

# **Estimation of parameters for solar cells with S-shaped current–voltage characteristics using meta–heuristic algorithms**

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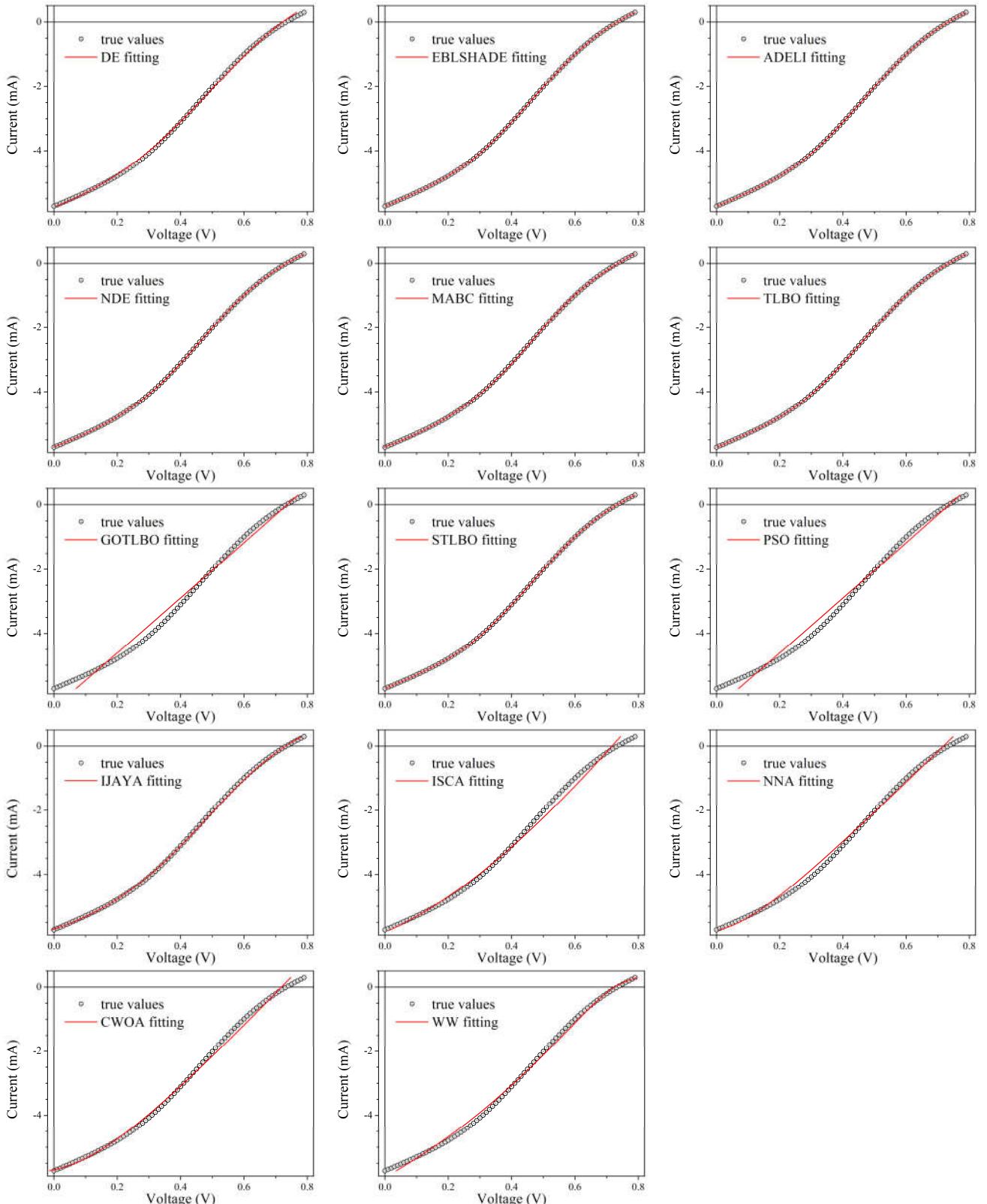
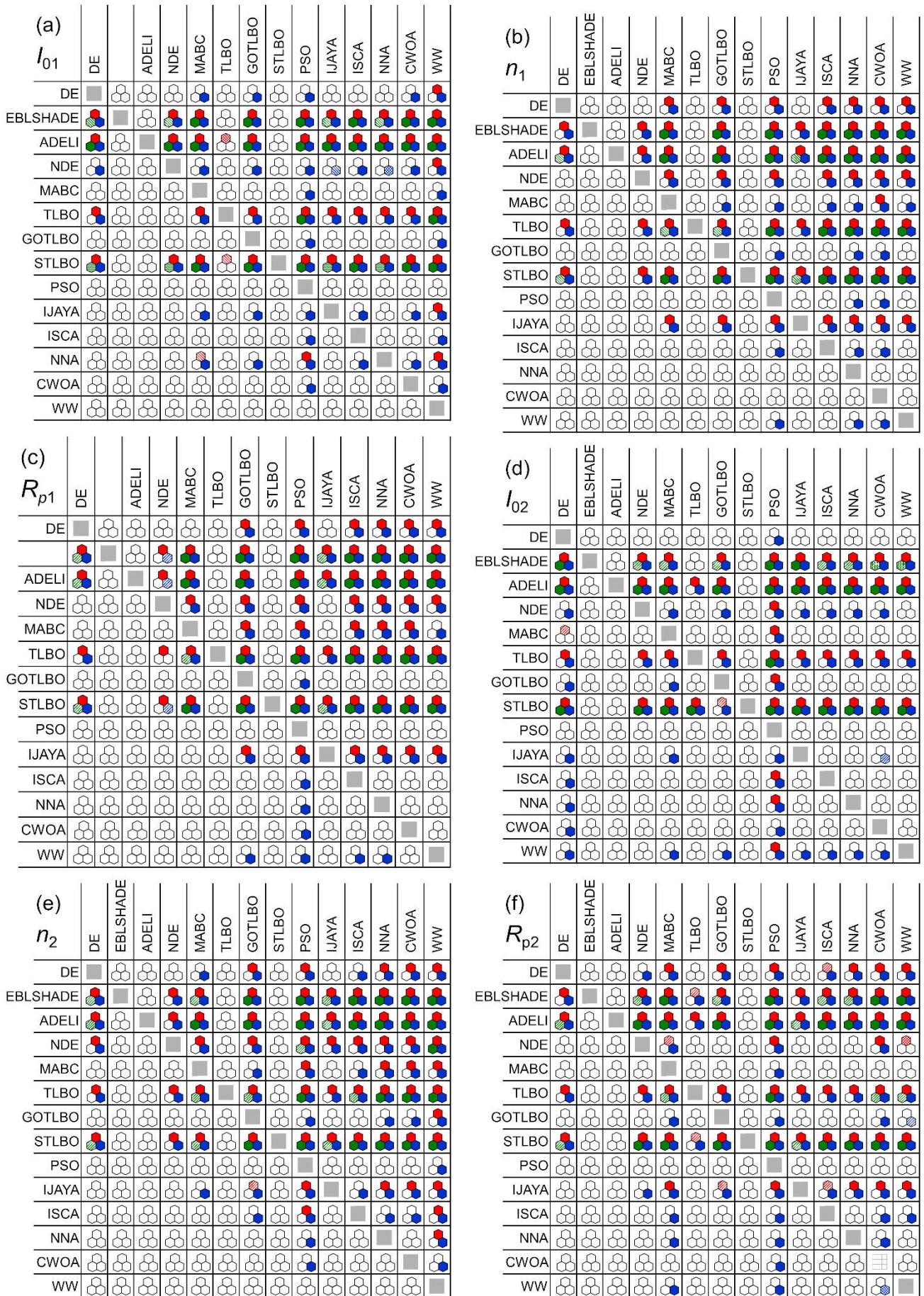


Fig.S1. Fitting results (lines) for the simulated current-voltage characteristic (symbols). The values  $I_{01} = 1.6 \cdot 10^{-6}$  mA,  $n_1 = 1.92$ ,  $R_{p1} = 190$  Ω,  $I_{02} = 0.16$  mA,  $n_2 = 1.92$ ,  $R_{p2} = 190$  Ω,  $R_s = 45$  Ω,  $I_{ph} = 8$  mA were assumed under simulation.



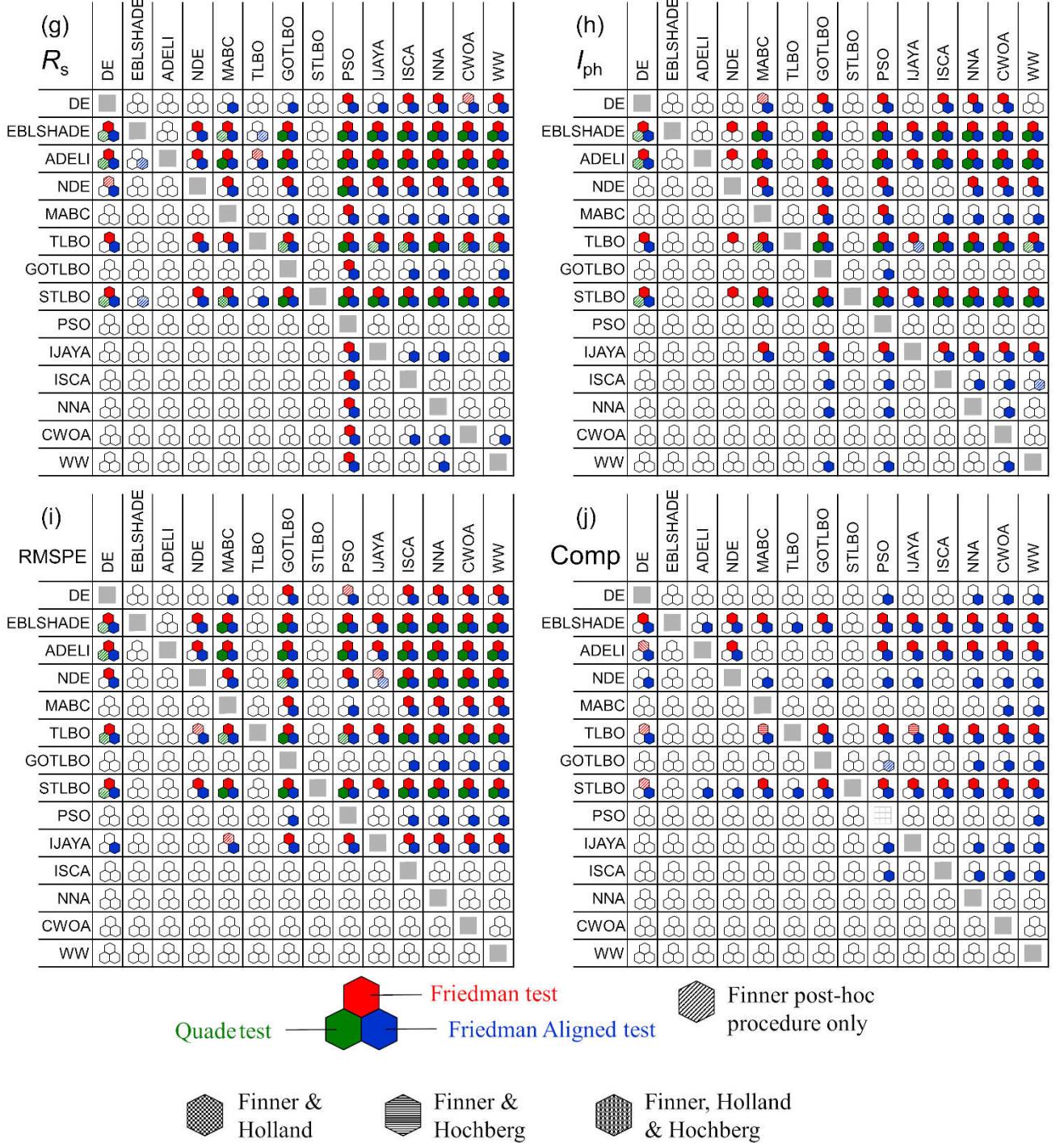
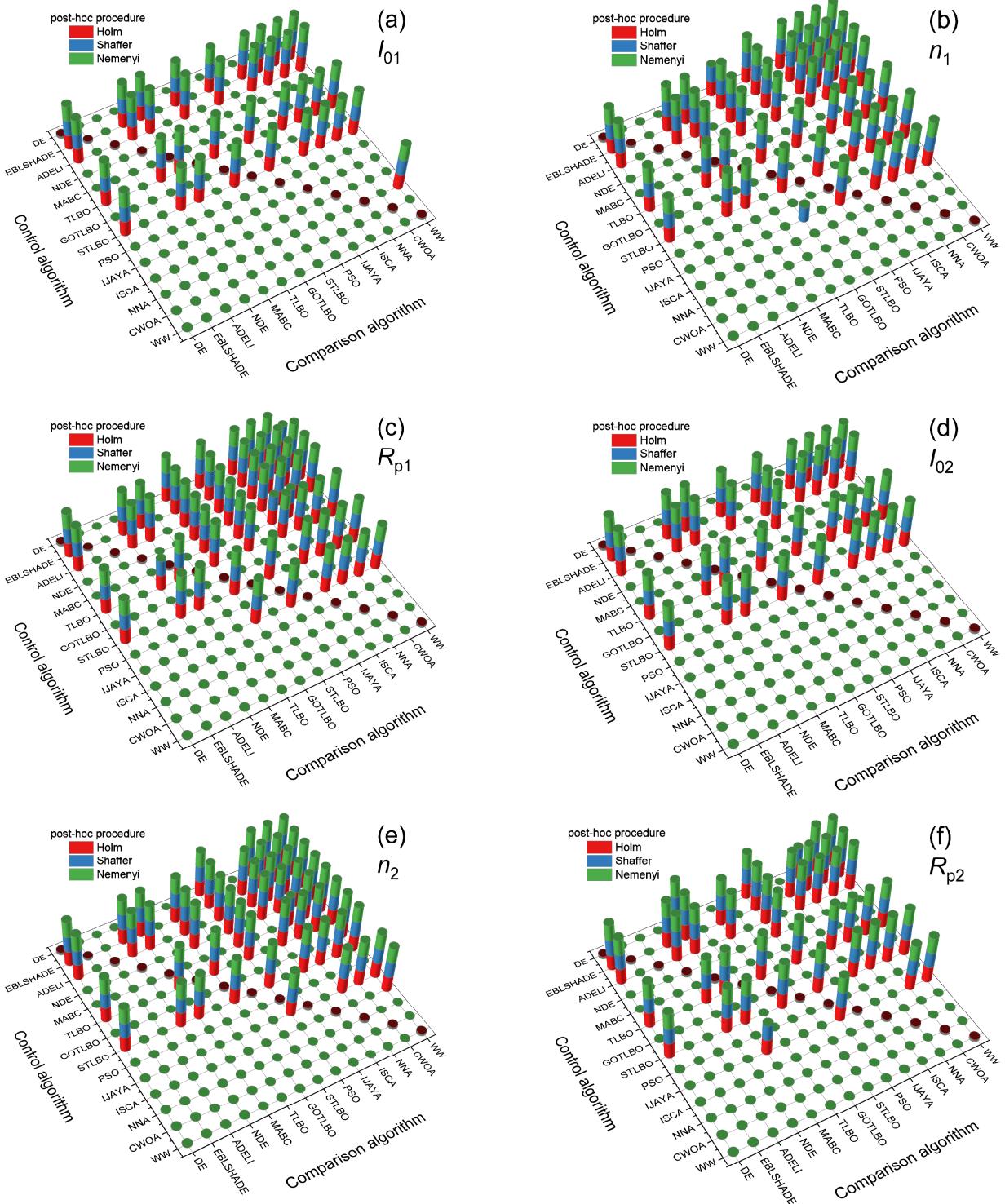


Fig.S2. The results of algorithm comparison in  $I_{01}$  (a),  $n_1$  (b),  $R_{p1}$  (c),  $I_{02}$  (d),  $n_2$  (e),  $R_{p2}$  (f),  $R_s$  (g),  $I_{ph}$  (h) evaluation, RMSPE (i), and Comp (j) parameters by Friedman, Friedman Aligned, and Quade tests in the single-IV case. The colored hexagon indicates that the adjusted  $p$ -value, which tests the hypothesis that an algorithm in a row outperforms an algorithm in a column, is not greater than  $p_{lim} = 0.1$ . The solid fill signifies that every post-hoc procedure resulted in  $p < p_{lim}$ ; the patterned fill indicates that only specific post-hoc procedures achieved this outcome. The correspondence between the color and position of the hexagon to a test as well as the fill pattern to procedures are shown in a legend at the bottom of the figure.



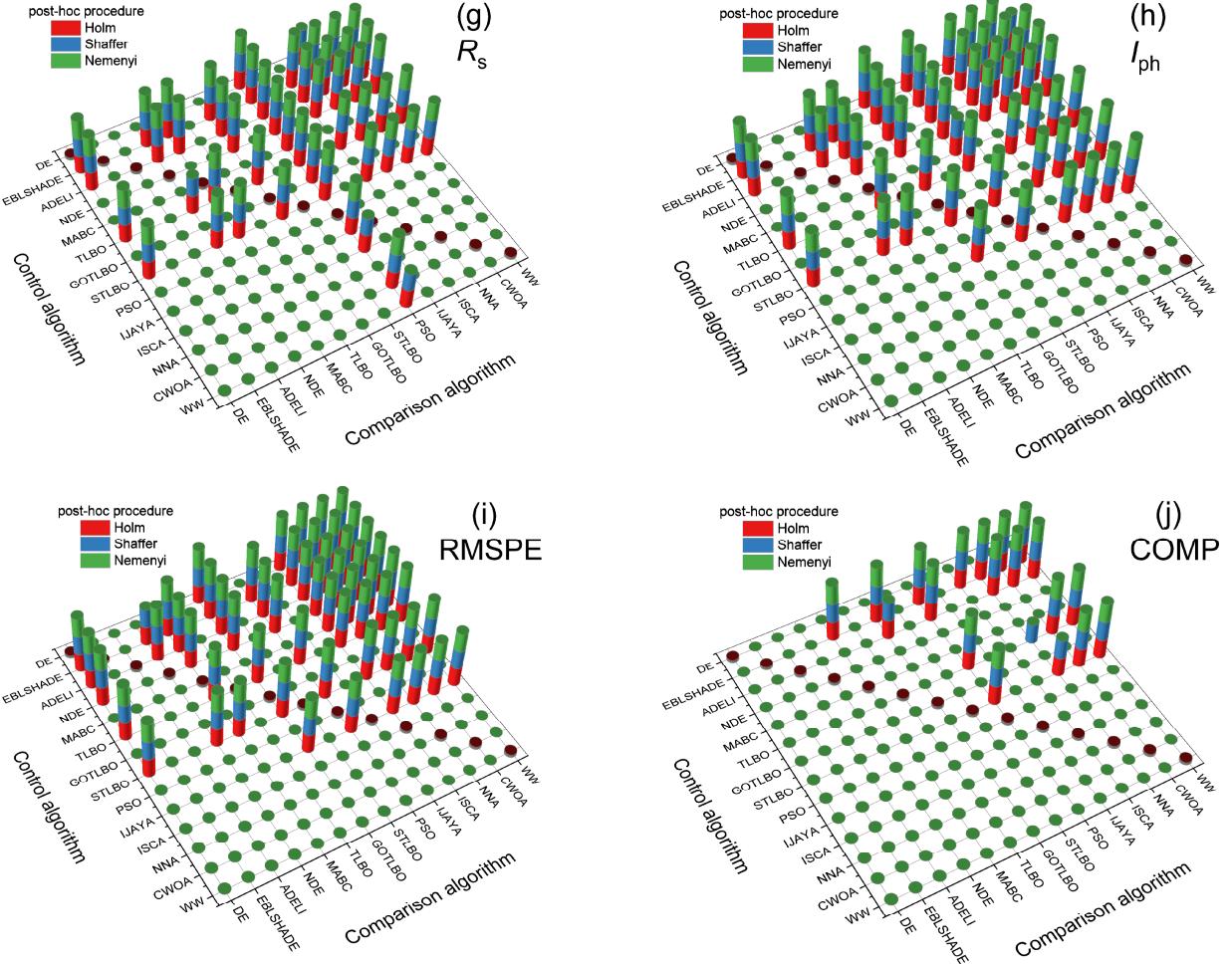


Fig.S3. The results of multiple comparisons in  $I_{01}$  (a),  $n_1$  (b),  $R_{p1}$  (c),  $I_{02}$  (d),  $n_2$  (e),  $R_{p2}$  (f),  $R_s$  (g),  $I_{ph}$  (h) evaluation, RMSPE (i), and Comp (j) parameters among all algorithms in the single--IV case. The colored cylinder indicates that the adjusted  $p$ -value, which tests the control algorithm outperforms the comparison algorithm, is not greater than  $p_{lim} = 0.1$ . The correspondence between the color of the cylinder to a post-hoc procedure is shown in the figure legend.

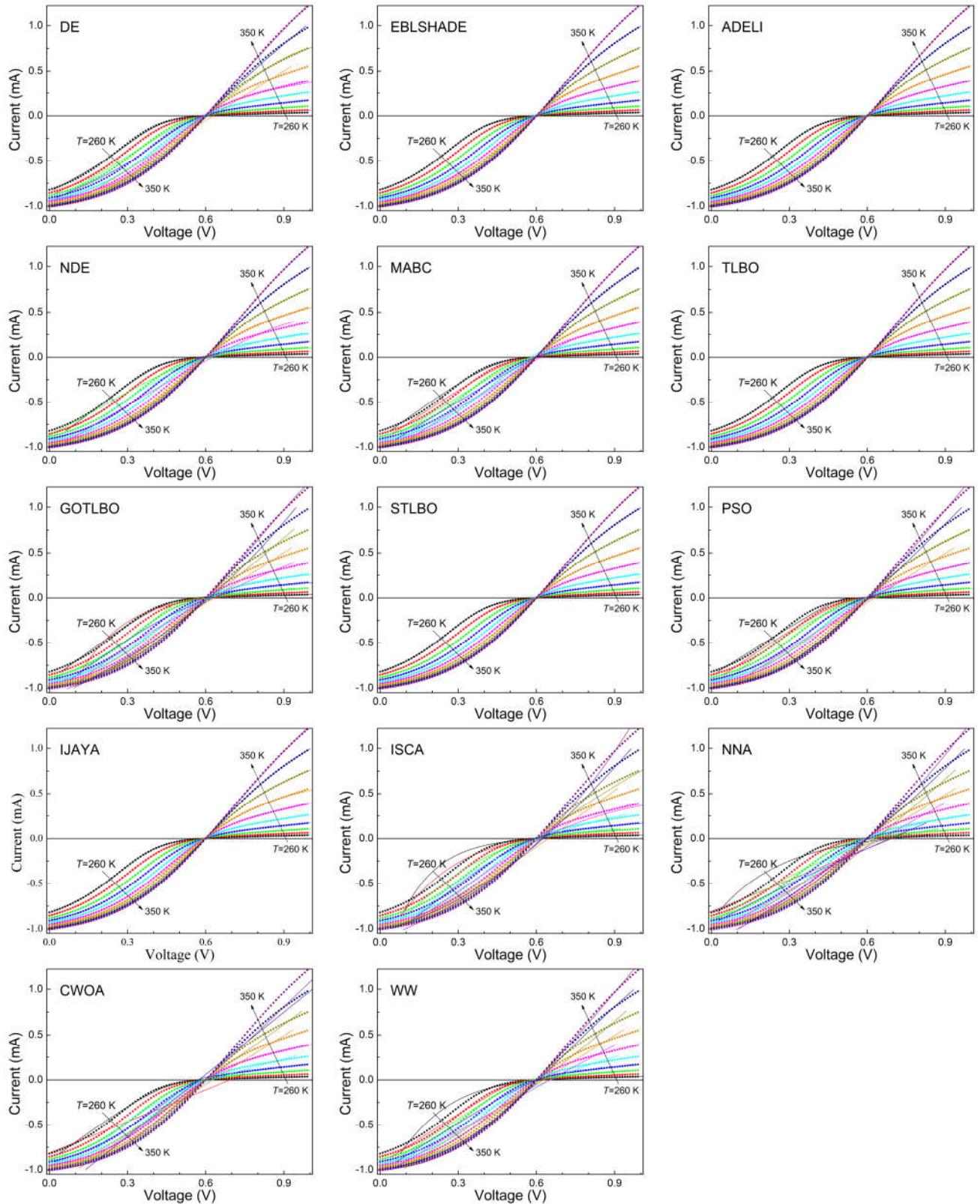


Fig.S4. Fitting results (lines) for the simulated current-voltage characteristic (symbols). The parameters values from Sec.2.2.2 were assumed under simulation.

