

TABLE I

THE IGD⁺ RESULTS (MEDIAN VALUES) OF NTSPEA, RMNSGAI, RTEA, Two_Arch2 AND TSEA ON THE DTLZ PROBLEMS. THE BEST RESULT IN EACH PROBLEM IS MARKED. THE SYMBOLS " + ", " - " AND " \approx " INDICATE THAT THE COMPARED ALGORITHM IS STATISTICALLY SIGNIFICANTLY SUPERIOR TO, INFERIOR TO, AND ALMOST EQUIVALENT TO TSEA, RESPECTIVELY (THE SIGNIFICANCE LEVEL IS 0.05).

Problems	σ	NTSPEA	RMNSGAI	RTEA	Two_Arch2	TSEA
DTLZ1	0.1	2.02e+01 (5.17e+00) -	2.51e+01 (7.11e+00) -	1.45e+01 (5.00e+00) -	1.10e+01 (4.75e+00) -	6.97e+00 (1.81e+00)
	0.2	1.88e+01 (6.24e+00) -	2.45e+01 (7.26e+00) -	1.70e+01 (4.80e+00) -	1.21e+01 (3.62e+00) -	6.51e+00 (1.57e+00)
	0.5	2.37e+01 (6.21e+00) -	2.53e+01 (8.56e+00) -	1.66e+01 (5.36e+00) -	1.70e+01 (4.48e+00) -	1.03e+01 (2.44e+00)
DTLZ2	0.1	9.54e-02 (1.38e-02) -	1.74e-01 (4.34e-02) -	9.18e-02 (2.24e-02) -	1.98e-01 (5.30e-02) -	4.24e-02 (9.14e-03)
	0.2	2.15e-01 (7.33e-02) -	2.69e-01 (6.34e-02) -	2.37e-01 (4.52e-02) -	3.56e-01 (6.44e-02) -	9.59e-02 (1.65e-02)
	0.5	3.48e-01 (6.17e-02) -	4.70e-01 (9.10e-02) -	5.89e-01 (1.13e-01) -	6.22e-01 (1.18e-01) -	1.88e-01 (7.81e-02)
DTLZ3	0.1	6.87e+01 (2.13e+01) -	7.30e+01 (1.75e+01) -	4.52e+01 (1.31e+01) -	3.38e+01 (9.26e+00) -	1.64e+01 (5.93e+00)
	0.2	6.38e+01 (1.49e+01) -	7.82e+01 (2.02e+01) -	4.11e+01 (1.17e+01) -	3.78e+01 (1.05e+01) -	1.84e+01 (6.29e+00)
	0.5	6.89e+01 (2.16e+01) -	6.91e+01 (1.62e+01) -	5.00e+01 (1.37e+01) -	4.10e+01 (1.03e+01) -	2.53e+01 (6.53e+00)
DTLZ4	0.1	1.03e-01 (9.27e-02) +	2.29e-01 (2.09e-01) -	1.03e-01 (1.82e-01) -	2.35e-01 (1.69e-01) -	6.49e-02 (1.67e-01)
	0.2	2.40e-01 (8.61e-02) +	3.78e-01 (2.23e-01) \approx	2.40e-01 (1.37e-01) \approx	4.15e-01 (1.64e-01) \approx	4.16e-01 (1.28e-01)
	0.5	3.63e-01 (7.66e-02) +	6.42e-01 (2.39e-01) -	7.02e-01 (1.97e-01) -	7.29e-01 (1.60e-01) -	4.68e-01 (1.38e-01)
DTLZ5	0.1	9.10e-02 (1.57e-02) -	1.84e-01 (4.07e-02) -	9.08e-02 (2.81e-02) -	1.95e-01 (3.87e-02) -	4.68e-02 (9.08e-03)
	0.2	2.31e-01 (8.23e-02) -	2.69e-01 (7.30e-02) -	2.21e-01 (6.84e-02) -	3.44e-01 (7.24e-02) -	9.51e-02 (2.33e-02)
	0.5	3.48e-01 (5.40e-02) -	4.52e-01 (1.28e-01) -	5.96e-01 (1.27e-01) -	6.08e-01 (9.95e-02) -	1.92e-01 (4.85e-02)
DTLZ6	0.1	5.05e-01 (7.47e-01) -	2.88e+00 (1.28e+00) -	1.39e+00 (1.22e+00) -	1.00e+00 (1.20e+00) -	4.48e-02 (4.30e-01)
	0.2	1.88e+00 (1.00e+00) -	5.48e+00 (1.80e+00) -	3.68e+00 (1.47e+00) -	3.46e+00 (1.17e+00) -	1.15e-01 (5.62e-01)
	0.5	3.89e+00 (1.34e+00) -	1.05e+01 (2.32e+00) -	7.18e+00 (1.29e+00) -	6.62e+00 (1.83e+00) -	1.34e+00 (9.85e-01)
DTLZ7	0.1	8.81e-01 (4.78e-02) -	1.46e+00 (2.21e-01) -	1.01e+00 (1.38e-01) -	1.19e+00 (1.13e-01) -	7.10e-01 (2.56e-01)
	0.2	1.48e+00 (2.68e-01) -	2.96e+00 (5.63e-01) -	2.03e+00 (3.48e-01) -	2.15e+00 (3.45e-01) -	7.07e-01 (4.18e-01)
	0.5	1.78e+00 (2.91e-01) -	3.79e+00 (5.60e-01) -	4.00e+00 (6.50e-01) -	2.76e+00 (4.29e-01) -	7.25e-01 (5.37e-01)
Average Rank		2.67	4.33	3.1	3.67	1.24
+ / \approx / -		3/0/18	0/1/20	0/1/20	0/1/20	