Std: Simple Swap		AS: Adaptive Search swap		A000 / AS (rho) SS		A000 / AS U SS	
Time	Iter.	Time	Iter.	Time	Iter.	Time	Iter.
62,160	108	980	274	65,470	244	64,750	192
60,050	102	1,100	338	90,400	219	65,350	215
60,900	104	400	126	22,760	99	55,930	225
164,690	245	2,510	814	33,230	103	102,410	300
57,950	115	2,380	866	20,860	90	112,620	298
137,180	221	280	96	24,470	104	63,870	191
139,970	233	320	103	23,710	119	3,670	84
60,600	114	250	98	25,650	112	11,580	105
73,670	120	2,760	986	27,540	94	63,830	200
60,480	104	1,860	654	65,820	217	9,670	90
64,240	124	690	285	28,980	98	58,400	219
155,360	227	500	190	31,630	114	162,710	436
56,860	105	560	187	69,000	232	182,930	397
58,050	109	980	347	75,730	239	4,720	96
148,500	236	320	118	80,710	240	130,950	333
65,760	106	650	200	74,160	201	124,350	318
56,050	111	240	106	95,450	357	9,260	98
149,560	211	1,080	311	17,390	87	4,500	89
65,510	101	1,420	483	16,010	75	3,500	88
69,260	108	300	98	18,940	86	9,790	106
50,830	102	240	86	33,360	106	132,650	325
57,180	107	320	100	68,100	221	123,940	361
54,430	100	270	98	23,190	114	8,410	109
153,100	243	2,130	660	32,040	109	9,220	87
59,940	110	1,070	332	16,390	93	58,940	220
72,780	114	1,310	337	21,700	109	11,360	82
154,310	229	2,180	754	20,190	99	10,700	91
55,590	112	960	316	23,570	93	121,510	305
63,300	112	1,900	598	21,640	110	8,780	84
148,800	241	1,880	607	77,870	229	59,280	204
87,902	**146**	**1,061**	**352**	**41,532**	**147**	**59,653**	**198**
41,961	**58**	**791**	**268**	**26,001**	**72**	**55,019**	**110**

Table SGP 1: Comparing neighborhood functions. Social Golfers 10-10-3 (40 cores)

Caption: **mean**
Standard Deviation

Best Improvement		First Improvement		First Improvement (sequential)	
Time	Iter.	Time	Iter.	Time	Iter.
3,020	2,714	1,370	1,308	12,950	27,257
3,860	3,433	1,380	1,308	8,210	17,417
880	751	2,850	2,849	11,310	23,687
15,040	13,458	1,010	958	15,110	31,674
6,470	5,454	2,160	2,193	8,470	17,890
2,160	1,878	450	444	2,090	4,464
4,350	3,756	1,060	1,087	3,390	7,244
3,080	2,908	2,680	2,677	16,140	34,172
4,770	4,272	1,770	1,729	2,780	5,925
3,170	2,842	480	504	17,940	37,708
15,150	13,470	1,710	1,769	9,440	19,294
1,910	1,690	780	784	360	774
7,350	6,544	850	871	4,510	9,558
3,190	2,895	440	482	13,740	28,960
1,450	1,256	2,290	2,329	36,550	74,451
1,680	1,541	1,640	1,549	3,780	8,027
2,430	2,127	540	547	5,160	10,899
4,640	4,021	420	439	1,920	3,377
3,570	3,266	1,920	1,874	21,140	42,813
19,450	17,174	2,020	1,979	9,470	19,832
1,340	1,222	910	931	5,900	12,503
5,100	4,559	1,510	1,517	1,290	2,754
3,680	2,987	1,770	1,715	4,810	10,186
3,680	2,987	1,970	2,013	2,430	4,997
1,960	1,740	1,150	1,090	940	1,996
1,970	1,712	630	664	10,130	21,330
4,740	4,166	960	956	2,060	4,370
8,780	7,878	600	622	7,940	16,710
2,770	2,449	1,390	1,330	4,060	8,656
8,340	7,475	1,120	1,130	5,380	11,473
4,999	**4,421**	**1,328**	**1,322**	**8,313**	**17,347**
4,430	**3,938**	**682**	**676**	**7,640**	**15,673**

