Supplementary Material

Results of Algorithm 3.3.1, Algorithm 3.3.2, Algorithm 3.3.3 and EA4OP

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Abstract

In this document we show supplementary results of part of the experiments for the paper *An efficient evolutionary algorithm for the orienteering problem.* We detail the results of Section 3.3, where the contribution of the components in the EA4OP algorithm are evaluated.

Table 1: Results of Algorithm 3.3.1, Algorithm 3.3.2, Algorithm 3.3.3 and EA4OP in generation 1.

	Algorithm 3.3.1			Algorithm 3.3.2			Algorithm 3.3.3			EA4OP		
instance	best	gap	time	best	gap	time	best	gap	time	best	gap	time
gil262	134	15.19	5.82	136	13.92	1.09	139	12.03	3.03	156	1.27	2.83
a280	133	9.52	7.10	134	8.84	1.02	136	7.48	3.02	143	2.72	3.00
lin318	171	16.59	12.40	184	10.24	3.38	185	9.76	7.07	202	1.46	7.15
pr299	144	11.11	8.01	145	10.49	1.39	147	9.26	3.02	160	1.23	3.12
rd400	200	16.32	18.69	215	10.04	2.17	216	9.62	7.04	234	2.09	6.59
pcb3038	1365	13.17	8903.48	1401	10.88	304.07	1437	8.59	681.24	1572	∗	681.94
fl3795	1496	17.58	14438.13	1616	10.96	670.28	1669	8.04	2996.22	1815	∗	2994.90
fnl4461	1993	15.19	–	2097	10.77	1024.42	2172	7.57	2463.64	2350	∗	2462.65
rl5934	2784	11.48	–	2982	5.18	2445.80	3051	2.99	5383.43	3145	∗	5382.25
pla7397	4188	18.54	–	4495	12.57	3195.25	4628	9.98	15982.47	5141	∗	15981.78

Table 2: Results of Algorithm 3.3.1, Algorithm 3.3.2, Algorithm 3.3.3 and EA4OP in generation 2.

	Algorithm 3.3.1			Algorithm 3.3.2			Algorithm 3.3.3			EA4OP		
instance	best	gap	time	best	gap	time	best	gap	time	best	gap	time
gil262	7201	13.46	8.16	7611	8.53	1.23	7630	8.30	4.03	8175	1.75	3.47
a280	7411	12.07	8.68	7494	11.08	1.09	7515	10.83	3.03	8304	1.47	2.85
lin318	9297	14.89	14.08	10362	5.14	2.74	10439	4.43	8.07	10866	0.52	8.29
pr299	8418	8.32	9.20	8652	5.77	1.46	8698	5.27	3.03	9112	0.76	3.23
rd400	11295	17.26	19.70	11670	14.52	2.23	11836	13.30	7.05	13442	1.54	6.80
pcb3038	77315	15.82	12439.37	80334	12.53	331.58	83847	8.71	820.23	91842	∗	820.37
fl3795	87534	15.34	–	93116	9.94	748.88	97617	5.59	4789.09	103397	∗	4788.96
fnl4461	113951	18.85	–	122232	12.96	1014.76	128427	8.54	2619.03	140424	∗	2618.15
rl5934	146403	14.71	–	157466	8.26	2591.68	166807	2.82	5757.77	171649	∗	5757.80
pla7397	226347	16.92	–	244388	10.30	3919.61	261568	3.99	–	272452	∗	–

Table 3: Results of Algorithm 3.3.1, Algorithm 3.3.2, Algorithm 3.3.3 and EA4OP in generation 3.

	Algorithm 3.3.1			Algorithm 3.3.2			Algorithm 3.3.3			EA4OP		
instance	best	gap	time	best	gap	time	best	gap	time	best	gap	time
gil262	8274	10.51	8.21	8429	8.84	1.27	8708	5.82	4.04	9094	1.64	3.94
a280	8001	18.14	8.98	8117	16.95	1.06	8229	15.81	4.02	8684	11.15	3.22
lin318	8484	18.17	12.13	9625	7.17	3.16	9625	7.17	7.09	10273	0.92	6.33
pr299	9071	12.30	10.35	9146	11.57	1.47	9239	10.67	4.04	9959	3.71	3.95
rd400	11400	13.79	22.63	11625	12.09	2.78	11779	10.92	8.05	13088	1.02	7.74
pcb3038	88097	15.83	16178.25	88756	15.20	309.60	92394	11.73	917.28	104667	∗	917.39
fl3795	82427	15.64	–	91545	6.31	824.38	92140	5.70	3160.52	97707	∗	3158.89
fnl4461	135326	17.59	–	142804	13.03	956.08	149330	9.06	3248.98	164201	∗	3248.64
rl5934	172220	16.96	–	193989	6.46	2831.70	193768	6.57	5882.33	207385	∗	5881.87
pla7397	257454	19.73	–	276725	13.72	3673.65	299270	6.70	–	320744	∗	–

Table 4: Results of Algorithm 3.3.1, Algorithm 3.3.2, Algorithm 3.3.3 and EA4OP in generation 4.

	Algorithm 3.3.1			Algorithm 3.3.2			Algorithm 3.3.3			EA4OP		
instance	best	gap	time	best	gap	time	best	gap	time	best	gap	time
gil262	1955	3.74	3.43	2004	1.33	1.07	2004	1.33	2.02	2030	0.05	1.35
a280	11615	3.72	7.11	11681	3.17	1.41	11714	2.90	4.04	12048	0.13	3.39
lin318	14739	2.60	10.39	14911	1.46	2.59	14892	1.59	8.07	15119	0.09	7.91
pr299	14954	0.21	3.63	14947	0.26	1.70	14956	0.20	4.06	14980	0.04	3.46
rd400	19994	0.56	9.88	20071	0.18	2.23	20071	0.18	10.10	20101	0.03	9.61
pcb3038	87338	13.67	13477.94	89617	11.42	331.67	92835	8.24	800.34	101173	∗	800.13
fl3795	69006	13.82	–	72665	9.25	671.90	75807	5.32	4496.88	80069	∗	4496.09
fnl4461	64382	24.33	–	71304	16.20	796.02	74942	11.92	1490.72	85088	∗	1490.80
rl5934	118749	13.85	–	125856	8.69	2603.21	130007	5.68	4038.32	137838	∗	4037.07
pla7397	116662	18.07	–	130276	8.51	3051.93	135336	4.96	6667.88	142399	∗	6667.36