

Tab. 1 Experimental results of four algorithms aims at testify the effectiveness of each part in ILTD_ABC

Fun		ABC	ILTD_ABC1	ILTD_ABC2	ILTD_ABC3	ILTD_ABC
1	mean	1.00E-16	8.00E-20	7.25E-48	6.77E-112	0
	SD	3.43E-17	1.76E-19	2.25E-47	2.67E-111	0
2	mean	6.91E+01	4.20E+01	5.60E+01	2.14E+02	0
	SD	3.00E+01	4.19E+01	5.45E+01	2.17E+02	0
3	mean	8.67E-17	1.57E-19	9.85E-38	6.58E-111	0
	SD	4.94E-17	3.64E-19	4.40E-37	2.32E-110	0
4	mean	1.10E-16	1.69E-19	2.99E-54	1.21E-111	0
	SD	4.53E-17	4.84E-19	1.32E-53	3.11E-111	0
5	mean	0	0	0	0	0
	SD	0	0	0	0	0
6	mean	8.72E-03	2.69E-03	3.44E-03	1.57E-03	5.08E-05
	SD	4.02E-03	1.45E-03	1.31E-03	6.27E-04	4.33E-05
7	mean	3.30E-16	5.56E-19	1.83E-24	4.14E-50	0
	SD	5.44E-17	8.82E-19	8.19E-24	4.59E-50	0
8	mean	9.83E-17	1.16E-19	8.94E-45	2.33E-111	0
	SD	3.13E-17	2.61E-19	4.00E-44	9.29E-111	0
9	mean	8.40E-03	1.24E-02	7.31E-03	4.62E-06	0
	SD	4.71E-03	2.33E-02	1.23E-02	1.74E-05	0
10	mean	0	0	1.95E-15	0	0
	SD	0	0	8.74E-15	0	0
11	mean	1.05E-02	9.97E-03	9.26E-03	8.44E-03	8.91E-03
	SD	3.95E-03	2.89E-03	2.43E-03	1.26E-03	2.57E-03
13	mean	7.03E-17	4.61E-20	1.83E-32	1.57E-32	1.57E-32
	SD	1.61E-17	9.79E-20	1.04E-32	2.81E-48	2.81E-48
14	mean	1.11E-16	9.14E-20	1.50E-29	1.35E-32	6.02E-03
	SD	5.65E-17	2.38E-19	6.68E-29	2.81E-48	2.69E-02
15	mean	2.80E-01	2.05E-01	2.10E-01	2.00E-01	4.99E-03
	SD	5.23E-02	6.05E-02	7.18E-02	4.59E-02	2.23E-02

Tab. 2 Results comparison (with or without the worst employed bee's intelligent learning strategy)

Fun		dABC	dABC1	distABC	distABC	ABCVSS	ABCVSS1	ABCM	ABCM1
1	mean	3.86E-52	3.93E-158	3.03E-77	1.95E-147	1.12E-11	7.94E-145	3.60E-47	1.66E-154
	SD	6.57E-52	1.72E-157	6.89E-77	8.68E-147	4.99E-11	3.55E-144	1.61E-46	7.01E-154
2	mean	8.10E+01	1.33E-43	5.05E+01	7.60E-45	1.11E+02	3.66E-45	3.96E+01	8.36E-43
	SD	4.51E+01	3.84E-43	2.80E+01	2.36E-44	9.55E+01	1.05E-44	2.04E+01	3.74E-42
3	mean	1.02E-46	2.67E-155	4.40E-74	1.55E-142	4.73E-11	4.95E-166	6.70E-46	4.41E-154
	SD	4.51E-46	1.19E-154	1.85E-73	6.94E-142	2.12E-10	0.00E+00	2.85E-45	1.49E-153
4	mean	1.09E-50	2.72E-153	4.47E-76	1.87E-144	1.36E-68	1.75E-163	2.38E-49	6.11E-150
	SD	2.47E-50	8.66E-153	1.08E-75	7.47E-144	5.64E-68	0.00E+00	5.40E-49	2.73E-149
5	mean	0	0	0	0	0	0	0	0
	SD	0	0	0	0	0	0	0	0
6	mean	9.39E-03	3.85E-04	4.66E-03	2.92E-04	3.97E-03	4.06E-04	9.33E-03	4.51E-04
	SD	3.59E-03	2.97E-04	2.09E-03	3.16E-04	1.52E-03	3.40E-04	4.66E-03	5.62E-04
7	mean	8.43E-28	5.58E-92	1.75E-40	1.88E-86	1.57E-08	9.54E-94	1.20E-27	1.04E-90
	SD	8.86E-28	2.48E-91	2.38E-40	8.19E-86	4.41E-08	3.55E-93	2.52E-27	4.65E-90
8	mean	1.04E-49	1.47E-157	2.01E-76	6.17E-146	2.86E-46	1.48E-167	2.76E-47	3.02E-156

