Stochastic Optimization - HW2

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Problem 2.1 : Traveling Salesman Problem

The shortest path found with my TSP algorithm is 99.34633, reached after 766 iterations (threshold = 0.99).

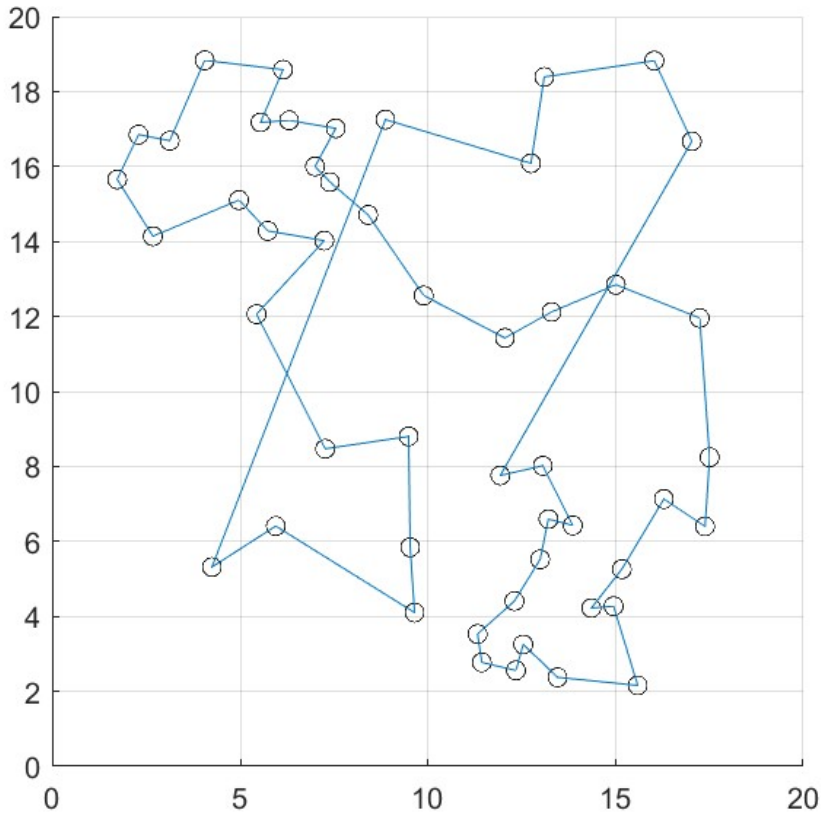

Figure 1: Graph of one of the shortest path found using TSP. Path = 99.34633. fig:DKL

Due to the stochasticity of the algorithm, some code runs find better paths than others, sometimes in a shorter amount of time. In order to asses the quality of the path, one could run the code several times, restricting the running time, and keeping track of which path is the shortest within the given running time.

1 Problem 2.2 : Particle Swarm Optimization

My code first generates a cloud of points around the four regions. In order to isolate the best ones only, I use the Brush tool in Matlab, which allows me to select the points in each region of interest. Each of these selection must be called "dataBrushedTL","dataBrushedTR","dataBrushedBL "dataBrushedBR" (T : Top, B : Bottom, L : Left, R : Right). Closing the figure after performing this action returns the figure shown as figure(2). fig:FF

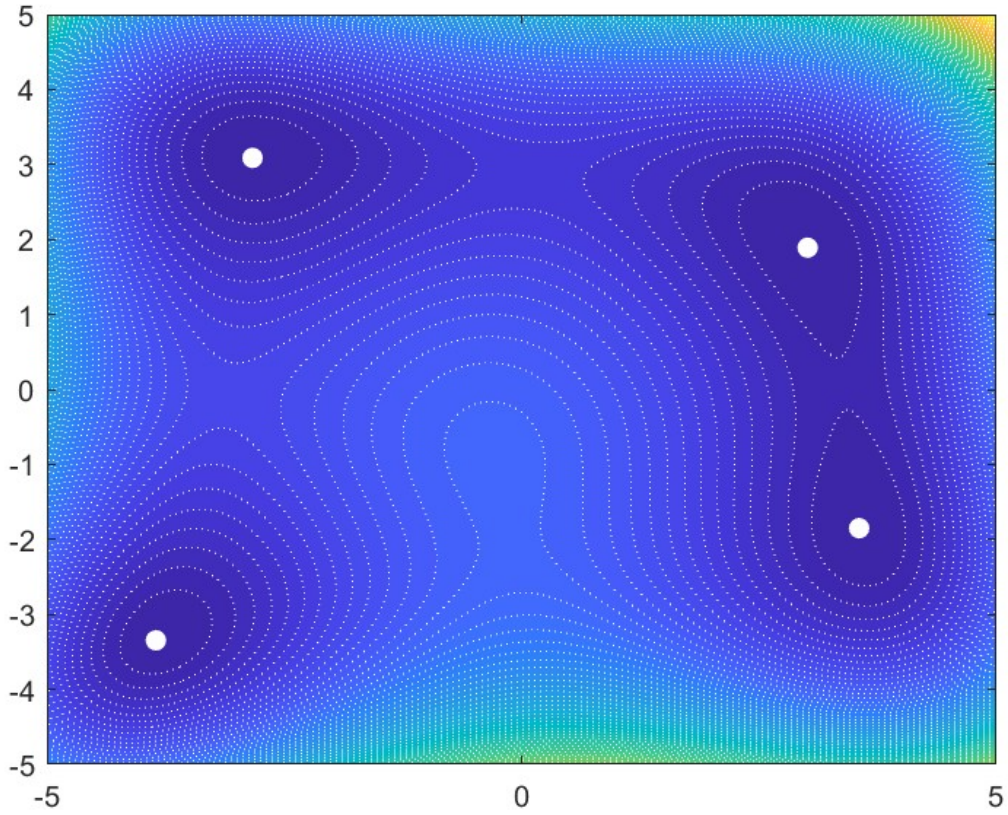

Figure 2: Contour plot of the considered function, with the location of the four minima. fig:FF

	X	Y	Performance
Minimum 1	-3.8525	-3.3461	0.36373
Minimum 2	-2.8346	3.0880	0.10459
Minimum 3	3.5554	-1.8505	0.04446
Minimum 4	3.0124	1.8906	0.17182

Table 1: Coordinates of the four minima found using PSO, of the considered function. Table2

Table 1 shows the coordinates of the four minima of the considered function, as well as their respective value. They all reached about zero, and therefore, minimze the considered function successfully.