

Table 1: Performance Results for Griewank\10DProblem

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
<b>QQN-Bisection-1</b>	$1.08 \times 10^1$	$1.21 \times 10^1$	$1.86 \times 10^{-12}$	$2.58 \times 10^1$	506.3	2.5	0.011
QQN-StrongWolfe	8.29	$1.16 \times 10^1$	$1.97 \times 10^{-2}$	$2.60 \times 10^1$	517.9	0.0	0.016
QQN-Backtracking	8.40	$1.15 \times 10^1$	$1.72 \times 10^{-2}$	$2.60 \times 10^1$	595.4	0.0	0.020
QQN-CubicQuadraticInterpolation	$1.03 \times 10^1$	$1.20 \times 10^1$	$1.20 \times 10^{-1}$	$2.58 \times 10^1$	344.4	0.0	0.013
Adam-Fast	$1.57 \times 10^1$	$6.84 \times 10^{-2}$	$1.56 \times 10^1$	$1.59 \times 10^1$	502.0	0.0	0.011
QQN-GoldenSection	$1.77 \times 10^1$	$1.17 \times 10^1$	$7.85 \times 10^{-3}$	$2.58 \times 10^1$	913.7	0.0	0.015
L-BFGS	$1.85 \times 10^1$	3.13	$1.22 \times 10^1$	$2.34 \times 10^1$	430.9	0.0	0.010
Trust Region-Conservative	$2.40 \times 10^1$	$5.92 \times 10^{-2}$	$2.40 \times 10^1$	$2.43 \times 10^1$	597.8	0.0	0.004
QQN-Bisection-2	$2.45 \times 10^1$	5.41	$9.42 \times 10^{-1}$	$2.58 \times 10^1$	644.6	0.0	0.014
L-BFGS-Conservative	$2.50 \times 10^1$	$5.19 \times 10^{-1}$	$2.37 \times 10^1$	$2.57 \times 10^1$	557.5	0.0	0.015
GD-Momentum	$2.52 \times 10^1$	$1.81 \times 10^{-2}$	$2.52 \times 10^1$	$2.53 \times 10^1$	335.0	0.0	0.010
GD-Nesterov	$2.53 \times 10^1$	$1.95 \times 10^{-2}$	$2.52 \times 10^1$	$2.53 \times 10^1$	335.0	0.0	0.011
Adam-WeightDecay	$2.56 \times 10^1$	$2.08 \times 10^{-2}$	$2.56 \times 10^1$	$2.57 \times 10^1$	502.0	0.0	0.012
QQN-MoreThuente	$2.57 \times 10^1$	$1.34 \times 10^{-2}$	$2.57 \times 10^1$	$2.58 \times 10^1$	414.3	0.0	0.015
GD-WeightDecay	$2.58 \times 10^1$	$1.91 \times 10^{-2}$	$2.57 \times 10^1$	$2.58 \times 10^1$	335.0	0.0	0.011
Adam	$2.59 \times 10^1$	$1.65 \times 10^{-2}$	$2.58 \times 10^1$	$2.59 \times 10^1$	502.0	0.0	0.011
Adam-AMSGrad	$2.59 \times 10^1$	$1.82 \times 10^{-2}$	$2.59 \times 10^1$	$2.59 \times 10^1$	502.0	0.0	0.012
GD	$2.59 \times 10^1$	$1.76 \times 10^{-2}$	$2.59 \times 10^1$	$2.60 \times 10^1$	335.0	0.0	0.009
Trust Region-Standard	$2.60 \times 10^1$	$1.94 \times 10^{-2}$	$2.60 \times 10^1$	$2.60 \times 10^1$	5.0	0.0	0.000
Trust Region-Adaptive	$2.60 \times 10^1$	$1.70 \times 10^{-2}$	$2.60 \times 10^1$	$2.60 \times 10^1$	5.0	0.0	0.000
L-BFGS-Aggressive	$2.84 \times 10^2$	$1.69 \times 10^3$	$9.30 \times 10^{-1}$	$1.09 \times 10^4$	663.4	0.0	0.011