Table SGP 2: Comparing selection functions. Social Golfers 5-3-7 (40 cores, and sequential)

Caption:

mean
Standard Deviation

100%/ com. 1-1		100% / com. 1-N		50% / com. 1-1		50% / com. 1-n	
Time	Iter.	Time	Iter.	Time	Iter.	Time	Iter.
1,080	1,083	520	506	870	848	690	735
1,600	1,562	860	845	1,060	1,087	1,020	965
740	723	580	575	580	580	840	844
860	856	820	763	870	841	710	715
520	609	2,130	2,139	480	484	570	557
2,340	2,352	1,270	1,151	1,000	953	1,340	1,248
1,720	1,650	1,030	979	2,460	2,458	310	282
870	834	820	791	610	579	980	989
1,100	1,068	520	454	1,610	1,559	210	209
1,280	1,317	730	682	1,710	1,744	1,150	1,112
100	116	1,220	1,234	1,280	1,300	900	921
90	116	1,790	1,649	1,580	1,527	380	387
1,730	1,670	540	517	1,100	1,090	1,620	1,549
740	680	1,160	1,056	1,260	1,195	1,600	1,613
1,380	1,291	860	761	780	746	1,000	1,025
1,390	1,271	1,230	1,199	340	342	1,120	1,078
2,670	2,488	1,790	1,727	1,210	1,156	2,360	2,364
1,160	1,163	1,990	1,976	730	741	1,020	961
1,410	1,381	1,880	1,793	1,140	1,042	960	961
1,730	1,657	810	780	720	737	1,340	1,233
1,860	1,727	1,820	1,584	1,240	1,189	740	738
2,000	1,946	1,290	1,231	620	541	1,160	1,171
590	601	1,180	1,080	1,300	1,205	280	277
1,980	1,828	490	458	750	702	1,810	1,742
770	776	1,370	1,278	830	826	2,000	2,037
590	604	890	858	1,400	1,302	650	618
1,590	1,493	1,080	1,095	250	227	2,020	2,050
320	289	690	678	1,470	1,419	680	676
1,050	961	480	464	1,000	1,036	1,040	1,002
580	568	1,740	1,700	1,140	1,127	880	870
1,195	1,156	1,119	1,067	1,046	1,019	1,046	1,031
646	608	499	484	459	456	533	530

Table SGP 3: Comparing communication strategies. Social Golfers 5-3-7 (40 cores)

Caption:

- mean
- Standard Deviation
- sender solver
- receiver solver
- receiver solver not tacking into account the received information
- non-communicating solver

25% / com. 1-1		25% / com. 1-n	
Time	Iter.	Time	Iter.
1,820	1,745	510	518
980	905	1,330	1,266
610	547	990	994
2,030	1,884	890	844
410	419	1,350	1,264
330	321	380	363
1,710	1,675	1,430	1,305
390	382	820	807
1,560	1,451	1,090	1,079
790	774	2,180	2,072
520	450	730	727
470	481	1,100	1,163
1,350	1,370	810	849
550	563	830	819
820	776	2,040	2,005
580	587	910	871
280	312	990	926
450	444	1,440	1,388
1,310	1,282	690	643
570	542	2,740	2,622
1,210	1,251	960	904
1,370	1,330	450	441
1,200	1,187	680	708
400	393	150	169
260	272	2,820	2,805
870	850	1,550	1,527
1,610	1,616	610	682
470	483	1,380	1,372
1,260	1,195	2,380	2,385
930	932	1,600	1,594
904	881	1,194	1,170
514	492	675	655

Table SGP 4: Comparing communication strategies. Social Golfers 5-3-7 (40 cores)

Caption:
mean
Standard Deviation
sender solver
receiver solver
receiver solver not tacking into account the received information
non-communicating solver

