Table 1: Performance Results for PenaltyI_5D_alpha1e6 Problem

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
QQN-GoldenSection	2.81e0	7.61e-5	2.81e0	2.81e0	3026.4	0.0	0.056
QQN-CubicQuadraticInterpolation	2.81e0	7.09e-16	2.81e0	2.81e0	38.0	0.0	0.001
L-BFGS-Conservative	2.85e0	5.01e-2	2.81e0	3.03e0	3087.5	0.0	0.033
QQN-Bisection-1	2.81e0	6.12e-4	2.81e0	2.81e0	2178.7	0.0	0.071
Adam-AMSGrad	2.85e0	9.04e-2	2.82e0	3.24e0	747.3	0.0	0.017
Adam-Robust	2.16e1	2.85e1	2.82e0	1.26e2	120.4	0.0	0.003
Adam	2.90e0	1.17e-1	2.82e0	3.24e0	733.5	0.0	0.015
L-BFGS-Limited	2.96e0	9.11e-2	2.84e0	3.13e0	4259.2	0.0	0.036
Adam-WeightDecay	7.65e0	7.96e0	2.86e0	3.08e1	260.1	0.0	0.006
QQN-StrongWolfe	4.21e0	1.19e0	2.86e0	7.74e0	3121.1	0.0	0.086
GD	8.04e1	1.22e2	3.17e0	4.27e2	17.1	0.0	0.000
GD-Nesterov	3.89e2	8.55e2	3.28e0	3.56e3	14.1	0.0	0.000
Adam-Fast	4.69e2	8.74e2	3.30e0	2.81e3	29.0	0.0	0.001
GD-AdaptiveMomentum	5.87e2	9.45e2	3.36e0	2.82e3	13.9	0.0	0.000
L-BFGS-Aggressive	2.82e5	2.24e5	3.49e0	6.03e5	1110.7	0.0	0.022
GD-WeightDecay	3.50e1	9.28e1	3.50e0	4.19e2	14.5	0.0	0.000
L-BFGS-MoreThuente	1.29e1	4.81e0	3.57e0	1.92e1	2860.6	0.0	0.036
QQN-Bisection-2	1.03e1	5.36e0	3.91e0	2.42e1	469.8	0.0	0.011
GD-Momentum	9.24e1	2.66e2	3.99e0	1.22e3	14.4	0.0	0.000
L-BFGS	7.00e4	1.12e5	4.88e0	5.16e5	95.2	0.0	0.001
Trust Region-Adaptive	3.71e5	1.47e5	9.78e4	6.40e5	3002.0	0.0	0.019
Trust Region-Standard	3.74e5	1.32e5	1.16e5	7.18e5	3002.0	0.0	0.019
Trust Region-Conservative	3.90e5	1.18e5	1.47e5	5.82e5	3002.0	0.0	0.022
Trust Region-Aggressive	3.61e5	1.19e5	1.76e5	5.61e5	3002.0	0.0	0.020
Trust Region-Precise	4.20e5	1.11e5	2.36e5	6.26e5	3002.0	0.0	0.020