Relatorio Bioinspirados II

João Pedro Dani Laguardia - 222050012

July 7, 2025

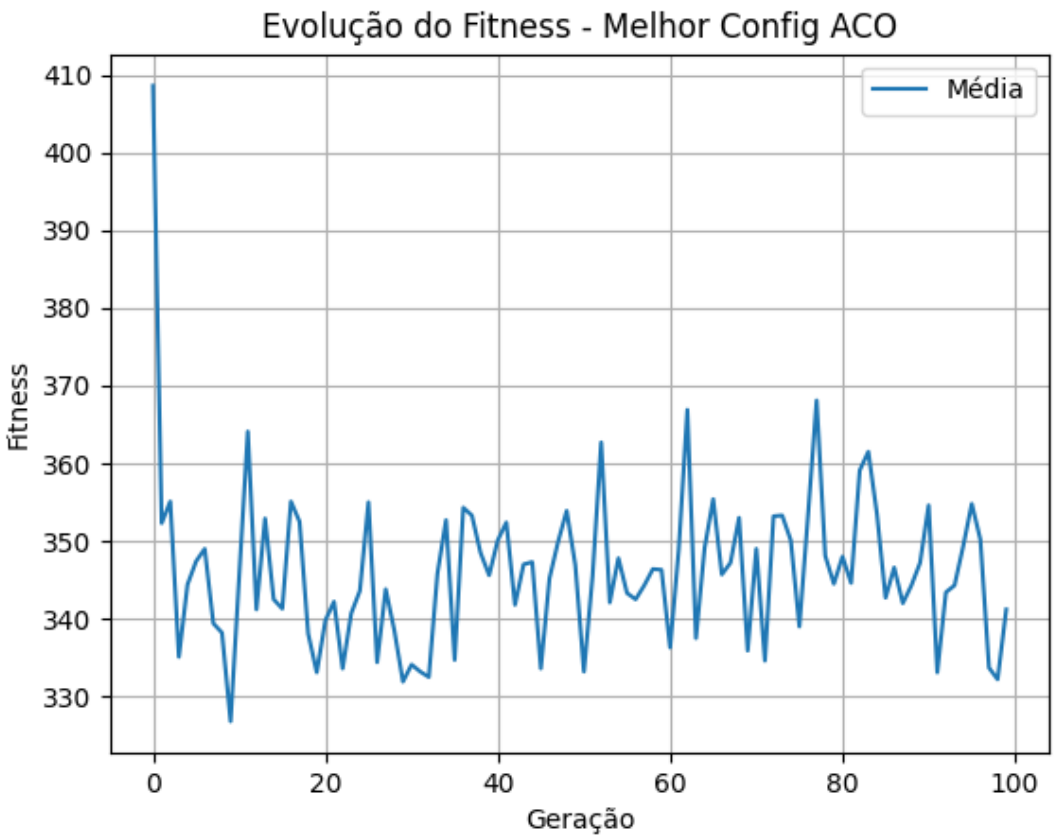
1 Colônia de Formigas

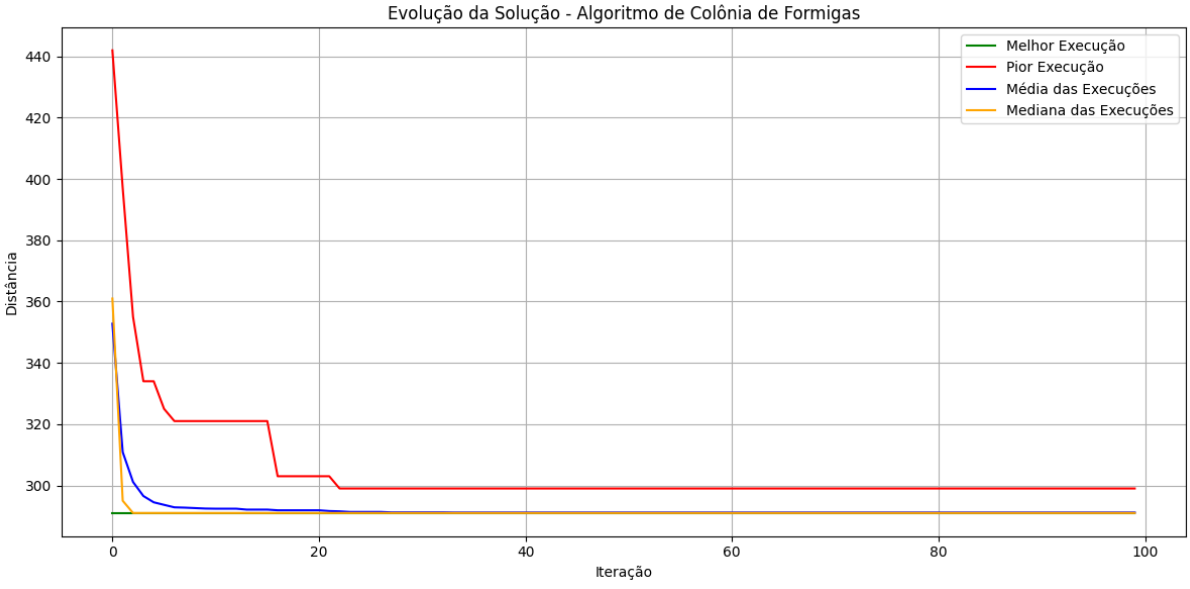
Top 30 - ACO

alpha	beta	rho	Melhor	Média	Desvio
0.5	2.0	0.1	291.0	291.4	1.2000000000000002
0.5	2.0	0.3	291.0	291.4	1.2000000000000002
0.5	2.0	0.5	291.0	291.0	0.0
0.5	5.0	0.1	291.0	291.0	0.0
0.5	5.0	0.3	291.0	291.0	0.0
0.5	5.0	0.5	291.0	291.0	0.0
1.0	1.0	0.1	291.0	291.0	0.0
1.0	1.0	0.3	291.0	291.0	0.0
1.0	1.0	0.5	291.0	291.0	0.0
1.0	2.0	0.1	291.0	291.0	0.0
1.0	2.0	0.3	291.0	291.0	0.0
1.0	2.0	0.5	291.0	291.0	0.0
1.0	5.0	0.1	291.0	291.0	0.0
1.0	5.0	0.3	291.0	291.0	0.0
1.0	5.0	0.5	291.0	291.0	0.0
2.0	1.0	0.1	291.0	307.0	10.392304845413264
2.0	1.0	0.3	291.0	306.3	15.375630068390693
2.0	1.0	0.5	291.0	307.8	17.71327186038762
2.0	2.0	0.1	291.0	292.6	4.8
2.0	2.0	0.3	291.0	293.4	4.079215610874227
2.0	2.0	0.5	291.0	291.8	1.6
2.0	5.0	0.1	291.0	291.4	1.2000000000000002
2.0	5.0	0.3	291.0	291.4	1.2
2.0	5.0	0.5	291.0	291.0	0.0
0.5	1.0	0.3	307.0	338.6	14.192955999368138
0.5	1.0	0.5	327.0	339.2	9.378699270154684
0.5	1.0	0.1	329.0	343.4	11.655041827466771

As execuções foram todas executadas 10 vezes e com 100 iterações. Os melhores parâmetros foram:

- alpha: 0.5
- beta: 2.0
- rho: 0.1


Evolução do Fitness - Melhor Config ACO
Média
Fitness
Geração
410
400
390
380
370
360
350
340
330
0
20
40
60
80
100


Evolução da Solução - Algoritmo de Colônia de Formigas
Melhor Execução
Pior Execução
Média das Execuções
Mediana das Execuções
Distância
Iteração
440
420
400
380
360
340
320
300
0
20
40
60
80
100