B001 / Best Impr.		B001 / First Impr.		First Improvement (sequential)	
Time	Iter.	Time	Iter.	Time	Iter.
6,300	1,192	1,720	424	12,760	5,994
5,220	991	1,620	385	1,560	739
3,130	573	2,990	718	22,930	10,742
5,450	1,023	1,390	361	6,120	2,888
2,690	502	4,700	1,104	3,330	1,560
5,810	1,100	1,450	373	5,470	2,631
3,250	623	1,170	300	7,700	3,443
3,880	724	1,780	417	10,140	4,541
6,270	1,163	1,220	308	11,960	5,574
2,880	541	2,320	551	1,280	640
1,520	279	1,660	406	11,450	5,302
4,180	783	2,100	518	48,190	22,314
5,460	980	880	220	18,640	8,735
8,270	1,564	2,190	537	11,670	5,413
4,240	797	1,470	361	16,190	6,423
4,650	836	1,530	387	770	419
8,230	1,548	1,580	380	2,780	1,333
4,790	885	940	255	37,270	17,453
4,920	907	4,110	962	30,880	14,246
7,850	1,455	2,280	537	14,470	6,841
6,340	1,197	1,600	390	24,590	11,291
3,260	605	1,450	343	22,820	10,632
3,470	653	2,090	498	20,230	9,409
7,380	1,384	950	261	58,420	27,138
5,170	973	1,630	405	3,470	1,637
3,200	594	2,020	491	16,220	7,521
5,500	1,046	1,660	401	25,120	11,640
7,920	1,466	1,190	313	500	264
5,570	1,035	1,330	324	49,260	22,696
6,340	1,189	1,720	419	11,470	5,409
5,105	**954**	**1,825**	**445**	**16,922**	**7,829**
1,776	334	840	191	15,151	7,019

Table SGP 5: Comparing selection functions. Social Golfers 8-4-7 (40 cores, and sequential)

Caption:

mean
Standard Deviation

100%/ com. 1-1		100% / com. 1-N		50% / com. 1-1		50% / com. 1-n	
Time	Iter.	Time	Iter.	Time	Iter.	Time	Iter.
1,250	287	1,500	358	890	229	2,060	472
1,390	327	1,450	362	1,900	416	2,210	520
1,320	321	1,990	455	1,930	449	770	201
2,220	522	1,010	253	740	206	1,070	276
850	213	2,130	466	760	206	1,800	418
2,200	499	1,010	247	640	151	860	214
1,040	271	820	178	960	239	840	224
2,860	667	1,040	258	870	229	4,120	936
2,710	630	1,370	309	1,680	415	1,550	365
320	97	2,250	532	1,040	251	1,230	308
410	102	1,930	431	180	61	300	112
1,140	283	950	209	2,040	485	1,380	357
870	215	1,580	356	1,860	417	730	203
960	254	1,210	277	370	127	990	249
710	184	2,620	620	1,040	250	1,230	318
2,150	468	1,470	339	2,520	556	1,230	318
800	207	1,160	304	1,050	279	2,230	531
2,720	642	1,720	441	1,510	375	1,770	424
490	152	2,470	587	1,600	378	830	223
460	134	1,770	393	1,290	343	2,450	581
1,340	335	970	234	1,810	425	820	206
1,220	292	490	148	1,380	382	2,360	516
2,040	496	740	197	2,160	507	930	248
680	175	1,050	256	2,060	449	700	187
1,590	382	2,210	502	1,790	417	1,080	281
1,790	435	2,440	562	1,960	421	1,160	300
1,030	257	930	220	1,890	468	1,350	336
660	160	1,370	336	1,140	289	1,330	321
1,040	283	920	221	1,720	400	1,360	334
820	208	1,420	349	1,210	297	2,420	596
1,303	317	1,466	347	1,400	337	1,439	353
724	161	572	128	579	122	768	167

Table SGP 6: Comparing communication strategies. Social Golfers 8-4-7 (40 cores)

Caption:

mean
Standard Deviation
sender solver
receiver solver
receiver solver not tacking into account the received information
non-communicating solver

