CS410.L11.KHTN WEEK 5 REPORT

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2 Dimension Test Optimization Functions

Experiment Results

(F,T)	Position	Objective Value	True Objective Value
(Rastrigin, Star)	$(-1.12e^{-05}, -1.56e^{-05})$	0.0	0
(Rosenbrock, Star)	$(0.7752, 0.6009)$	0.05052	0
(Ackley, Star)	$(-0.00033, 0.00015)$	0.00104	0
(Eggholder, Star)	$(512, 404.23)$	-959.64063	-959.6407
(Rastrigin, Ring)	$(-0.00043, -0.00073)$	0.00012	0
(Rosenbrock, Ring)	$(0.611397, 0.384703)$	0.14782	0
(Ackley, Ring)	$(-0.000179, -0.0001923)$	0.000472	0
(Eggholder, Ring)	$(-465.87559, 385.89385)$	-894.5712	-959.6407

The contour GIF-s is attached in the submitted files

Observation **Star topology** converges faster in Rastrigin, Rosenbrock and Ackley functions. **Ring topology** converges faster converges on Eggholder function.

10 Dimension Test Optimization Functions

Experiment Results

Function	Pop Size N	Star Topo	Ring Topo	p-value (t-test)
Rastrigin	**128**	**14.645(5.588)**	**5.572(2.049)**	**0.000235**
	256	**18.108(8.93)**	**3.383(1.274)**	**0.000116**
	512	12.238(3.505)	2.488(1.112)	1.298
	1024	16.019(3.343)	3.342(0.933)	2.150
	2048	13.332(4.899)	3.452(1.018)	1.316
Rosenbrock	128	94.73(145.625)	0.401(1.197)	0.0678
	256	224.938(426.77)	1.197(1.827)	0.1331
	512	1.209(1.847)	0.0(0.0)	0.065
	1024	**2.212(2.393)**	**0.0(0.001)**	**0.012**
	2048	1.211(1.831)	0.191(0.24)	0.1147

Observation **Star topology** converges faster but not usually on global optima. **Ring topology** often converges on the true global optima