

CEC 2020 Benchmark Functions

baseCSA and modifiedCSA comparison with seven other Meta-Heuristic Algorithms

Function	BestAlgorithm	BaseCSA_Mean	ModCSA_Mean	ABC_Mean	DE_Mean	GA_custom_Mean	GWO_Mean	PSO_Mean	SSA_Mean	WOA_Mean
F1	DE	70097760843	1.10908E+11	43336.14027	100	2906.8374	920395851.1	7912691129	1062.570927	48624530826
F2	GWO	8639.408539	8463.837429	9798.465822	7877.569434	5655.115027	3682.195743	5684.843685	4369.51256	6694.708398
F3	GWO	2319.773426	2319.497006	1065.533816	897.0550771	1198.842236	844.0040108	861.9227936	924.4137331	1324.910791
F4	GWO	244024.2275	227929.7815	2426.665453	1913.982175	1900.41431	1900	1909.876125	1916.68294	1900
F5	DE	51575939.57	29834124.19	9991015.476	2100.611757	2876718.183	954597.7354	29103905.6	136888.9599	124754591.8
F6	GWO	4154.854351	4711.835291	3538.439668	2110.036932	2964.11378	2030.968926	3569.91461	2629.344107	3708.291518
F7	DE	23884890.39	25232280.42	6238765.236	2336.761369	2344585.87	1805246.508	153593.9792	69014.50325	54635476.92
F8	DE	5.12902E+11	1.04398E+11	2.22669E+13	2363.756019	30905056643	412458.5036	2398.751302	2389.076902	7254626991

baseCSA and modifiedCSA comparison with other CSA Variants

Function	BestAlgorithm	BaseCSA_Mean	ModCSA_Mean	CSA_ADAPTIVE_Mean	CSA_CHAOTIC_Mean	CSA_LF_Mean	CSA_OB_Mean	CSA_PSO_Mean
F1	CSA_CHAOTIC	96943255138	71336428186	17210.51965	2782.029753	8586.752907	10202902.86	45643279529
F2	CSA_LF	8600.413572	8915.285402	5513.425103	5679.112974	4953.397084	5386.161229	7679.647451
F3	CSA_OB	2137.746669	2532.233239	2830.440687	2750.168551	1499.13393	1124.819066	2756.511259
F4	CSA_OB	166651.7389	103678.0025	2172.385599	1923.549351	1921.597182	1914.321478	788463.1393
F5	CSA_OB	27546619.9	87592414.33	197460.0928	188844.8716	744864.7967	150589.5367	29522499.28
F6	CSA_CHAOTIC	4437.159052	5050.293556	3783.790077	3119.991645	3907.188885	3189.239879	4043.909139
F7	CSA_CHAOTIC	15269812.85	11419190.52	130377.201	28306.38516	86521.16792	70315.29517	8031929.955
F8	BaseCSA	NaN	NaN	NaN	NaN	NaN	NaN	NaN