

Table 1: Performance Results for Ackley\\$_{10}Dn_a20n_b0.2n_c6.28e0Problem\$

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
L-BFGS	3.14	1.15	7.30×10^{-2}	4.18	151.6	20.0	0.003
QQN-Backtracking	3.36	5.40×10^{-1}	1.65	3.57	149.7	15.0	0.006
QQN-MoreThuente	3.52	2.17×10^{-1}	2.58	3.57	81.1	5.0	0.002
QQN-Bisection-1	3.49	3.55×10^{-1}	1.65	3.57	119.8	2.5	0.003
QQN-GoldenSection	3.42	6.12×10^{-1}	6.05×10^{-11}	3.57	198.9	1.7	0.003
QQN-CubicQuadraticInterpolation	3.49	3.92×10^{-1}	1.16	3.58	296.3	0.0	0.012
QQN-Bisection-2	3.57	1.36×10^{-14}	3.57	3.57	61.1	0.0	0.001
QQN-StrongWolfe	3.57	8.88×10^{-15}	3.57	3.57	76.5	0.0	0.002
GD	3.57	1.99×10^{-10}	3.57	3.57	98.2	0.0	0.003
L-BFGS-Conservative	3.57	1.95×10^{-8}	3.57	3.57	240.4	0.0	0.005
L-BFGS-Aggressive	3.57	2.43×10^{-7}	3.57	3.57	183.3	0.0	0.003
Adam-WeightDecay	3.57	1.53×10^{-5}	3.57	3.57	301.5	0.0	0.007
Adam	3.57	1.54×10^{-4}	3.57	3.57	502.0	0.0	0.011
Adam-AMSGrad	3.58	3.10×10^{-3}	3.57	3.59	502.0	0.0	0.012
Trust Region-Conservative	3.58	8.55×10^{-3}	3.57	3.60	212.1	0.0	0.002
Adam-Fast	3.59	3.04×10^{-2}	3.57	3.70	160.8	0.0	0.004
GD-WeightDecay	3.59	4.40×10^{-3}	3.58	3.60	19.7	0.0	0.001
GD-Nesterov	3.66	3.70×10^{-2}	3.61	3.76	14.1	0.0	0.000
GD-Momentum	3.77	6.22×10^{-2}	3.69	3.89	14.3	0.0	0.000
Trust Region-Adaptive	3.96	8.34×10^{-1}	3.59	6.71	17.3	0.0	0.000
Trust Region-Standard	4.99	1.10	3.63	6.40	10.4	0.0	0.000