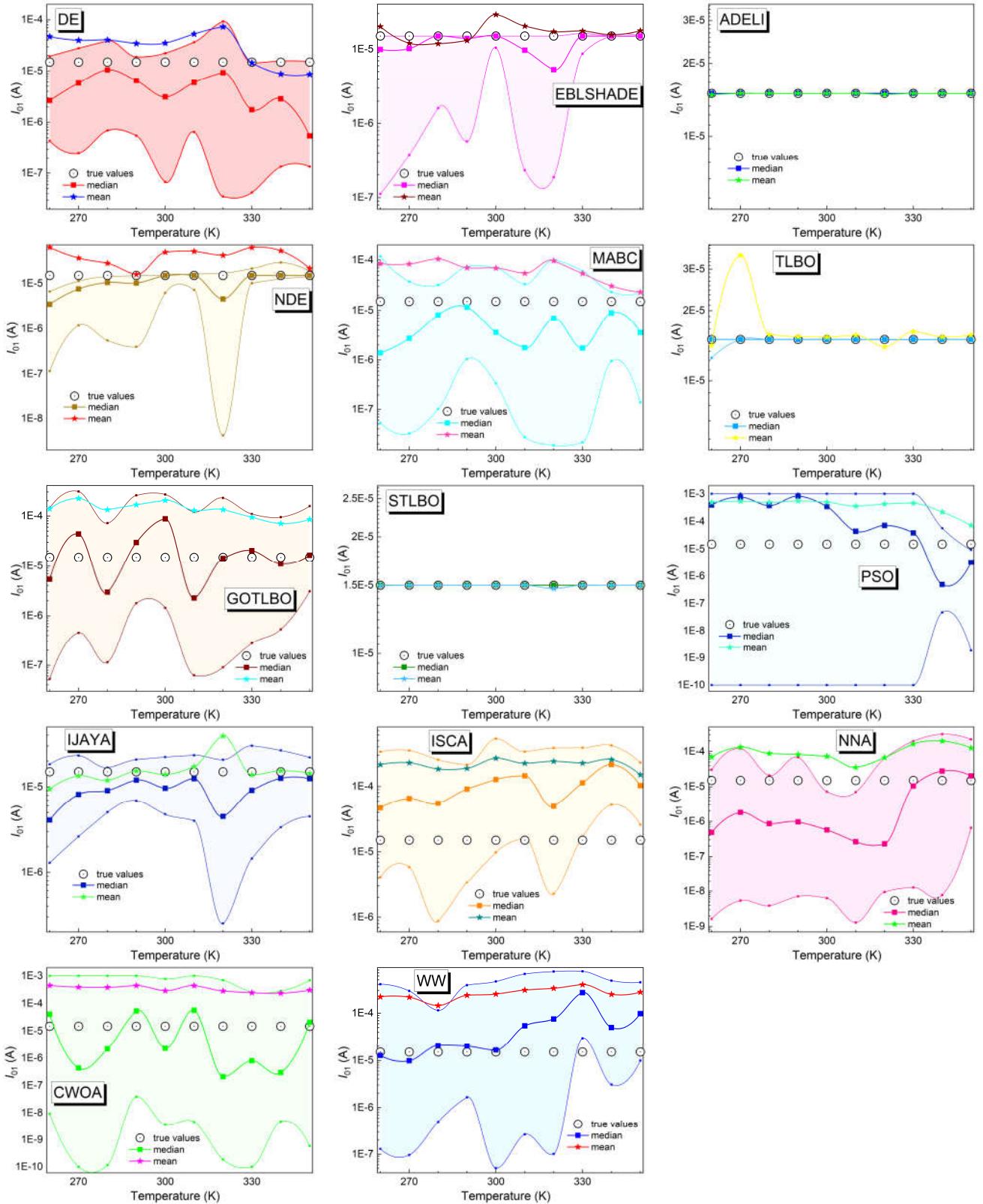


Fig.S5. Comparison of  $I_{01}$  value estimation by different algorithms on the IV curve set. Circles represent the  $I_{01}$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

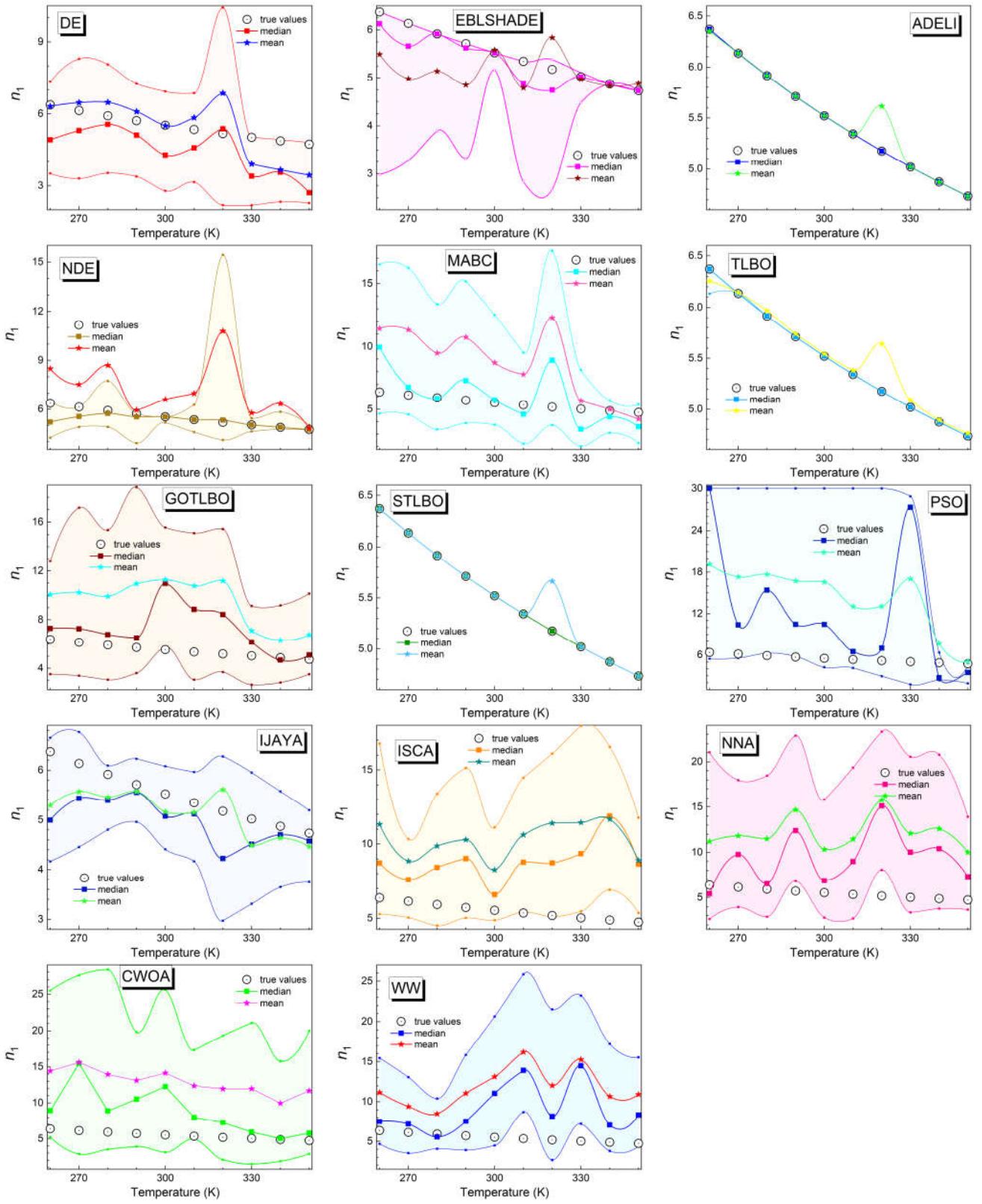


Fig.S6. Comparison of  $n_1$  value estimation by different algorithms on the IV curve set. Circles represent the  $n_1$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

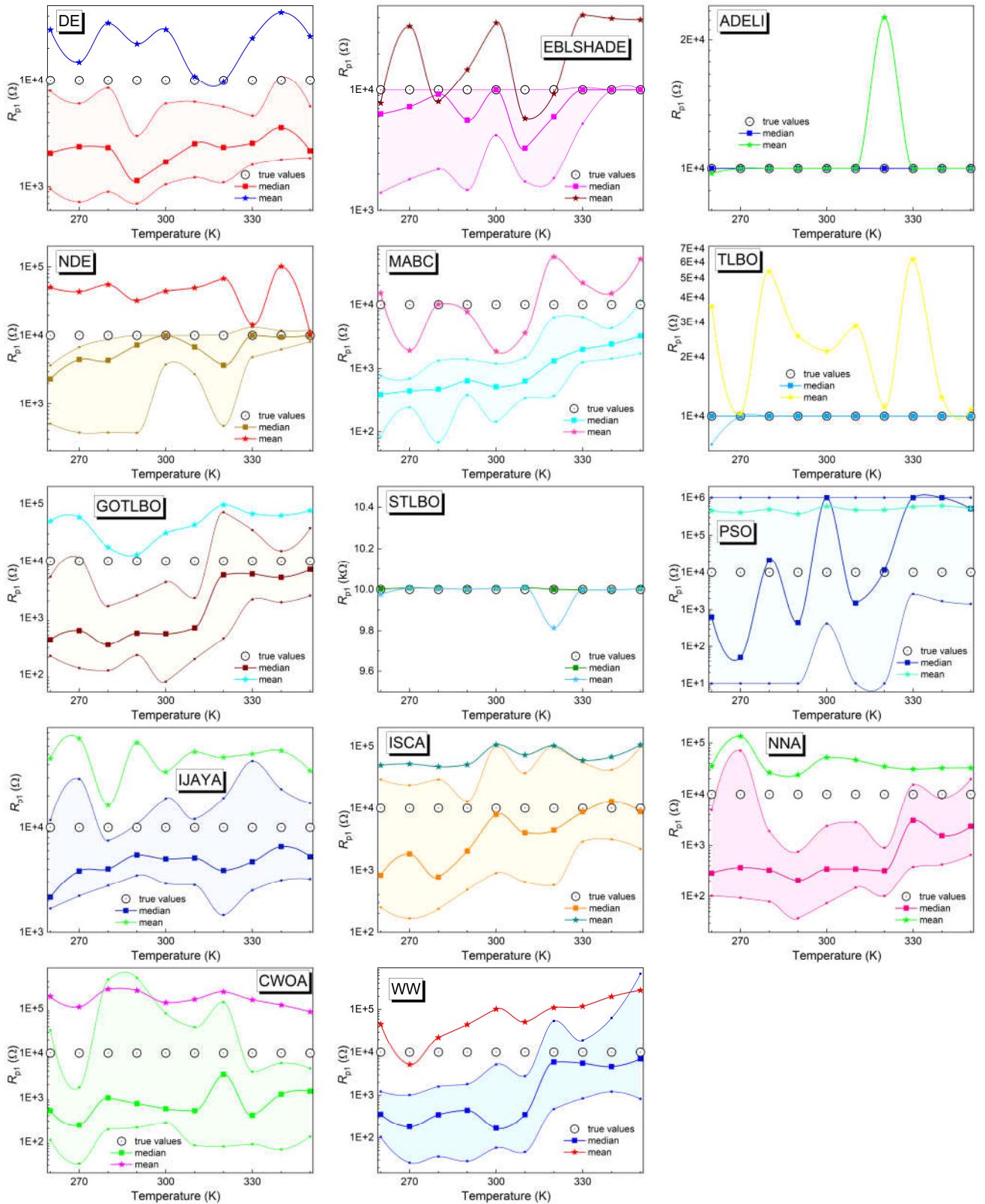


Fig.S7. Comparison of  $R_{p1}$  value estimation by different algorithms on the IV curve set. Circles represent the  $R_{p1}$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

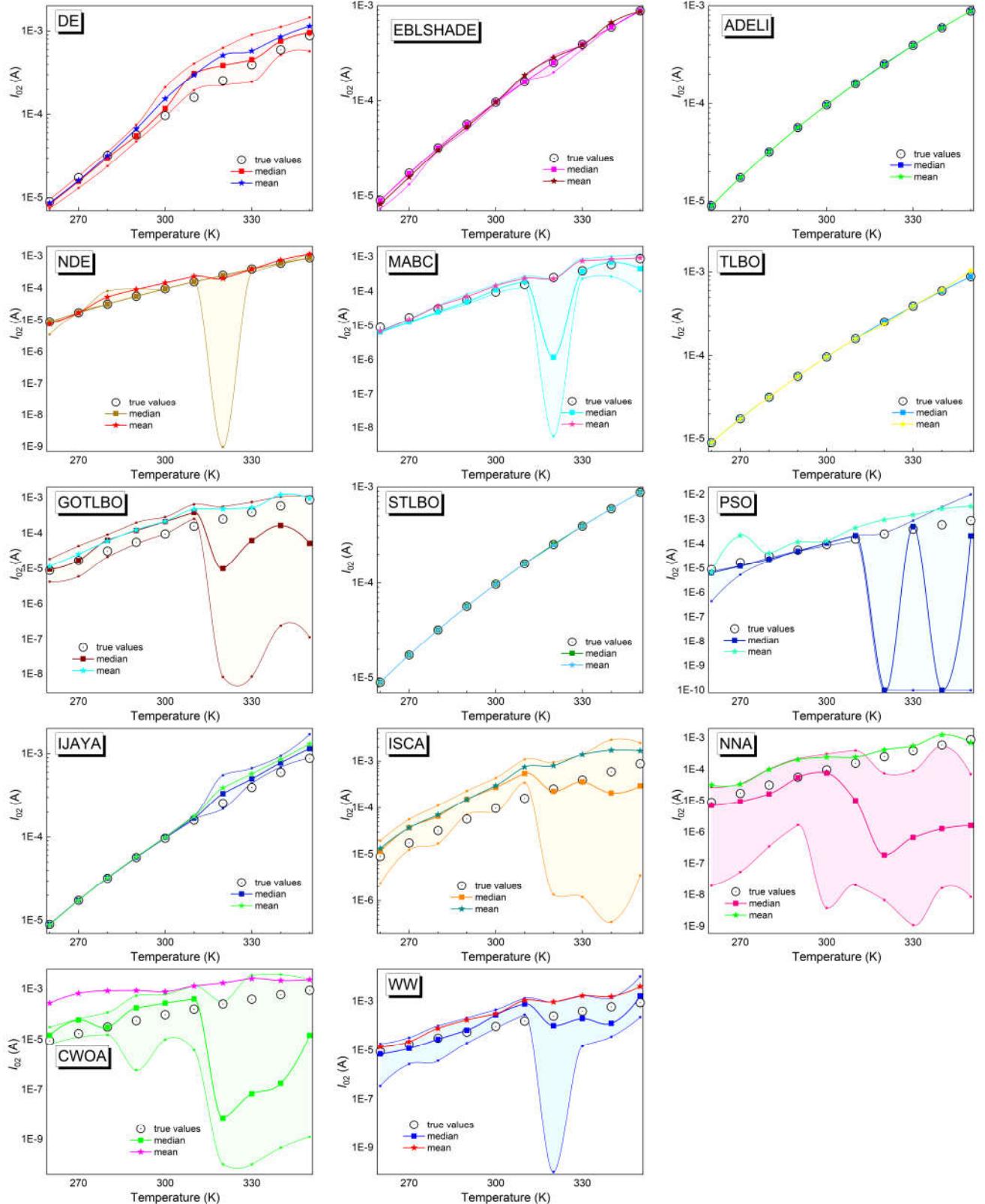


Fig.S8. Comparison of  $I_{02}$  value estimation by different algorithms on the IV curve set. Circles represent the  $I_{02}$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

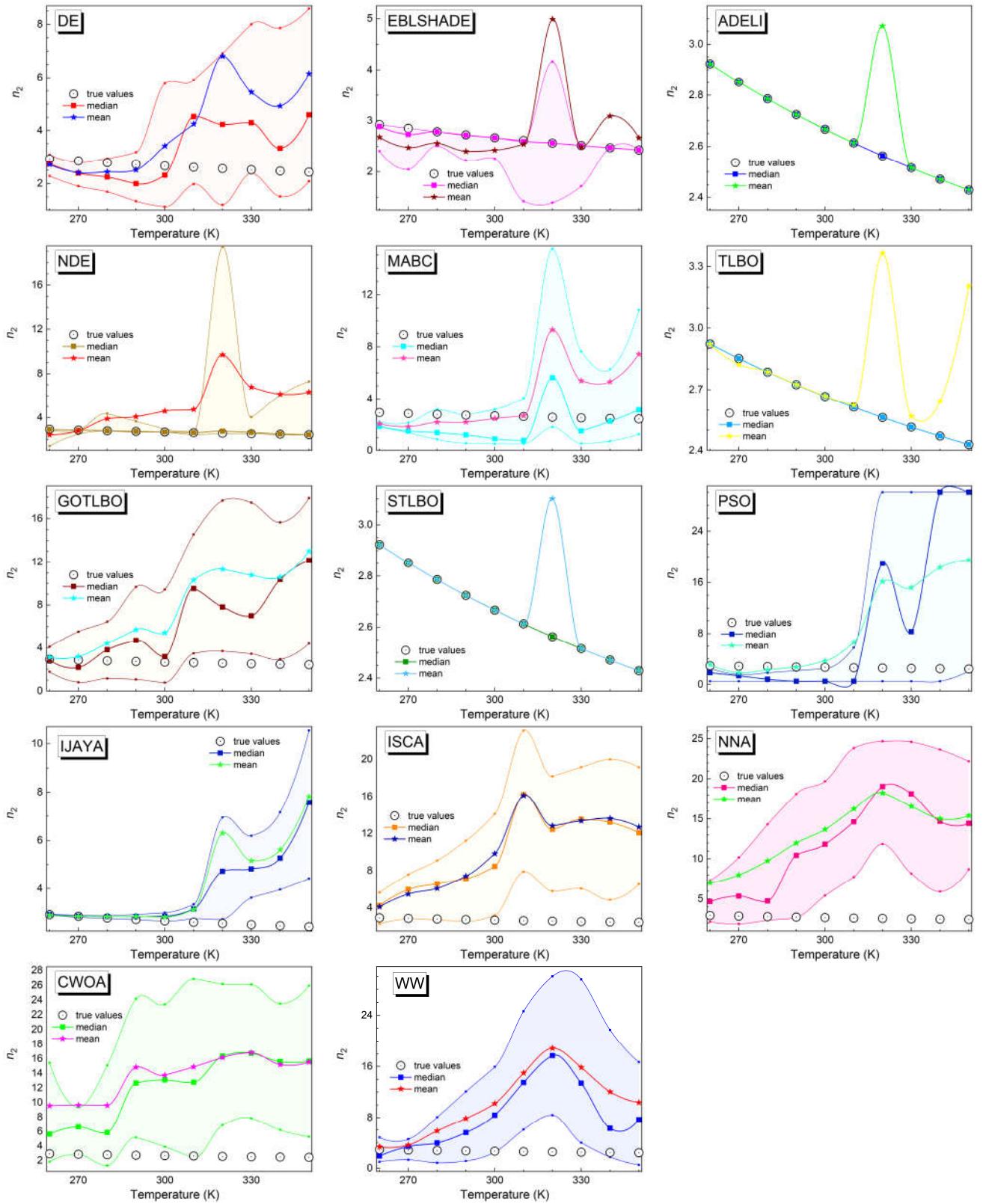


Fig.S9. Comparison of  $n_2$  value estimation by different algorithms on the IV curve set. Circles represent the  $n_2$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

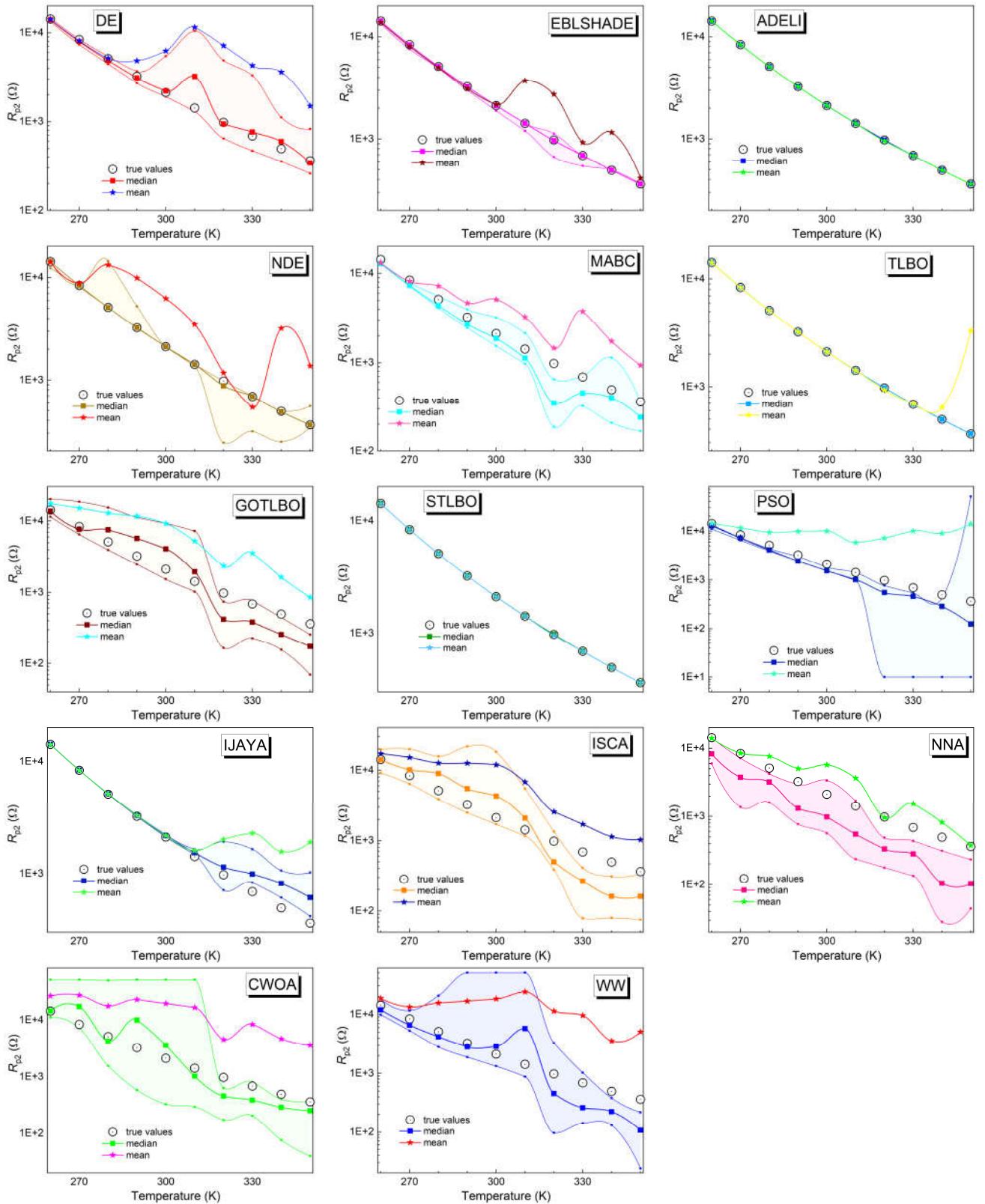


Fig.S10. Comparison of  $R_{p2}$  value estimation by different algorithms on the IV curve set. Circles represent the  $R_{p2}$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

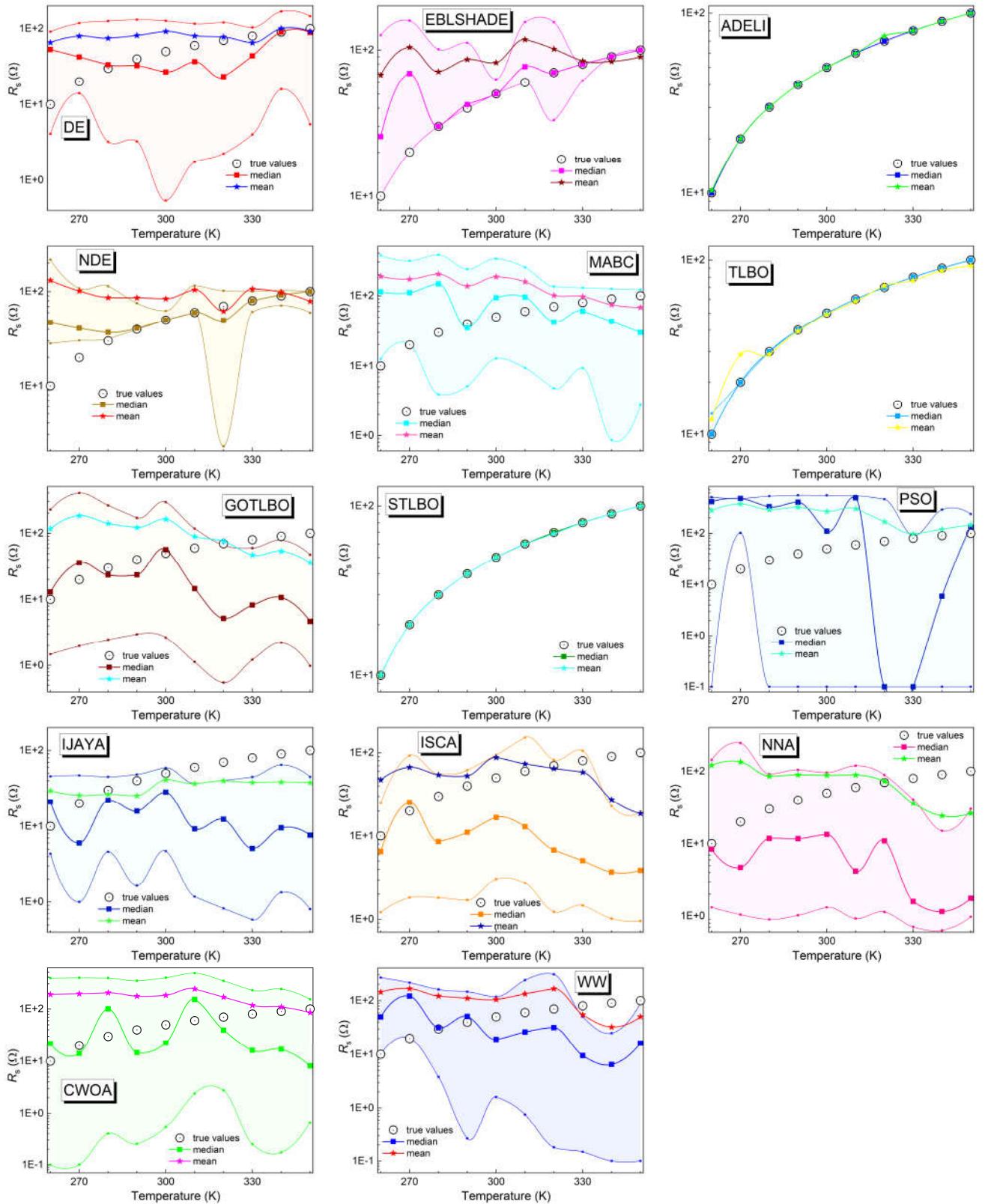


Fig.S11. Comparison of  $R_s$  value estimation by different algorithms on the IV curve set. Circles represent the  $R_s$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

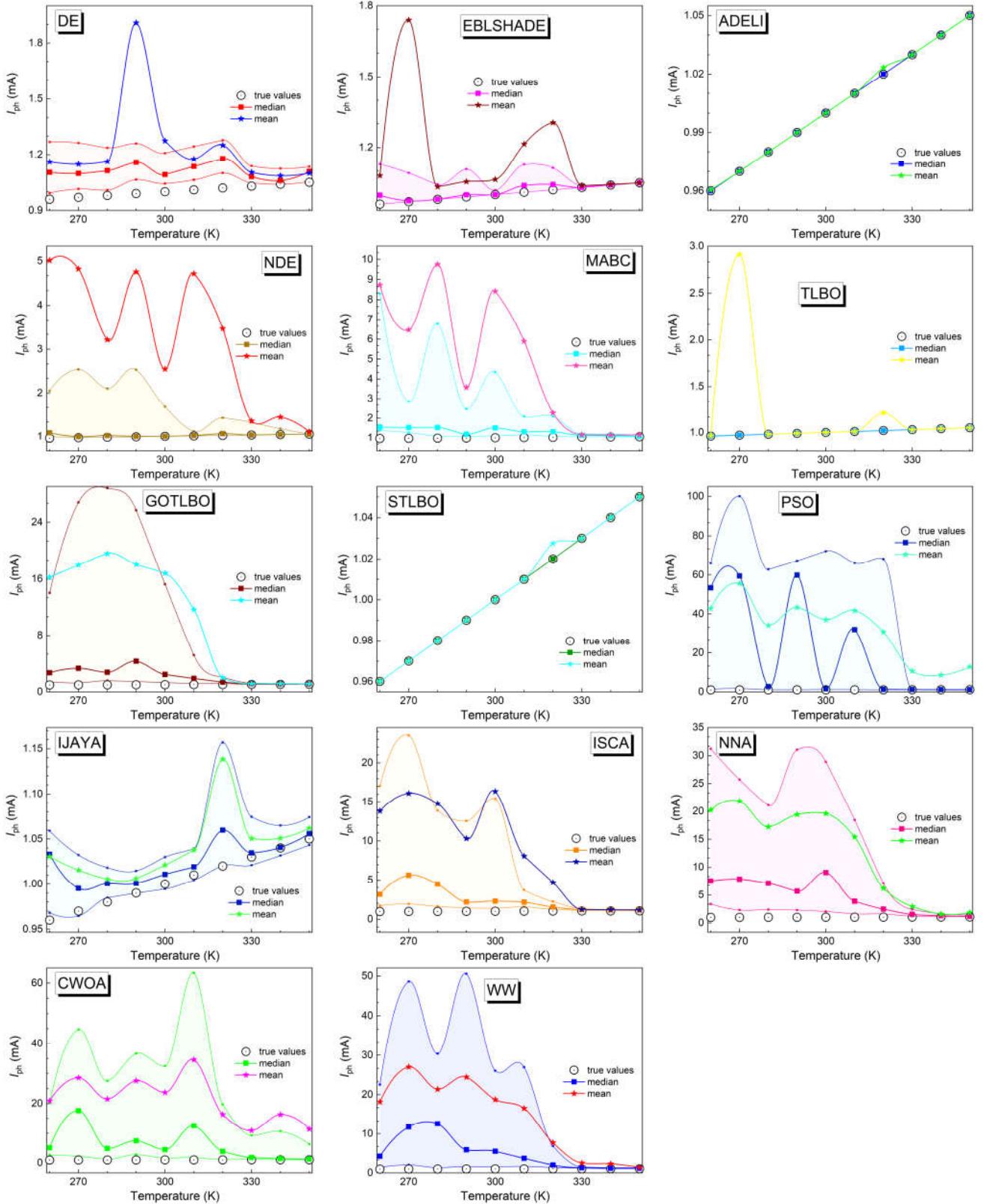


Fig.S12. Comparison of  $I_{ph}$  value estimation by different algorithms on the IV curve set. Circles represent the  $I_{ph}$  values, which have been used in IV curve simulations, squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.

