

Table 1: Performance Results for Rastrigin\2DProblem

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
L-BFGS-Conservative	9.45	2.28	7.96	1.29×10^1	283.6	70.0	0.005
QQN-StrongWolfe	8.11	5.91	0.00	2.49×10^1	113.8	65.0	0.003
Adam-WeightDecay	8.97	1.99	7.98	1.30×10^1	258.3	65.0	0.005
QQN-GoldenSection	7.98	5.34	0.00	1.99×10^1	244.9	60.0	0.004
QQN-Bisection-1	8.26	4.48	0.00	1.79×10^1	131.2	60.0	0.003
QQN-MoreThuente	7.96	4.66	0.00	1.79×10^1	126.5	55.0	0.003
QQN-CubicQuadraticInterpolation	1.05×10^1	6.16	0.00	2.49×10^1	114.6	47.5	0.003
QQN-Backtracking	1.07×10^1	5.50	9.95×10^{-1}	1.99×10^1	120.0	40.0	0.003
QQN-Bisection-2	7.53	5.99	9.95×10^{-1}	1.59×10^1	30.6	20.0	0.001
GD-WeightDecay	1.00×10^1	2.24	7.96	1.32×10^1	26.0	10.0	0.001
GD-Nesterov	1.01×10^1	2.49	8.07	1.48×10^1	20.1	10.0	0.001
Trust Region-Adaptive	1.14×10^1	6.06	7.97	3.03×10^1	242.9	10.0	0.002
L-BFGS	5.74×10^1	2.12×10^1	1.66×10^1	1.05×10^2	81.0	10.0	0.001
Adam	1.36×10^1	3.70	7.96	1.99×10^1	500.2	5.0	0.010
Adam-Fast	9.02	1.90	7.97	1.59×10^1	45.0	0.0	0.001
Trust Region-Standard	1.01×10^1	2.44	7.97	1.32×10^1	62.6	0.0	0.000
GD	1.03×10^1	2.46	8.09	1.39×10^1	13.4	0.0	0.000
GD-Momentum	1.16×10^1	2.84	8.07	1.91×10^1	24.6	0.0	0.001
Adam-AMSGrad	1.29×10^1	3.21	7.96	1.81×10^1	502.0	0.0	0.012
Trust Region-Conservative	2.54×10^1	5.23	1.59×10^1	3.39×10^1	602.0	0.0	0.004
L-BFGS-Aggressive	2.84×10^1	5.91	6.90	3.97×10^1	717.8	0.0	0.005