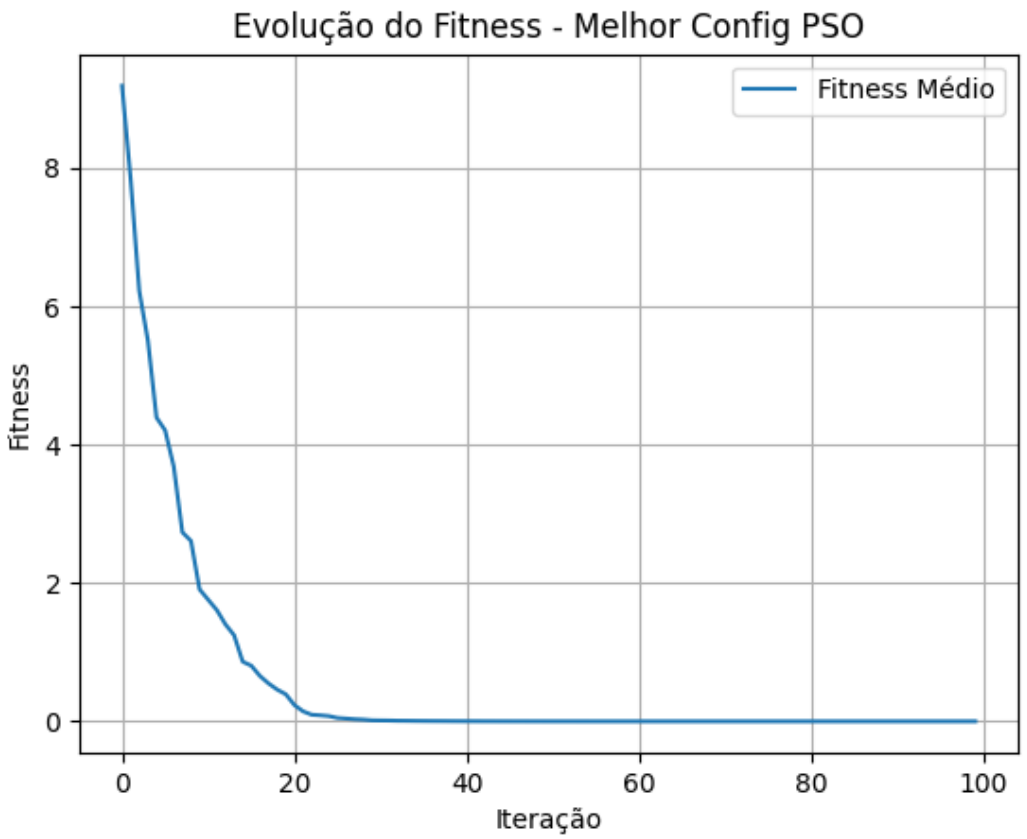
2 PSO

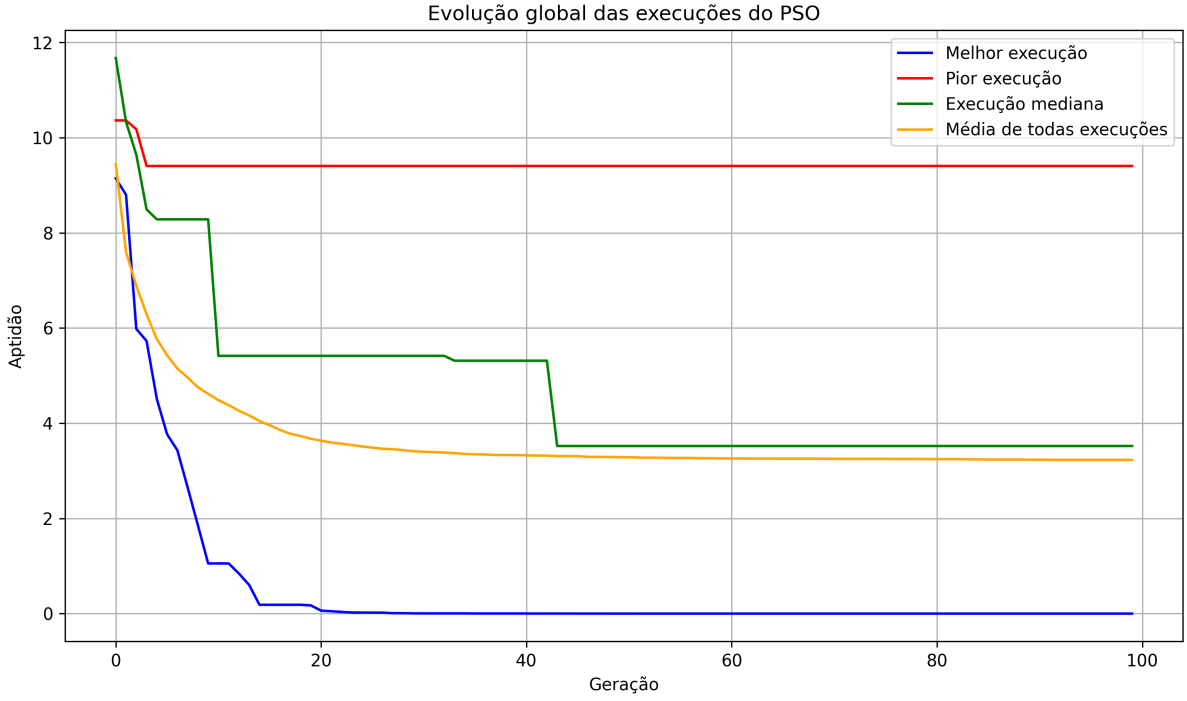
Top 30 - PSO (Ackley)