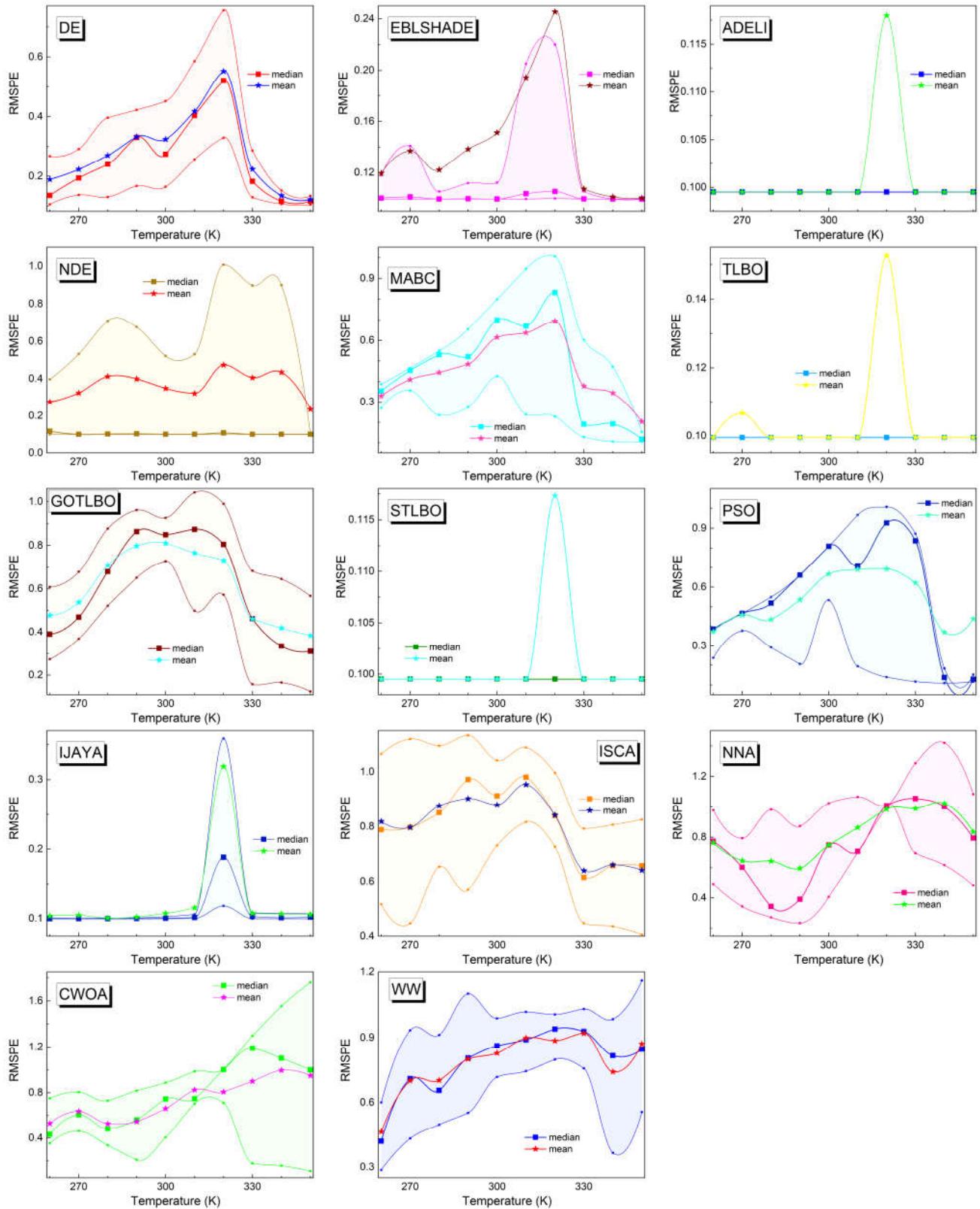


Fig.S13. Comparison of RMSPE value for different algorithms, applied to the IV curve set. Squares represent the median values, and stars represent the mean values. The colored regions correspond to the IQR. The lines only serve as guide to the eye.



**Table S1.** The results of the compared algorithms in the single-IV case.

		Parameter								
		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
DE	true value	1.6e-9	1.92	190	1.6e-4	1.92	190	45	8e-3	
	MEAN	4.30612E-7	2.29342	273.866	8.17387E-4	8.08356	217.375	23.6714	0.00793327	0.202896
	MEDIAN	6.31239E-9	2.09479	200.493	3.843E-4	4.91355	106.342	14.1994	0.00776123	0.177838
	STD	9.79424E-7	0.819543	327.208	0.00101283	8.7304	448.313	22.4509	8.7897E-4	0.0818108
EBL SHADE	IQR	2.47897E-7	1.18701	73.9815	0.00118424	6.42196	73.1935	36.6225	0.00105832	0.12722
	MEAN	4.89016E-8	1.99143	191.859	1.90839E-4	2.09441	257.032	42.8834	0.00795469	0.112344
	MEDIAN	1.59673E-9	1.91973	189.998	1.59904E-4	1.91936	189.951	45.0092	0.00800011	0.111803
	STD	2.94351E-7	0.302862	7.06297	1.42778E-4	0.749826	408.471	8.42013	1.76013E-4	0.00378624
ADELI	IQR	2.45E-17	2E-9	1E-7	4E-13	2.5E-9	2.5E-7	5E-8	2E-12	0
	MEAN	1.59673E-9	1.91973	189.998	1.59904E-4	1.91936	189.951	45.0092	0.00800011	0.111803
	MEDIAN	1.59673E-9	1.91973	189.998	1.59904E-4	1.91936	189.951	45.0092	0.00800011	0.111803
	STD	2.24774E-17	1.8407E-9	8.14411E-8	2.26085E-12	1.09586E-8	1.29649E-6	8.3637E-8	1.67527E-12	5.60747E-17
NDE	IQR	2.5E-17	2E-9	1E-7	8E-13	6E-9	3.5E-7	6.5E-8	2E-12	0
	MEAN	2.96195E-7	2.42087	217.047	4.32932E-4	4.1948	572.088	31.1402	0.00768983	0.150002
	MEDIAN	1.97951E-8	2.31401	205.507	2.7074E-4	2.82514	247.163	33.9332	0.00765711	0.111897
	STD	1.06531E-6	0.585381	81.8273	3.94921E-4	6.46811	902.42	16.9948	3.9184E-4	0.149461
MABC	IQR	1.28566E-7	0.782389	32.2484	5.10535E-4	2.85309	341.063	30.0524	6.3894E-4	2.59792E-4
	MEAN	1.87007E-6	3.23398	517.263	0.00116959	14.9942	881.309	25.5168	0.0101761	0.404887
	MEDIAN	3.78613E-8	3.00104	141.578	2.22821E-4	6.65565	82.0348	12.4381	0.00855776	0.169928
	STD	3.35158E-6	3.38085	2492.2	0.00255612	17.4695	2269.68	27.1128	0.00447919	0.313895
TLBO	IQR	1.56208E-6	2.81682	158.743	7.57854E-4	23.8231	151.829	47.2398	0.00357495	0.608581
	MEAN	4.76305E-9	1.91592	189.79	2.17925E-4	2.14102	494.417	44.2879	0.00801613	0.111834
	MEDIAN	1.59673E-9	1.91973	189.998	1.59904E-4	1.91936	189.951	45.0092	0.00800011	0.111803
	STD	1.1263E-8	0.237052	9.96477	2.26679E-4	1.05125	1239.57	9.34268	2.38013E-4	9.91547E-5
	IQR	3.78381E-11	0.00312336	0.131118	2.10985E-8	0.00210025	0.0325284	0.0313024	1.92458E-6	2.0801E-6

**Table S1 (continued)**

	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
	true value	1.6e-9	1.92	190	1.6e-4	1.92	190	45	8e-3
GOTLBO	MEAN	1.71767E-6	9.57122	11628.3	7.92397E-4	20.2703	128.312	24.659	0.0228366
	MEDIAN	1.03447E-8	3.41832	69.094	7.71914E-7	14.2566	74.3327	8.80183	0.0142995
	STD	3.34406E-6	11.018	44234.6	0.00216328	14.115	417.298	29.8185	0.0197114
	IQR	1.36228E-6	15.8671	216.793	2.4192E-4	23.5098	64.4833	43.6466	0.0237021
STLBO	MEAN	1.59673E-9	1.91973	189.998	1.59904E-4	1.91936	189.951	45.0092	0.00800011
	MEDIAN	1.59673E-9	1.91973	189.998	1.59904E-4	1.91936	189.951	45.0092	0.00800011
	STD	3.10035E-17	2.53498E-9	1.09935E-7	7.54905E-13	5.08363E-9	3.95897E-7	7.27714E-8	2.265E-12
	IQR	3.6E-17	2.5E-9	1E-7	1.15E-12	7.5E-9	6E-7	1E-7	3E-12
PSO	MEAN	3.14227E-6	16.6587	180118	0.00271538	36.2226	1271.15	41.1715	0.0386418
	MEDIAN	1E-16	3.52665	106.144	1E-10	50	22.0427	0.409733	0.00899564
	STD	4.55814E-6	22.0702	388032	0.00438738	21.3176	3258.81	45.3494	0.0350568
	IQR	1E-5	49.083	163.924	0.00643173	40.2401	100.011	92.3135	0.0667872
IJAYA	MEAN	4.22388E-7	2.24164	311.312	6.00966E-4	6.98969	296.131	13.8104	0.00757605
	MEDIAN	9.73093E-9	2.19089	210.625	4.10043E-4	5.6748	159.549	3.75794	0.00761625
	STD	1.1024E-6	0.833675	469.522	9.60642E-4	5.94046	532.266	18.5512	6.09311E-4
	IQR	1.12926E-7	1.11574	61.1361	5.19021E-4	3.36356	169.582	18.6422	8.92576E-4
ISCA	MEAN	1.15274E-6	10.4396	22799	5.06103E-4	15.9083	152.337	12.3251	0.0178729
	MEDIAN	2.08898E-8	3.5363	102.061	6.45362E-7	12.4266	76.6075	2.41391	0.0104324
	STD	2.29412E-6	12.3668	98896.9	0.00127207	11.5125	585.368	23.4796	0.0187227
	IQR	1.16327E-6	11.1835	413.555	9.58418E-5	16.2615	68.6495	7.87543	0.0101581
NNA	MEAN	4.86072E-7	17.7241	7704.75	7.60416E-4	26.175	181.643	7.19023	0.0194113
	MEDIAN	4.09834E-12	13.7798	75.4677	6.53373E-6	24.3121	74.7187	1.47635	0.0127364
	STD	1.37597E-6	15.7707	23975	0.00178214	12.9398	643.998	14.9043	0.01764
	IQR	2.55487E-8	28.9827	126.308	4.49047E-4	21.3311	63.1188	3.89105	0.0132889

**Table S1** (continued)

	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
true value	1.6e-9	1.92	190	1.6e-4	1.92	190	45	8e-3	
CWOA	MEAN	1.91016E-6	19.7767	27364.9	0.00115056	30.3776	400.515	27.5457	0.026159
	MEDIAN	5.94422E-10	17.2753	56.5524	6.44204E-9	34.0434	52.5507	9.03927	0.0141445
	STD	3.8446E-6	17.5006	145161	0.00303351	17.6242	1479.81	32.8588	0.0257545
	IQR	5.44157E-7	30.0379	70.4671	9.36563E-5	32.9741	74.873	53.057	0.0233644
WW	MEAN	2.25657E-6	6.01898	1815.69	3.60402E-4	45.528	79.1659	16.1267	0.0242362
	MEDIAN	4.28549E-7	4.43733	94.2486	1E-10	50	31.019	1.15863	0.00961191
	STD	3.10815E-6	7.02418	7319.67	0.00147962	11.7448	227.327	25.8349	0.0246133
	IQR	3.2253E-6	3.28317	58.5468	5.44421E-5	0	61.1333	15.4329	0.0241842

**Table S2.** The statistical significance of the null hypothesis in Friedman, Friedman Aligned, and Quade tests and the Iman–Davenport extension

Test	<i>p</i> -value										IV-set case
	Single IV case										
	$I_{01}$	$n_1$	$R_{p1}$	$I_{02}$	$n_2$	$R_{p2}$	$R_s$	$I_{ph}$	RMSPE	Comp	
Friedman	4.9664E-07	0.0000E+00	0.0000E+00	3.0381E-07	0.0000E+00	6.8597E-07	2.3210E-06	0.0000E+00	0.0000E+00	0.0000E+00	2.2964E-06
Iman-Davenport	0.0000E+00	1.4774E-09	1.4310E-09	0.0000E+00	1.3797E-09	0.0000E+00	1.5223E-09	1.4438E-09	1.2472E-09	0.0000E+00	0.0000E+00
Friedman Aligned	4.0411E-07	5.9524E-07	2.7010E-05	1.4847E-06	0.0000E+00	4.9647E-06	0.0000E+00	5.0555E-07	0.0000E+00	4.3982E-04	0.0000E+00
Quade	1.1191E-09	0.0000E+00	0.0000E+00	1.1432E-09	0.0000E+00	1.0869E-09	0.0000E+00	0.0000E+00	0.0000E+00	8.3247E-06	0.0000E+00

**Table S3.** Ranking of the algorithms according to Friedman, Friedman Aligned, and Quade tests.

Test	DE	EBLSHADE	ADELI	NDE	MABC	TLBO	GOTLBO	STLBO	PSO	IJAYA	ISCA	NNA	CWOA	WW
<i>Single-IV case</i>														
<i>I<sub>01</sub></i>														
Friedman	8.88	2.69	<b>2.24</b>	8.76	9.98	4.02	9.02	2.45	10.59	8.62	9.56	8.07	8.98	11.14
Friedman Aligned	6.695	5.448	5.210	6.149	8.248	5.261	8.254	<b>5.209</b>	9.168	6.618	7.847	6.668	7.814	9.552
Quade	8.332	2.921	<b>2.091</b>	8.318	9.632	4.337	9.587	2.568	11	8.464	9.183	8.156	9.323	11.09
<i>n<sub>1</sub></i>														
Friedman	7.16	2.61	<b>2.22</b>	6.42	9.32	3.53	9.66	2.4	10.99	7.18	9.98	11.1	11.67	10.76
Friedman Aligned	5.581	4.653	<b>4.570</b>	5.362	6.718	4.740	8.325	<b>4.570</b>	9.506	5.645	8.593	10.701	10.971	8.205
Quade	6.952	2.835	<b>2.211</b>	6.122	8.978	3.66	9.123	2.415	11.65	7.343	9.886	11.23	11.96	10.64
<i>R<sub>p1</sub></i>														
Friedman	7.3	2.37	<b>2.26</b>	6.24	8.46	3.51	11.36	2.34	11.2	7.22	10.98	10.94	10.84	9.98
Friedman Aligned	6.493	5.73	<b>5.687</b>	6.154	6.691	5.806	8.293	<b>5.687</b>	9.425	6.435	8.094	8.308	7.875	7.462
Quade	7.162	2.367	2.358	6.113	8.725	3.444	11.05	<b>2.311</b>	11.48	7.213	11.21	11.08	10.71	9.781
<i>I<sub>02</sub></i>														
Friedman	9.62	2.78	<b>2.29</b>	7.98	8.94	4.14	8.96	2.49	11.46	9.6	8.96	9.16	9.45	9.17
Friedman Aligned	8.649	5.008	<b>4.807</b>	6.892	8.111	5.275	7.530	4.808	9.699	7.469	7.632	7.663	7.958	6.640
Quade	9.531	2.999	<b>2.227</b>	8.038	8.985	4.273	8.831	2.375	11.78	9.843	8.599	8.987	9.276	9.257
<i>n<sub>2</sub></i>														
Friedman	7.6	2.41	<b>2.31</b>	5.64	8.1	3.66	9.74	2.46	11.44	7.68	9.1	10.72	10.97	13.17
Friedman Aligned	5.849	3.254	<b>3.145</b>	4.351	7.446	3.433	9.089	<b>3.145</b>	11.052	5.934	8.362	10.019	10.405	12.657
Quade	7.642	2.454	<b>2.311</b>	5.532	8.369	3.533	9.656	2.572	11.54	7.591	8.989	10.71	10.97	13.14
<i>R<sub>p2</sub></i>														
Friedman	7.12	2.72	<b>2.28</b>	8.16	10.16	4.21	9.49	2.55	11.03	7.44	9.14	9.78	10.58	10.34
Friedman Aligned	6.683	4.937	<b>4.592</b>	7.716	8.735	5.646	7.424	4.593	9.445	6.769	7.389	7.690	8.544	7.978
Quade	6.956	3.071	<b>2.309</b>	8.925	10.21	4.462	9.142	2.491	11.34	7.465	8.784	9.207	10.54	10.1
<i>R<sub>s</sub></i>														
Friedman	7.8	2.5	<b>2.31</b>	6.28	8.68	3.75	9.34	2.38	12.62	9.22	10.1	10.38	9.62	10.02
Friedman Aligned	7.358	2.416	<b>1.994</b>	5.419	8.051	2.793	8.732	1.995	11.78	8.819	9.974	10.33	8.905	9.572
Quade	7.349	2.553	<b>2.359</b>	6.479	8.252	3.846	9.004	2.394	13.41	9.028	10.04	10.35	9.766	10.18
<i>I<sub>ph</sub></i>														
Friedman	7.3	2.4	<b>2.21</b>	6.14	9.02	3.72	11.34	2.39	11.72	6.88	10.56	10.62	10.72	9.98
Friedman Aligned	5.405	4.803	<b>4.765</b>	5.112	6.609	4.848	9.646	<b>4.765</b>	10.50	5.322	8.428	9.055	9.944	8.934
Quade	7.083	2.399	<b>2.293</b>	6.202	8.682	3.905	11.09	2.331	12.19	6.56	10.54	10.61	11.13	9.974

**Table S3 (continued)**

Test	DE	EBLSHADE	ADELI	NDE	MABC	TLBO	GOTLBO	STLBO	PSO	IJAYA	ISCA	NNA	CWOA	WW
RMSPE														
Friedman	7.92	2.51	<b>2.28</b>	5.03	8.56	3.26	10.7	<b>2.28</b>	9.74	6.66	11.32	11.38	11.5	11.86
Friedman Aligned	5.783	3.392	<b>3.367</b>	3.943	7.203	3.387	9.803	<b>3.367</b>	8.968	4.422	11.03	11.16	10.89	11.42
Quade	7.93	2.449	<b>2.281</b>	5.009	8.478	3.272	10.6	<b>2.281</b>	9.312	6.623	11.92	11.75	11.59	11.51
Comp														
Friedman	7.4	<b>2</b>	3.55	6.5	8.3	3.75	9.6	3.7	10.85	8.3	9.3	9.7	10.9	11.15
Friedman Aligned	7.23	4.165	5.305	5.36	7.84	5.295	7.58	<b>4.045</b>	8.685	7.34	7.05	9.15	9.59	10.06
Quade	7.945	<b>2.409</b>	4.364	7.073	8.945	4.355	8.745	3.782	10.31	8.891	8.964	8.673	9.636	10.91
<i>IV set case</i>														
Friedman	7.81	3.86	<b>2.19</b>	4.84	8.86	2.61	9.54	2.75	11.2	6.77	10.9	11.6	11.3	10.7
Friedman Aligned	6.181	4.583	4.379	4.722	7.154	4.378	8.004	<b>4.226</b>	10.50	5.850	9.774	9.278	9.743	9.302
Quade	8.056	3.931	<b>2.336</b>	4.956	8.895	2.71	9.135	2.812	11.88	6.855	10.63	11.11	11.42	10.27

**Table S4.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	8.61820E-02	8.98122E-02	8.98122E-02	8.61820E-02
WW	Friedman Aligned	2.30441E-08	7.09049E-08	7.09049E-08	7.09049E-08
WW	Quade	9.80292E-01	1.0	1.0	9.80292E-01
PSO	Friedman	2.38076E-01	4.91631E-01	4.91631E-01	3.94673E-01
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	9.80292E-01	1.0	1.0	9.80292E-01
MABC	Friedman	5.95703E-01	1.0	1.0	8.99625E-01
MABC	Friedman Aligned	6.53233E-12	1.32871E-11	1.32871E-11	1.32871E-11
MABC	Quade	9.80292E-01	1.0	1.0	9.99953E-01
ISCA	Friedman	8.26230E-01	1.0	1.0	9.95414E-01
ISCA	Friedman Aligned	3.32249E-07	1.15009E-06	1.15009E-06	1.15009E-06
ISCA	Quade	9.80292E-01	1.0	1.0	9.99970E-01
GOTLBO	Friedman	9.94739E-01	1.0	1.0	1.0
GOTLBO	Friedman Aligned	6.53233E-12	1.20597E-11	1.20597E-11	1.20597E-11
GOTLBO	Quade	9.80292E-01	1.0	1.0	9.99953E-01
CWOA	Friedman	9.94739E-01	1.0	1.0	1.0
CWOA	Friedman Aligned	6.22265E-07	2.29759E-06	2.29759E-06	2.29759E-06
CWOA	Quade	9.80292E-01	1.0	1.0	9.99970E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S4** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.97117E-01	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0

**Table S5.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
DE	Friedman	6.00409E-13	1.59650E-12	1.59650E-12	1.59650E-12
DE	Friedman Aligned	2.11188E-08	7.96017E-08	7.96017E-08	7.96017E-08
DE	Quade	4.39270E-02	1.66115E-01	1.30659E-01	1.54746E-01
GOTLBO	Friedman	6.00409E-13	6.00409E-13	6.00409E-13	6.00409E-13
GOTLBO	Friedman Aligned	1.14652E-08	3.96874E-08	3.70043E-08	3.96874E-08
GOTLBO	Quade	2.64966E-02	6.79570E-02	6.52926E-02	6.58962E-02
ISCA	Friedman	6.00409E-13	1.41664E-12	1.41664E-12	1.41664E-12
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.64966E-02	8.49735E-02	8.49735E-02	8.18808E-02
CWOA	Friedman	6.00409E-13	7.88702E-13	7.88702E-13	7.88702E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	2.64966E-02	8.09879E-02	8.09879E-02	7.81332E-02
NDE	Friedman	1.19158E-12	4.12470E-12	4.12470E-12	4.12470E-12
NDE	Friedman Aligned	1.71258E-03	5.27053E-03	5.27053E-03	5.26012E-03
NDE	Quade	4.39270E-02	1.66115E-01	1.30659E-01	1.54746E-01
IJAYA	Friedman	3.31860E-12	1.22533E-11	1.22533E-11	1.22533E-11
IJAYA	Friedman Aligned	1.17856E-07	4.07961E-07	4.07961E-07	4.07961E-07
IJAYA	Quade	4.36225E-02	1.66115E-01	1.30659E-01	1.54746E-01
MABC	Friedman	6.32573E-12	2.38431E-11	2.38431E-11	2.38431E-11
MABC	Friedman Aligned	1.14652E-08	3.96874E-08	3.70043E-08	3.96874E-08
MABC	Quade	2.64966E-02	6.79570E-02	6.52926E-02	6.58962E-02
NNA	Friedman	2.20572E-10	8.14419E-10	8.08514E-10	8.14419E-10
NNA	Friedman Aligned	3.72214E-08	1.37433E-07	1.37433E-07	1.37433E-07
NNA	Quade	4.39270E-02	1.66115E-01	1.30659E-01	1.54746E-01

**Table S5** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	2.33571E-10	8.14419E-10	8.08514E-10	8.14419E-10
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	1.11341E-02	1.17606E-02	1.17606E-02	1.16974E-02
WW	Friedman	3.41671E-09	1.05129E-08	1.05129E-08	1.05129E-08
WW	Friedman Aligned	3.32036E-11	1.02165E-10	1.02165E-10	1.02165E-10
WW	Quade	1.11341E-02	1.11918E-02	1.11918E-02	1.11341E-02
TLBO	Friedman	1.30872E-01	3.35738E-01	3.35738E-01	2.99567E-01
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	6.24383E-01	1.0	1.0	9.16727E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S6.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
WW	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
WW	Friedman Aligned	4.81753E-11	1.66761E-10	1.66761E-10	1.66761E-10
WW	Quade	3.13831E-03	3.14287E-03	3.14287E-03	3.13831E-03
DE	Friedman	<1E-13	2.10054E-13	2.10054E-13	2.10054E-13
DE	Friedman Aligned	3.56117E-11	1.09575E-10	1.09575E-10	1.09575E-10
DE	Quade	1.76412E-02	6.53596E-02	5.33566E-02	6.36053E-02
NDE	Friedman	<1E-13	1.54543E-13	1.54543E-13	1.54543E-13
NDE	Friedman Aligned	2.17264E-05	6.68505E-05	6.68505E-05	6.68488E-05
NDE	Quade	1.76412E-02	6.53596E-02	5.33566E-02	6.36053E-02
IJAYA	Friedman	<1E-13	3.04201E-13	3.04201E-13	3.04201E-13
IJAYA	Friedman Aligned	2.12767E-10	8.01968E-10	8.01968E-10	8.01968E-10
IJAYA	Quade	1.72505E-02	6.52823E-02	5.33566E-02	6.34840E-02
CWOA	Friedman	1.09690E-13	3.79696E-13	3.79696E-13	3.79696E-13
CWOA	Friedman Aligned	1.10735E-09	4.08867E-09	4.08867E-09	4.08867E-09
CWOA	Quade	9.04167E-03	2.85526E-02	2.85526E-02	2.81930E-02
GOTLBO	Friedman	1.28934E-13	4.76064E-13	4.76064E-13	4.76064E-13
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	9.04167E-03	2.30322E-02	2.22560E-02	2.27926E-02
NNA	Friedman	6.62388E-12	2.49669E-11	2.49669E-11	2.49669E-11
NNA	Friedman Aligned	5.41195E-11	1.99826E-10	1.99826E-10	1.99826E-10
NNA	Quade	1.76412E-02	6.53596E-02	5.33566E-02	6.36053E-02
ISCA	Friedman	6.84661E-12	2.52798E-11	2.52798E-11	2.52798E-11
ISCA	Friedman Aligned	1.38616E-09	4.79825E-09	4.79825E-09	4.79825E-09
ISCA	Quade	9.04167E-03	3.04966E-02	3.04966E-02	3.00928E-02

**Table S6 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
MABC	Friedman	9.26368E-11	3.20666E-10	3.20666E-10	3.20666E-10
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	9.04167E-03	2.30322E-02	2.22560E-02	2.27926E-02
PSO	Friedman	2.14340E-09	6.59507E-09	6.59507E-09	6.59507E-09
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	3.13831E-03	3.34101E-03	3.34101E-03	3.33590E-03
TLBO	Friedman	3.93259E-02	1.00134E-01	1.00134E-01	9.68289E-02
TLBO	Friedman Aligned	8.39430E-01	1.0	1.0	9.65839E-01
TLBO	Quade	4.09330E-01	1.0	8.45736E-01	7.37234E-01
EBLSHADE	Friedman	6.20041E-01	1.0	8.01816E-01	8.32456E-01
EBLSHADE	Friedman Aligned	3.15644E-01	8.23571E-01	8.23571E-01	6.18170E-01
EBLSHADE	Quade	7.62820E-01	1.0	8.45736E-01	9.29806E-01
STLBO	Friedman	8.01816E-01	1.0	8.01816E-01	8.32456E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	8.45736E-01	1.0	8.45736E-01	9.29806E-01

**Table S7.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	5.62824E-02	5.77994E-02	5.77994E-02	5.62824E-02
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	9.79432E-01	1.0	1.0	9.79432E-01
PSO	Friedman	1.72572E-01	3.44675E-01	3.44675E-01	2.95116E-01
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	9.79432E-01	1.0	1.0	9.79432E-01
MABC	Friedman	4.92255E-01	1.0	1.0	8.21025E-01
MABC	Friedman Aligned	9.56302E-10	3.31028E-09	3.29539E-09	3.31028E-09
MABC	Quade	9.79432E-01	1.0	1.0	9.99948E-01
ISCA	Friedman	7.39566E-01	1.0	1.0	9.84073E-01
ISCA	Friedman Aligned	<1E-13	1.46549E-13	1.46549E-13	1.46549E-13
ISCA	Quade	9.79432E-01	1.0	1.0	9.99966E-01
GOTLBO	Friedman	9.74456E-01	1.0	1.0	9.99997E-01
GOTLBO	Friedman Aligned	9.56302E-10	3.31028E-09	3.29539E-09	3.31028E-09
GOTLBO	Quade	9.79432E-01	1.0	1.0	9.99948E-01
CWOA	Friedman	9.74456E-01	1.0	1.0	9.99997E-01
CWOA	Friedman Aligned	<1E-13	2.86438E-13	2.86438E-13	2.86438E-13
CWOA	Quade	9.79432E-01	1.0	1.0	9.99966E-01
DE	Friedman	9.82263E-01	1.0	1.0	1.0
DE	Friedman Aligned	2.28343E-02	8.65263E-02	8.65263E-02	8.33830E-02
DE	Quade	9.99841E-01	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S7 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	4.50905E-02	1.57187E-01	1.57187E-01	1.47610E-01
IJAYA	Quade	9.96518E-01	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	2.79302E-02	1.03688E-01	1.03688E-01	9.93104E-02
NNA	Quade	1.0	1.0	1.0	1.0

