Practical session on Robust Inference using the Python Mystic framework for global optimization

Description of the folder.

- Model.py: *Contains the hydraulic physical model and the cost function that calculates the p.o.f of the quantity of interest.*
- Solver_Simulated_Annealing.py: *Contains our personal implementation of a simulated annealing solver. 4 schedules are available.*
- Script_Simulated_Annealing.py: *Optimization of the cost function using the simulated annealing solver.*
- Script_Differential_Evolution.py: *Optimization of the cost function using a differential evolution solver.*
- Script_Mystic_Framework.py: *Optimization of the p.o.f using the mystic framework.*
- Cross_Visualisation.py: *Visualisation of the results imported from the three script files.*

Level 1.

Open one of the three script files. Each files contains some errors that prevent the result to be optimal. Your first task is to correct those errors. Do it for at least two scripts in order to compare your results using the 'Cross_Visualisation' file. How do you explain the discontinuity of the curve?

Level 2.

You can now modify the model and the script files to treat the 4 dimensional case. Compute the optimization with the three methods.

Level 3.

What differences can you observe between the three methods? How could you improve the Differential Evolution solver?

Level 4.

Using the most adapted method, try to run the optimization with variance enforcement.