

Table 1: Performance Results for Barrier_5D-mu0.1 Problem

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
QQN-CubicQuadraticInterpolation	9.99e-1	1.54e-8	9.99e-1	9.99e-1	78.7	0.0	0.002
QQN-Bisection-2	9.99e-1	1.38e-16	9.99e-1	9.99e-1	126.0	0.0	0.003
L-BFGS-Aggressive	9.99e-1	3.84e-14	9.99e-1	9.99e-1	63.8	0.0	0.001
QQN-GoldenSection	9.99e-1	6.83e-15	9.99e-1	9.99e-1	144.7	0.0	0.002
QQN-Bisection-1	9.99e-1	3.83e-14	9.99e-1	9.99e-1	77.2	0.0	0.002
L-BFGS	9.99e-1	1.51e-11	9.99e-1	9.99e-1	89.1	0.0	0.002
QQN-StrongWolfe	9.99e-1	4.30e-15	9.99e-1	9.99e-1	112.1	0.0	0.004
L-BFGS-Limited	9.99e-1	1.63e-9	9.99e-1	9.99e-1	190.6	0.0	0.004
L-BFGS-Conservative	9.99e-1	6.66e-9	9.99e-1	9.99e-1	599.6	0.0	0.015
GD	9.99e-1	2.58e-11	9.99e-1	9.99e-1	304.1	0.0	0.008
Adam-WeightDecay	9.99e-1	2.90e-9	9.99e-1	9.99e-1	1316.6	0.0	0.028
Adam	9.99e-1	9.02e-6	9.99e-1	9.99e-1	2502.0	0.0	0.051
GD-WeightDecay	9.99e-1	1.40e-5	9.99e-1	9.99e-1	49.2	0.0	0.002
Adam-Robust	1.01e0	4.00e-3	1.00e0	1.01e0	2502.0	0.0	0.057
Trust Region-Conservative	1.05e0	6.79e-2	1.00e0	1.18e0	984.2	0.0	0.007
Adam-AMSGrad	1.03e0	1.71e-2	1.01e0	1.07e0	2502.0	0.0	0.057
Trust Region-Precise	1.02e0	1.63e-2	1.01e0	1.07e0	143.6	0.0	0.001
Trust Region-Adaptive	1.17e0	1.56e-1	1.03e0	1.37e0	28.0	0.0	0.000
Trust Region-Standard	1.23e0	5.13e-2	1.14e0	1.30e0	5.5	0.0	0.000
Adam-Fast	1.28e0	5.59e-2	1.19e0	1.40e0	31.7	0.0	0.001
GD-Nesterov	1.26e0	2.76e-2	1.22e0	1.30e0	20.4	0.0	0.001
GD-Momentum	1.37e0	9.02e-2	1.28e0	1.64e0	21.0	0.0	0.001
Trust Region-Aggressive	1.99e0	2.18e-1	1.58e0	2.39e0	5.7	0.0	0.000