

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-GoldenSection</b>	$1.68 \times 10^1$	$1.21 \times 10^1$	$7.79 \times 10^{-13}$	$2.58 \times 10^1$	908.8	1.7	0.017
QQN-Backtracking	2.37	5.48	$1.63 \times 10^{-1}$	$2.60 \times 10^1$	606.1	0.0	0.025
QQN-StrongWolfe	5.77	$1.01 \times 10^1$	$1.27 \times 10^{-1}$	$2.60 \times 10^1$	524.2	0.0	0.020
QQN-Bisection-1	$1.05 \times 10^1$	$1.17 \times 10^1$	$6.16 \times 10^{-10}$	$2.58 \times 10^1$	499.8	0.0	0.013
QQN-CubicQuadraticInterpolation	$1.38 \times 10^1$	$1.24 \times 10^1$	$1.85 \times 10^{-4}$	$2.58 \times 10^1$	326.1	0.0	0.013
L-BFGS-Aggressive	$1.46 \times 10^1$	8.51	$4.97 \times 10^{-1}$	$2.59 \times 10^1$	714.0	0.0	0.012
Adam-Fast	$1.59 \times 10^1$	$8.59 \times 10^{-1}$	$1.55 \times 10^1$	$2.12 \times 10^1$	498.6	0.0	0.011
L-BFGS	$1.85 \times 10^1$	3.79	7.08	$2.45 \times 10^1$	457.0	0.0	0.012
QQN-Bisection-2	$2.32 \times 10^1$	7.54	$2.39 \times 10^{-1}$	$2.58 \times 10^1$	669.4	0.0	0.017
Trust Region-Conservative	$2.40 \times 10^1$	$9.15 \times 10^{-2}$	$2.40 \times 10^1$	$2.43 \times 10^1$	593.5	0.0	0.005
QQN-MoreThuente	$2.44 \times 10^1$	5.13	2.31	$2.58 \times 10^1$	401.1	0.0	0.016
L-BFGS-Conservative	$2.50 \times 10^1$	$5.88 \times 10^{-1}$	$2.36 \times 10^1$	$2.57 \times 10^1$	558.6	0.0	0.016
GD-Nesterov	$2.53 \times 10^1$	$1.40 \times 10^{-2}$	$2.52 \times 10^1$	$2.53 \times 10^1$	335.0	0.0	0.012
GD-Momentum	$2.53 \times 10^1$	$1.41 \times 10^{-2}$	$2.52 \times 10^1$	$2.53 \times 10^1$	335.0	0.0	0.011
Adam-WeightDecay	$2.56 \times 10^1$	$1.99 \times 10^{-2}$	$2.56 \times 10^1$	$2.57 \times 10^1$	502.0	0.0	0.012
GD-WeightDecay	$2.58 \times 10^1$	$1.59 \times 10^{-2}$	$2.57 \times 10^1$	$2.58 \times 10^1$	335.0	0.0	0.012
Adam	$2.59 \times 10^1$	$1.46 \times 10^{-2}$	$2.59 \times 10^1$	$2.59 \times 10^1$	502.0	0.0	0.011
Adam-AMSGrad	$2.59 \times 10^1$	$2.20 \times 10^{-2}$	$2.58 \times 10^1$	$2.59 \times 10^1$	502.0	0.0	0.013
GD	$2.59 \times 10^1$	$1.29 \times 10^{-2}$	$2.59 \times 10^1$	$2.60 \times 10^1$	335.0	0.0	0.010
Trust Region-Standard	$2.60 \times 10^1$	$1.70 \times 10^{-2}$	$2.60 \times 10^1$	$2.60 \times 10^1$	5.0	0.0	0.000
Trust Region-Adaptive	$2.60 \times 10^1$	$1.75 \times 10^{-2}$	$2.60 \times 10^1$	$2.60 \times 10^1$	5.0	0.0	0.000