**Table S8.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	9.04976E-01	1.0	1.0	9.04976E-01
WW	Friedman Aligned	3.09282E-08	3.09282E-08	3.09282E-08	3.09282E-08
WW	Quade	9.99971E-01	1.0	1.0	9.99971E-01
PSO	Friedman	9.83045E-01	1.0	1.0	9.99462E-01
PSO	Friedman Aligned	1.62361E-04	2.99763E-04	2.99763E-04	2.99722E-04
PSO	Quade	9.99971E-01	1.0	1.0	9.99971E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S8** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S9.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.73195E-13	1.73195E-13	1.73195E-13	1.73195E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	7.37772E-02	7.87500E-02	7.87500E-02	7.59689E-02
MABC	Friedman	6.30140E-12	1.30429E-11	1.30429E-11	1.30429E-11
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	1.26592E-01	3.38277E-01	3.21918E-01	2.90779E-01
WW	Friedman	6.30140E-12	1.16334E-11	1.16334E-11	1.16334E-11
WW	Friedman Aligned	5.34616E-11	1.64497E-10	1.64497E-10	1.64497E-10
WW	Quade	7.37772E-02	7.64150E-02	7.64150E-02	7.37772E-02
ISCA	Friedman	1.24759E-10	3.83875E-10	3.83875E-10	3.83875E-10
ISCA	Friedman Aligned	8.36943E-10	3.09025E-09	2.80188E-09	3.09025E-09
ISCA	Quade	1.26592E-01	3.84352E-01	3.84352E-01	3.25573E-01
GOTLBO	Friedman	6.17865E-09	2.13876E-08	2.13876E-08	2.13876E-08
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.26592E-01	3.38277E-01	3.21918E-01	2.90779E-01
CWOA	Friedman	6.88175E-09	2.54096E-08	2.54096E-08	2.54096E-08
CWOA	Friedman Aligned	7.23793E-10	2.72814E-09	2.72814E-09	2.72814E-09
CWOA	Quade	1.26592E-01	3.77401E-01	3.77401E-01	3.19919E-01
DE	Friedman	1.20683E-08	4.54881E-08	4.54881E-08	4.54881E-08
DE	Friedman Aligned	1.38245E-10	4.78541E-10	4.78541E-10	4.78541E-10
DE	Quade	1.64554E-01	6.45899E-01	4.76691E-01	4.92200E-01
NDE	Friedman	2.44925E-08	9.04338E-08	9.04338E-08	9.04338E-08
NDE	Friedman Aligned	6.08400E-05	1.87201E-04	1.87201E-04	1.87188E-04
NDE	Quade	1.64554E-01	6.45899E-01	4.76691E-01	4.92200E-01

**Table S9** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	5.66935E-08	1.96247E-07	1.96247E-07	1.96247E-07
IJAYA	Friedman Aligned	8.36943E-10	3.09025E-09	2.80188E-09	3.09025E-09
IJAYA	Quade	1.64554E-01	6.45899E-01	4.76691E-01	4.92200E-01
NNA	Friedman	1.68226E-06	5.17618E-06	5.17618E-06	5.17617E-06
NNA	Friedman Aligned	2.55778E-10	9.44411E-10	9.44411E-10	9.44411E-10
NNA	Quade	1.64554E-01	6.45899E-01	4.76691E-01	4.92200E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	4.42830E-01	1.0	1.0	7.73432E-01
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S10.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.37121E-01	1.46648E-01	1.46648E-01	1.37121E-01
WW	Friedman Aligned	3.61499E-08	3.61499E-08	3.61499E-08	3.61499E-08
WW	Quade	9.99959E-01	1.0	1.0	9.99959E-01
PSO	Friedman	3.33849E-01	7.27025E-01	7.27025E-01	5.27624E-01
PSO	Friedman Aligned	1.81858E-04	3.35764E-04	3.35764E-04	3.35712E-04
PSO	Quade	9.99959E-01	1.0	1.0	9.99959E-01
MABC	Friedman	7.14527E-01	1.0	1.0	9.58507E-01
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	9.07106E-01	1.0	1.0	9.99332E-01
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S10** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S11.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
DE	Friedman	1.67422E-13	2.22267E-13	2.22267E-13	2.22267E-13
DE	Friedman Aligned	3.49457E-11	1.07525E-10	1.07525E-10	1.07525E-10
DE	Quade	3.02027E-02	1.13113E-01	9.04256E-02	1.07775E-01
GOTLBO	Friedman	1.67422E-13	1.67422E-13	1.59872E-13	1.67422E-13
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.70097E-02	4.34638E-02	4.18609E-02	4.26152E-02
CWOA	Friedman	1.67422E-13	1.67422E-13	1.59872E-13	1.67422E-13
CWOA	Friedman Aligned	1.11444E-09	4.11484E-09	4.11484E-09	4.11484E-09
CWOA	Quade	1.70097E-02	5.26703E-02	5.26703E-02	5.14540E-02
NDE	Friedman	1.78968E-13	5.50671E-13	5.50671E-13	5.50671E-13
NDE	Friedman Aligned	2.14581E-05	6.60250E-05	6.60250E-05	6.60233E-05
NDE	Quade	3.02027E-02	1.13113E-01	9.04256E-02	1.07775E-01
IJAYA	Friedman	4.96492E-13	1.71863E-12	1.71863E-12	1.71863E-12
IJAYA	Friedman Aligned	2.08974E-10	7.87669E-10	7.87669E-10	7.87669E-10
IJAYA	Quade	2.98017E-02	1.13113E-01	9.04256E-02	1.07775E-01
ISCA	Friedman	1.94555E-12	7.18359E-12	7.18359E-12	7.18359E-12
ISCA	Friedman Aligned	1.39470E-09	4.82782E-09	4.82782E-09	4.82782E-09
ISCA	Quade	1.70097E-02	5.56810E-02	5.56810E-02	5.43433E-02
MABC	Friedman	3.23165E-11	1.21808E-10	1.20929E-10	1.21808E-10
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	1.70097E-02	4.34638E-02	4.18609E-02	4.26152E-02
NNA	Friedman	3.27515E-11	1.21808E-10	1.20929E-10	1.21808E-10
NNA	Friedman Aligned	5.31237E-11	1.96149E-10	1.96149E-10	1.96149E-10
NNA	Quade	3.02027E-02	1.13113E-01	9.04256E-02	1.07775E-01

**Table S11 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	8.45375E-10	2.92630E-09	2.92630E-09	2.92630E-09
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	6.58951E-03	6.97972E-03	6.97972E-03	6.95743E-03
WW	Friedman	9.80423E-09	3.01669E-08	3.01669E-08	3.01669E-08
WW	Friedman Aligned	4.82405E-11	1.66986E-10	1.66986E-10	1.66986E-10
WW	Quade	6.58951E-03	6.60964E-03	6.60964E-03	6.58951E-03
TLBO	Friedman	7.11999E-02	1.81756E-01	1.81756E-01	1.70967E-01
TLBO	Friedman Aligned	8.37421E-01	1.0	9.97806E-01	9.65045E-01
TLBO	Quade	5.28241E-01	1.0	1.0	8.51492E-01
EBLSHADE	Friedman	8.00557E-01	1.0	1.0	9.49025E-01
EBLSHADE	Friedman Aligned	3.14299E-01	8.19952E-01	8.19952E-01	6.16263E-01
EBLSHADE	Quade	9.04532E-01	1.0	1.0	9.86919E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	9.97806E-01	1.0	9.97806E-01	9.97806E-01
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S12.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	9.99908E-01	1.0	1.0	9.99908E-01
WW	Friedman Aligned	6.53248E-01	1.0	1.0	6.53248E-01
WW	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S12** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S13.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	3.32214E-02	3.37419E-02	3.37419E-02	3.32214E-02
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	9.87045E-01	1.0	1.0	9.87045E-01
PSO	Friedman	1.14549E-01	2.22512E-01	2.22512E-01	2.01165E-01
PSO	Friedman Aligned	1.21060E-09	3.72493E-09	3.72493E-09	3.72493E-09
PSO	Quade	9.87045E-01	1.0	1.0	9.87045E-01
MABC	Friedman	3.78814E-01	1.0	1.0	7.01392E-01
MABC	Friedman Aligned	5.00822E-13	1.02585E-12	1.02585E-12	1.02585E-12
MABC	Quade	9.87097E-01	1.0	1.0	9.99984E-01
ISCA	Friedman	6.26168E-01	1.0	1.0	9.51565E-01
ISCA	Friedman Aligned	4.74790E-08	1.64351E-07	1.64351E-07	1.64351E-07
ISCA	Quade	9.87097E-01	1.0	1.0	9.99992E-01
GOTLBO	Friedman	9.25970E-01	1.0	1.0	9.99878E-01
GOTLBO	Friedman Aligned	5.00822E-13	9.24594E-13	9.24594E-13	9.24594E-13
GOTLBO	Quade	9.87097E-01	1.0	1.0	9.99984E-01
CWOA	Friedman	9.25970E-01	1.0	1.0	9.99878E-01
CWOA	Friedman Aligned	9.31630E-08	3.43987E-07	3.43987E-07	3.43987E-07
CWOA	Quade	9.87097E-01	1.0	1.0	9.99991E-01
DE	Friedman	9.27163E-01	1.0	1.0	9.99948E-01
DE	Friedman Aligned	9.09797E-01	1.0	1.0	9.99885E-01
DE	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	9.62357E-01	1.0	1.0	9.99994E-01
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S13 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	9.37660E-01	1.0	1.0	9.99965E-01
NNA	Quade	1.0	1.0	1.0	1.0

**Table S14.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	5.46183E-01	7.66533E-01	7.66533E-01	5.46183E-01
WW	Friedman Aligned	1.67422E-13	1.67422E-13	1.67422E-13	1.67422E-13
WW	Quade	9.99427E-01	1.0	1.0	9.99427E-01
PSO	Friedman	7.98259E-01	1.0	1.0	9.47935E-01
PSO	Friedman Aligned	9.59407E-09	1.77121E-08	1.77121E-08	1.77121E-08
PSO	Quade	9.99427E-01	1.0	1.0	9.99427E-01
MABC	Friedman	9.84137E-01	1.0	1.0	9.99973E-01
MABC	Friedman Aligned	2.43064E-01	6.84667E-01	6.59303E-01	5.06830E-01
MABC	Quade	9.99765E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S14** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	2.43064E-01	6.84667E-01	6.59303E-01	5.06830E-01
GOTLBO	Quade	9.99765E-01	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	9.99765E-01	1.0	1.0	1.0

**Table S15.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	3.15655E-03	3.16116E-03	3.16116E-03	3.15655E-03
WW	Friedman Aligned	2.84215E-08	8.74507E-08	8.74507E-08	8.74507E-08
WW	Quade	9.67443E-01	1.0	1.0	9.67443E-01
PSO	Friedman	1.67510E-02	3.11464E-02	3.11464E-02	3.07056E-02
PSO	Friedman Aligned	9.00108E-10	2.28489E-09	2.28489E-09	2.28489E-09
PSO	Quade	9.67443E-01	1.0	1.0	9.67443E-01
MABC	Friedman	9.36544E-02	2.46808E-01	2.46808E-01	2.20902E-01
MABC	Friedman Aligned	5.44120E-12	6.05649E-12	6.05649E-12	6.05649E-12
MABC	Quade	9.67711E-01	1.0	1.0	9.99836E-01
ISCA	Friedman	2.23633E-01	7.49303E-01	7.49303E-01	5.41072E-01
ISCA	Friedman Aligned	1.70405E-07	5.89862E-07	5.89862E-07	5.89862E-07
ISCA	Quade	9.67711E-01	1.0	1.0	9.99883E-01
DE	Friedman	5.36748E-01	1.0	1.0	9.41253E-01
DE	Friedman Aligned	9.87042E-01	1.0	1.0	1.0
DE	Quade	9.90483E-01	1.0	1.0	1.0
GOTLBO	Friedman	5.36748E-01	1.0	1.0	9.30303E-01
GOTLBO	Friedman Aligned	5.44120E-12	5.44120E-12	5.44120E-12	5.44120E-12
GOTLBO	Quade	9.67711E-01	1.0	1.0	9.99836E-01
CWOA	Friedman	5.36748E-01	1.0	1.0	9.30303E-01
CWOA	Friedman Aligned	3.24827E-07	1.19936E-06	1.19936E-06	1.19936E-06
CWOA	Quade	9.67711E-01	1.0	1.0	9.99883E-01
NDE	Friedman	5.75197E-01	1.0	1.0	9.57621E-01
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	9.90483E-01	1.0	1.0	1.0

**Table S15 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	6.44122E-01	1.0	1.0	9.72022E-01
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.86183E-01	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S16.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.20537E-01	1.27812E-01	1.27812E-01	1.20537E-01
WW	Friedman Aligned	2.91545E-13	2.91545E-13	2.91545E-13	2.91545E-13
WW	Quade	9.99748E-01	1.0	1.0	9.99748E-01
PSO	Friedman	3.04410E-01	6.51777E-01	6.51777E-01	4.88366E-01
PSO	Friedman Aligned	3.75852E-09	6.93880E-09	6.93880E-09	6.93880E-09
PSO	Quade	9.99748E-01	1.0	1.0	9.99748E-01
MABC	Friedman	6.81406E-01	1.0	1.0	9.45174E-01
MABC	Friedman Aligned	1.76838E-01	4.83063E-01	4.66752E-01	3.89813E-01
MABC	Quade	9.99953E-01	1.0	1.0	1.0
ISCA	Friedman	8.86583E-01	1.0	1.0	9.98766E-01
ISCA	Friedman Aligned	9.96008E-01	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	9.99795E-01	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.76838E-01	4.83063E-01	4.66752E-01	3.89813E-01
GOTLBO	Quade	9.99953E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S16** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0

**Table S17.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $I_{01}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S17 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S18.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	9.13669E-07	9.13669E-07	9.13669E-07	9.13669E-07
CWOA	Friedman Aligned	3.17443E-10	9.76748E-10	9.76748E-10	9.76748E-10
CWOA	Quade	4.21326E-01	5.35667E-01	5.35667E-01	4.21326E-01
NNA	Friedman	1.61653E-05	2.98438E-05	2.98438E-05	2.98434E-05
NNA	Friedman Aligned	3.15806E-10	8.01662E-10	8.01662E-10	8.01662E-10
NNA	Quade	4.21326E-01	8.89041E-01	8.89041E-01	6.04273E-01
PSO	Friedman	2.03695E-05	5.17077E-05	5.17077E-05	5.17065E-05
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	4.21326E-01	6.62888E-01	6.62888E-01	4.94345E-01
WW	Friedman	5.48061E-05	1.68637E-04	1.68637E-04	1.68625E-04
WW	Friedman Aligned	2.17279E-09	7.52120E-09	7.52120E-09	7.52120E-09
WW	Quade	4.21326E-01	1.0	1.0	7.59069E-01
ISCA	Friedman	1.94934E-03	6.75178E-03	6.75178E-03	6.73155E-03
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	4.95300E-01	1.0	1.0	9.06235E-01
GOTLBO	Friedman	6.07282E-03	2.24595E-02	2.24595E-02	2.22401E-02
GOTLBO	Friedman Aligned	5.81901E-09	2.14856E-08	2.14856E-08	2.14856E-08
GOTLBO	Quade	6.39735E-01	1.0	1.0	9.76937E-01
MABC	Friedman	1.81819E-02	6.88217E-02	6.88217E-02	6.68248E-02
MABC	Friedman Aligned	3.53249E-07	1.33148E-06	1.33148E-06	1.33148E-06
MABC	Quade	6.39735E-01	1.0	1.0	9.76937E-01
IJAYA	Friedman	9.98394E-01	1.0	1.0	1.0
IJAYA	Friedman Aligned	9.08636E-01	1.0	1.0	9.99854E-01
IJAYA	Quade	9.65203E-01	1.0	1.0	9.99996E-01

**Table S18** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S19.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	2.57175E-03	2.57480E-03	2.57480E-03	2.57175E-03
MABC	Friedman	2.13607E-13	3.94351E-13	3.94351E-13	3.94351E-13
MABC	Friedman Aligned	3.33763E-10	1.25803E-09	1.25803E-09	1.25803E-09
MABC	Quade	2.25210E-02	8.53328E-02	8.53328E-02	8.22748E-02
GOTLBO	Friedman	2.44012E-12	6.19416E-12	6.19416E-12	6.19416E-12
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	2.21704E-02	8.23542E-02	8.23542E-02	7.94473E-02
ISCA	Friedman	1.94065E-11	5.97122E-11	5.97122E-11	5.97122E-11
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	1.04000E-02	3.61159E-02	3.61159E-02	3.55416E-02
WW	Friedman	1.60152E-09	5.54373E-09	5.54373E-09	5.54373E-09
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	4.71779E-03	1.45400E-02	1.45400E-02	1.44453E-02
PSO	Friedman	4.11590E-09	1.51972E-08	1.51972E-08	1.51972E-08
PSO	Friedman Aligned	1.29144E-10	4.47038E-10	4.47038E-10	4.47038E-10
PSO	Quade	2.57175E-03	3.86298E-03	3.86298E-03	3.85615E-03
NNA	Friedman	5.85484E-09	2.20682E-08	2.20682E-08	2.20682E-08
NNA	Friedman Aligned	1.73241E-10	6.39659E-10	6.39659E-10	6.39659E-10
NNA	Quade	2.65209E-03	6.73911E-03	6.73911E-03	6.71851E-03
IJAYA	Friedman	7.80303E-08	2.88112E-07	2.74456E-07	2.88112E-07
IJAYA	Friedman Aligned	8.81170E-06	3.25356E-05	3.25356E-05	3.25351E-05
IJAYA	Quade	1.04801E-01	3.95158E-01	3.95158E-01	3.35534E-01

**Table S19** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	7.92873E-08	2.88112E-07	2.74456E-07	2.88112E-07
DE	Friedman Aligned	3.00304E-05	1.03952E-04	1.03952E-04	1.03948E-04
DE	Quade	1.31444E-01	4.64771E-01	4.64771E-01	3.86031E-01
NDE	Friedman	6.84857E-06	2.10725E-05	2.10725E-05	2.10724E-05
NDE	Friedman Aligned	1.50161E-03	4.62113E-03	4.62113E-03	4.61313E-03
NDE	Quade	2.27244E-01	7.19509E-01	7.19509E-01	5.47608E-01
TLBO	Friedman	3.12274E-01	8.14506E-01	8.14506E-01	6.13379E-01
TLBO	Friedman Aligned	7.47586E-01	1.0	1.0	9.69641E-01
TLBO	Quade	7.92910E-01	1.0	1.0	9.81630E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S20.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	1.41434E-10	4.89580E-10	4.51671E-10	4.89580E-10
PSO	Quade	9.10568E-04	1.40843E-03	1.40843E-03	1.40752E-03
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Friedman Aligned	1.41434E-10	4.89580E-10	4.51671E-10	4.89580E-10
NNA	Quade	1.00825E-03	2.56039E-03	2.56039E-03	2.55742E-03
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	9.10568E-04	9.10951E-04	9.10951E-04	9.10568E-04
MABC	Friedman	2.70184E-12	8.31335E-12	8.31335E-12	8.31335E-12
MABC	Friedman Aligned	1.75948E-09	6.63187E-09	6.63187E-09	6.63187E-09
MABC	Quade	1.06705E-02	4.03192E-02	4.03192E-02	3.96291E-02
GOTLBO	Friedman	2.50012E-11	8.65428E-11	8.65428E-11	8.65428E-11
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.03648E-02	3.83774E-02	3.83774E-02	3.77392E-02
ISCA	Friedman	1.56474E-10	5.77749E-10	5.77749E-10	5.77749E-10
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	4.51230E-03	1.56412E-02	1.56412E-02	1.55329E-02
IJAYA	Friedman	5.89865E-09	2.22334E-08	1.97169E-08	2.22334E-08
IJAYA	Friedman Aligned	1.36159E-06	5.02741E-06	5.02741E-06	5.02740E-06
IJAYA	Quade	5.82602E-02	2.17592E-01	2.17592E-01	1.98793E-01
DE	Friedman	5.96217E-09	2.22334E-08	1.97169E-08	2.22334E-08
DE	Friedman Aligned	5.16020E-06	1.78623E-05	1.78623E-05	1.78621E-05
DE	Quade	7.57041E-02	2.65210E-01	2.65210E-01	2.38529E-01

**Table S20** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
WW	Friedman	5.96217E-09	2.22334E-08	1.97169E-08	2.22334E-08
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	1.90142E-03	5.85437E-03	5.85437E-03	5.83897E-03
NDE	Friedman	6.71920E-07	2.06745E-06	2.06745E-06	2.06745E-06
NDE	Friedman Aligned	3.70876E-04	1.14121E-03	1.14121E-03	1.14072E-03
NDE	Quade	1.41276E-01	4.42227E-01	4.42227E-01	3.74146E-01
TLBO	Friedman	1.37223E-01	3.52222E-01	3.52222E-01	3.12487E-01
TLBO	Friedman Aligned	4.91056E-01	1.0	1.0	8.19950E-01
TLBO	Quade	6.15068E-01	1.0	9.33437E-01	9.11384E-01
EBLSHADE	Friedman	6.70491E-01	1.0	8.29657E-01	8.71202E-01
EBLSHADE	Friedman Aligned	7.33523E-01	1.0	1.0	9.12968E-01
EBLSHADE	Quade	8.24213E-01	1.0	9.33437E-01	9.59624E-01
STLBO	Friedman	8.29657E-01	1.0	8.29657E-01	8.71202E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	9.33437E-01	1.0	9.33437E-01	9.59624E-01

**Table S21.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	4.80155E-09	4.80155E-09	4.80155E-09	4.80155E-09
CWOA	Friedman Aligned	3.03064E-10	1.01341E-09	1.01341E-09	1.01341E-09
CWOA	Quade	2.02938E-01	2.24855E-01	2.24855E-01	2.02938E-01
NNA	Friedman	1.48126E-07	2.73464E-07	2.73464E-07	2.73464E-07
NNA	Friedman Aligned	3.03064E-10	9.32505E-10	9.32505E-10	9.32505E-10
NNA	Quade	2.02938E-01	4.07942E-01	4.07942E-01	3.40121E-01
PSO	Friedman	2.08081E-07	5.28205E-07	5.28205E-07	5.28205E-07
PSO	Friedman Aligned	4.93547E-11	1.25285E-10	1.25285E-10	1.25285E-10
PSO	Quade	2.02938E-01	2.88952E-01	2.88952E-01	2.53595E-01
WW	Friedman	6.93545E-07	2.13398E-06	2.13398E-06	2.13398E-06
WW	Friedman Aligned	1.17732E-08	4.43760E-08	4.43760E-08	4.43760E-08
WW	Quade	2.02938E-01	6.53907E-01	6.53907E-01	4.91488E-01
ISCA	Friedman	5.43490E-05	1.88134E-04	1.88134E-04	1.88118E-04
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.92346E-01	1.0	1.0	6.97900E-01
GOTLBO	Friedman	2.33350E-04	8.61656E-04	8.61656E-04	8.61331E-04
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	4.17424E-01	1.0	1.0	8.63978E-01
MABC	Friedman	9.80244E-04	3.69560E-03	3.69560E-03	3.68975E-03
MABC	Friedman Aligned	1.16884E-09	4.31572E-09	4.31572E-09	4.31572E-09
MABC	Quade	4.17424E-01	1.0	1.0	8.63978E-01
DE	Friedman	5.20298E-01	1.0	1.0	9.33618E-01
DE	Friedman Aligned	4.19991E-01	1.0	1.0	8.48253E-01
DE	Quade	8.52896E-01	1.0	1.0	9.98686E-01

**Table S21** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	5.20298E-01	1.0	1.0	9.33618E-01
IJAYA	Friedman Aligned	2.96026E-01	1.0	1.0	7.26390E-01
IJAYA	Quade	7.90937E-01	1.0	1.0	9.96908E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S22.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	6.27529E-02	6.46470E-02	6.46470E-02	6.27529E-02
CWOA	Friedman Aligned	3.90675E-11	1.35234E-10	1.35234E-10	1.35234E-10
CWOA	Quade	9.63252E-01	1.0	1.0	9.63252E-01
PSO	Friedman	1.98011E-01	5.05235E-01	5.05235E-01	4.03816E-01
PSO	Friedman Aligned	8.64602E-09	3.19237E-08	3.19237E-08	3.19237E-08
PSO	Quade	9.63252E-01	1.0	1.0	9.79096E-01
NNA	Friedman	1.98011E-01	4.00536E-01	4.00536E-01	3.34604E-01
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	9.63252E-01	1.0	1.0	9.92351E-01
WW	Friedman	2.51369E-01	8.52274E-01	8.52274E-01	5.89672E-01
WW	Friedman Aligned	3.28118E-11	1.00959E-10	1.00959E-10	1.00959E-10
WW	Quade	9.63252E-01	1.0	1.0	9.98990E-01
ISCA	Friedman	7.68325E-01	1.0	1.0	9.93668E-01
ISCA	Friedman Aligned	7.18181E-12	1.82308E-11	1.82308E-11	1.82308E-11
ISCA	Quade	9.63252E-01	1.0	1.0	9.99986E-01
GOTLBO	Friedman	9.17851E-01	1.0	1.0	9.99902E-01
GOTLBO	Friedman Aligned	1.29896E-12	2.39808E-12	2.39808E-12	2.39808E-12
GOTLBO	Quade	9.98660E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S22** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S23.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
ISCA	Friedman	2.30926E-13	2.30926E-13	2.30926E-13	2.30926E-13
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.85517E-02	9.97146E-02	9.97146E-02	9.54079E-02
GOTLBO	Friedman	1.76370E-12	3.25606E-12	3.25606E-12	3.25606E-12
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	5.51141E-02	2.06606E-01	2.06606E-01	1.88865E-01
WW	Friedman	9.56997E-12	2.42930E-11	2.42930E-11	2.42930E-11
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	1.42835E-02	4.41684E-02	4.41684E-02	4.33008E-02
MABC	Friedman	1.61944E-11	4.98290E-11	4.98290E-11	4.98290E-11
MABC	Friedman Aligned	6.35232E-11	2.19888E-10	2.19888E-10	2.19888E-10
MABC	Quade	5.51141E-02	2.10249E-01	2.10249E-01	1.92225E-01
PSO	Friedman	2.85766E-11	9.89189E-11	9.89189E-11	9.89189E-11
PSO	Friedman Aligned	9.31095E-11	3.43789E-10	3.43789E-10	3.43789E-10
PSO	Quade	9.23007E-03	1.33680E-02	1.33680E-02	1.32864E-02
NNA	Friedman	4.87447E-11	1.79980E-10	1.79980E-10	1.79980E-10
NNA	Friedman Aligned	1.82343E-10	6.87292E-10	6.87292E-10	6.87292E-10
NNA	Quade	9.23007E-03	2.20922E-02	2.20922E-02	2.18717E-02
CWOA	Friedman	1.08691E-09	4.09682E-09	4.09682E-09	4.09682E-09
CWOA	Friedman Aligned	3.22900E-11	9.93539E-11	9.93539E-11	9.93539E-11
CWOA	Quade	9.23007E-03	9.26962E-03	9.26962E-03	9.23007E-03
DE	Friedman	2.08871E-05	7.71220E-05	7.16714E-05	7.71195E-05
DE	Friedman Aligned	1.67354E-04	5.79317E-04	5.79317E-04	5.79183E-04
DE	Quade	2.48241E-01	8.96274E-01	8.96274E-01	6.27573E-01

