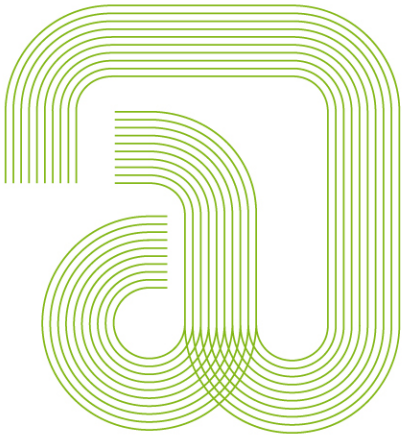
Universidade Vigo

Evolutionary Computation – Lab-Session 3



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We have fixed the due dates for the two homeworks as announced already:

- **February 28th** for the minimization of the real-valued functions and the TSP problem applying genetic algorithms.
- **March 21th** for the topics to be still ahead...

1. Third Week

Objectives: Dig somewhat deeper into the Guofei-package. Run the genetic algorithm in a Monte Carlo loop to obtain some statistical data.

1. Run the jupyter notebook on sorting to repeat and to settle what has been presented in the lecture.
2. Run the examples of the Guofei-packages that minimize the Schaffer-function (with both encodings) in a Monte Carlo loop and log the mininum, mean, and variance of the objective function.
3. Try to find a parameter set of the genetic algorithms that you consider sufficiently good. Argue why you took that decision.
4. Replace the Schaffer-function by the Rosenbrock-function (in three or four dimensions) in your code and study what happens: for instance, does the same parameter set, give equally good results? does the search area (defined by the lower and upper bound) have some influence?

```
def rosenbrock(p):
  sum = 0;
  for i in range(len(p)-1):
    xi = p[i];
    xii = p[i+1];
    part = 100*(xii-xi**2)**2 + (xi-1)**2;
    sum+=part;
  return sum
```

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5. Use the Guofei-package to find the optimal tour in a Monte Carlo loop and log the mininum, mean, and variance of the objective function. Do you win against the other heuristics given in the jupyter notebook?
6. Feel free to implement one of the mentioned but missing heuristics for the traveling salesperson problem (e.g. farthest insertion). There is some publically available python code around: https://github.com/afourmy/pyTSP/blob/master/README.md
7. Are the parameters you chose to win against the heuristics on one problem instance well suited over all problems instances? Argue with data.