

Table 1: Performance Results for Michalewicz\\$\_5Dn\_m10Problem

Optimizer	Mean Final Value	Std Dev	Best Value	Worst Value	Mean Func Evals	Success Rate (%)	Mean Time (s)
<b>Adam-Fast</b>	-2.81	$7.34 \times 10^{-1}$	-3.69	-1.36	87.0	60.0	0.002
Adam-AMSGrad	-2.51	$5.61 \times 10^{-1}$	-3.45	-1.73	474.4	10.0	0.011
Adam-WeightDecay	-1.85	$5.68 \times 10^{-1}$	-2.68	$-8.44 \times 10^{-1}$	163.5	10.0	0.004
QQN-Backtracking	-1.34	$6.05 \times 10^{-1}$	-2.69	$-8.39 \times 10^{-1}$	538.2	10.0	0.019
GD	-1.33	$7.28 \times 10^{-1}$	-2.69	$-3.25 \times 10^{-5}$	208.8	10.0	0.005
GD-WeightDecay	-1.23	$7.25 \times 10^{-1}$	-2.69	$-3.48 \times 10^{-4}$	77.3	10.0	0.002
QQN-GoldenSection	-1.48	$6.14 \times 10^{-1}$	-2.73	$-4.92 \times 10^{-1}$	611.7	6.7	0.011
Adam	-1.85	$7.84 \times 10^{-1}$	-3.13	$-8.37 \times 10^{-1}$	409.9	5.0	0.009
L-BFGS-Conservative	-1.69	$8.13 \times 10^{-1}$	-3.66	$-2.19 \times 10^{-4}$	520.2	5.0	0.009
QQN-Bisection-2	-1.60	$4.88 \times 10^{-1}$	-2.74	$-8.39 \times 10^{-1}$	358.8	5.0	0.011
QQN-Bisection-1	-1.54	$6.36 \times 10^{-1}$	-3.39	$-7.54 \times 10^{-1}$	418.0	0.0	0.010
QQN-StrongWolfe	-1.46	$6.22 \times 10^{-1}$	-2.69	$-4.92 \times 10^{-1}$	547.0	0.0	0.017
QQN-MoreThuente	-1.28	$4.26 \times 10^{-1}$	-1.89	$-8.39 \times 10^{-1}$	385.9	0.0	0.011
QQN-CubicQuadraticInterpolation	-1.20	$5.12 \times 10^{-1}$	-2.44	$-8.82 \times 10^{-5}$	348.3	0.0	0.013
GD-Nesterov	-1.13	$6.01 \times 10^{-1}$	-2.60	$-6.95 \times 10^{-1}$	20.7	0.0	0.001
Trust Region-Conservative	$-8.45 \times 10^{-1}$	$3.97 \times 10^{-1}$	-1.74	$-2.13 \times 10^{-3}$	221.2	0.0	0.002
GD-Momentum	$-7.30 \times 10^{-1}$	$6.46 \times 10^{-1}$	-2.37	$-6.76 \times 10^{-6}$	54.2	0.0	0.002
L-BFGS-Aggressive	$-6.92 \times 10^{-1}$	$3.94 \times 10^{-1}$	-1.73	$-1.66 \times 10^{-1}$	716.7	0.0	0.006
Trust Region-Adaptive	$-6.10 \times 10^{-1}$	$5.30 \times 10^{-1}$	-1.78	$-1.23 \times 10^{-5}$	9.2	0.0	0.000
Trust Region-Standard	$-2.21 \times 10^{-1}$	$2.32 \times 10^{-1}$	$-7.43 \times 10^{-1}$	$-1.12 \times 10^{-5}$	5.3	0.0	0.000
L-BFGS	$-5.99 \times 10^{-2}$	$1.53 \times 10^{-1}$	$-6.73 \times 10^{-1}$	$-8.22 \times 10^{-8}$	108.0	0.0	0.002