	SD	4.17E-49	6.55E-157	4.02E-76	2.76E-145	1.28E-45	0.00E+00	9.92E-47	7.71E-156
9	mean	7.51E-03	7.38E-43	8.86E-05	2.08E-40	1.06E-01	1.97E-40	7.97E-03	6.56E-41
	SD	2.10E-03	2.77E-42	1.27E-04	7.57E-40	2.08E-01	8.80E-40	3.79E-03	2.66E-40
10	mean	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-01	0.00E+00	0.00E+00	0.00E+00
	SD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.68E-01	0.00E+00	0.00E+00	0.00E+00
11	mean	1.02E-02	9.71E-03	1.00E-02	1.07E-02	9.33E-03	1.01E-02	1.04E-02	9.50E-03
	SD	4.05E-03	2.18E-03	3.21E-03	4.25E-03	2.61E-03	2.88E-03	3.16E-03	2.80E-03
13	mean	1.57E-32	1.57E-32	1.57E-32	1.57E-32	6.46E-06	1.57E-32	1.57E-32	1.57E-32
	SD	2.81E-48	2.81E-48	2.81E-48	2.81E-48	2.89E-05	2.81E-48	2.81E-48	2.81E-48
14	mean	1.35E-32	4.87E-02	1.35E-32	1.35E-32	1.26E-05	9.96E-06	1.35E-32	1.35E-32
	SD	2.81E-48	2.18E-01	2.81E-48	2.81E-48	5.64E-05	4.46E-05	2.81E-48	2.81E-48
15	mean	2.60E-01	8.49E-02	2.40E-01	8.49E-02	2.80E-01	7.99E-02	2.65E-01	7.49E-02
	SD	5.03E-02	3.66E-02	8.21E-02	3.66E-02	2.40E-01	4.10E-02	7.45E-02	4.44E-02

Tab. 3 Effectiveness demonstration of the maximum absolute value of γ

Maximum absolute value of γ		1	2	3	4
1	mean	0	0	0	0
	SD	0	0	0	0
2	mean	0	0	0	2.13E-234
	SD	0	0	0	0
3	mean	0	0	0	0
	SD	0	0	0	0
4	mean	0	0	0	0
	SD	0	0	0	0
5	mean	0	0	0	0
	SD	0	0	0	0
6	mean	2.71E-05	4.08E-05	3.68E-05	4.44E-05
	SD	2.84E-05	5.26E-05	2.94E-05	3.27E-05
7	mean	1.00E-322	0	1.20E-316	4.43E-241
	SD	0	0	0	0
8	mean	0	0	0	0
	SD	0	0	0	0
9	mean	3.27E-310	0	8.27E-286	3.83E-185
	SD	0	0	0	0
10	mean	0	0	0	0
	SD	0	0	0	0
11	mean	1.07E-02	8.50E-03	8.93E-03	7.92E-03
	SD	4.18E-03	1.57E-03	1.83E-03	3.37E-04
13	mean	5.18E-03	1.57E-32	1.57E-32	1.57E-32
	SD	2.32E-02	2.81E-48	2.81E-48	2.81E-48
14	mean	4.26E-18	1.91E-26	1.35E-32	1.60E-32
	SD	1.90E-17	8.53E-26	2.81E-48	1.10E-32
15	mean	9.99E-03	2.71E-115	2.00E-02	3.50E-02
	SD	3.07E-02	1.21E-114	4.10E-02	4.89E-02