25% / com. 1-1		25% / com. 1-n	
Time	Iter.	Time	Iter.
800	209	1,490	337
1,570	396	790	194
890	221	960	247
1,130	308	1,360	324
1,470	359	1,820	419
1,590	380	1,410	349
2,160	496	1,510	356
2,080	508	2,640	621
880	222	1,660	368
1,770	397	1,410	346
1,070	275	1,050	278
1,230	323	1,120	292
1,220	323	1,830	427
1,610	384	1,810	419
1,090	270	1,620	388
1,910	430	1,220	323
780	215	1,680	436
870	223	1,410	331
1,090	282	1,270	316
1,580	396	1,340	324
1,490	368	1,810	427
2,160	500	1,330	310
1,500	329	1,500	356
1,590	384	1,660	395
1,580	384	760	186
720	188	1,070	247
1,830	435	1,730	417
1,880	433	1,560	385
1,600	374	710	191
820	203	2,450	565
1,399	341	1,466	352
435	94	434	96

Table SGP 7: Comparing communication strategies. Social Golfers 8-4-7 (40 cores)

Caption:

mean	
Standard Deviation	

sender solver

receiver solver

receiver solver not tacking into account the received information

non-communicating solver

B001 / Best Impr.		B001 / First Impr.		First Improvement (sequential)	
Time	Iter.	Time	Iter.	Time	Iter.
6,700	722	5,150	697	87,900	23,451
10,500	1,136	9,710	1,312	32,970	8,761
12,320	1,342	1,630	261	42,030	11,055
8,250	891	7,580	923	199,170	53,107
16,480	1,805	2,930	428	200,570	53,327
11,080	1,193	5,100	693	99,330	26,472
10,400	1,124	7,660	1,004	153,110	40,620
12,670	1,385	2,810	420	28,660	7,641
7,630	817	6,440	903	65,230	17,365
20,590	2,250	3,990	558	82,080	21,887
13,150	1,401	4,270	597	8,060	2,168
11,360	1,227	5,410	729	10,520	2,818
3,090	327	7,310	996	109,290	28,731
7,210	773	3,700	534	122,420	32,141
3,390	351	15,430	2,037	11,800	3,068
19,630	2,136	1,280	223	57,280	14,529
19,290	2,105	21,620	2,817	30,700	8,036
8,090	874	2,470	381	76,630	20,459
18,030	1,964	15,710	2,076	55,600	14,763
15,600	1,712	2,130	314	78,660	20,925
19,950	2,181	7,210	987	20,690	5,507
14,200	1,538	7,360	985	131,740	34,774
23,010	2,502	10,660	1,403	10,300	2,712
19,090	2,043	3,250	453	145,370	38,315
16,470	1,781	4,260	619	4,570	1,266
9,870	1,075	10,550	1,403	122,070	31,495
6,620	713	3,680	528	41,970	10,294
11,440	1,242	4,330	598	256,760	62,613
6,700	725	6,000	826	55,230	13,420
8,410	917	3,540	488	47,320	11,650
12,374	**1,342**	**6,439**	**873**	**79,601**	**20,779**
5,400	591	4,607	591	64,072	16,537

Table SGP 8: Comparing selection functions. Social Golfers 9-4-8 (40 cores, and sequential)

