Lab of Applied Computational Intelligence

IST

2023/2024

Multiobjective with Deap

Guide 11

17 Outubro 2023

(Week 6)

1 – Objetives

With this work the student should be able to create a graphic of the pareto front of a two-objective function.

2 – Pareto Front

New function Optimization

This example comes with two files nsga2.py and nsga3.py. To run the second file you need to install the pymop library. This library has several functions to test the algorithms. Now change these files to run the problem with our two functions:

Find the maximum/minimum value of the following functions $f1(x1, x2)$ and $f2(x1, x2)$

$$Z1 = \sqrt{X1^2 + X2^2}$$

$$Z2 = \sqrt{(X1 - 1)^2 + (X2 + 1)^2}$$

$$f1 = (\sin(4 * Z1)\ /Z1) + (\sin\ (2.5 * Z2)/Z2)$$

$$f2 = (1 - \sin(5 * Z1)\ /Z1)$$

Plot the pareto front of the two objective problem. Use the *ParetoFront* function from deap tools. Plot for each generation the population in the objective space and the pareto front. Do not forget to update the pareto front in each cicle.