

Table 1: Performance Results for Schwefel<sub>2</sub>*DProblem*

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
<b>QQN-StrongWolfe</b>	$-1.19 \times 10^2$	$1.33 \times 10^3$	$-5.26 \times 10^3$	$5.92 \times 10^2$	421.1	40.0	0.014
QQN-Backtracking	$-5.03 \times 10^4$	$2.11 \times 10^5$	$-9.68 \times 10^5$	$5.92 \times 10^2$	491.1	10.0	0.018
QQN-CubicQuadraticInterpolation	$6.20 \times 10^2$	$2.45 \times 10^2$	$2.37 \times 10^2$	$8.85 \times 10^2$	168.1	0.0	0.005
QQN-Bisection-2	$7.11 \times 10^2$	$3.57 \times 10^{-13}$	$7.11 \times 10^2$	$7.11 \times 10^2$	48.7	0.0	0.001
QQN-MoreThuente	$7.11 \times 10^2$	$3.35 \times 10^{-13}$	$7.11 \times 10^2$	$7.11 \times 10^2$	65.2	0.0	0.001
QQN-Bisection-1	$7.11 \times 10^2$	$6.67 \times 10^{-13}$	$7.11 \times 10^2$	$7.11 \times 10^2$	50.2	0.0	0.001
GD-Momentum	$7.11 \times 10^2$	$1.09 \times 10^{-7}$	$7.11 \times 10^2$	$7.11 \times 10^2$	277.5	0.0	0.007
GD-Nesterov	$7.11 \times 10^2$	$1.68 \times 10^{-7}$	$7.11 \times 10^2$	$7.11 \times 10^2$	292.4	0.0	0.008
L-BFGS	$7.11 \times 10^2$	$1.86 \times 10^{-5}$	$7.11 \times 10^2$	$7.11 \times 10^2$	307.0	0.0	0.007
QQN-GoldenSection	$7.11 \times 10^2$	$7.93 \times 10^{-5}$	$7.11 \times 10^2$	$7.11 \times 10^2$	145.9	0.0	0.002
L-BFGS-Aggressive	$7.11 \times 10^2$	$6.72 \times 10^{-2}$	$7.11 \times 10^2$	$7.11 \times 10^2$	210.1	0.0	0.004
GD-WeightDecay	$7.18 \times 10^2$	$7.44 \times 10^{-2}$	$7.18 \times 10^2$	$7.18 \times 10^2$	335.0	0.0	0.010
Adam-Fast	$7.45 \times 10^2$	$2.89 \times 10^{-1}$	$7.44 \times 10^2$	$7.45 \times 10^2$	502.0	0.0	0.010
Trust Region-Standard	$7.48 \times 10^2$	$6.22 \times 10^{-1}$	$7.47 \times 10^2$	$7.49 \times 10^2$	602.0	0.0	0.004
GD	$7.97 \times 10^2$	$6.14 \times 10^{-1}$	$7.96 \times 10^2$	$7.98 \times 10^2$	335.0	0.0	0.008
L-BFGS-Conservative	$8.45 \times 10^2$	$7.94 \times 10^{-1}$	$8.43 \times 10^2$	$8.47 \times 10^2$	558.7	0.0	0.013
Trust Region-Adaptive	$8.97 \times 10^2$	$7.80 \times 10^{-1}$	$8.96 \times 10^2$	$8.98 \times 10^2$	602.0	0.0	0.004
Adam-WeightDecay	$9.40 \times 10^2$	$7.69 \times 10^{-1}$	$9.38 \times 10^2$	$9.41 \times 10^2$	502.0	0.0	0.010
Adam-AMSGrad	$9.44 \times 10^2$	$8.25 \times 10^{-1}$	$9.43 \times 10^2$	$9.45 \times 10^2$	502.0	0.0	0.011
Trust Region-Conservative	$9.45 \times 10^2$	$6.60 \times 10^{-1}$	$9.43 \times 10^2$	$9.46 \times 10^2$	602.0	0.0	0.004
Adam	$9.45 \times 10^2$	$8.50 \times 10^{-1}$	$9.43 \times 10^2$	$9.46 \times 10^2$	502.0	0.0	0.010