

Table 1: Performance Results for NoisySphere\\$_2Dn_{sigma}0.01Problem

| Optimizer | Mean Final Value | Std Dev | Best Value | Worst Value | Mean Func Evals | Success Rate (%) | Mean Time (s) |
|---------------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------|------------------|---------------|
| GD-Momentum | 1.98 | 9.78×10^{-1} | 3.78×10^{-1} | 4.11 | 16.4 | 45.0 | 0.001 |
| L-BFGS | 1.30×10^1 | 1.07×10^1 | 1.53 | 3.99×10^1 | 77.3 | 40.0 | 0.002 |
| GD-Nesterov | 2.60 | 1.16 | 4.92×10^{-1} | 5.12 | 14.8 | 35.0 | 0.001 |
| L-BFGS-Conservative | 2.94×10^{-1} | 2.62×10^{-1} | -5.43×10^{-3} | 7.50×10^{-1} | 811.8 | 30.0 | 0.018 |
| GD | 1.91 | 7.14×10^{-1} | 1.29×10^{-1} | 3.07 | 14.7 | 30.0 | 0.001 |
| Adam-Fast | 2.15 | 9.51×10^{-1} | 7.94×10^{-2} | 4.22 | 25.3 | 30.0 | 0.001 |
| GD-WeightDecay | 2.10 | 6.49×10^{-1} | 8.06×10^{-1} | 3.31 | 13.6 | 25.0 | 0.001 |
| Trust Region-Adaptive | 2.01 | 3.74×10^{-1} | 1.32 | 2.53 | 5.0 | 10.0 | 0.000 |
| Trust Region-Conservative | 1.95 | 3.16×10^{-1} | 1.34 | 2.48 | 6.8 | 5.0 | 0.000 |
| QQN-StrongWolfe | 1.03 | 7.87×10^{-1} | 1.87×10^{-3} | 2.48 | 29.9 | 0.0 | 0.002 |
| QQN-Bisection-1 | 1.19 | 7.55×10^{-1} | 3.91×10^{-3} | 2.37 | 115.7 | 0.0 | 0.011 |
| QQN-MoreThuente | 1.32 | 6.84×10^{-1} | 1.71×10^{-1} | 2.32 | 29.7 | 0.0 | 0.002 |
| QQN-Backtracking | 1.47 | 8.66×10^{-1} | -9.29×10^{-3} | 2.51 | 223.8 | 0.0 | 0.008 |
| QQN-GoldenSection | 1.54 | 6.91×10^{-1} | 9.91×10^{-3} | 2.44 | 29.7 | 0.0 | 0.001 |
| QQN-CubicQuadraticInterpolation | 1.63 | 6.87×10^{-1} | 4.61×10^{-2} | 2.61 | 31.1 | 0.0 | 0.002 |
| Adam-AMSGrad | 2.00 | 2.88×10^{-1} | 1.46 | 2.46 | 20.6 | 0.0 | 0.001 |
| L-BFGS-Aggressive | 2.02 | 3.00×10^{-1} | 1.60 | 2.62 | 7.0 | 0.0 | 0.000 |
| Adam | 2.03 | 2.96×10^{-1} | 1.56 | 2.59 | 20.6 | 0.0 | 0.001 |
| Trust Region-Standard | 2.09 | 3.23×10^{-1} | 1.62 | 2.75 | 5.0 | 0.0 | 0.000 |
| Adam-WeightDecay | 2.09 | 2.99×10^{-1} | 1.41 | 2.61 | 23.4 | 0.0 | 0.001 |