w	c1	c2	Melhor	Média	Desvio
0.5	1.0	1.0	9.5288443802132 86e-10	5.324932406125527e-09	7.787898844828035e-09
0.5	0.5	1.0	1.5294117083897163e-09	8.23164301166912e-09	6.86352354840126e-09
0.5	2.0	1.0	2.186758552014112e-08	5.7492376814849425e-08	3.342612774202095e-08
0.5	1.0	2.0	4.1932196426230917e-07	1.2444551047430252e-06	5.126825455583515e-07
0.5	0.5	2.0	4.775108171095 61e-07	1.2156247174210932e-06	5.840976327867835e-07
0.5	1.0	0.5	7.669956549882784e-07	0.005430814015685304	0.006310027387111308
0.5	2.0	0.5	1.74980035838 60111e-06	0.002122308162507469	0.002489930253062777
0.5	0.5	0.5	5.8814871167545135e-05	0.010271276770123895	0.018690531354504786
0.5	2.0	2.0	0.000122699081 40938313	0.000367973712155578 17	0.000214365301065726 5
1.0	1.0	0.5	0.5401674317420206	1.8946502954801976	0.8763839637057937
1.0	2.0	2.0	1.0129586138898259	3.6247234269832136	1.0079206660727598
1.0	0.5	0.5	1.2154483334529798	2.461008782713022	0.5259983173127074
1.0	2.0	0.5	1.8089540338924377	2.665039861561269	0.5210467291736954
1.0	2.0	1.0	2.001624746283721	3.2190475062149844	0.5382129562671428
1.0	0.5	1.0	2.142467241108719	3.1498101363937687	0.4511948460482006
1.0	1.0	1.0	2.2110953309219146	2.8923891982329177	0.5403091984880215
1.0	0.5	2.0	2.261389885645514	3.576209586569516	0.7641506126798225
1.0	1.0	2.0	2.782941324751708	4.004547958672321	0.7549061488488108
1.5	2.0	2.0	2.8796378814648134	6.288278215955823	1.944557037288779
1.5	0.5	1.0	3.940669301776851	7.18510108567353	1.6206062310846234
1.5	0.5	2.0	3.98883337691677	6.589827888351377	1.1434063950946531
1.5	1.0	2.0	4.23248704454225	7.116051366088419	1.2623324393778148
1.5	2.0	1.0	4.491394638432336	6.404090657116 24	1.284853104281783
1.5	2.0	0.5	4.56097682053467	5.625656637636583	0.5497850392010695
1.5	1.0	0.5	4.813442592117173	5.73362869957077	0.7194279293248078
1.5	0.5	0.5	5.100282272058987	6.409444030975368	0.9505507319544642
1.5	1.0	1.0	5.238344537365521	6.0844238460439 8	0.4886506521052227

