

Online materials

1. Unsolvable instances

1.1. *Small instances set*

bay_04_05_090_1.txt
bay_04_05_090_4.txt
bay_05_05_090_2.txt
bay_06_05_090_1.txt
bay_06_05_090_4.txt
bay_06_06_090_1.txt
bay_06_06_090_4.txt
bay_07_06_090_1.txt
bay_08_05_090_2.txt
bay_08_05_090_4.txt

1.2. *Normal instances set*

bay_08_06_090_3.txt
bay_08_06_090_4.txt
bay_08_07_090_3.txt

2. Results for Caserta et al. (2009) instances

Set size	Re-implementation	Proposed	Dec. re.
3x3	151.71	143.73	5.26%
3x4	196.84	190.83	3.05%
3x5	241.40	235.99	2.24%
3x6	295.76	289.34	2.17%
3x7	341.42	335.28	1.80%
3x8	406.53	397.57	2.20%
4x4	335.93	307.36	8.50%
4x5	418.08	395.77	5.34%
4x6	482.97	467.41	3.22%
4x7	575.98	553.24	3.95%
5x4	509.38	465.21	8.67%
5x5	637.54	594.42	6.76%
5x6	768.96	722.77	6.01%
5x7	878.46	829.55	5.57%
5x8	1011.00	964.06	4.64%
5x9	1149.15	1091.49	5.02%
5x10	1292.34	1233.65	4.54%
6x6	1126.01	1038.29	7.79%
6x10	1827.31	1732.39	5.19%
10x6	3377.56	3330.94	1.38%
10x10	5406.54	5551.58	−2.68%

Table 1: Crane working time for 3s execution time [hours].

Set size	Re-implementation	Proposed	Dec. re.
3x3	151.71	143.73	5.26%
3x4	196.83	190.83	3.05%
3x5	240.83	235.99	2.01%
3x6	295.29	289.23	2.05%
3x7	340.99	335.25	1.68%
3x8	405.44	397.34	2.00%
4x4	334.92	307.19	8.28%
4x5	416.32	395.41	5.02%
4x6	481.20	466.15	3.13%
4x7	573.61	552.20	3.73%
5x4	507.02	463.91	8.50%
5x5	633.06	591.43	6.58%
5x6	764.20	715.89	6.32%
5x7	874.72	825.56	5.62%
5x8	1006.03	957.95	4.78%
5x9	1142.81	1086.36	4.94%
5x10	1285.62	1225.66	4.66%
6x6	1116.94	1030.07	7.78%
6x10	1818.17	1722.49	5.26%
10x6	3338.61	3231.70	3.20%
10x10	5368.97	5415.95	−0.88%

Table 2: Crane working time for 30s execution time [hours].

Set size	Re-implementation	Proposed	Dec. re.
3x3	151.71	143.73	5.26%
3x4	196.83	190.83	3.05%
3x5	240.34	235.99	1.81%
3x6	294.16	289.22	1.68%
3x7	340.24	335.25	1.46%
3x8	404.24	397.28	1.72%
4x4	334.27	307.13	8.12%
4x5	413.93	394.91	4.59%
4x6	479.59	464.90	3.06%
4x7	570.28	550.73	3.43%
5x4	504.99	462.76	8.36%
5x5	628.19	589.09	6.22%
5x6	756.54	708.84	6.31%
5x7	869.24	820.09	5.65%
5x8	996.83	949.58	4.74%
5x9	1132.68	1078.51	4.78%
5x10	1274.36	1214.95	4.66%
6x6	1103.23	1015.42	7.96%
6x10	1802.74	1708.64	5.22%
10x6	3280.07	3124.27	4.75%
10x10	5314.64	5221.30	1.76%

Table 3: Crane working time for 300s execution time [hours].

Set size	3s	30s	300s
3x3	4410	4410	4410
3x4	5271	5271	5271
3x5	5922	5922	5922
3x6	7121	7159	7207
3x7	7882	7924	7969
3x8	9040	9070	9114
4x4	9176	9168	9154
4x5	11295	11288	11250
4x6	12047	12065	12076
4x7	13936	13897	13932
5x4	14083	14046	14054
5x5	16990	16984	16920
5x6	19954	19864	19795
5x7	21604	21559	21521
5x8	24159	24144	24137
5x9	26758	26663	26513
5x10	28997	28923	28821
6x6	28831	28697	28485
6x10	40739	40680	40500
10x6	76748	75841	74667
10x10	108664	108048	107204

Table 4: Relocations for the initial reactive GRASP.

Set size	3s	30s	300s
3x3	4221	4221	4221
3x4	5460	5460	5460
3x5	6090	6090	6090
3x6	7376	7392	7392
3x7	8085	8085	8085
3x8	9268	9263	9261
4x4	8789	8800	8799
4x5	11305	11358	11393
4x6	12595	12616	12586
4x7	14470	14496	14531
5x4	13640	13582	13485
5x5	17373	17259	17288
5x6	20493	20254	20026
5x7	21812	21844	21861
5x8	25339	25226	25126
5x9	27531	27486	27473
5x10	29985	29842	29831
6x6	29830	29610	29095
6x10	43307	42865	42432
10x6	90285	86506	82431
10x10	144359	139029	131606

Table 5: Relocations for the proposed reactive GRASP.