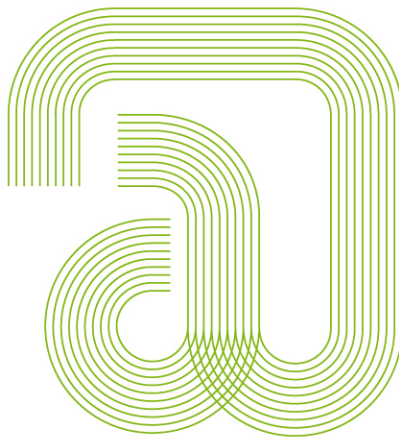


Universidade de Vigo

Evolutionary Computation – Lab-Session 7



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Remind we have extended the due dates for the second homework:

- **March 27th** for the particle swarm optimization for real-valued functions (Griewank and Rosenbrock) and the TSP problem.

7. Seventh Week

Objectives: Finish the second deliverable. Add some Pareto-front aspects.

1. Implement and run (using the Guofei-package) the minimization of the traveling salesperson problem with the PSO approach. You can use the examples given in the package as baseline. Experiment with the settings of the free parameters and argue about your findings.
2. Take into account that the parameters—in order to converge—should fulfill the following conditions:

$$1 > \xi > \frac{1}{2}(\varphi_1 + \varphi_2) - 1 \geq 0$$

For other values, the algorithm may converge, and does it often, but there is no guarantee. Hence we should set: $\varphi_1 + \varphi_2 < 4$.

3. Inspect in the package and compare the implementation and the class notes.
4. Calculate simple statistics (such as average, mean, standard deviation, etc.) regarding the values found by your Monte Carlo runs.
5. Consider now a 2-objective point-of-view looking at our experimental implementations regarding TSP: on the one hand side we want to have fast algorithms (short runtimes) and on the other hand side we want to have good algorithms (small gaps). Plot your measurements (e.g. runtime versus gap) and inspect the *Pareto front*, which are the dominant points you observe? Include a discussion into your deliverable.

Use a python notebook to implement, execute, and document your work.