As execuções foram todas executadas 10 vezes com 100 iterações e o tamanho do enxame 30. Os melhores parâmetros foram:

- w: 0.5
- c1: 1.0
- c2: 1.0


Evolução do Fitness - Melhor Config PSO
Fitness Médio
Fitness
Iteração
0
2
4
6
8
0
20
40
60
80
100


Evolução global das execuções do PSO
Melhor execução
Pior execução
Execução mediana
Média de todas execuções
Aptidão
Geração
0
2
4
6
8
10
12
0
20
40
60
80
100

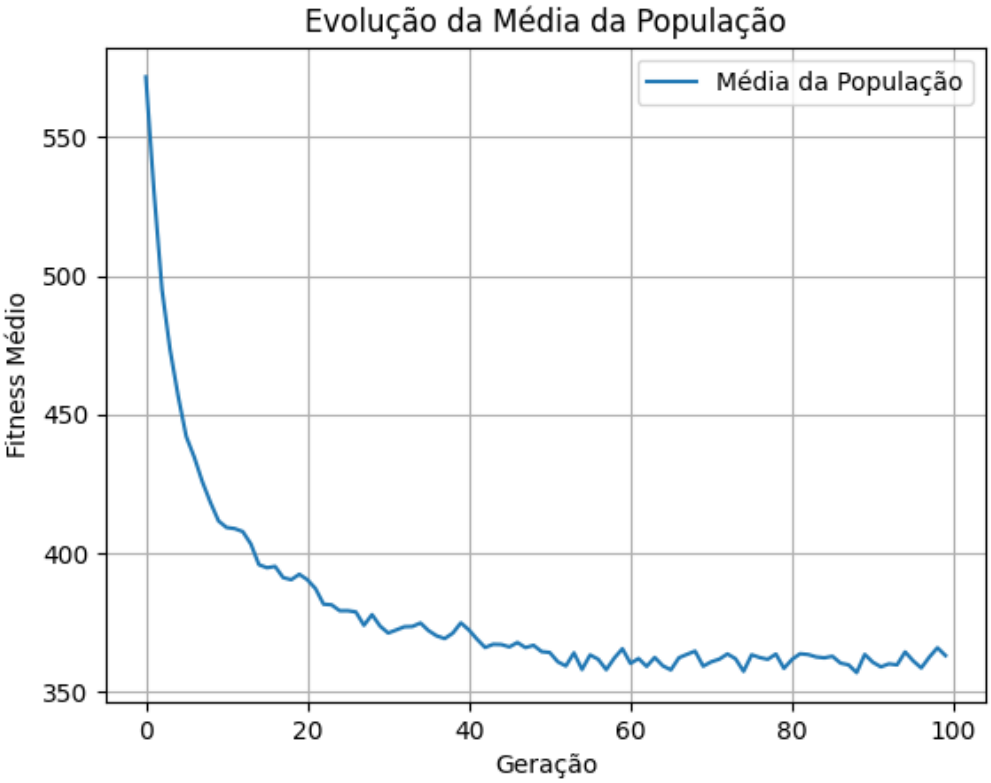
3 CLONALG

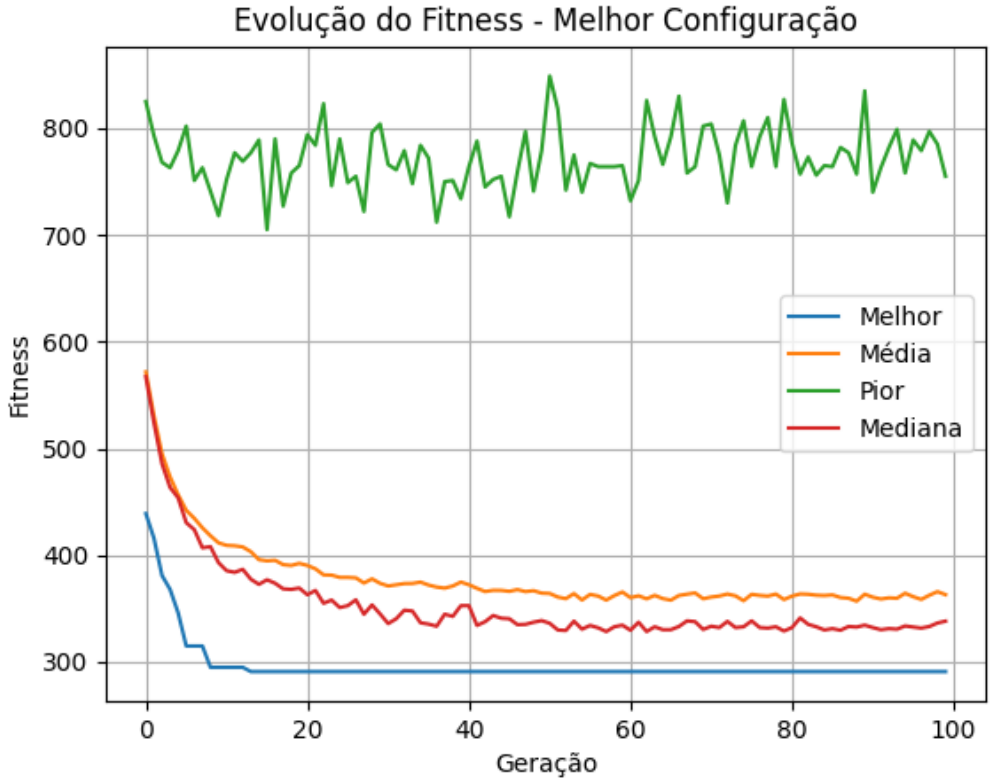
Top 30 Configurações - CLONALG

n	d	beta	Melhor	Média	Desvio
10.0	2.0	1.0	291.0	292.6	4.8
10.0	2.0	3.0	291.0	297.8	11.6
10.0	2.0	5.0	291.0	306.4	16.347476869535555
10.0	5.0	1.0	291.0	305.9	17.57526671205874
10.0	5.0	3.0	291.0	299.8	14.647866738880444
10.0	5.0	5.0	291.0	295.6	9.718024490605073
10.0	8.0	1.0	291.0	308.3	14.940214188558343
10.0	8.0	3.0	291.0	300.2	12.106196760337244
10.0	8.0	5.0	291.0	300.6	14.745846872933408
15.0	2.0	1.0	291.0	295.6	9.718024490605073
15.0	2.0	3.0	291.0	306.6	19.386593305684215
15.0	2.0	5.0	291.0	295.6	9.718024490605073
