FFR105 - HP2

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Problem 2.1 - The traveling salesman problem

The shortest path my Ant System was able to obtain was a length of 96.8533. The Path can be seen in Figure 1.
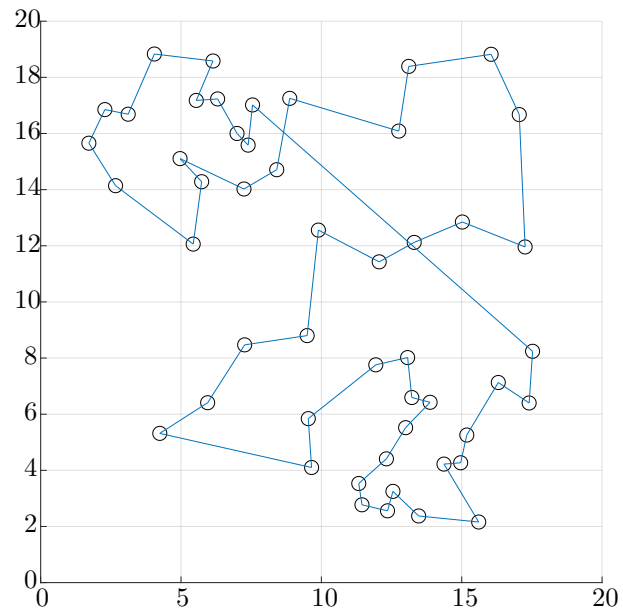
Figure 1: Shortest path found by the ant system.

Problem 2.2 - Particle swarm optimization

The attached Matlab files, included in the submission, implement a PSO algorithm that iteratively identifies multiple minima within the range of -5 to 5. The algorithm has been executed multiple times to pinpoint all the minima accurately. Table 1 displays the coordinates of the four identified minima along wioth the function value. Figure 2 showcases the contour plots corresponding to these minima.

Table 1: PSO solutions

x_1	x_2	$f(x_1, x_2)$
-2.805118	3.131313	0.000000
3.000000	2.000000	0.000000
3.584423	-1.848138	0.000000
-3.779310	-3.283186	0.000000

(a) PSO solution 1

(b) PSO solution 2

(c) PSO solution 3

(d) PSO solution 4

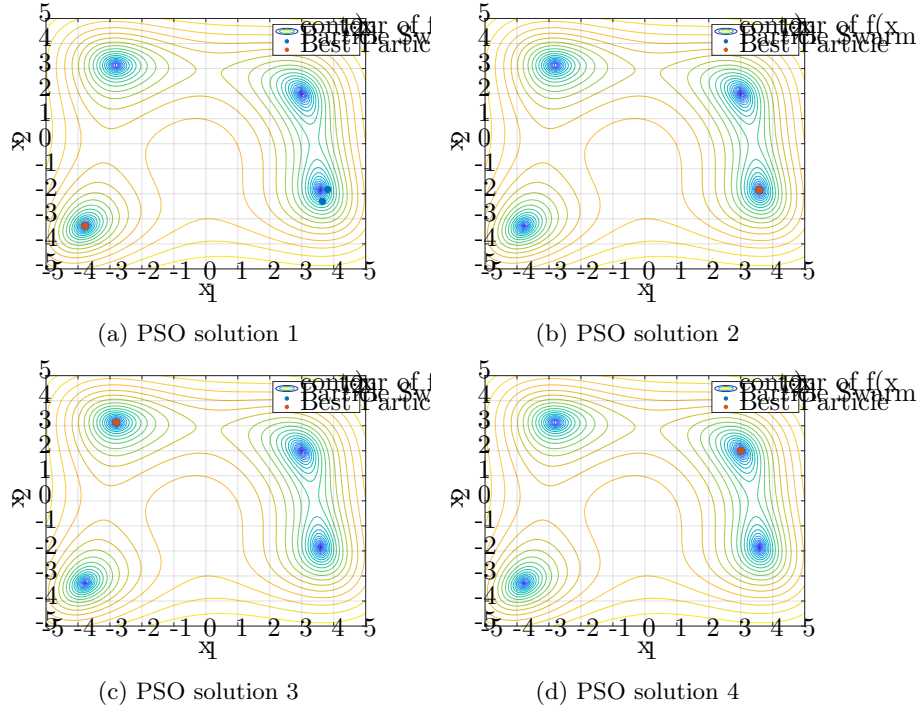Figure 2: The four different unique PSO solutions

Problem 2.3 - Optimization of braking systems

Problem 2.4 - Function fitting using LGP