**Table S23** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	2.08871E-05	7.71220E-05	7.16714E-05	7.71195E-05
IJAYA	Friedman Aligned	5.49245E-05	2.02800E-04	2.02800E-04	2.02783E-04
IJAYA	Quade	2.06971E-01	7.97941E-01	7.97941E-01	5.75239E-01
NDE	Friedman	7.17418E-04	2.20762E-03	2.20762E-03	2.20580E-03
NDE	Friedman Aligned	5.71229E-03	1.75879E-02	1.75879E-02	1.74722E-02
NDE	Quade	3.88843E-01	1.0	1.0	7.80209E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S24.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	1.92232E-01	2.11737E-01	2.11737E-01	1.92232E-01
CWOA	Friedman Aligned	6.82306E-09	1.25964E-08	1.25964E-08	1.25964E-08
CWOA	Quade	9.75324E-01	1.0	1.0	9.75324E-01
PSO	Friedman	4.39552E-01	1.0	1.0	7.28974E-01
PSO	Friedman Aligned	2.73702E-07	6.94782E-07	6.94782E-07	6.94781E-07
PSO	Quade	9.75324E-01	1.0	1.0	9.86727E-01
NNA	Friedman	4.39552E-01	1.0	1.0	6.56634E-01
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	9.75324E-01	1.0	1.0	9.95625E-01
WW	Friedman	4.92980E-01	1.0	1.0	8.76296E-01
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	9.75324E-01	1.0	1.0	9.99544E-01
ISCA	Friedman	9.57091E-01	1.0	1.0	9.99982E-01
ISCA	Friedman Aligned	5.54018E-01	1.0	1.0	9.16636E-01
ISCA	Quade	9.75324E-01	1.0	1.0	9.99997E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S24** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S25.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.28896E-03	1.28973E-03	1.28973E-03	1.28896E-03
MABC	Friedman	1.27587E-12	2.35545E-12	2.35545E-12	2.35545E-12
MABC	Friedman Aligned	1.75948E-09	6.63187E-09	6.63187E-09	6.63187E-09
MABC	Quade	1.37262E-02	5.19022E-02	5.19022E-02	5.07619E-02
GOTLBO	Friedman	1.19004E-11	3.02087E-11	3.02087E-11	3.02087E-11
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.33923E-02	4.96280E-02	4.96280E-02	4.85638E-02
ISCA	Friedman	7.79167E-11	2.39744E-10	2.39744E-10	2.39744E-10
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	5.97483E-03	2.07202E-02	2.07202E-02	2.05304E-02
WW	Friedman	4.49481E-09	1.55589E-08	1.55589E-08	1.55589E-08
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	2.57937E-03	7.94361E-03	7.94361E-03	7.91528E-03
PSO	Friedman	1.06456E-08	3.93067E-08	3.93067E-08	3.93067E-08
PSO	Friedman Aligned	1.41434E-10	4.89580E-10	4.51671E-10	4.89580E-10
PSO	Quade	1.28896E-03	1.97444E-03	1.97444E-03	1.97266E-03
NNA	Friedman	1.46074E-08	5.50586E-08	5.50586E-08	5.50586E-08
NNA	Friedman Aligned	1.41434E-10	4.89580E-10	4.51671E-10	4.89580E-10
NNA	Quade	1.39422E-03	3.54107E-03	3.54107E-03	3.53537E-03
IJAYA	Friedman	1.85427E-08	6.84653E-08	6.55898E-08	6.84653E-08
IJAYA	Friedman Aligned	1.36159E-06	5.02741E-06	5.02741E-06	5.02740E-06
IJAYA	Quade	7.11225E-02	2.66321E-01	2.66321E-01	2.38460E-01

**Table S25** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.89482E-08	6.84653E-08	6.55898E-08	6.84653E-08
DE	Friedman Aligned	5.16020E-06	1.78623E-05	1.78623E-05	1.78621E-05
DE	Quade	9.13398E-02	3.20806E-01	3.20806E-01	2.82197E-01
NDE	Friedman	2.01368E-06	6.19594E-06	6.19594E-06	6.19592E-06
NDE	Friedman Aligned	3.70876E-04	1.14121E-03	1.14121E-03	1.14072E-03
NDE	Quade	1.66209E-01	5.21958E-01	5.21958E-01	4.28391E-01
TLBO	Friedman	2.05435E-01	5.30463E-01	5.30463E-01	4.42194E-01
TLBO	Friedman Aligned	4.91056E-01	1.0	1.0	8.19950E-01
TLBO	Quade	6.72809E-01	1.0	1.0	9.41340E-01
EBLSHADE	Friedman	8.26822E-01	1.0	1.0	9.60723E-01
EBLSHADE	Friedman Aligned	7.33523E-01	1.0	1.0	9.12968E-01
EBLSHADE	Quade	8.85007E-01	1.0	1.0	9.81556E-01
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S26.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	9.99088E-01	1.0	1.0	9.99088E-01
CWOA	Friedman Aligned	2.64607E-10	2.64607E-10	2.64607E-10	2.64607E-10
CWOA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	2.86786E-07	5.29452E-07	5.29452E-07	5.29452E-07
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S26** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S27.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	1.04337E-06	1.04337E-06	1.04337E-06	1.04337E-06
CWOA	Friedman Aligned	2.99270E-10	9.20832E-10	9.20832E-10	9.20832E-10
CWOA	Quade	5.51537E-01	7.77695E-01	7.77695E-01	5.51537E-01
NNA	Friedman	1.81715E-05	3.35477E-05	3.35477E-05	3.35472E-05
NNA	Friedman Aligned	2.90478E-10	7.37368E-10	7.37368E-10	7.37368E-10
NNA	Quade	5.51537E-01	1.0	1.0	7.31301E-01
PSO	Friedman	2.28284E-05	5.79495E-05	5.79495E-05	5.79480E-05
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	5.51537E-01	9.45753E-01	9.45753E-01	6.26599E-01
WW	Friedman	6.10355E-05	1.87806E-04	1.87806E-04	1.87790E-04
WW	Friedman Aligned	1.09380E-09	3.78623E-09	3.78623E-09	3.78623E-09
WW	Quade	5.51537E-01	1.0	1.0	8.60596E-01
ISCA	Friedman	2.12534E-03	7.36176E-03	7.36176E-03	7.33772E-03
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	6.03485E-01	1.0	1.0	9.59322E-01
GOTLBO	Friedman	6.56427E-03	2.42803E-02	2.42803E-02	2.40239E-02
GOTLBO	Friedman Aligned	3.19607E-09	1.18009E-08	1.18009E-08	1.18009E-08
GOTLBO	Quade	7.44807E-01	1.0	1.0	9.93544E-01
MABC	Friedman	1.94748E-02	7.37379E-02	7.37379E-02	7.14482E-02
MABC	Friedman Aligned	1.63074E-06	6.14664E-06	6.14664E-06	6.14663E-06
MABC	Quade	7.44807E-01	1.0	1.0	9.93544E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0

**Table S27** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S28.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	4.38236E-01	5.64070E-01	5.64070E-01	4.38236E-01
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	9.98650E-01	1.0	1.0	9.98650E-01
PSO	Friedman	7.26197E-01	1.0	1.0	9.41422E-01
PSO	Friedman Aligned	1.22720E-04	3.11535E-04	3.11535E-04	3.11491E-04
PSO	Quade	9.98650E-01	1.0	1.0	9.99526E-01
NNA	Friedman	7.26197E-01	1.0	1.0	9.08499E-01
NNA	Friedman Aligned	2.86687E-09	5.29268E-09	5.29268E-09	5.29268E-09
NNA	Quade	9.98650E-01	1.0	1.0	9.99934E-01
WW	Friedman	7.54881E-01	1.0	1.0	9.86782E-01
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	9.98650E-01	1.0	1.0	9.99999E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S28** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S29.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
CWOA	Friedman	9.99864E-01	1.0	1.0	9.99864E-01
CWOA	Friedman Aligned	9.57403E-01	1.0	1.0	9.57403E-01
CWOA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S29** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S30.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S30** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S31.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $n_1$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	9.85182E-01	1.0	1.0	9.85182E-01
CWOA	Friedman Aligned	1.67199E-08	3.60651E-08	3.60651E-08	3.60651E-08
CWOA	Quade	9.99991E-01	1.0	1.0	9.99991E-01
PSO	Friedman	9.99446E-01	1.0	1.0	1.0
PSO	Friedman Aligned	1.67199E-08	3.08676E-08	3.08676E-08	3.08676E-08
PSO	Quade	9.99991E-01	1.0	1.0	9.99999E-01
NNA	Friedman	9.99446E-01	1.0	1.0	9.99999E-01
NNA	Friedman Aligned	2.58561E-09	2.58561E-09	2.58561E-09	2.58561E-09
NNA	Quade	9.99991E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0

**Table S31 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	8.96669E-01	1.0	1.0	9.99613E-01
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	2.25568E-01	7.56404E-01	7.56404E-01	5.44583E-01
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S32.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	1.58394E-05	1.58395E-05	1.58395E-05	1.58394E-05
GOTLBO	Friedman Aligned	1.10556E-12	2.04103E-12	2.04103E-12	2.04103E-12
GOTLBO	Quade	6.53381E-01	1.0	1.0	7.22069E-01
PSO	Friedman	2.04155E-05	3.76906E-05	3.76906E-05	3.76899E-05
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	6.53381E-01	1.0	1.0	6.53381E-01
ISCA	Friedman	4.72466E-05	1.19936E-04	1.19936E-04	1.19929E-04
ISCA	Friedman Aligned	1.10556E-12	2.72826E-12	2.72826E-12	2.72826E-12
ISCA	Quade	6.53381E-01	1.0	1.0	7.12615E-01
NNA	Friedman	4.72466E-05	1.35747E-04	1.35747E-04	1.35739E-04
NNA	Friedman Aligned	1.10556E-12	2.75335E-12	2.75335E-12	2.75335E-12
NNA	Quade	6.53381E-01	1.0	1.0	7.22069E-01
CWOA	Friedman	6.04602E-05	2.09289E-04	2.09289E-04	2.09270E-04
CWOA	Friedman Aligned	6.56553E-10	2.27268E-09	2.27268E-09	2.27268E-09
CWOA	Quade	6.53381E-01	1.0	1.0	7.63921E-01
WW	Friedman	2.94224E-03	1.08723E-02	1.08723E-02	1.08207E-02
WW	Friedman Aligned	1.94472E-05	7.18054E-05	7.18054E-05	7.18031E-05
WW	Quade	6.53381E-01	1.0	1.0	9.31924E-01
MABC	Friedman	2.85543E-01	1.0	1.0	7.18420E-01
MABC	Friedman Aligned	5.68648E-01	1.0	1.0	9.57966E-01
MABC	Quade	7.47708E-01	1.0	1.0	9.94433E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S32** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.98751E-01	1.0	1.0	1.0

**Table S33.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Friedman Aligned	1.40443E-09	4.32133E-09	4.32133E-09	4.32133E-09
GOTLBO	Quade	2.61275E-03	4.15154E-03	3.95252E-03	4.14372E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	2.61275E-03	2.61590E-03	2.61590E-03	2.61275E-03
MABC	Friedman	1.66844E-12	4.23528E-12	4.23528E-12	4.23528E-12
MABC	Friedman Aligned	1.97530E-05	7.44541E-05	7.44541E-05	7.44517E-05
MABC	Quade	1.75248E-02	6.63245E-02	6.63245E-02	6.44687E-02
WW	Friedman	9.41487E-11	2.89688E-10	2.89688E-10	2.89688E-10
WW	Friedman Aligned	<1E-13	2.10054E-13	2.10054E-13	2.10054E-13
WW	Quade	5.37659E-03	1.98809E-02	1.98809E-02	1.97088E-02
CWOA	Friedman	7.48653E-09	2.59149E-08	2.59149E-08	2.59149E-08
CWOA	Friedman Aligned	1.94632E-09	7.18643E-09	7.18643E-09	7.18643E-09
CWOA	Quade	2.61275E-03	6.00747E-03	6.00747E-03	5.99146E-03
DE	Friedman	8.54237E-09	3.15410E-08	3.15118E-08	3.15410E-08
DE	Friedman Aligned	7.66528E-04	2.83067E-03	2.83067E-03	2.82734E-03
DE	Quade	7.68637E-02	2.88156E-01	2.51938E-01	2.55695E-01
NNA	Friedman	8.54237E-09	3.15410E-08	3.15118E-08	3.15410E-08
NNA	Friedman Aligned	1.40443E-09	4.60157E-09	4.60157E-09	4.60157E-09
NNA	Quade	2.61275E-03	4.15154E-03	3.95252E-03	4.14372E-03
ISCA	Friedman	8.70900E-09	3.21563E-08	3.21563E-08	3.21563E-08
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.61275E-03	3.70459E-03	3.70459E-03	3.69830E-03

**Table S33 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	1.00756E-08	3.48770E-08	3.48770E-08	3.48770E-08
IJAYA	Friedman Aligned	1.77340E-03	6.14036E-03	6.14036E-03	6.12529E-03
IJAYA	Quade	7.68637E-02	2.88156E-01	2.51938E-01	2.55695E-01
NDE	Friedman	4.85736E-06	1.49457E-05	1.49457E-05	1.49457E-05
NDE	Friedman Aligned	6.70249E-02	2.07871E-01	2.07871E-01	1.92221E-01
NDE	Quade	1.61095E-01	5.05559E-01	5.05559E-01	4.17534E-01
TLBO	Friedman	2.01098E-01	5.19063E-01	5.19063E-01	4.34434E-01
TLBO	Friedman Aligned	7.84943E-01	1.0	1.0	9.79783E-01
TLBO	Quade	7.20831E-01	1.0	1.0	9.60794E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S34.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $R_{p^1}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Friedman Aligned	2.23361E-09	6.87266E-09	6.87266E-09	6.87266E-09
GOTLBO	Quade	2.57827E-03	4.09880E-03	3.90245E-03	4.09117E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	2.57827E-03	2.58134E-03	2.58134E-03	2.57827E-03
MABC	Friedman	6.35048E-13	1.61204E-12	1.61204E-12	1.61204E-12
MABC	Friedman Aligned	7.88131E-06	2.97065E-05	2.97065E-05	2.97062E-05
MABC	Quade	1.73550E-02	6.56791E-02	6.56791E-02	6.38590E-02
WW	Friedman	1.84926E-10	5.69003E-10	5.69003E-10	5.69003E-10
WW	Friedman Aligned	3.15599E-13	8.01137E-13	8.01137E-13	8.01137E-13
WW	Quade	5.31725E-03	1.96611E-02	1.96611E-02	1.94928E-02
DE	Friedman	4.61292E-09	1.59678E-08	1.59678E-08	1.59678E-08
DE	Friedman Aligned	3.62181E-04	1.33738E-03	1.33738E-03	1.33663E-03
DE	Quade	7.62673E-02	2.85885E-01	2.49968E-01	2.53918E-01
IJAYA	Friedman	6.88175E-09	2.54096E-08	2.54096E-08	2.54096E-08
IJAYA	Friedman Aligned	8.79672E-04	3.04543E-03	3.04543E-03	3.04172E-03
IJAYA	Quade	7.62673E-02	2.85885E-01	2.49968E-01	2.53918E-01
CWOA	Friedman	8.73483E-09	3.29236E-08	3.29236E-08	3.29236E-08
CWOA	Friedman Aligned	4.27917E-09	1.58000E-08	1.58000E-08	1.58000E-08
CWOA	Quade	2.57827E-03	5.93402E-03	5.93402E-03	5.91840E-03
NNA	Friedman	1.17491E-08	4.33811E-08	4.27586E-08	4.33811E-08
NNA	Friedman Aligned	2.23361E-09	7.25937E-09	7.25937E-09	7.25937E-09
NNA	Quade	2.57827E-03	4.09880E-03	3.90245E-03	4.09117E-03

**Table S34** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
ISCA	Friedman	1.23525E-08	4.33811E-08	4.27586E-08	4.33811E-08
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.57827E-03	3.65691E-03	3.65691E-03	3.65079E-03
NDE	Friedman	2.55436E-06	7.85957E-06	7.85957E-06	7.85955E-06
NDE	Friedman Aligned	4.19953E-02	1.29854E-01	1.29854E-01	1.23666E-01
NDE	Quade	1.60056E-01	5.02233E-01	5.02233E-01	4.15313E-01
TLBO	Friedman	1.57702E-01	4.05499E-01	4.05499E-01	3.53159E-01
TLBO	Friedman Aligned	6.48054E-01	1.0	1.0	9.29409E-01
TLBO	Quade	7.18467E-01	1.0	1.0	9.59945E-01
EBLSHADE	Friedman	9.13338E-01	1.0	9.23824E-01	9.89059E-01
EBLSHADE	Friedman Aligned	8.67482E-01	1.0	1.0	9.76034E-01
EBLSHADE	Quade	9.98363E-01	1.0	1.0	9.99993E-01
STLBO	Friedman	9.23824E-01	1.0	9.23824E-01	9.89059E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S35.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	1.27739E-08	1.27739E-08	1.27739E-08	1.27739E-08
GOTLBO	Friedman Aligned	2.60296E-09	8.00911E-09	8.00911E-09	8.00911E-09
GOTLBO	Quade	3.14219E-01	4.69400E-01	4.39320E-01	3.81037E-01
PSO	Friedman	2.06453E-08	3.81143E-08	3.81143E-08	3.81143E-08
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	3.14219E-01	3.71777E-01	3.71777E-01	3.14219E-01
ISCA	Friedman	6.53133E-08	1.65795E-07	1.65795E-07	1.65795E-07
ISCA	Friedman Aligned	4.15456E-11	1.05462E-10	1.05462E-10	1.05462E-10
ISCA	Quade	3.14219E-01	4.50989E-01	4.39320E-01	3.68516E-01
NNA	Friedman	6.53133E-08	1.98658E-07	1.98658E-07	1.98658E-07
NNA	Friedman Aligned	2.77977E-09	9.62227E-09	9.62227E-09	9.62227E-09
NNA	Quade	3.14219E-01	4.69400E-01	4.39320E-01	3.81037E-01
CWOA	Friedman	1.02048E-07	3.53244E-07	3.53244E-07	3.53244E-07
CWOA	Friedman Aligned	<1E-13	1.78524E-13	1.78524E-13	1.78524E-13
CWOA	Quade	3.14219E-01	5.48252E-01	5.48252E-01	4.32016E-01
WW	Friedman	1.69355E-05	6.25314E-05	6.25314E-05	6.25297E-05
WW	Friedman Aligned	4.63527E-09	1.71148E-08	1.71148E-08	1.71148E-08
WW	Quade	3.14219E-01	1.0	1.0	6.85077E-01
MABC	Friedman	1.47478E-02	5.57785E-02	5.57785E-02	5.44627E-02
MABC	Friedman Aligned	2.56191E-02	9.71425E-02	9.71425E-02	9.31905E-02
MABC	Quade	4.65703E-01	1.0	1.0	9.05822E-01
DE	Friedman	3.11442E-01	1.0	1.0	7.47869E-01
DE	Friedman Aligned	1.88248E-01	7.22700E-01	7.22700E-01	5.37019E-01
DE	Quade	8.21502E-01	1.0	1.0	9.98275E-01

**Table S35** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	3.29145E-01	1.0	1.0	7.48888E-01
IJAYA	Friedman Aligned	2.72182E-01	9.87202E-01	9.87202E-01	6.67044E-01
IJAYA	Quade	8.21502E-01	1.0	1.0	9.98275E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S36.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	6.84156E-03	6.86326E-03	6.86326E-03	6.84156E-03
GOTLBO	Friedman Aligned	1.87628E-12	2.89635E-12	2.89635E-12	2.89635E-12
GOTLBO	Quade	9.80537E-01	1.0	1.0	9.89041E-01
PSO	Friedman	6.84988E-03	1.26827E-02	1.26827E-02	1.26093E-02
PSO	Friedman Aligned	7.99504E-09	2.46001E-08	2.46001E-08	2.46001E-08
PSO	Quade	9.80537E-01	1.0	1.0	9.80537E-01
ISCA	Friedman	1.11987E-02	2.85508E-02	2.85508E-02	2.81832E-02
ISCA	Friedman Aligned	5.83509E-10	1.48121E-09	1.48121E-09	1.48121E-09
ISCA	Quade	9.80537E-01	1.0	1.0	9.88524E-01
NNA	Friedman	1.11987E-02	3.03504E-02	3.03504E-02	2.99392E-02
NNA	Friedman Aligned	1.87628E-12	1.87628E-12	1.87628E-12	1.87628E-12
NNA	Quade	9.80537E-01	1.0	1.0	9.89041E-01
CWOA	Friedman	1.15188E-02	4.00150E-02	4.00150E-02	3.93107E-02
CWOA	Friedman Aligned	1.52119E-07	5.26565E-07	5.26565E-07	5.26565E-07
CWOA	Quade	9.80537E-01	1.0	1.0	9.92456E-01
WW	Friedman	1.44016E-01	5.54046E-01	5.54046E-01	4.36826E-01
WW	Friedman Aligned	8.90158E-04	3.28753E-03	3.28753E-03	3.28280E-03
WW	Quade	9.80537E-01	1.0	1.0	9.99848E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S36** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S37.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	2.04947E-13	2.04947E-13	2.04947E-13	2.04947E-13
WW	Friedman Aligned	1.71270E-13	4.34763E-13	4.34763E-13	4.34763E-13
WW	Quade	2.09412E-02	7.77621E-02	7.77621E-02	7.51674E-02
CWOA	Friedman	2.93825E-11	5.42446E-11	5.42446E-11	5.42446E-11
CWOA	Friedman Aligned	5.78031E-10	1.77856E-09	1.71036E-09	1.77856E-09
CWOA	Quade	1.35083E-02	2.74130E-02	2.74130E-02	2.70814E-02
ISCA	Friedman	3.89592E-11	1.17459E-10	1.17459E-10	1.17459E-10
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	1.35083E-02	1.83968E-02	1.83968E-02	1.82425E-02
NNA	Friedman	3.89592E-11	9.88964E-11	9.88964E-11	9.88964E-11
NNA	Friedman Aligned	5.78031E-10	1.77856E-09	1.71036E-09	1.77856E-09
NNA	Quade	1.35083E-02	2.01743E-02	1.91111E-02	1.99904E-02
PSO	Friedman	1.23417E-10	4.27212E-10	4.27212E-10	4.27212E-10
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	1.35083E-02	1.35932E-02	1.35932E-02	1.35083E-02
GOTLBO	Friedman	2.64018E-10	9.74834E-10	9.74834E-10	9.74834E-10
GOTLBO	Friedman Aligned	5.78031E-10	1.77856E-09	1.71036E-09	1.77856E-09
GOTLBO	Quade	1.35083E-02	2.01743E-02	1.91111E-02	1.99904E-02
MABC	Friedman	6.34021E-09	2.38977E-08	2.38977E-08	2.38977E-08
MABC	Friedman Aligned	9.29163E-05	3.50231E-04	3.50231E-04	3.50178E-04
MABC	Quade	5.71120E-02	2.18187E-01	2.18187E-01	1.98812E-01
DE	Friedman	9.58882E-06	3.54050E-05	3.54050E-05	3.54044E-05
DE	Friedman Aligned	2.67052E-03	9.86544E-03	9.86544E-03	9.82497E-03
DE	Quade	1.93779E-01	7.44857E-01	6.46164E-01	5.48560E-01

**Table S37** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	1.33429E-05	4.61871E-05	4.61871E-05	4.61862E-05
IJAYA	Friedman Aligned	5.66798E-03	1.96371E-02	1.96371E-02	1.94834E-02
IJAYA	Quade	1.93779E-01	7.44857E-01	6.46164E-01	5.48560E-01
NDE	Friedman	1.43301E-03	4.40998E-03	4.40998E-03	4.40270E-03
NDE	Friedman Aligned	1.41455E-01	4.42799E-01	4.42799E-01	3.74549E-01
NDE	Quade	3.43054E-01	1.0	1.0	7.25493E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S38.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	2.72905E-06	2.72905E-06	2.72905E-06	2.72905E-06
PSO	Quade	1.0	1.0	1.0	1.0

**Table S38** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S39.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Friedman Aligned	2.23361E-09	6.87266E-09	6.87266E-09	6.87266E-09
GOTLBO	Quade	2.38776E-03	3.80690E-03	3.62535E-03	3.80032E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	2.38776E-03	2.39040E-03	2.39040E-03	2.38776E-03
MABC	Friedman	1.28357E-12	3.25828E-12	3.25828E-12	3.25828E-12
MABC	Friedman Aligned	7.88131E-06	2.97065E-05	2.97065E-05	2.97062E-05
MABC	Quade	1.64044E-02	6.20680E-02	6.20680E-02	6.04412E-02
WW	Friedman	1.13508E-10	3.49256E-10	3.49256E-10	3.49256E-10
WW	Friedman Aligned	3.15599E-13	8.01137E-13	8.01137E-13	8.01137E-13
WW	Quade	4.98681E-03	1.84376E-02	1.84376E-02	1.82896E-02
DE	Friedman	8.25810E-09	2.85857E-08	2.63838E-08	2.85857E-08
DE	Friedman Aligned	3.62181E-04	1.33738E-03	1.33738E-03	1.33663E-03
DE	Quade	7.29045E-02	2.73093E-01	2.38867E-01	2.43841E-01
CWOA	Friedman	8.25810E-09	2.85857E-08	2.63838E-08	2.85857E-08
CWOA	Friedman Aligned	4.27917E-09	1.58000E-08	1.58000E-08	1.58000E-08
CWOA	Quade	2.38776E-03	5.52683E-03	5.52683E-03	5.51327E-03
IJAYA	Friedman	9.53069E-09	3.59234E-08	3.04931E-08	3.59234E-08
IJAYA	Friedman Aligned	8.79672E-04	3.04543E-03	3.04543E-03	3.04172E-03
IJAYA	Quade	7.29045E-02	2.73093E-01	2.38867E-01	2.43841E-01
ISCA	Friedman	9.53069E-09	3.59234E-08	3.04931E-08	3.59234E-08
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.38776E-03	3.39323E-03	3.39323E-03	3.38795E-03

**Table S39** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
NNA	Friedman	9.53069E-09	3.59234E-08	3.04931E-08	3.59234E-08
NNA	Friedman Aligned	2.23361E-09	7.25937E-09	7.25937E-09	7.25937E-09
NNA	Quade	2.38776E-03	3.80690E-03	3.62535E-03	3.80032E-03
NDE	Friedman	4.08314E-06	1.25635E-05	1.25635E-05	1.25635E-05
NDE	Friedman Aligned	4.19953E-02	1.29854E-01	1.29854E-01	1.23666E-01
NDE	Quade	1.54173E-01	4.83401E-01	4.83401E-01	4.02619E-01
TLBO	Friedman	1.88486E-01	4.85963E-01	4.85963E-01	4.11494E-01
TLBO	Friedman Aligned	6.48054E-01	1.0	1.0	9.29409E-01
TLBO	Quade	7.04858E-01	1.0	9.84554E-01	9.54846E-01
EBLSHADE	Friedman	9.78729E-01	1.0	1.0	9.99182E-01
EBLSHADE	Friedman Aligned	8.67482E-01	1.0	1.0	9.76034E-01
EBLSHADE	Quade	9.87023E-01	1.0	9.84554E-01	9.99671E-01
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	9.87023E-01	1.0	9.84554E-01	9.99671E-01

**Table S40.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S40** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S41.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	9.73564E-06	9.73569E-06	9.73569E-06	9.73564E-06
GOTLBO	Friedman Aligned	4.31832E-12	1.09619E-11	1.09619E-11	1.09619E-11
GOTLBO	Quade	6.70250E-01	1.0	1.0	7.37556E-01
PSO	Friedman	1.27717E-05	2.35787E-05	2.35787E-05	2.35785E-05
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	6.70250E-01	1.0	1.0	6.70250E-01
ISCA	Friedman	3.02807E-05	7.68673E-05	7.68673E-05	7.68646E-05
ISCA	Friedman Aligned	2.29483E-13	4.23661E-13	4.23661E-13	4.23661E-13
ISCA	Quade	6.70250E-01	1.0	1.0	7.28467E-01
NNA	Friedman	3.02807E-05	8.73835E-05	8.73835E-05	8.73801E-05
NNA	Friedman Aligned	5.02987E-12	1.54765E-11	1.54765E-11	1.54765E-11
NNA	Quade	6.70250E-01	1.0	1.0	7.37556E-01
CWOA	Friedman	3.93486E-05	1.36208E-04	1.36208E-04	1.36200E-04
CWOA	Friedman Aligned	1.16523E-10	4.03347E-10	4.03347E-10	4.03347E-10
CWOA	Quade	6.70250E-01	1.0	1.0	7.78072E-01
WW	Friedman	2.10239E-03	7.76707E-03	7.76707E-03	7.74073E-03
WW	Friedman Aligned	5.51419E-06	2.03601E-05	2.03601E-05	2.03600E-05
WW	Quade	6.70250E-01	1.0	1.0	9.38720E-01
MABC	Friedman	2.41545E-01	9.68227E-01	9.68227E-01	6.47281E-01
MABC	Friedman Aligned	4.01332E-01	1.0	1.0	8.55401E-01
MABC	Quade	7.60748E-01	1.0	1.0	9.95442E-01
DE	Friedman	9.84761E-01	1.0	1.0	1.0
DE	Friedman Aligned	9.21905E-01	1.0	1.0	9.99918E-01
DE	Quade	1.0	1.0	1.0	1.0

