

SLS' Coverage Characteristics

Table 1: Coverage of sets / fronts: percentage of “covered” sets (i.e., at least one individual of the final population is located in the ε -environment of that set). The characteristics are computed for each (single) set separately or considering connected sets as a combined set. Analogously for the fronts.

ID	Shape	Coverage of Local				Coverage of Pareto			
		Sets		Fronts		Sets		Fronts	
		single	conn.	single	conn.	single	conn.	single	conn.
1	Ellipse	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	Ellipse	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3	Ellipse	0.750	0.750	0.750	0.750	1.000	1.000	1.000	1.000
4	Ellipse	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5	Ellipse	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6	Ellipse	0.714	0.786	0.643	0.786	1.000	1.000	1.000	1.000
7	Ellipse	0.800	0.800	0.800	0.800	0.667	0.667	0.667	0.667
8	Ellipse	0.800	0.800	0.733	0.733	1.000	1.000	1.000	1.000
9	Ellipse	0.556	0.667	0.667	0.778	1.000	1.000	1.000	1.000
10	Ellipse	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
11	Ellipse	0.800	1.000	0.800	1.000	1.000	1.000	1.000	1.000
12	Ellipse	0.636	0.636	0.636	0.636	1.000	1.000	1.000	1.000
13	Ellipse	0.615	0.692	0.577	0.615	1.000	1.000	1.000	1.000
14	Ellipse	0.800	0.800	1.000	1.000	0.500	0.500	1.000	1.000
15	Ellipse	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
16	Ellipse	0.615	0.692	0.692	0.769	1.000	1.000	1.000	1.000
17	Ellipse	0.714	0.786	0.786	0.857	1.000	1.000	1.000	1.000
18	Ellipse	0.700	0.700	0.700	0.700	1.000	1.000	1.000	1.000
19	Ellipse	0.619	0.667	0.667	0.714	1.000	1.000	1.000	1.000
20	Ellipse	0.576	0.667	0.485	0.606	0.800	1.000	0.800	1.000
21	Sphere	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
22	Sphere	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
23	Sphere	0.800	1.000	0.600	1.000	0.667	1.000	0.667	1.000
24	Sphere	0.667	1.000	0.333	0.667	0.500	1.000	0.000	0.667
25	Sphere	1.000	1.000	0.667	0.667	1.000	1.000	1.000	1.000
26	Sphere	0.778	0.778	0.333	0.889	1.000	1.000	1.000	1.000
27	Sphere	1.000	1.000	0.800	1.000	1.000	1.000	0.667	1.000
28	Sphere	0.769	1.000	0.385	1.000	1.000	1.000	0.750	1.000
29	Sphere	0.800	0.800	0.400	0.400	1.000	1.000	1.000	1.000
30	Sphere	0.700	0.900	0.400	0.900	0.667	1.000	0.667	1.000
31	Sphere	0.833	1.000	0.000	0.000	0.667	1.000	0.000	0.000
32	Sphere	0.667	0.833	0.500	0.583	1.000	1.000	0.667	1.000
33	Sphere	0.474	0.579	0.368	0.526	1.000	1.000	1.000	1.000
34	Sphere	1.000	1.000	0.750	0.750	1.000	1.000	1.000	1.000
35	Sphere	0.667	1.000	0.333	0.667	0.500	1.000	0.000	0.667
36	Sphere	0.692	1.000	0.231	1.000	1.000	1.000	1.000	1.000
37	Sphere	0.529	0.765	0.235	0.529	0.667	1.000	0.667	1.000
38	Sphere	0.875	1.000	0.250	0.250	0.667	1.000	0.000	0.000
39	Sphere	0.562	0.875	0.438	0.688	1.000	1.000	0.667	1.000
40	Sphere	0.220	0.390	0.160	0.542	0.800	0.850	0.600	1.000

SLS' Population Characteristics

Table 2: Population characteristics for all 40 benchmark problems: Percentage of individuals from SLS' final population that are located in the ε -environment of a local efficient set, a Pareto set or a set that is connected to a Pareto Set. Analogously for the fronts.

ID	Shape	Local		Pareto			
		Single Set	Front	Single Set	Front	Connected Set	Front
1	Ellipse	0.900	0.580	0.900	0.580	0.900	0.580
2	Ellipse	1.000	0.920	0.960	0.900	0.960	0.900
3	Ellipse	0.600	0.960	0.320	0.400	0.320	0.400
4	Ellipse	0.400	0.920	0.200	0.720	0.200	0.720
5	Ellipse	0.740	0.960	0.300	0.440	0.300	0.440
6	Ellipse	0.680	0.880	0.240	0.260	0.240	0.260
7	Ellipse	0.320	0.820	0.220	0.440	0.220	0.440
8	Ellipse	0.900	0.900	0.400	0.400	0.400	0.400
9	Ellipse	0.940	0.940	0.700	0.660	0.700	0.660
10	Ellipse	0.760	0.920	0.380	0.440	0.380	0.440
11	Ellipse	0.400	0.920	0.200	0.720	0.200	0.720
12	Ellipse	0.680	0.900	0.280	0.420	0.280	0.420
13	Ellipse	0.820	0.820	0.420	0.420	0.420	0.420
14	Ellipse	0.520	0.940	0.180	0.220	0.180	0.220
15	Ellipse	0.440	1.000	0.360	0.360	0.360	0.360
16	Ellipse	1.000	0.860	0.420	0.420	0.420	0.420
17	Ellipse	0.780	0.960	0.440	0.580	0.440	0.580
18	Ellipse	0.640	1.000	0.320	0.320	0.320	0.320
19	Ellipse	0.760	0.940	0.260	0.280	0.260	0.280
20	Ellipse	0.860	0.820	0.380	0.360	0.380	0.360
21	Sphere	1.000	1.000	1.000	1.000	1.000	1.000
22	Sphere	0.640	0.620	0.260	0.300	0.260	0.300
23	Sphere	0.560	0.600	0.380	0.240	0.560	0.600
24	Sphere	0.480	0.420	0.340	0.000	0.480	0.420
25	Sphere	0.760	0.740	0.380	0.520	0.380	0.520
26	Sphere	0.680	0.720	0.420	0.460	0.420	0.460
27	Sphere	0.560	0.680	0.500	0.480	0.560	0.680
28	Sphere	0.760	0.280	0.320	0.220	0.420	0.280
29	Sphere	0.820	0.560	0.240	0.280	0.240	0.280
30	Sphere	0.500	0.180	0.200	0.080	0.500	0.180
31	Sphere	0.420	0.000	0.240	0.000	0.420	0.000
32	Sphere	0.860	0.640	0.340	0.300	0.500	0.420
33	Sphere	0.760	0.500	0.340	0.280	0.560	0.420
34	Sphere	0.760	0.660	0.420	0.440	0.420	0.440
35	Sphere	0.460	0.280	0.380	0.000	0.460	0.280
36	Sphere	0.680	0.460	0.180	0.180	0.180	0.180
37	Sphere	0.600	0.160	0.160	0.080	0.460	0.160
38	Sphere	0.620	0.120	0.240	0.000	0.420	0.000
39	Sphere	0.860	0.640	0.300	0.260	0.460	0.380
40	Sphere	0.740	0.480	0.360	0.260	0.580	0.440