Table 1: Performance Results for Levy\_5D Problem

Optimizer	Mean Final	Std Dev	Best	Worst	Mean Func	Success	Mean Time
-	Value		Value	Value	Evals	Rate $(\%)$	(s)
Adam-	7.64e-2	1.84e-2	5.66e-2	1.23e-1	2502.0	0.0	0.060
AMSGrad							
Adam-Robust	6.80e-2	2.38e-2	3.18e-2	1.12e-1	2502.0	0.0	0.060
Adam	7.73e-3	2.59e-3	3.13e-3	1.23e-2	2502.0	0.0	0.054
GD-	9.96e-7	2.36e-9	9.93e-7	1.00e-6	1448.8	100.0	0.048
WeightDecay							
Adam-	1.43e-6	8.78e-7	9.65e-7	3.66e-6	2087.2	60.0	0.048
WeightDecay							
$\overline{\mathrm{GD}}$	2.32e-4	2.08e-5	1.98e-4	2.68e-4	1668.0	0.0	0.045
L-BFGS-	2.87e-4	1.19e-3	2.75e-7	5.49e-3	1375.8	70.0	0.025
Limited							
L-BFGS-	2.73e-2	8.04e-2	6.19e-7	2.69e-1	825.3	75.0	0.012
Aggressive							
L-BFGS-	6.68e-7	2.83e-7	1.69e-8	9.92e-7	332.8	100.0	0.008
Conservative							
Trust Region-	1.23e-2	2.42e-3	8.28e-3	1.73e-2	996.6	0.0	0.007
Conservative			0.200			0.0	0.000
QQN-	2.57e-7	2.61e-7	1.77e-10	8.61e-7	382.3	100.0	0.007
GoldenSection		2.010 .	11110 10	0.010	302.0	100.0	0.00.
L-BFGS-	6.91e-7	2.89e-7	1.12e-9	9.44e-7	296.9	100.0	0.006
MoreThuente	0.010 1	2.000 1	1.120 0	0.110	200.0	100.0	0.000
L-BFGS	4.35e-2	1.89e-1	2.47e-7	8.69e-1	173.6	80.0	0.004
GD-Nesterov	9.57e-2	5.82e-2	9.78e-7	1.77e-1	102.2	25.0	0.003
QQN-	2.65e-7	2.41e-7	2.28e-9	8.78e-7	96.0	100.0	0.003
CubicQuadraticIn		2.110 1	2.200 0	0.100 1	00.0	100.0	0.000
QQN-Bisection-	3.74e-7	3.37e-7	4.32e-9	9.98e-7	103.4	100.0	0.003
1	0.110 1	0.0101	1.020 0	0.000 1	100.1	100.0	0.000
QQN-Bisection-	2.16e-7	2.19e-7	1.51e-10	8.82e-7	101.3	100.0	0.003
2	2.100 1	2.150 1	1.010 10	0.020 1	101.0	100.0	0.000
QQN-	3.31e-7	3.09e-7	1.45e-9	9.50e-7	69.2	100.0	0.002
StrongWolfe	3.31e-7	5.056-1	1.400-3	3.00 <del>c-</del> 1	09.2	100.0	0.002
GD-Momentum	1.72e-1	6.34e-2	9.75e-7	2.44e-1	56.5	10.0	0.002
Trust Region-	3.62e-2	1.15e-2	1.69e-2	5.90e-2	168.1	0.0	0.002
Precise Precise	3.02e-2	1.106-2	1.036-2	0.906-2	100.1	0.0	0.001
Adam-Fast	1.67e-1	6.57e-3	1.54e-1	1.81e-1	37.0	0.0	0.001
GD-	4.77e-1	4.91e-2	3.80e-1	5.58e-1	19.2	0.0	0.001
AdaptiveMoment		4.916-2	3.006-1	0.006-1	13.2	0.0	0.001
Trust Region-	4111 1.06e1	3.16e1	4.60e-2	1.07e2	46.9	0.0	0.000
Adaptive	1.0061	9.1061	4.000-2	1.0762	40.8	0.0	0.000
Trust Region-	2.49e0	5.26e0	4.43e-4	2.47e1	26.4	0.0	0.000
Standard	4.49eu	J.20e0	4.436-4	2.47e1	40.4	0.0	0.000
Trust Region-	1 27 <sub>0</sub> 1	1.99e-1	1.82e-1	1.11e0	8.2	0.0	0.000
Aggressive	4.37e-1	1.996-1	1.020-1	1.1160	0.2	0.0	0.000