**Table S41** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S42.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	9.99999E-01	1.0	1.0	9.99999E-01
GOTLBO	Friedman Aligned	9.23523E-01	1.0	1.0	9.92894E-01
GOTLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	9.99999E-01	1.0	1.0	1.0
PSO	Friedman Aligned	1.42884E-08	1.42884E-08	1.42884E-08	1.42884E-08
PSO	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S42 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	9.23523E-01	1.0	1.0	9.91314E-01
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S43.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	9.99996E-01	1.0	1.0	9.99996E-01
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	9.99996E-01	1.0	1.0	1.0
PSO	Friedman Aligned	3.95810E-06	3.95810E-06	3.95810E-06	3.95810E-06
PSO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	9.99999E-01	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0

**Table S43 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S44.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	9.99951E-01	1.0	1.0	9.99951E-01
GOTLBO	Friedman Aligned	2.69091E-01	6.09156E-01	6.09156E-01	4.65633E-01
GOTLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	9.99951E-01	1.0	1.0	9.99998E-01
PSO	Friedman Aligned	1.74407E-11	1.74407E-11	1.74407E-11	1.74407E-11
PSO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	9.99951E-01	1.0	1.0	1.0
ISCA	Friedman Aligned	7.07645E-01	1.0	1.0	9.77267E-01
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	9.99951E-01	1.0	1.0	1.0
NNA	Friedman Aligned	2.69091E-01	5.64974E-01	5.64974E-01	4.39377E-01
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S44** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S45.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $R_{p1}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	7.42350E-01	1.0	1.0	7.42350E-01
GOTLBO	Friedman Aligned	6.80259E-04	1.52988E-03	1.52988E-03	1.52881E-03
GOTLBO	Quade	9.99837E-01	1.0	1.0	9.99953E-01
PSO	Friedman	7.42350E-01	1.0	1.0	8.46939E-01
PSO	Friedman Aligned	2.26308E-10	2.26308E-10	2.26308E-10	2.26308E-10
PSO	Quade	9.99837E-01	1.0	1.0	9.99837E-01
ISCA	Friedman	7.42350E-01	1.0	1.0	9.45174E-01
ISCA	Friedman Aligned	1.21307E-02	3.74832E-02	3.74832E-02	3.68572E-02
ISCA	Quade	9.99837E-01	1.0	1.0	9.99947E-01
NNA	Friedman	7.42350E-01	1.0	1.0	9.45174E-01
NNA	Friedman Aligned	6.80259E-04	1.25623E-03	1.25623E-03	1.25550E-03
NNA	Quade	9.99837E-01	1.0	1.0	9.99953E-01
CWOA	Friedman	7.42350E-01	1.0	1.0	9.61674E-01
CWOA	Friedman Aligned	1.44448E-01	5.24146E-01	5.24146E-01	4.17268E-01
CWOA	Quade	9.99837E-01	1.0	1.0	9.99984E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S45** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S46.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.07433E-01	3.62209E-01	3.62209E-01	3.07433E-01
PSO	Friedman Aligned	1.93615E-05	1.93617E-05	1.93617E-05	1.93615E-05
PSO	Quade	9.96926E-01	1.0	1.0	9.96926E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S46 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S47.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
DE	Friedman	3.11751E-13	8.99281E-13	8.99281E-13	8.99281E-13
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	3.35107E-02	8.46505E-02	8.46505E-02	8.14674E-02
IJAYA	Friedman	3.11751E-13	8.41549E-13	8.41549E-13	8.41549E-13
IJAYA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
IJAYA	Quade	3.35107E-02	6.27616E-02	6.27616E-02	6.09874E-02
NNA	Friedman	3.11751E-13	3.32179E-13	3.32179E-13	3.32179E-13
NNA	Friedman Aligned	1.48834E-09	4.57951E-09	4.57951E-09	4.57951E-09
NNA	Quade	3.35256E-02	1.16402E-01	1.02123E-01	1.10644E-01
CWOA	Friedman	3.11751E-13	3.11751E-13	3.11751E-13	3.11751E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	3.35256E-02	1.04376E-01	9.59914E-02	9.96075E-02
WW	Friedman	3.11751E-13	3.30402E-13	3.30402E-13	3.30402E-13
WW	Friedman Aligned	2.28617E-13	7.91367E-13	7.91367E-13	7.91367E-13
WW	Quade	3.35256E-02	1.04376E-01	9.59914E-02	9.96075E-02
MABC	Friedman	3.78623E-13	1.39799E-12	1.24967E-12	1.39799E-12
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	3.35256E-02	1.16402E-01	1.02123E-01	1.10644E-01
GOTLBO	Friedman	3.78623E-13	1.39799E-12	1.22324E-12	1.39799E-12
GOTLBO	Friedman Aligned	4.42446E-10	1.63365E-09	1.63365E-09	1.63365E-09
GOTLBO	Quade	3.35256E-02	1.16402E-01	1.04050E-01	1.10644E-01
ISCA	Friedman	3.78623E-13	1.39799E-12	1.22324E-12	1.39799E-12
ISCA	Friedman Aligned	1.21214E-09	4.19586E-09	4.19586E-09	4.19586E-09
ISCA	Quade	3.35256E-02	1.16402E-01	1.11569E-01	1.10644E-01

**Table S47 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
NDE	Friedman	7.79360E-10	2.69779E-09	2.69779E-09	2.69779E-09
NDE	Friedman Aligned	4.65894E-12	1.72022E-11	1.72022E-11	1.72022E-11
NDE	Quade	5.14231E-02	1.59184E-01	1.59184E-01	1.49931E-01
PSO	Friedman	9.39925E-09	2.89208E-08	2.89208E-08	2.89208E-08
PSO	Friedman Aligned	6.99497E-11	2.63656E-10	2.63656E-10	2.63656E-10
PSO	Quade	4.42167E-03	4.43072E-03	4.43072E-03	4.42167E-03
TLBO	Friedman	1.21775E-01	3.12161E-01	3.12161E-01	2.80806E-01
TLBO	Friedman Aligned	2.56398E-01	6.65169E-01	6.65169E-01	5.28586E-01
TLBO	Quade	6.64444E-01	1.0	1.0	9.37458E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S48.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	1.37251E-10	4.75100E-10	4.75100E-10	4.75100E-10
PSO	Quade	1.26537E-03	1.26611E-03	1.26611E-03	1.26537E-03
MABC	Friedman	1.32783E-13	2.45137E-13	2.37588E-13	2.45137E-13
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	1.30356E-02	4.64870E-02	4.07958E-02	4.55525E-02
GOTLBO	Friedman	1.32783E-13	2.61346E-13	2.37588E-13	2.61346E-13
GOTLBO	Friedman Aligned	3.62435E-09	1.33822E-08	1.33822E-08	1.33822E-08
GOTLBO	Quade	1.30356E-02	4.64870E-02	4.23263E-02	4.55525E-02
ISCA	Friedman	1.32783E-13	2.61346E-13	2.37588E-13	2.61346E-13
ISCA	Friedman Aligned	7.90632E-09	2.73680E-08	2.73680E-08	2.73680E-08
ISCA	Quade	1.34430E-02	4.66302E-02	4.66302E-02	4.57685E-02
NNA	Friedman	3.34843E-13	1.15907E-12	1.12266E-12	1.15907E-12
NNA	Friedman Aligned	9.12892E-09	2.80890E-08	2.80890E-08	2.80890E-08
NNA	Quade	1.30356E-02	4.64870E-02	4.07958E-02	4.55525E-02
WW	Friedman	3.34843E-13	1.15907E-12	1.12266E-12	1.15907E-12
WW	Friedman Aligned	1.56092E-12	4.80282E-12	4.80282E-12	4.80282E-12
WW	Quade	1.30356E-02	4.02919E-02	3.71360E-02	3.95691E-02
CWOA	Friedman	2.43957E-12	9.19531E-12	9.19531E-12	9.19531E-12
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.30356E-02	4.02919E-02	3.71360E-02	3.95691E-02
IJAYA	Friedman	6.38042E-12	2.35585E-11	2.26019E-11	2.35585E-11
IJAYA	Friedman Aligned	2.28953E-09	8.62977E-09	8.62977E-09	8.62977E-09
IJAYA	Quade	1.22051E-02	2.26497E-02	2.26497E-02	2.24160E-02

**Table S48 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	6.52944E-12	2.35585E-11	2.26019E-11	2.35585E-11
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	1.24297E-02	3.17044E-02	3.17044E-02	3.12514E-02
NDE	Friedman	1.48064E-11	4.55582E-11	4.55582E-11	4.55582E-11
NDE	Friedman Aligned	6.02958E-10	2.22631E-09	2.22631E-09	2.22631E-09
NDE	Quade	2.30164E-02	7.10095E-02	7.10095E-02	6.91409E-02
TLBO	Friedman	3.18582E-02	8.10716E-02	8.10716E-02	7.89005E-02
TLBO	Friedman Aligned	3.76448E-02	9.58407E-02	9.58407E-02	9.28115E-02
TLBO	Quade	4.57286E-01	1.0	9.51773E-01	7.88058E-01
EBLSHADE	Friedman	5.87176E-01	1.0	8.11070E-01	8.04727E-01
EBLSHADE	Friedman Aligned	3.79133E-01	7.11894E-01	7.11894E-01	5.85196E-01
EBLSHADE	Quade	7.80025E-01	1.0	9.51773E-01	9.38917E-01
STLBO	Friedman	8.11070E-01	1.0	8.11070E-01	8.11070E-01
STLBO	Friedman Aligned	9.94880E-01	9.94880E-01	9.94880E-01	9.94880E-01
STLBO	Quade	9.51773E-01	1.0	9.51773E-01	9.51773E-01

**Table S49.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	4.14742E-04	4.14821E-04	4.14821E-04	4.14742E-04
PSO	Friedman Aligned	3.02198E-08	5.57904E-08	5.57904E-08	5.57904E-08
PSO	Quade	8.28789E-01	1.0	1.0	8.28789E-01
DE	Friedman	2.83400E-01	5.99704E-01	5.81181E-01	4.59472E-01
DE	Friedman Aligned	5.25358E-13	5.25358E-13	5.25358E-13	5.25358E-13
DE	Quade	9.82071E-01	1.0	1.0	9.99815E-01
IJAYA	Friedman	2.83400E-01	5.99704E-01	5.81181E-01	4.59472E-01
IJAYA	Friedman Aligned	1.33614E-02	4.94618E-02	4.94618E-02	4.84535E-02
IJAYA	Quade	9.82071E-01	1.0	1.0	9.99403E-01
CWOA	Friedman	2.83400E-01	7.89202E-01	7.89202E-01	5.60486E-01
CWOA	Friedman Aligned	3.39155E-06	1.04356E-05	1.04356E-05	1.04355E-05
CWOA	Quade	9.82071E-01	1.0	1.0	9.99926E-01
NNA	Friedman	3.54469E-01	1.0	1.0	7.80203E-01
NNA	Friedman Aligned	1.07552E-03	3.72420E-03	3.72420E-03	3.71804E-03
NNA	Quade	9.82071E-01	1.0	1.0	9.99931E-01
WW	Friedman	3.54469E-01	1.0	1.0	7.80203E-01
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	9.82071E-01	1.0	1.0	9.99926E-01
MABC	Friedman	4.01459E-01	1.0	1.0	8.55518E-01
MABC	Friedman Aligned	1.04059E-07	2.64149E-07	2.64149E-07	2.64149E-07
MABC	Quade	9.82071E-01	1.0	1.0	9.99931E-01
GOTLBO	Friedman	4.01459E-01	1.0	1.0	8.55518E-01
GOTLBO	Friedman Aligned	6.40261E-03	2.41687E-02	2.41687E-02	2.39198E-02
GOTLBO	Quade	9.82071E-01	1.0	1.0	9.99931E-01

**Table S49** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ISCA	Friedman	4.01459E-01	1.0	1.0	8.55518E-01
ISCA	Friedman Aligned	1.50390E-03	5.55512E-03	5.55512E-03	5.54164E-03
ISCA	Quade	9.82071E-01	1.0	1.0	9.99931E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S50.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.32214E-02	3.37419E-02	3.37419E-02	3.32214E-02
PSO	Friedman Aligned	5.02265E-12	5.02265E-12	5.02265E-12	5.02265E-12
PSO	Quade	9.77998E-01	1.0	1.0	9.77998E-01
DE	Friedman	9.69804E-01	1.0	1.0	9.98438E-01
DE	Friedman Aligned	8.55596E-02	1.63995E-01	1.63995E-01	1.52213E-01
DE	Quade	9.99780E-01	1.0	1.0	1.0
IJAYA	Friedman	9.69804E-01	1.0	1.0	9.98438E-01
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.99780E-01	1.0	1.0	1.0
CWOA	Friedman	9.69804E-01	1.0	1.0	9.99595E-01
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	9.99780E-01	1.0	1.0	1.0
NNA	Friedman	9.81260E-01	1.0	1.0	9.99999E-01
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	9.81260E-01	1.0	1.0	9.99999E-01
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	9.99780E-01	1.0	1.0	1.0
GOTLBO	Friedman	9.99360E-01	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	9.99360E-01	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S50** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S51.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	5.47757E-11	5.47757E-11	5.47757E-11	5.47757E-11
PSO	Friedman Aligned	5.78066E-11	2.00100E-10	2.00100E-10	2.00100E-10
PSO	Quade	2.81980E-02	2.85718E-02	2.85718E-02	2.81980E-02
DE	Friedman	4.02282E-10	7.42675E-10	7.42675E-10	7.42675E-10
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	1.40685E-01	3.51358E-01	3.51358E-01	3.00292E-01
IJAYA	Friedman	4.02282E-10	7.97424E-10	7.97424E-10	7.97424E-10
IJAYA	Friedman Aligned	3.62409E-09	1.33812E-08	1.33812E-08	1.33812E-08
IJAYA	Quade	1.40685E-01	2.76675E-01	2.76675E-01	2.44151E-01
CWOA	Friedman	7.58384E-10	2.33349E-09	2.33349E-09	2.33349E-09
CWOA	Friedman Aligned	2.81525E-09	1.06113E-08	1.06113E-08	1.06113E-08
CWOA	Quade	1.40685E-01	4.12529E-01	3.77842E-01	3.43793E-01
NNA	Friedman	4.96355E-09	1.71815E-08	1.64311E-08	1.71815E-08
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.40685E-01	4.35460E-01	3.77842E-01	3.60942E-01
WW	Friedman	4.96355E-09	1.71815E-08	1.64311E-08	1.71815E-08
WW	Friedman Aligned	8.94877E-10	3.30416E-09	3.30416E-09	3.30416E-09
WW	Quade	1.40685E-01	4.12529E-01	3.77842E-01	3.43793E-01
MABC	Friedman	1.60093E-08	6.03426E-08	4.96032E-08	6.03426E-08
MABC	Friedman Aligned	8.61753E-09	2.98299E-08	2.55256E-08	2.98299E-08
MABC	Quade	1.40685E-01	4.35460E-01	3.77842E-01	3.60942E-01
GOTLBO	Friedman	1.60093E-08	6.03426E-08	4.96032E-08	6.03426E-08
GOTLBO	Friedman Aligned	8.61753E-09	2.98299E-08	2.55256E-08	2.98299E-08
GOTLBO	Quade	1.40685E-01	4.35460E-01	3.77842E-01	3.60942E-01

**Table S51 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
ISCA	Friedman	1.60093E-08	6.03426E-08	4.96032E-08	6.03426E-08
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	1.40685E-01	4.35460E-01	3.87838E-01	3.60942E-01
NDE	Friedman	5.77124E-06	1.77577E-05	1.77577E-05	1.77575E-05
NDE	Friedman Aligned	4.58966E-13	1.41220E-12	1.41220E-12	1.41220E-12
NDE	Quade	1.58827E-01	4.98296E-01	4.98296E-01	4.12676E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S52.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.58882E-02	3.64967E-02	3.64967E-02	3.58882E-02
PSO	Friedman Aligned	1.81719E-08	1.81719E-08	1.81719E-08	1.81719E-08
PSO	Quade	9.66028E-01	1.0	1.0	9.66028E-01
DE	Friedman	9.74166E-01	1.0	1.0	9.98829E-01
DE	Friedman Aligned	1.92213E-06	3.54855E-06	3.54855E-06	3.54855E-06
DE	Quade	9.99387E-01	1.0	1.0	1.0
IJAYA	Friedman	9.74166E-01	1.0	1.0	9.98829E-01
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.99387E-01	1.0	1.0	9.99999E-01
CWOA	Friedman	9.74166E-01	1.0	1.0	9.99716E-01
CWOA	Friedman Aligned	1.53881E-01	5.01146E-01	5.01146E-01	4.01985E-01
CWOA	Quade	9.99387E-01	1.0	1.0	1.0
NNA	Friedman	9.85128E-01	1.0	1.0	1.0
NNA	Friedman Aligned	8.70151E-01	1.0	1.0	9.99147E-01
NNA	Quade	9.99387E-01	1.0	1.0	1.0
WW	Friedman	9.85128E-01	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	9.99387E-01	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S52 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	3.33973E-02	8.58886E-02	8.58886E-02	8.26128E-02
MABC	Quade	9.99387E-01	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	8.90777E-01	1.0	1.0	9.99719E-01
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S53.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	1.36951E-10	4.74063E-10	4.74063E-10	4.74063E-10
PSO	Quade	1.62108E-03	1.62229E-03	1.62229E-03	1.62108E-03
MABC	Friedman	1.02474E-13	1.89182E-13	1.77636E-13	1.89182E-13
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	1.57469E-02	5.58419E-02	4.90027E-02	5.44965E-02
GOTLBO	Friedman	1.02474E-13	1.89182E-13	1.73417E-13	1.89182E-13
GOTLBO	Friedman Aligned	3.57744E-09	1.32090E-08	1.32090E-08	1.32090E-08
GOTLBO	Quade	1.57469E-02	5.58419E-02	5.06633E-02	5.44965E-02
ISCA	Friedman	1.02474E-13	1.89182E-13	1.73417E-13	1.89182E-13
ISCA	Friedman Aligned	7.81461E-09	2.70506E-08	2.70506E-08	2.70506E-08
ISCA	Quade	1.60006E-02	5.58419E-02	5.55239E-02	5.44965E-02
NNA	Friedman	1.02474E-13	2.11831E-13	2.02505E-13	2.11831E-13
NNA	Friedman Aligned	9.02635E-09	2.77734E-08	2.77734E-08	2.77734E-08
NNA	Quade	1.57469E-02	5.58419E-02	4.90027E-02	5.44965E-02
WW	Friedman	1.02474E-13	2.11831E-13	2.02505E-13	2.11831E-13
WW	Friedman Aligned	1.49597E-12	4.60298E-12	4.60298E-12	4.60298E-12
WW	Quade	1.57469E-02	4.87185E-02	4.48837E-02	4.76642E-02
CWOA	Friedman	5.07213E-13	1.91180E-12	1.91180E-12	1.91180E-12
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.57469E-02	4.87185E-02	4.48837E-02	4.76642E-02
IJAYA	Friedman	1.45953E-12	5.38902E-12	5.23359E-12	5.38902E-12
IJAYA	Friedman Aligned	2.25780E-09	8.51019E-09	8.51019E-09	8.51019E-09
IJAYA	Quade	1.49333E-02	2.77449E-02	2.77449E-02	2.73948E-02

**Table S53 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.51193E-12	5.38902E-12	5.23359E-12	5.38902E-12
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	1.51015E-02	3.85593E-02	3.85593E-02	3.78906E-02
NDE	Friedman	7.43248E-11	2.28692E-10	2.28692E-10	2.28692E-10
NDE	Friedman Aligned	5.85711E-10	2.16263E-09	2.16263E-09	2.16263E-09
NDE	Quade	2.70504E-02	8.34946E-02	8.34946E-02	8.09165E-02
TLBO	Friedman	5.71734E-02	1.45785E-01	1.45785E-01	1.38816E-01
TLBO	Friedman Aligned	3.82516E-02	9.73902E-02	9.73902E-02	9.42628E-02
TLBO	Quade	4.94637E-01	1.0	1.0	8.23149E-01
EBLSHADE	Friedman	7.56821E-01	1.0	1.0	9.26494E-01
EBLSHADE	Friedman Aligned	3.82635E-01	7.18601E-01	7.18601E-01	5.89504E-01
EBLSHADE	Quade	8.24330E-01	1.0	1.0	9.59673E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S54.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S54 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S55.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	2.91949E-01	3.40696E-01	3.40696E-01	2.91949E-01
PSO	Friedman Aligned	5.39802E-08	5.39802E-08	5.39802E-08	5.39802E-08
PSO	Quade	9.99326E-01	1.0	1.0	9.99326E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	4.13136E-07	7.62714E-07	7.62714E-07	7.62713E-07
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.40272E-02	3.58013E-02	3.58013E-02	3.52243E-02
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	9.38730E-01	1.0	1.0	9.99973E-01
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S55 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	7.29777E-01	1.0	1.0	9.92025E-01
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	7.04009E-01	1.0	1.0	9.85215E-01
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	7.90035E-02	2.50048E-01	2.50048E-01	2.23709E-01
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S56.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.58882E-02	3.64967E-02	3.64967E-02	3.58882E-02
PSO	Friedman Aligned	2.40712E-09	2.40712E-09	2.40712E-09	2.40712E-09
PSO	Quade	9.39986E-01	1.0	1.0	9.39986E-01
DE	Friedman	9.74166E-01	1.0	1.0	9.98829E-01
DE	Friedman Aligned	2.06881E-05	3.81937E-05	3.81937E-05	3.81931E-05
DE	Quade	9.97867E-01	1.0	1.0	9.99998E-01
IJAYA	Friedman	9.74166E-01	1.0	1.0	9.98829E-01
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.97867E-01	1.0	1.0	9.99988E-01
CWOA	Friedman	9.74166E-01	1.0	1.0	9.99716E-01
CWOA	Friedman Aligned	3.77795E-01	1.0	1.0	7.67754E-01
CWOA	Quade	9.97867E-01	1.0	1.0	1.0
NNA	Friedman	9.85128E-01	1.0	1.0	1.0
NNA	Friedman Aligned	9.96719E-01	1.0	1.0	1.0
NNA	Quade	9.97867E-01	1.0	1.0	1.0
WW	Friedman	9.85128E-01	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	9.97867E-01	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S56 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.17077E-01	3.11585E-01	3.11585E-01	2.71001E-01
MABC	Quade	9.97867E-01	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	9.97867E-01	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S57.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	7.49779E-02	7.77045E-02	7.77045E-02	7.49779E-02
PSO	Friedman Aligned	1.24163E-09	1.24163E-09	1.24163E-09	1.24163E-09
PSO	Quade	9.78151E-01	1.0	1.0	9.78151E-01
DE	Friedman	9.96576E-01	1.0	1.0	9.99972E-01
DE	Friedman Aligned	4.03245E-05	7.44465E-05	7.44465E-05	7.44440E-05
DE	Quade	9.99784E-01	1.0	1.0	1.0
IJAYA	Friedman	9.96576E-01	1.0	1.0	9.99972E-01
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.99784E-01	1.0	1.0	1.0
CWOA	Friedman	9.96576E-01	1.0	1.0	9.99998E-01
CWOA	Friedman Aligned	4.67657E-01	1.0	1.0	8.56281E-01
CWOA	Quade	9.99784E-01	1.0	1.0	1.0
WW	Friedman	9.99994E-01	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	9.99784E-01	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S57 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.62259E-01	4.40367E-01	4.40367E-01	3.62005E-01
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S58.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.92232E-01	2.11737E-01	2.11737E-01	1.92232E-01
PSO	Friedman Aligned	3.20410E-13	3.20410E-13	3.20410E-13	3.20410E-13
PSO	Quade	9.91529E-01	1.0	1.0	9.91529E-01
DE	Friedman	9.99993E-01	1.0	1.0	1.0
DE	Friedman Aligned	9.96242E-03	1.84702E-02	1.84702E-02	1.83146E-02
DE	Quade	9.99984E-01	1.0	1.0	1.0
IJAYA	Friedman	9.99993E-01	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	9.99984E-01	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	9.42723E-01	1.0	1.0	9.99297E-01
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S58** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S59.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $I_{02}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	7.76548E-02	8.05850E-02	8.05850E-02	7.76548E-02
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	9.90947E-01	1.0	1.0	9.90947E-01
DE	Friedman	9.96991E-01	1.0	1.0	9.99978E-01
DE	Friedman Aligned	2.24129E-10	5.68944E-10	5.68944E-10	5.68944E-10
DE	Quade	9.99980E-01	1.0	1.0	1.0
IJAYA	Friedman	9.96991E-01	1.0	1.0	9.99978E-01
IJAYA	Friedman Aligned	2.35391E-04	8.69175E-04	8.69175E-04	8.68860E-04
IJAYA	Quade	9.99980E-01	1.0	1.0	1.0
CWOA	Friedman	9.96991E-01	1.0	1.0	9.99998E-01
CWOA	Friedman Aligned	5.19146E-09	1.59737E-08	1.59737E-08	1.59737E-08
CWOA	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	3.36136E-01	1.0	1.0	7.57830E-01
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.10441E-10	2.03890E-10	2.03890E-10	2.03890E-10
MABC	Quade	1.0	1.0	1.0	1.0

**Table S59 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	8.28991E-05	3.12472E-04	3.12472E-04	3.12430E-04
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.16470E-05	4.30045E-05	4.30045E-05	4.30037E-05
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	7.14139E-06	2.47202E-05	2.47202E-05	2.47200E-05
NNA	Quade	1.0	1.0	1.0	1.0

**Table S60.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	3.92321E-10	3.92321E-10	3.92321E-10	3.92321E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	2.79373E-01	3.23540E-01	3.23540E-01	2.79373E-01
PSO	Friedman	2.88559E-05	5.32730E-05	5.32730E-05	5.32717E-05
PSO	Friedman Aligned	1.74677E-10	6.44961E-10	6.44961E-10	6.44961E-10
PSO	Quade	5.37934E-01	1.0	1.0	7.59568E-01
CWOA	Friedman	2.43825E-04	6.18999E-04	6.18999E-04	6.18825E-04
CWOA	Friedman Aligned	7.59015E-11	2.62736E-10	2.62736E-10	2.62736E-10
CWOA	Quade	5.65449E-01	1.0	1.0	8.79446E-01
NNA	Friedman	6.24368E-04	1.92155E-03	1.92155E-03	1.91989E-03
NNA	Friedman Aligned	3.95173E-11	1.21592E-10	1.21592E-10	1.21592E-10
NNA	Quade	5.65449E-01	1.0	1.0	9.06685E-01
GOTLBO	Friedman	2.71581E-02	9.48059E-02	9.48059E-02	9.09078E-02
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	7.47711E-01	1.0	1.0	9.91495E-01
ISCA	Friedman	1.51455E-01	5.83984E-01	5.83984E-01	4.54688E-01
ISCA	Friedman Aligned	4.49465E-10	1.69414E-09	1.69414E-09	1.69414E-09
ISCA	Quade	8.49293E-01	1.0	1.0	9.99077E-01
MABC	Friedman	7.73122E-01	1.0	1.0	9.96269E-01
MABC	Friedman Aligned	1.26240E-12	3.20455E-12	3.20455E-12	3.20455E-12
MABC	Quade	9.33013E-01	1.0	1.0	9.99962E-01
IJAYA	Friedman	9.84761E-01	1.0	1.0	1.0
IJAYA	Friedman Aligned	8.57775E-01	1.0	1.0	9.99254E-01
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S60** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S61.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	1.36721E-03	2.52555E-03	2.52555E-03	2.52263E-03
ISCA	Friedman	1.78968E-13	3.30402E-13	3.30402E-13	3.30402E-13
ISCA	Friedman Aligned	1.55372E-10	5.73682E-10	5.73682E-10	5.73682E-10
ISCA	Quade	1.65281E-02	6.13009E-02	6.13009E-02	5.96818E-02
GOTLBO	Friedman	1.95883E-11	4.97242E-11	4.97242E-11	4.97242E-11
GOTLBO	Friedman Aligned	2.08030E-10	7.84112E-10	7.84112E-10	7.84112E-10
GOTLBO	Quade	8.54988E-03	2.96740E-02	2.96740E-02	2.92856E-02
MABC	Friedman	3.70161E-11	1.13896E-10	1.13896E-10	1.13896E-10
MABC	Friedman Aligned	4.17948E-11	1.28599E-10	1.28599E-10	1.28599E-10
MABC	Quade	2.91472E-02	1.10612E-01	1.10612E-01	1.05504E-01
IJAYA	Friedman	8.24453E-10	2.85388E-09	2.85388E-09	2.85388E-09
IJAYA	Friedman Aligned	2.11001E-09	7.30389E-09	7.30389E-09	7.30389E-09
IJAYA	Quade	5.50979E-02	2.05651E-01	1.80331E-01	1.88814E-01
DE	Friedman	1.26059E-09	4.65450E-09	4.65450E-09	4.65450E-09
DE	Friedman Aligned	9.99304E-10	3.68974E-09	3.68974E-09	3.68974E-09
DE	Quade	5.50979E-02	2.05651E-01	1.80331E-01	1.88814E-01
NNA	Friedman	2.52900E-09	9.53238E-09	9.53238E-09	9.53238E-09
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	2.46551E-03	7.59267E-03	7.59267E-03	7.56678E-03
CWOA	Friedman	7.00046E-09	2.58479E-08	2.31404E-08	2.58479E-08
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	2.22641E-03	5.65651E-03	5.65651E-03	5.64199E-03