Caption:
mean
Standard Deviation

100%/ com. 1-1		100% / com. 1-N		50% / com. 1-1		50% / com. 1-n	
Time	Iter.	Time	Iter.	Time	Iter.	Time	Iter.
2,050	292	6,020	809	4,590	640	8,980	1,143
4,200	594	4,010	573	6,570	888	14,360	1,909
1,880	281	4,770	641	5,530	774	7,770	999
3,530	516	5,560	755	5,180	714	3,800	529
1,000	175	5,250	686	3,360	477	1,950	282
5,960	793	6,180	832	2,750	401	5,870	759
3,730	532	15,050	2,001	4,050	565	5,570	755
2,610	362	5,660	752	8,980	1,195	2,200	286
3,990	529	8,910	1,150	8,920	1,161	7,180	970
4,760	633	8,610	1,098	2,180	299	5,420	745
3,460	462	1,620	256	6,570	925	1,580	255
9,290	1,187	4,480	608	8,040	1,083	8,860	1,185
2,820	387	5,300	709	2,970	415	6,110	846
10,050	1,357	1,030	166	3,380	469	5,590	787
11,170	1,465	2,690	393	4,390	550	3,300	442
4,200	565	5,970	803	3,130	421	4,090	555
2,340	324	3,100	418	2,840	405	3,930	572
4,140	561	10,100	1,311	3,550	500	5,550	757
4,920	669	3,700	507	2,450	369	4,540	631
2,810	412	800	147	6,140	847	9,990	1,301
7,010	957	7,250	952	1,660	240	11,020	1,427
10,160	1,313	3,790	507	3,840	538	8,060	1,067
3,380	465	6,020	765	3,350	478	4,590	647
1,960	315	4,230	583	5,430	733	3,100	438
4,750	667	6,370	873	3,090	456	2,050	316
2,760	365	2,360	330	2,760	408	3,200	488
2,270	349	4,890	684	5,830	764	4,210	593
6,480	856	3,050	403	7,520	1,004	6,390	862
2,220	331	11,060	1,395	8,510	1,103	3,040	424
1,510	202	7,560	975	1,920	290	10,290	1,324
4,380	597	5,513	736	4,649	637	5,753	776
2,720	347	3,066	389	2,173	279	3,067	389

Table SGP 6: Comparing communication strategies. Social Golfers 8-4-7 (40 cores)

Caption: mean

Standard Deviation

sender solver

receiver solver

receiver solver not tacking into account the received information

non-communicating solver

25% / com. 1-1		25% / com. 1-n	
Time	Iter.	Time	Iter.
3,280	472	7,040	923
6,380	876	7,440	994
6,570	882	1,920	315
3,150	405	2,180	348
1,990	293	3,940	510
4,010	545	5,510	754
5,130	658	5,130	689
5,460	750	3,210	465
6,360	856	4,050	565
4,030	564	3,110	434
8,970	1,235	5,160	714
1,660	270	2,580	384
1,710	252	2,360	359
3,530	503	2,450	372
4,130	588	4,370	602
3,950	592	3,660	530
1,630	272	7,130	991
5,660	775	2,790	403
7,110	914	9,110	1,178
5,500	709	2,790	393
3,870	541	2,550	390
2,700	366	4,560	591
3,290	450	6,390	873
6,430	851	2,340	345
7,860	1,083	5,560	766
3,330	486	4,750	651
2,840	412	6,480	843
3,220	459	7,160	950
3,700	512	7,700	1,021
2,520	389	2,630	394
4,332	599	4,535	625
1,920	248	2,019	251

Table SGP 7: Comparing communication strategies. Social Golfers 8-4-7 (40 cores)

Caption: **mean**
Standard Deviation

sender solver

receiver solver

receiver solver not tacking into account the received information

non-communicating solver

B001 / Best Impr.		B001 / First Impr.		First Improvement (sequential)	
Time	Iter.	Time	Iter.	Time	Iter.
8,650	565	1,340	179	1,850	320
1,910	129	2,600	302	5,040	964
6,440	447	2,490	280	2,780	556
2,340	160	2,510	297	1,940	406
2,370	160	3,460	350	1,440	324
4,170	280	1,770	235	4,640	929
6,770	469	3,720	402	6,470	1,201
7,720	531	3,730	402	3,190	627
4,270	283	2,520	325	2,650	586
6,490	440	1,860	228	2,440	501
2,920	194	1,300	202	9,190	1,694
6,510	446	2,380	286	3,980	757
6,510	446	1,390	216	1,210	313
4,540	301	1,860	245	3,790	739
6,320	433	3,630	387	5,810	1,065
6,260	429	2,410	278	2,070	438
5,170	339	1,950	265	2,890	599
6,370	438	1,780	233	1,650	392
6,580	427	1,660	255	1,600	356
5,290	361	2,260	275	5,670	1,070
6,480	446	2,690	323	2,750	558
4,520	315	2,300	276	1,980	402
4,670	317	2,280	276	4,060	815
3,570	241	1,750	217	8,560	1,563
3,010	193	1,800	245	2,970	614
6,670	457	2,280	281	4,120	810
4,840	327	2,270	281	520	172
4,080	272	1,500	196	520	172
5,330	348	1,600	265	720	196
4,990	338	1,530	197	3,920	768
5,192	**351**	**2,221**	**273**	**3,347**	**664**
1,671	**114**	**692**	**58**	**2,167**	**380**