15.0	5.0	1.0	291.0	308.2	14.176036117335482
15.0	5.0	3.0	291.0	300.4	15.596153371905524
15.0	5.0	5.0	291.0	308.6	16.56019323558756
15.0	8.0	5.0	291.0	302.8	10.524257693538296
20.0	2.0	1.0	291.0	298.0	9.767292357659825
20.0	2.0	3.0	291.0	301.3	17.58436805802244
20.0	2.0	5.0	291.0	295.6	9.718024490605073
20.0	5.0	3.0	291.0	319.3	16.74544714243248
20.0	8.0	5.0	291.0	316.6	16.42071862008481
15.0	8.0	3.0	295.0	314.2	8.997777503361595
15.0	8.0	1.0	299.0	325.9	17.86309043810729
20.0	5.0	5.0	299.0	316.5	8.452810183601665
20.0	8.0	3.0	307.0	325.2	8.328265125462805
20.0	5.0	1.0	319.0	342.5	17.089470442351338
20.0	8.0	1.0	325.0	350.8	14.140721339450826

As execuções foram todas executadas 10 vezes e com 100 gerações e N = 20. Os melhores parâmetros foram:

- n: 10
- d: 2
- beta: 1


Evolução da Média da População
Média da População
Fitness Médio
Geração
550
500
450
400
350
0
20
40
60
80
100


Evolução do Fitness - Melhor Configuração
Melhor
Média
Pior
Mediana
Fitness
Geração
800
700
600
500
400
300
0
20
40
60
80
100