**Table S61** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
WW	Friedman	7.00046E-09	2.58479E-08	2.31404E-08	2.58479E-08
WW	Friedman Aligned	1.32567E-10	4.58885E-10	4.58885E-10	4.58885E-10
WW	Quade	1.69100E-04	1.69113E-04	1.69113E-04	1.69100E-04
NDE	Friedman	1.47046E-04	4.52458E-04	4.52458E-04	4.52382E-04
NDE	Friedman Aligned	6.50237E-07	2.00073E-06	2.00073E-06	2.00073E-06
NDE	Quade	2.62860E-01	8.36446E-01	8.36446E-01	6.08744E-01
TLBO	Friedman	1.57702E-01	4.05499E-01	4.05499E-01	3.53159E-01
TLBO	Friedman Aligned	4.66638E-01	1.0	1.0	7.97205E-01
TLBO	Quade	7.20268E-01	1.0	1.0	9.60593E-01
STLBO	Friedman	9.63022E-01	1.0	1.0	9.97729E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	9.70725E-01	1.0	1.0	9.98525E-01
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S62.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	1.08556E-03	2.00503E-03	2.00503E-03	2.00319E-03
ISCA	Friedman	4.21441E-13	7.78044E-13	7.78044E-13	7.78044E-13
ISCA	Friedman Aligned	1.77441E-10	6.55168E-10	6.55168E-10	6.55168E-10
ISCA	Quade	1.38937E-02	5.14932E-02	5.14932E-02	5.03480E-02
MABC	Friedman	2.15926E-11	5.48119E-11	5.48119E-11	5.48119E-11
MABC	Friedman Aligned	5.46148E-11	1.68046E-10	1.68046E-10	1.68046E-10
MABC	Quade	2.48402E-02	9.41718E-02	9.41718E-02	9.04551E-02
GOTLBO	Friedman	2.92194E-11	8.99059E-11	8.99059E-11	8.99059E-11
GOTLBO	Friedman Aligned	1.87348E-10	7.06158E-10	7.06158E-10	7.06158E-10
GOTLBO	Quade	7.08114E-03	2.45652E-02	2.45652E-02	2.42987E-02
IJAYA	Friedman	3.81470E-10	1.32047E-09	1.32047E-09	1.32047E-09
IJAYA	Friedman Aligned	5.75403E-09	1.99178E-08	1.99178E-08	1.99178E-08
IJAYA	Quade	4.77133E-02	1.77825E-01	1.56099E-01	1.65159E-01
DE	Friedman	5.89532E-10	2.17673E-09	2.17673E-09	2.17673E-09
DE	Friedman Aligned	3.00876E-09	1.11092E-08	1.11092E-08	1.11092E-08
DE	Quade	4.77133E-02	1.77825E-01	1.56099E-01	1.65159E-01
NNA	Friedman	4.05858E-09	1.52977E-08	1.52977E-08	1.52977E-08
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.99442E-03	6.14092E-03	6.14092E-03	6.12398E-03
WW	Friedman	9.35983E-09	3.45594E-08	3.32115E-08	3.45594E-08
WW	Friedman Aligned	1.45939E-10	5.05172E-10	5.05172E-10	5.05172E-10
WW	Quade	1.29473E-04	1.29480E-04	1.29480E-04	1.29473E-04

**Table S62 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
CWOA	Friedman	9.59443E-09	3.45594E-08	3.32115E-08	3.45594E-08
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.79060E-03	4.54851E-03	4.54851E-03	4.53912E-03
NDE	Friedman	8.95473E-05	2.75533E-04	2.75533E-04	2.75505E-04
NDE	Friedman Aligned	4.36010E-08	1.34157E-07	1.34157E-07	1.34157E-07
NDE	Quade	2.38174E-01	7.55260E-01	7.55260E-01	5.67008E-01
TLBO	Friedman	1.24750E-01	3.19870E-01	3.19870E-01	2.86976E-01
TLBO	Friedman Aligned	2.17176E-01	5.61378E-01	5.61378E-01	4.62882E-01
TLBO	Quade	6.79515E-01	1.0	9.53684E-01	9.44344E-01
STLBO	Friedman	8.79054E-01	1.0	9.04861E-01	9.79755E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	9.31129E-01	1.0	9.53684E-01	9.92841E-01
EBLSHADE	Friedman	9.04861E-01	1.0	9.04861E-01	9.79755E-01
EBLSHADE	Friedman Aligned	6.46794E-01	1.0	1.0	8.53584E-01
EBLSHADE	Quade	9.53684E-01	1.0	9.53684E-01	9.92841E-01

**Table S63.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	5.95906E-11	5.95906E-11	5.95906E-11	5.95906E-11
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	8.92612E-02	1.71378E-01	1.71378E-01	1.58537E-01
WW	Friedman	1.13108E-10	2.08814E-10	2.08814E-10	2.08814E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	2.45418E-02	2.48242E-02	2.48242E-02	2.45418E-02
CWOA	Friedman	8.66736E-10	2.20018E-09	2.20018E-09	2.20018E-09
CWOA	Friedman Aligned	1.27564E-10	4.71006E-10	4.71006E-10	4.71006E-10
CWOA	Quade	1.10293E-01	2.92688E-01	2.92688E-01	2.56697E-01
NNA	Friedman	4.29575E-09	1.32177E-08	1.32177E-08	1.32177E-08
NNA	Friedman Aligned	1.65481E-10	5.72820E-10	5.72820E-10	5.72820E-10
NNA	Quade	1.10293E-01	3.47534E-01	3.47534E-01	2.97926E-01
GOTLBO	Friedman	2.48635E-06	8.60661E-06	8.60661E-06	8.60658E-06
GOTLBO	Friedman Aligned	7.60474E-11	2.86640E-10	2.86640E-10	2.86640E-10
GOTLBO	Quade	2.22940E-01	8.32115E-01	8.32115E-01	5.82358E-01
ISCA	Friedman	7.67415E-05	2.83359E-04	2.83359E-04	2.83324E-04
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	3.11725E-01	1.0	1.0	7.48251E-01
MABC	Friedman	6.08165E-03	2.29554E-02	2.29554E-02	2.27308E-02
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	4.09668E-01	1.0	1.0	8.62846E-01
IJAYA	Friedman	2.38708E-02	8.85474E-02	8.85474E-02	8.53440E-02
IJAYA	Friedman Aligned	1.19504E-12	4.13669E-12	4.13669E-12	4.13669E-12
IJAYA	Quade	5.51337E-01	1.0	1.0	9.48146E-01

**Table S63 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	2.75393E-02	9.57372E-02	9.57372E-02	9.21405E-02
DE	Friedman Aligned	1.55452E-11	5.73976E-11	5.73976E-11	5.73976E-11
DE	Quade	5.51337E-01	1.0	1.0	9.48146E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S64.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.84990E-08	1.84990E-08	1.84990E-08	1.84990E-08
WW	Friedman Aligned	2.64637E-10	8.14269E-10	8.14269E-10	8.14269E-10
WW	Quade	4.97749E-01	6.70733E-01	6.70733E-01	4.97749E-01
PSO	Friedman	4.25680E-04	7.86013E-04	7.86013E-04	7.85730E-04
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	7.58062E-01	1.0	1.0	9.27185E-01
CWOA	Friedman	2.60995E-03	6.63191E-03	6.63191E-03	6.61195E-03
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	7.72259E-01	1.0	1.0	9.76617E-01
NNA	Friedman	5.64123E-03	1.73916E-02	1.73916E-02	1.72562E-02
NNA	Friedman Aligned	1.26098E-09	4.36494E-09	4.36494E-09	4.36494E-09
NNA	Quade	7.72259E-01	1.0	1.0	9.84364E-01
GOTLBO	Friedman	1.24793E-01	4.49778E-01	4.49778E-01	3.69603E-01
GOTLBO	Friedman Aligned	2.57868E-13	6.54587E-13	6.54587E-13	6.54587E-13
GOTLBO	Quade	9.07365E-01	1.0	1.0	9.99735E-01
ISCA	Friedman	4.35559E-01	1.0	1.0	8.78968E-01
ISCA	Friedman Aligned	5.82208E-05	2.14973E-04	2.14973E-04	2.14952E-04
ISCA	Quade	9.69469E-01	1.0	1.0	9.99997E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S64 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S65.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
GOTLBO	Friedman	5.46141E-12	5.46141E-12	5.46141E-12	5.46141E-12
GOTLBO	Friedman Aligned	1.85656E-10	6.85500E-10	6.85500E-10	6.85500E-10
GOTLBO	Quade	3.21257E-02	1.12323E-01	1.12323E-01	1.06876E-01
NNA	Friedman	5.46141E-12	7.30616E-12	7.30616E-12	7.30616E-12
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.10836E-02	3.42350E-02	3.42350E-02	3.37124E-02
CWOA	Friedman	1.70145E-11	4.31906E-11	4.31906E-11	4.31906E-11
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.04534E-02	2.66429E-02	2.66429E-02	2.63226E-02
PSO	Friedman	2.64060E-10	8.12492E-10	7.63813E-10	8.12492E-10
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	7.07405E-03	1.30990E-02	1.30990E-02	1.30207E-02
ISCA	Friedman	2.64060E-10	8.12492E-10	7.63813E-10	8.12492E-10
ISCA	Friedman Aligned	1.03659E-10	3.90714E-10	3.90714E-10	3.90714E-10
ISCA	Quade	5.54732E-02	2.07973E-01	2.07973E-01	1.90003E-01
WW	Friedman	3.54090E-10	1.30741E-09	1.30741E-09	1.30741E-09
WW	Friedman Aligned	9.35998E-11	3.45599E-10	3.45599E-10	3.45599E-10
WW	Quade	1.15226E-03	1.15287E-03	1.15287E-03	1.15226E-03
MABC	Friedman	2.07209E-07	7.81020E-07	7.81020E-07	7.81020E-07
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	8.81588E-02	3.39358E-01	3.39358E-01	2.93802E-01
IJAYA	Friedman	2.51710E-06	9.29391E-06	9.29391E-06	9.29387E-06
IJAYA	Friedman Aligned	3.03666E-10	1.05115E-09	1.05115E-09	1.05115E-09
IJAYA	Quade	1.47660E-01	5.61846E-01	4.88755E-01	4.45628E-01

**Table S65 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	3.59231E-06	1.24349E-05	1.24349E-05	1.24349E-05
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	1.47660E-01	5.61846E-01	4.88755E-01	4.45628E-01
NDE	Friedman	2.32779E-02	7.18185E-02	7.18185E-02	6.99073E-02
NDE	Friedman Aligned	3.36822E-05	1.03638E-04	1.03638E-04	1.03634E-04
NDE	Quade	5.01560E-01	1.0	1.0	8.82625E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S66.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	5.37814E-04	5.37948E-04	5.37948E-04	5.37814E-04
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	8.88379E-01	1.0	1.0	8.88379E-01
PSO	Friedman	2.44230E-01	5.05979E-01	5.05979E-01	4.03667E-01
PSO	Friedman Aligned	1.12035E-10	2.06835E-10	2.06835E-10	2.06835E-10
PSO	Quade	9.77652E-01	1.0	1.0	9.99104E-01
CWOA	Friedman	4.83801E-01	1.0	1.0	8.13363E-01
CWOA	Friedman Aligned	7.28206E-09	1.84852E-08	1.84852E-08	1.84852E-08
CWOA	Quade	9.79642E-01	1.0	1.0	9.99949E-01
NNA	Friedman	5.92700E-01	1.0	1.0	9.36943E-01
NNA	Friedman Aligned	6.56552E-05	2.02020E-04	2.02020E-04	2.02002E-04
NNA	Quade	9.79642E-01	1.0	1.0	9.99984E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S66 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S67.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	1.65138E-03	3.05083E-03	3.05083E-03	3.04656E-03
ISCA	Friedman	1.24123E-13	2.29150E-13	2.29150E-13	2.29150E-13
ISCA	Friedman Aligned	1.77441E-10	6.55168E-10	6.55168E-10	6.55168E-10
ISCA	Quade	1.90410E-02	7.06693E-02	7.06693E-02	6.85226E-02
GOTLBO	Friedman	1.37420E-11	3.48837E-11	3.48837E-11	3.48837E-11
GOTLBO	Friedman Aligned	1.87348E-10	7.06158E-10	7.06158E-10	7.06158E-10
GOTLBO	Quade	9.97190E-03	3.46246E-02	3.46246E-02	3.40965E-02
MABC	Friedman	5.56843E-11	1.71336E-10	1.71336E-10	1.71336E-10
MABC	Friedman Aligned	5.46148E-11	1.68046E-10	1.68046E-10	1.68046E-10
MABC	Quade	3.31985E-02	1.26107E-01	1.26107E-01	1.19493E-01
IJAYA	Friedman	1.20599E-09	4.17460E-09	4.17460E-09	4.17460E-09
IJAYA	Friedman Aligned	5.75403E-09	1.99178E-08	1.99178E-08	1.99178E-08
IJAYA	Quade	6.19298E-02	2.31468E-01	2.02790E-01	2.10260E-01
DE	Friedman	1.83414E-09	6.77223E-09	6.77223E-09	6.77223E-09
DE	Friedman Aligned	3.00876E-09	1.11092E-08	1.11092E-08	1.11092E-08
DE	Quade	6.19298E-02	2.31468E-01	2.02790E-01	2.10260E-01
NNA	Friedman	1.98348E-09	7.47618E-09	7.47618E-09	7.47618E-09
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	2.93233E-03	9.03172E-03	9.03172E-03	8.99510E-03
CWOA	Friedman	5.60543E-09	2.06970E-08	2.06949E-08	2.06970E-08
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	2.66069E-03	6.76098E-03	6.76098E-03	6.74024E-03

**Table S67 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
WW	Friedman	5.97853E-09	2.06970E-08	2.06949E-08	2.06970E-08
WW	Friedman Aligned	1.45939E-10	5.05172E-10	5.05172E-10	5.05172E-10
WW	Quade	2.10491E-04	2.10511E-04	2.10511E-04	2.10491E-04
NDE	Friedman	1.87474E-04	5.76856E-04	5.76856E-04	5.76731E-04
NDE	Friedman Aligned	4.36010E-08	1.34157E-07	1.34157E-07	1.34157E-07
NDE	Quade	2.84587E-01	9.08417E-01	9.08417E-01	6.43152E-01
TLBO	Friedman	1.76463E-01	4.54482E-01	4.54482E-01	3.89108E-01
TLBO	Friedman Aligned	2.17176E-01	5.61378E-01	5.61378E-01	4.62882E-01
TLBO	Quade	7.54166E-01	1.0	1.0	9.71610E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	6.46794E-01	1.0	1.0	8.53584E-01
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S68.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	4.01067E-01	5.02631E-01	5.02631E-01	4.01067E-01
WW	Friedman Aligned	2.83462E-12	2.83462E-12	2.83462E-12	2.83462E-12
WW	Quade	9.99914E-01	1.0	1.0	9.99914E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S68 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S69.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	7.43248E-10	7.43248E-10	7.43248E-10	7.43248E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	2.66782E-01	3.06638E-01	3.06638E-01	2.66782E-01
PSO	Friedman	4.54207E-05	8.38553E-05	8.38553E-05	8.38520E-05
PSO	Friedman Aligned	1.35070E-10	5.09112E-10	5.09112E-10	5.09112E-10
PSO	Quade	5.22216E-01	1.0	1.0	7.44252E-01
CWOA	Friedman	3.64540E-04	9.25501E-04	9.25501E-04	9.25112E-04
CWOA	Friedman Aligned	5.32651E-11	1.96671E-10	1.96671E-10	1.96671E-10
CWOA	Quade	5.50483E-01	1.0	1.0	8.68626E-01
NNA	Friedman	9.08440E-04	2.79608E-03	2.79608E-03	2.79256E-03
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	5.50483E-01	1.0	1.0	8.97503E-01
GOTLBO	Friedman	3.55101E-02	1.24289E-01	1.24289E-01	1.17640E-01
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	7.34526E-01	1.0	1.0	9.89856E-01
ISCA	Friedman	1.84143E-01	7.17234E-01	7.17234E-01	5.28316E-01
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	8.38066E-01	1.0	1.0	9.98796E-01
MABC	Friedman	8.30669E-01	1.0	1.0	9.98761E-01
MABC	Friedman Aligned	1.20936E-11	4.18625E-11	4.18625E-11	4.18625E-11
MABC	Quade	9.24393E-01	1.0	1.0	9.99941E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	9.98735E-01	1.0	1.0	1.0

**Table S69 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S70.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.49117E-05	1.49118E-05	1.49118E-05	1.49117E-05
WW	Friedman Aligned	1.07945E-10	1.99283E-10	1.99283E-10	1.99283E-10
WW	Quade	7.08152E-01	1.0	1.0	7.08152E-01
PSO	Friedman	3.30715E-02	6.19271E-02	6.19271E-02	6.01993E-02
PSO	Friedman Aligned	5.28264E-09	1.62543E-08	1.62543E-08	1.62543E-08
PSO	Quade	9.00243E-01	1.0	1.0	9.85813E-01
CWOA	Friedman	1.05547E-01	2.79535E-01	2.79535E-01	2.46592E-01
CWOA	Friedman Aligned	4.87572E-10	1.23768E-09	1.23768E-09	1.23768E-09
CWOA	Quade	9.05533E-01	1.0	1.0	9.97495E-01
NNA	Friedman	1.61730E-01	5.28346E-01	5.28346E-01	4.18890E-01
NNA	Friedman Aligned	4.82059E-13	4.82059E-13	4.82059E-13	4.82059E-13
NNA	Quade	9.05533E-01	1.0	1.0	9.98649E-01
GOTLBO	Friedman	7.82941E-01	1.0	1.0	9.94947E-01
GOTLBO	Friedman Aligned	2.23133E-03	7.72913E-03	7.72913E-03	7.70263E-03
GOTLBO	Quade	9.81758E-01	1.0	1.0	9.99999E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S70** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S71.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	4.34105E-02	4.43053E-02	4.43053E-02	4.34105E-02
WW	Friedman Aligned	1.25781E-08	1.25781E-08	1.25781E-08	1.25781E-08
WW	Quade	9.93459E-01	1.0	1.0	9.93459E-01
PSO	Friedman	9.59537E-01	1.0	1.0	9.97318E-01
PSO	Friedman Aligned	1.41924E-05	2.62016E-05	2.62016E-05	2.62013E-05
PSO	Quade	9.99820E-01	1.0	1.0	1.0
CWOA	Friedman	9.98121E-01	1.0	1.0	1.0
CWOA	Friedman Aligned	2.92359E-01	8.43733E-01	8.43733E-01	5.84323E-01
CWOA	Quade	9.99978E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0

**Table S71 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S72.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.05634E-01	1.11163E-01	1.11163E-01	1.05634E-01
WW	Friedman Aligned	7.79425E-08	7.79425E-08	7.79425E-08	7.79425E-08
WW	Quade	9.97790E-01	1.0	1.0	9.97790E-01
PSO	Friedman	9.96116E-01	1.0	1.0	9.99965E-01
PSO	Friedman Aligned	1.94787E-02	3.62606E-02	3.62606E-02	3.56640E-02
PSO	Quade	9.99983E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S72 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0

**Table S73.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $n_2$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S73 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S74.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.85241E-05	3.85248E-05	3.85248E-05	3.85241E-05
PSO	Friedman Aligned	1.30970E-08	3.32462E-08	3.16401E-08	3.32462E-08
PSO	Quade	6.28939E-01	9.54531E-01	9.54531E-01	6.28939E-01
CWOA	Friedman	2.30207E-04	4.25038E-04	4.25038E-04	4.24956E-04
CWOA	Friedman Aligned	1.45657E-11	1.45657E-11	1.45657E-11	1.45657E-11
CWOA	Quade	6.36202E-01	1.0	1.0	8.45375E-01
WW	Friedman	5.14600E-04	1.30655E-03	1.30655E-03	1.30577E-03
WW	Friedman Aligned	1.30970E-08	3.32462E-08	3.16401E-08	3.32462E-08
WW	Quade	6.36202E-01	1.0	1.0	8.93749E-01
MABC	Friedman	9.08440E-04	2.79608E-03	2.79608E-03	2.79256E-03
MABC	Friedman Aligned	8.90533E-10	1.64406E-09	1.64406E-09	1.64406E-09
MABC	Quade	6.36202E-01	1.0	1.0	8.93749E-01
NNA	Friedman	3.83377E-03	1.32864E-02	1.32864E-02	1.32082E-02
NNA	Friedman Aligned	8.30815E-06	3.06763E-05	3.06763E-05	3.06759E-05
NNA	Quade	6.84588E-01	1.0	1.0	9.81577E-01
GOTLBO	Friedman	9.97395E-03	3.69263E-02	3.69263E-02	3.63352E-02
GOTLBO	Friedman Aligned	1.25934E-03	4.74813E-03	4.74813E-03	4.73848E-03
GOTLBO	Quade	6.84588E-01	1.0	1.0	9.81577E-01
ISCA	Friedman	2.90759E-02	1.10340E-01	1.10340E-01	1.05257E-01
ISCA	Friedman Aligned	1.94427E-03	7.18153E-03	7.18153E-03	7.16008E-03
ISCA	Quade	6.84588E-01	1.0	1.0	9.81577E-01
NDE	Friedman	3.23617E-01	1.0	1.0	7.63942E-01
NDE	Friedman Aligned	5.67700E-06	1.96512E-05	1.96512E-05	1.96510E-05
NDE	Quade	6.84588E-01	1.0	1.0	9.81577E-01

**Table S74** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	8.26099E-01	1.0	1.0	9.97654E-01
IJAYA	Friedman Aligned	8.17591E-01	1.0	1.0	9.97233E-01
IJAYA	Quade	9.26311E-01	1.0	1.0	9.99880E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S75.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
ISCA	Friedman	2.82885E-13	2.82885E-13	2.82885E-13	2.82885E-13
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	3.19021E-02	1.18526E-01	1.18526E-01	1.12824E-01
GOTLBO	Friedman	3.53606E-13	6.52811E-13	6.52811E-13	6.52811E-13
GOTLBO	Friedman Aligned	2.87605E-10	1.06193E-09	1.06193E-09	1.06193E-09
GOTLBO	Quade	3.16479E-02	1.10636E-01	1.05998E-01	1.05349E-01
NNA	Friedman	2.63833E-12	6.69731E-12	6.69731E-12	6.69731E-12
NNA	Friedman Aligned	4.20856E-09	1.45681E-08	1.45681E-08	1.45681E-08
NNA	Quade	3.16479E-02	1.10636E-01	1.05998E-01	1.05349E-01
MABC	Friedman	3.12516E-11	9.61586E-11	9.61586E-11	9.61586E-11
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	1.54402E-02	3.94292E-02	3.94292E-02	3.87301E-02
WW	Friedman	8.01828E-11	2.77556E-10	2.77556E-10	2.77556E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	1.54402E-02	4.15868E-02	4.15868E-02	4.08171E-02
NDE	Friedman	1.83881E-10	6.78945E-10	6.78945E-10	6.78945E-10
NDE	Friedman Aligned	4.73813E-09	1.45789E-08	1.45789E-08	1.45789E-08
NDE	Quade	3.16479E-02	1.18446E-01	1.18446E-01	1.12600E-01
CWOA	Friedman	2.39580E-10	9.03031E-10	9.03031E-10	9.03031E-10
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.49768E-02	2.78262E-02	2.78262E-02	2.74741E-02
PSO	Friedman	2.21287E-09	8.17061E-09	8.17061E-09	8.17061E-09
PSO	Friedman Aligned	4.91679E-11	1.85325E-10	1.85325E-10	1.85325E-10
PSO	Quade	9.54010E-03	9.58237E-03	9.58237E-03	9.54010E-03

**Table S75** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	2.50012E-08	8.65425E-08	8.65425E-08	8.65425E-08
IJAYA	Friedman Aligned	9.85286E-13	3.63798E-12	3.63798E-12	3.63798E-12
IJAYA	Quade	1.03731E-01	3.65075E-01	3.65075E-01	3.15515E-01
DE	Friedman	1.88313E-07	5.79424E-07	5.79424E-07	5.79424E-07
DE	Friedman Aligned	<1E-13	2.51799E-13	2.51799E-13	2.51799E-13
DE	Quade	1.44238E-01	4.51670E-01	4.51670E-01	3.80764E-01
TLBO	Friedman	8.79380E-02	2.24791E-01	2.24791E-01	2.08368E-01
TLBO	Friedman Aligned	1.36519E-03	3.46585E-03	3.46585E-03	3.46185E-03
TLBO	Quade	6.31532E-01	1.0	1.0	9.20691E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S76.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
ISCA	Friedman	1.54143E-12	1.54143E-12	1.54143E-12	1.54143E-12
ISCA	Friedman Aligned	6.19721E-09	2.14519E-08	2.14519E-08	2.14519E-08
ISCA	Quade	1.33574E-02	4.94471E-02	4.94471E-02	4.84395E-02
NDE	Friedman	1.23935E-11	2.57512E-11	2.57512E-11	2.57512E-11
NDE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NDE	Quade	1.28596E-02	4.86156E-02	4.86156E-02	4.76143E-02
GOTLBO	Friedman	1.23935E-11	2.28804E-11	2.28804E-11	2.28804E-11
GOTLBO	Friedman Aligned	7.46673E-09	2.29745E-08	2.29745E-08	2.29745E-08
GOTLBO	Quade	1.26457E-02	4.39450E-02	4.24241E-02	4.30964E-02
NNA	Friedman	4.65187E-11	1.43134E-10	1.43134E-10	1.43134E-10
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.26457E-02	4.39450E-02	4.24241E-02	4.30964E-02
MABC	Friedman	3.75683E-10	1.30044E-09	1.30044E-09	1.30044E-09
MABC	Friedman Aligned	2.94570E-11	1.01966E-10	1.01966E-10	1.01966E-10
MABC	Quade	5.47342E-03	1.39234E-02	1.39234E-02	1.38356E-02
WW	Friedman	8.36500E-10	3.08861E-09	3.08861E-09	3.08861E-09
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	5.47342E-03	1.48853E-02	1.48853E-02	1.47860E-02
IJAYA	Friedman	1.35369E-09	5.10235E-09	5.10235E-09	5.10235E-09
IJAYA	Friedman Aligned	2.63984E-09	9.74710E-09	9.74710E-09	9.74710E-09
IJAYA	Quade	5.07250E-02	1.76988E-01	1.76988E-01	1.64894E-01
CWOA	Friedman	2.10865E-09	7.78579E-09	7.78579E-09	7.78579E-09
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	5.10914E-03	9.45270E-03	9.45270E-03	9.41186E-03