Table SGP 11: Comparing selection functions. Social Golfers 11-7-5 (40 cores, and sequential)

Caption: **mean**

Standard Deviation

100%/ – – >		100% / # – >		50% / – – >		50% / # – >	
Time	Iter.	Time	Iter.	Time	Iter.	Time	Iter.
1,330	180	1,790	216	1,010	154	1,390	151
2,240	223	1,530	207	1,960	220	1,810	238
1,590	215	1,200	177	1,540	220	2,030	249
2,090	216	1,580	217	2,640	276	2,260	253
1,790	215	1,340	150	1,970	230	2,030	276
1,590	216	1,530	166	1,640	209	2,080	248
1,710	187	1,080	146	2,160	195	1,540	213
1,010	141	2,570	286	1,640	183	1,510	181
1,790	189	1,580	205	1,640	219	2,280	258
2,370	221	1,530	196	2,290	257	1,390	176
1,990	220	1,300	198	1,800	228	1,300	217
1,990	220	1,540	203	1,800	218	1,640	179
1,320	180	1,640	170	2,670	298	1,340	199
1,890	249	1,330	194	1,640	206	1,400	200
1,130	143	2,140	251	1,620	234	2,170	210
1,250	150	1,720	189	2,160	232	1,940	259
1,390	210	1,190	160	2,130	279	2,040	187
1,210	159	1,910	203	1,900	237	1,900	206
1,240	149	2,130	221	1,630	216	1,600	201
1,830	204	1,900	243	1,840	197	1,280	153
1,610	227	1,790	223	1,540	206	2,550	275
1,710	226	1,430	173	2,290	248	2,500	301
2,420	272	1,360	188	1,200	198	1,830	230
1,820	240	1,360	185	1,410	187	1,360	186
1,830	240	1,990	219	1,910	254	1,570	224
2,220	270	1,400	208	1,680	211	2,660	288
2,280	266	1,520	195	1,570	193	1,920	255
1,680	192	2,270	253	1,050	145	1,890	196
1,810	233	1,770	212	1,890	223	1,430	202
2,730	352	1,340	191	2,250	234	2,020	252
1,762	214	1,625	202	1,816	220	1,822	222
420	45	348	31	401	33	395	39

Table SGP 12: Comparing communication strategies. Social Golfers 11-7-5 (40 cores)

Caption: mean

Standard Deviation

sender solver

receiver solver

receiver solver not tacking into account the received information

non-communicating solver

25% / – – >		25% / # – >	
Time	Iter.	Time	Iter.
2,330	268	2,180	250
2,590	300	2,150	258
2,600	300	1,760	237
2,600	300	1,760	260
1,420	211	2,510	277
2,680	280	2,470	271
1,830	221	2,420	286
2,190	261	2,400	286
2,220	268	1,840	220
770	139	2,120	221
1,280	170	1,710	218
2,020	210	2,040	244
1,520	207	2,050	244
2,030	263	2,150	258
2,550	269	1,760	241
1,140	180	1,390	197
2,530	280	1,540	196
2,520	319	1,730	220
1,530	201	2,200	246
2,580	286	1,930	261
1,560	161	1,090	179
1,510	215	1,800	195
1,980	270	1,200	179
2,130	271	1,510	209
1,640	211	1,810	229
2,150	265	1,680	233
1,260	150	1,830	250
1,470	204	1,500	218
2,730	320	2,070	225
2,440	274	2,080	237
1,993	242	1,630	224

Table SGP 12: Comparing communication strategies. Social Golfers 11-7-5 (40 cores)

Caption:
- mean
- Standard Deviation
- sender solver
- receiver solver
- receiver solver not tacking into account the received information
- non-communicating solver