**Table S76** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.08138E-08	3.74326E-08	3.74326E-08	3.74326E-08
DE	Friedman Aligned	5.65963E-10	2.13325E-09	2.13325E-09	2.13325E-09
DE	Quade	7.46403E-02	2.31704E-01	2.31704E-01	2.12337E-01
PSO	Friedman	1.25898E-08	3.87379E-08	3.87379E-08	3.87379E-08
PSO	Friedman Aligned	1.07413E-10	3.96600E-10	3.96600E-10	3.96600E-10
PSO	Quade	2.95239E-03	2.95642E-03	2.95642E-03	2.95239E-03
TLBO	Friedman	2.48488E-02	6.31994E-02	6.31994E-02	6.18773E-02
TLBO	Friedman Aligned	1.59818E-06	4.05692E-06	4.05692E-06	4.05691E-06
TLBO	Quade	4.31217E-01	1.0	9.40692E-01	7.61251E-01
EBLSHADE	Friedman	6.28359E-01	1.0	7.46914E-01	8.39165E-01
EBLSHADE	Friedman Aligned	1.22462E-01	2.27198E-01	2.27198E-01	2.14293E-01
EBLSHADE	Quade	7.82837E-01	1.0	9.40692E-01	9.40351E-01
STLBO	Friedman	7.46914E-01	1.0	7.46914E-01	8.39165E-01
STLBO	Friedman Aligned	9.97806E-01	9.97806E-01	9.97806E-01	9.97806E-01
STLBO	Quade	9.40692E-01	1.0	9.40692E-01	9.40692E-01

**Table S77.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	7.80942E-03	7.83771E-03	7.83771E-03	7.80942E-03
PSO	Friedman Aligned	2.30926E-13	2.30926E-13	2.30926E-13	2.30926E-13
PSO	Quade	9.93803E-01	1.0	1.0	9.93803E-01
CWOA	Friedman	2.45863E-02	4.58695E-02	4.58695E-02	4.49174E-02
CWOA	Friedman Aligned	6.34585E-04	1.61126E-03	1.61126E-03	1.61008E-03
CWOA	Quade	9.93803E-01	1.0	1.0	9.99812E-01
WW	Friedman	3.91395E-02	1.00885E-01	1.00885E-01	9.63840E-02
WW	Friedman Aligned	5.71982E-01	1.0	1.0	9.26542E-01
WW	Quade	9.93803E-01	1.0	1.0	9.99958E-01
MABC	Friedman	5.36610E-02	1.68274E-01	1.68274E-01	1.56087E-01
MABC	Friedman Aligned	1.94364E-05	3.58829E-05	3.58829E-05	3.58823E-05
MABC	Quade	9.93803E-01	1.0	1.0	9.99958E-01
NNA	Friedman	1.31625E-01	4.75511E-01	4.75511E-01	3.86475E-01
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	9.97994E-01	1.0	1.0	1.0
GOTLBO	Friedman	2.26749E-01	8.95302E-01	8.95302E-01	6.13059E-01
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	9.97994E-01	1.0	1.0	1.0
ISCA	Friedman	4.01459E-01	1.0	1.0	8.55518E-01
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0

**Table S77 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S78.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $R_{p^2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.90021E-01	1.0	1.0	9.90021E-01
PSO	Friedman Aligned	1.47252E-02	1.48262E-02	1.48262E-02	1.47252E-02
PSO	Quade	9.99998E-01	1.0	1.0	9.99998E-01
CWOA	Friedman	9.98002E-01	1.0	1.0	9.99990E-01
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	9.99533E-01	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S78** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0

**Table S79.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	4.24327E-13	4.24327E-13	4.24327E-13	4.24327E-13
CWOA	Friedman Aligned	1.58213E-08	5.84171E-08	5.84171E-08	5.84171E-08
CWOA	Quade	8.27070E-02	1.58322E-01	1.58322E-01	1.47324E-01
PSO	Friedman	5.47007E-13	1.00986E-12	1.00986E-12	1.00986E-12
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	6.29272E-02	6.48321E-02	6.48321E-02	6.29272E-02
WW	Friedman	1.17580E-12	2.98472E-12	2.98472E-12	2.98472E-12
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	8.27070E-02	2.15423E-01	2.15423E-01	1.95696E-01
MABC	Friedman	4.19564E-12	1.29097E-11	1.29097E-11	1.29097E-11
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	8.27070E-02	2.09263E-01	2.09263E-01	1.90452E-01
NNA	Friedman	7.84642E-11	2.71607E-10	2.71607E-10	2.71607E-10
NNA	Friedman Aligned	2.47028E-10	9.12102E-10	9.12102E-10	9.12102E-10
NNA	Quade	1.31675E-01	4.75701E-01	4.49624E-01	3.86597E-01
GOTLBO	Friedman	6.36465E-10	2.35003E-09	2.35003E-09	2.35003E-09
GOTLBO	Friedman Aligned	2.11298E-13	7.31415E-13	7.31415E-13	7.31415E-13
GOTLBO	Quade	1.31675E-01	4.75701E-01	4.49624E-01	3.86597E-01
ISCA	Friedman	7.32203E-09	2.75984E-08	2.75984E-08	2.75984E-08
ISCA	Friedman Aligned	<1E-13	2.62013E-13	2.62013E-13	2.62013E-13
ISCA	Quade	1.31675E-01	4.80357E-01	4.66941E-01	3.92032E-01
NDE	Friedman	3.81094E-06	1.40712E-05	1.40712E-05	1.40711E-05
NDE	Friedman Aligned	3.64961E-10	1.37562E-09	1.37562E-09	1.37562E-09
NDE	Quade	1.31675E-01	4.80357E-01	4.66941E-01	3.92032E-01

**Table S79** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	1.63384E-04	5.65573E-04	5.65573E-04	5.65445E-04
IJAYA	Friedman Aligned	3.87465E-07	1.34123E-06	1.34123E-06	1.34123E-06
IJAYA	Quade	3.02189E-01	1.0	1.0	7.12198E-01
DE	Friedman	6.56389E-04	2.01981E-03	2.01981E-03	2.01828E-03
DE	Friedman Aligned	2.66423E-06	8.19762E-06	8.19762E-06	8.19760E-06
DE	Quade	3.81323E-01	1.0	1.0	7.71781E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S80.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	5.86488E-01	8.53743E-01	8.53743E-01	5.86488E-01
PSO	Friedman Aligned	8.81758E-10	8.81758E-10	8.81758E-10	8.81758E-10
PSO	Quade	9.97484E-01	1.0	1.0	9.97484E-01
CWOA	Friedman	7.51157E-01	1.0	1.0	9.23302E-01
CWOA	Friedman Aligned	1.22647E-06	3.11335E-06	3.11335E-06	3.11335E-06
CWOA	Quade	9.97484E-01	1.0	1.0	9.99959E-01
WW	Friedman	7.99268E-01	1.0	1.0	9.83028E-01
WW	Friedman Aligned	3.57471E-02	1.11380E-01	1.11380E-01	1.05960E-01
WW	Quade	9.97484E-01	1.0	1.0	9.99994E-01
MABC	Friedman	8.32806E-01	1.0	1.0	9.95927E-01
MABC	Friedman Aligned	1.26421E-08	2.33393E-08	2.33393E-08	2.33393E-08
MABC	Quade	9.97484E-01	1.0	1.0	9.99994E-01
NNA	Friedman	9.66409E-01	1.0	1.0	9.99992E-01
NNA	Friedman Aligned	4.19070E-01	1.0	1.0	8.65391E-01
NNA	Quade	9.99955E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S80** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	4.05106E-01	1.0	1.0	8.34341E-01
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S81.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
ISCA	Friedman	1.84741E-13	1.84741E-13	1.84741E-13	1.84741E-13
ISCA	Friedman Aligned	6.16534E-09	2.13416E-08	2.13416E-08	2.13416E-08
ISCA	Quade	1.65864E-02	6.14388E-02	6.14388E-02	5.98873E-02
GOTLBO	Friedman	1.50679E-12	2.78177E-12	2.78177E-12	2.78177E-12
GOTLBO	Friedman Aligned	7.42973E-09	2.28607E-08	2.28607E-08	2.28607E-08
GOTLBO	Quade	1.58830E-02	5.52505E-02	5.32410E-02	5.39130E-02
NNA	Friedman	9.56997E-12	2.42930E-11	2.42930E-11	2.42930E-11
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.58830E-02	5.52505E-02	5.32410E-02	5.39130E-02
NDE	Friedman	7.10301E-11	2.18554E-10	2.18554E-10	2.18554E-10
NDE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NDE	Quade	1.60291E-02	6.06427E-02	6.06427E-02	5.90891E-02
MABC	Friedman	7.53190E-11	2.60719E-10	2.60719E-10	2.60719E-10
MABC	Friedman Aligned	2.94091E-11	1.01801E-10	1.01801E-10	1.01801E-10
MABC	Quade	7.07439E-03	1.80071E-02	1.80071E-02	1.78605E-02
WW	Friedman	1.86658E-10	6.89200E-10	6.89200E-10	6.89200E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	7.07439E-03	1.91887E-02	1.91887E-02	1.90239E-02
CWOA	Friedman	6.11462E-10	2.30474E-09	2.30474E-09	2.30474E-09
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	6.66498E-03	1.23394E-02	1.23394E-02	1.22699E-02
PSO	Friedman	4.89640E-09	1.80790E-08	1.80790E-08	1.80790E-08
PSO	Friedman Aligned	1.07310E-10	3.96220E-10	3.96220E-10	3.96220E-10
PSO	Quade	3.94226E-03	3.94945E-03	3.94945E-03	3.94226E-03

**Table S81** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	7.58306E-09	2.62490E-08	2.62490E-08	2.62490E-08
IJAYA	Friedman Aligned	2.61112E-09	9.64106E-09	9.64106E-09	9.64106E-09
IJAYA	Quade	6.06906E-02	2.12098E-01	2.12098E-01	1.94851E-01
DE	Friedman	6.24243E-08	1.92075E-07	1.92075E-07	1.92075E-07
DE	Friedman Aligned	5.59014E-10	2.10705E-09	2.10705E-09	2.10705E-09
DE	Quade	8.80902E-02	2.73906E-01	2.73906E-01	2.47035E-01
TLBO	Friedman	5.55943E-02	1.41741E-01	1.41741E-01	1.35150E-01
TLBO	Friedman Aligned	1.62041E-06	4.11334E-06	4.11334E-06	4.11334E-06
TLBO	Quade	4.76082E-01	1.0	1.0	8.06197E-01
EBLSHADE	Friedman	8.61718E-01	1.0	1.0	9.74075E-01
EBLSHADE	Friedman Aligned	1.23136E-01	2.28456E-01	2.28456E-01	2.15408E-01
EBLSHADE	Quade	8.37323E-01	1.0	1.0	9.65006E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S82.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S82 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S83.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $R_{p^2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	2.31344E-04	2.31368E-04	2.31368E-04	2.31344E-04
PSO	Friedman Aligned	6.11085E-09	1.55122E-08	1.55122E-08	1.55122E-08
PSO	Quade	7.91155E-01	1.0	1.0	7.91155E-01
CWOA	Friedman	1.13512E-03	2.09662E-03	2.09662E-03	2.09461E-03
CWOA	Friedman Aligned	9.81437E-13	9.81437E-13	9.81437E-13	9.81437E-13
CWOA	Quade	7.91155E-01	1.0	1.0	9.40998E-01
WW	Friedman	2.28574E-03	5.80737E-03	5.80737E-03	5.79207E-03
WW	Friedman Aligned	1.00298E-07	3.08611E-07	3.08611E-07	3.08611E-07
WW	Quade	7.91155E-01	1.0	1.0	9.65039E-01
MABC	Friedman	3.73238E-03	1.14991E-02	1.14991E-02	1.14398E-02
MABC	Friedman Aligned	1.20086E-10	2.21697E-10	2.21697E-10	2.21697E-10
MABC	Quade	7.91155E-01	1.0	1.0	9.65039E-01
NNA	Friedman	1.33622E-02	4.64453E-02	4.64453E-02	4.54980E-02
NNA	Friedman Aligned	5.19667E-05	1.91880E-04	1.91880E-04	1.91864E-04
NNA	Quade	8.14745E-01	1.0	1.0	9.97080E-01
GOTLBO	Friedman	3.06760E-02	1.14216E-01	1.14216E-01	1.08668E-01
GOTLBO	Friedman Aligned	4.97230E-03	1.87633E-02	1.87633E-02	1.86131E-02
GOTLBO	Quade	8.14745E-01	1.0	1.0	9.97080E-01
ISCA	Friedman	7.68884E-02	2.95155E-01	2.95155E-01	2.60335E-01
ISCA	Friedman Aligned	7.23856E-03	2.67643E-02	2.67643E-02	2.64676E-02
ISCA	Quade	8.14745E-01	1.0	1.0	9.97080E-01
NDE	Friedman	5.51498E-01	1.0	1.0	9.48214E-01
NDE	Friedman Aligned	3.71045E-05	1.28440E-04	1.28440E-04	1.28433E-04
NDE	Quade	8.14745E-01	1.0	1.0	9.97080E-01

**Table S83 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S84.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	2.69676E-01	3.10499E-01	3.10499E-01	2.69676E-01
PSO	Friedman Aligned	1.90081E-09	1.90081E-09	1.90081E-09	1.90081E-09
PSO	Quade	9.89623E-01	1.0	1.0	9.89623E-01
CWOA	Friedman	4.39552E-01	1.0	1.0	6.56634E-01
CWOA	Friedman Aligned	5.21440E-07	1.32366E-06	1.32366E-06	1.32366E-06
CWOA	Quade	9.89623E-01	1.0	1.0	9.99557E-01
WW	Friedman	5.09275E-01	1.0	1.0	8.35864E-01
WW	Friedman Aligned	2.25658E-02	6.99826E-02	6.99826E-02	6.78193E-02
WW	Quade	9.89623E-01	1.0	1.0	9.99883E-01
MABC	Friedman	5.59198E-01	1.0	1.0	9.19580E-01
MABC	Friedman Aligned	4.73291E-09	8.73769E-09	8.73769E-09	8.73769E-09
MABC	Quade	9.89623E-01	1.0	1.0	9.99883E-01
NNA	Friedman	7.82941E-01	1.0	1.0	9.94947E-01
NNA	Friedman Aligned	3.27655E-01	1.0	1.0	7.69104E-01
NNA	Quade	9.94298E-01	1.0	1.0	1.0
GOTLBO	Friedman	9.12830E-01	1.0	1.0	9.99878E-01
GOTLBO	Friedman Aligned	9.78655E-01	1.0	1.0	9.99999E-01
GOTLBO	Quade	9.94298E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S84** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	3.13388E-01	1.0	1.0	7.27874E-01
NDE	Quade	9.96741E-01	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S85.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	8.48601E-01	1.0	1.0	8.48601E-01
PSO	Friedman Aligned	4.90719E-13	4.90719E-13	4.90719E-13	4.90719E-13
PSO	Quade	9.98135E-01	1.0	1.0	9.98135E-01
CWOA	Friedman	9.32174E-01	1.0	1.0	9.93041E-01
CWOA	Friedman Aligned	3.95822E-04	1.00493E-03	1.00493E-03	1.00447E-03
CWOA	Quade	9.98135E-01	1.0	1.0	9.99976E-01
WW	Friedman	9.51791E-01	1.0	1.0	9.99546E-01
WW	Friedman Aligned	4.91869E-01	1.0	1.0	8.75460E-01
WW	Quade	9.98135E-01	1.0	1.0	9.99997E-01
MABC	Friedman	9.66929E-01	1.0	1.0	9.99972E-01
MABC	Friedman Aligned	1.10045E-05	2.03160E-05	2.03160E-05	2.03159E-05
MABC	Quade	9.98135E-01	1.0	1.0	9.99997E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	9.97980E-01	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S85** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S86.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.99991E-01	1.0	1.0	9.99991E-01
PSO	Friedman Aligned	4.75831E-04	4.75935E-04	4.75935E-04	4.75831E-04
PSO	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	9.56126E-01	1.0	1.0	9.96886E-01
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S86** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S87.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $R_{p2}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.98940E-01	1.0	1.0	9.98940E-01
PSO	Friedman Aligned	2.50197E-10	2.50197E-10	2.50197E-10	2.50197E-10
PSO	Quade	9.99995E-01	1.0	1.0	9.99995E-01
CWOA	Friedman	9.99937E-01	1.0	1.0	1.0
CWOA	Friedman Aligned	4.02222E-02	1.03720E-01	1.03720E-01	9.89662E-02
CWOA	Quade	9.99997E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	3.37036E-03	6.23109E-03	6.23109E-03	6.21332E-03
MABC	Quade	9.99999E-01	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S87** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0

**Table S88.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.65316E-06	1.65316E-06	1.65316E-06	1.65316E-06
PSO	Friedman Aligned	1.53731E-10	5.67622E-10	5.67622E-10	5.67622E-10
PSO	Quade	3.88398E-01	4.82491E-01	4.82491E-01	3.88398E-01
GOTLBO	Friedman	8.93210E-06	1.64901E-05	1.64901E-05	1.64900E-05
GOTLBO	Friedman Aligned	4.73962E-11	1.45834E-10	1.45834E-10	1.45834E-10
GOTLBO	Quade	4.90459E-01	1.0	1.0	7.11990E-01
CWOA	Friedman	1.88793E-04	4.79278E-04	4.79278E-04	4.79174E-04
CWOA	Friedman Aligned	7.33780E-11	2.54001E-10	2.54001E-10	2.54001E-10
CWOA	Quade	4.90459E-01	1.0	1.0	7.11990E-01
NNA	Friedman	2.35379E-04	7.24303E-04	7.24303E-04	7.24067E-04
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	4.90459E-01	1.0	1.0	8.02179E-01
ISCA	Friedman	2.53779E-04	8.78536E-04	8.78536E-04	8.78193E-04
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	4.90459E-01	1.0	1.0	8.02179E-01
WW	Friedman	2.94224E-03	1.08723E-02	1.08723E-02	1.08207E-02
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	4.90459E-01	1.0	1.0	8.86478E-01
MABC	Friedman	7.26555E-02	2.78617E-01	2.78617E-01	2.47469E-01
MABC	Friedman Aligned	6.49287E-08	2.44731E-07	2.44731E-07	2.44731E-07
MABC	Quade	7.38143E-01	1.0	1.0	9.93595E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S88** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S89.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Friedman Aligned	1.34914E-10	4.67010E-10	4.67010E-10	4.67010E-10
GOTLBO	Quade	2.01733E-03	3.72749E-03	3.62027E-03	3.72113E-03
MABC	Friedman	5.02265E-13	9.27258E-13	9.27258E-13	9.27258E-13
MABC	Friedman Aligned	4.27647E-12	7.89502E-12	7.89502E-12	7.89502E-12
MABC	Quade	1.69013E-02	6.39553E-02	6.39553E-02	6.22288E-02
WW	Friedman	3.31974E-10	8.42703E-10	8.42703E-10	8.42703E-10
WW	Friedman Aligned	5.25791E-11	1.33470E-10	1.33470E-10	1.33470E-10
WW	Quade	3.73309E-03	1.37976E-02	1.37976E-02	1.37146E-02
PSO	Friedman	5.31136E-10	1.63426E-09	1.63426E-09	1.63426E-09
PSO	Friedman Aligned	2.13919E-10	8.06309E-10	8.06309E-10	8.06309E-10
PSO	Quade	6.98330E-04	6.98555E-04	6.98555E-04	6.98330E-04
DE	Friedman	3.19170E-09	1.10482E-08	1.10482E-08	1.10482E-08
DE	Friedman Aligned	5.47403E-03	2.02331E-02	2.02331E-02	2.00633E-02
DE	Quade	8.10275E-02	3.04024E-01	3.04024E-01	2.68016E-01
ISCA	Friedman	3.57233E-09	1.31901E-08	1.31901E-08	1.31901E-08
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.22682E-03	6.90912E-03	6.90912E-03	6.88795E-03
NNA	Friedman	4.05858E-09	1.52977E-08	1.52977E-08	1.52977E-08
NNA	Friedman Aligned	5.32343E-11	1.63798E-10	1.63798E-10	1.63798E-10
NNA	Quade	2.22682E-03	6.85703E-03	6.85703E-03	6.83591E-03
CWOA	Friedman	5.60543E-09	2.06970E-08	2.06970E-08	2.06970E-08
CWOA	Friedman Aligned	1.69719E-10	6.26656E-10	6.26656E-10	6.26656E-10
CWOA	Quade	2.01733E-03	3.72749E-03	3.62027E-03	3.72113E-03

**Table S89** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	3.52483E-08	1.22013E-07	1.22013E-07	1.22013E-07
IJAYA	Friedman Aligned	1.53493E-02	5.32586E-02	5.32586E-02	5.21360E-02
IJAYA	Quade	1.15779E-01	4.08298E-01	4.08298E-01	3.46842E-01
NDE	Friedman	3.42808E-06	1.05479E-05	1.05479E-05	1.05479E-05
NDE	Friedman Aligned	1.43525E-01	4.49397E-01	4.49397E-01	3.79176E-01
NDE	Quade	1.41545E-01	4.43086E-01	4.43086E-01	3.74750E-01
TLBO	Friedman	8.34811E-02	2.13320E-01	2.13320E-01	1.98511E-01
TLBO	Friedman Aligned	7.63709E-01	1.0	1.0	9.74324E-01
TLBO	Quade	5.70319E-01	1.0	9.87681E-01	8.82846E-01
EBLSHADE	Friedman	8.44298E-01	1.0	8.29657E-01	9.67726E-01
EBLSHADE	Friedman Aligned	8.82085E-01	1.0	1.0	9.80682E-01
EBLSHADE	Quade	9.74027E-01	1.0	9.87681E-01	9.98817E-01
STLBO	Friedman	8.44298E-01	1.0	8.29657E-01	9.67726E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	9.87681E-01	1.0	9.87681E-01	9.98817E-01

**Table S90.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Friedman Aligned	1.26962E-10	4.39482E-10	4.39482E-10	4.39482E-10
GOTLBO	Quade	2.37937E-03	4.39710E-03	4.26800E-03	4.38825E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	2.13792E-10	8.05830E-10	8.05830E-10	8.05830E-10
PSO	Quade	8.38441E-04	8.38765E-04	8.38765E-04	8.38441E-04
MABC	Friedman	<1E-13	1.83187E-13	1.83187E-13	1.83187E-13
MABC	Friedman Aligned	1.31339E-12	2.42473E-12	2.42473E-12	2.42473E-12
MABC	Quade	1.91431E-02	7.24764E-02	7.24764E-02	7.02637E-02
WW	Friedman	7.79167E-11	2.39744E-10	2.39744E-10	2.39744E-10
WW	Friedman Aligned	4.75574E-11	1.20723E-10	1.20723E-10	1.20723E-10
WW	Quade	4.31959E-03	1.59678E-02	1.59678E-02	1.58567E-02
ISCA	Friedman	1.68524E-09	5.83353E-09	5.83353E-09	5.83353E-09
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.60407E-03	8.07052E-03	8.07052E-03	8.04163E-03
NNA	Friedman	1.89918E-09	7.01236E-09	7.01236E-09	7.01236E-09
NNA	Friedman Aligned	4.85501E-11	1.49385E-10	1.49385E-10	1.49385E-10
NNA	Quade	2.60407E-03	8.01975E-03	8.01975E-03	7.99087E-03
CWOA	Friedman	2.65354E-09	1.00018E-08	1.00018E-08	1.00018E-08
CWOA	Friedman Aligned	1.61977E-10	5.98069E-10	5.98069E-10	5.98069E-10
CWOA	Quade	2.37937E-03	4.39710E-03	4.26800E-03	4.38825E-03
DE	Friedman	7.94319E-09	2.93287E-08	2.93287E-08	2.93287E-08
DE	Friedman Aligned	9.47613E-03	3.50528E-02	3.50528E-02	3.45449E-02
DE	Quade	8.93754E-02	3.35921E-01	3.35921E-01	2.92269E-01

**Table S90** (*continued*)

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	1.23860E-07	4.28745E-07	4.28745E-07	4.28745E-07
IJAYA	Friedman Aligned	2.49893E-02	8.68378E-02	8.68378E-02	8.38734E-02
IJAYA	Quade	1.26669E-01	4.47523E-01	4.47523E-01	3.74268E-01
NDE	Friedman	1.01613E-05	3.12657E-05	3.12657E-05	3.12654E-05
NDE	Friedman Aligned	2.00048E-01	6.31055E-01	6.31055E-01	4.96806E-01
NDE	Quade	1.54053E-01	4.83018E-01	4.83018E-01	4.02358E-01
TLBO	Friedman	1.34018E-01	3.43902E-01	3.43902E-01	3.05986E-01
TLBO	Friedman Aligned	8.84270E-01	1.0	1.0	9.95806E-01
TLBO	Quade	5.99326E-01	1.0	1.0	9.01893E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S91.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.61989E-10	3.61989E-10	3.61989E-10	3.61989E-10
PSO	Friedman Aligned	1.81743E-10	6.85032E-10	6.85032E-10	6.85032E-10
PSO	Quade	1.73209E-01	1.88818E-01	1.88818E-01	1.73209E-01
GOTLBO	Friedman	3.50712E-09	6.47468E-09	6.47468E-09	6.47468E-09
GOTLBO	Friedman Aligned	7.27926E-11	2.51974E-10	2.51974E-10	2.51974E-10
GOTLBO	Quade	2.54954E-01	5.31222E-01	5.04676E-01	4.19195E-01
CWOA	Friedman	1.94580E-07	4.93934E-07	4.93934E-07	4.93934E-07
CWOA	Friedman Aligned	1.03934E-10	3.83757E-10	3.83757E-10	3.83757E-10
CWOA	Quade	2.54954E-01	5.31222E-01	5.04676E-01	4.19195E-01
NNA	Friedman	2.78684E-07	8.57490E-07	8.57490E-07	8.57490E-07
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	2.54954E-01	7.17822E-01	6.91359E-01	5.25213E-01
ISCA	Friedman	3.30631E-07	1.14449E-06	1.14449E-06	1.14449E-06
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.54954E-01	7.17822E-01	6.91359E-01	5.25213E-01
WW	Friedman	9.61871E-06	3.55153E-05	3.55153E-05	3.55148E-05
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	2.54954E-01	9.90015E-01	9.90015E-01	6.52450E-01
MABC	Friedman	1.07108E-03	4.03815E-03	4.03815E-03	4.03117E-03
MABC	Friedman Aligned	2.42220E-11	7.45293E-11	7.45293E-11	7.45293E-11
MABC	Quade	4.99948E-01	1.0	1.0	9.26630E-01
DE	Friedman	2.54875E-01	9.93629E-01	9.93629E-01	6.62534E-01
DE	Friedman Aligned	2.74197E-01	1.0	1.0	6.93733E-01
DE	Quade	8.73049E-01	1.0	1.0	9.99510E-01

**Table S91 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	4.94513E-01	1.0	1.0	9.05728E-01
IJAYA	Friedman Aligned	4.44005E-01	1.0	1.0	8.68915E-01
IJAYA	Quade	9.55250E-01	1.0	1.0	9.99979E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S92.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.61343E-02	1.62557E-02	1.62557E-02	1.61343E-02
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	8.83074E-01	1.0	1.0	8.83074E-01
GOTLBO	Friedman	3.55630E-02	6.66648E-02	6.66648E-02	6.46651E-02
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	9.16596E-01	1.0	1.0	9.89806E-01
CWOA	Friedman	1.70290E-01	4.63814E-01	4.63814E-01	3.77416E-01
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	9.16596E-01	1.0	1.0	9.89806E-01
ISCA	Friedman	1.70313E-01	5.91053E-01	5.91053E-01	4.57385E-01
ISCA	Friedman Aligned	6.75460E-13	2.49401E-12	2.49401E-12	2.49401E-12
ISCA	Quade	9.16596E-01	1.0	1.0	9.96412E-01
NNA	Friedman	1.70313E-01	5.58293E-01	5.58293E-01	4.37004E-01
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	9.16596E-01	1.0	1.0	9.96412E-01
WW	Friedman	4.65704E-01	1.0	1.0	9.01170E-01
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	9.16596E-01	1.0	1.0	9.99320E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S92 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S93.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
ISCA	Friedman	1.11422E-12	1.19904E-12	1.19904E-12	1.19904E-12
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.05739E-02	6.19145E-02	6.12106E-02	6.02176E-02
NNA	Friedman	1.11422E-12	1.82943E-12	1.82943E-12	1.82943E-12
NNA	Friedman Aligned	4.34834E-11	1.33795E-10	1.33795E-10	1.33795E-10
NNA	Quade	2.05739E-02	6.19145E-02	6.12106E-02	6.02176E-02
WW	Friedman	1.11422E-12	1.11422E-12	1.11422E-12	1.11422E-12
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	2.85496E-02	1.06236E-01	1.06236E-01	1.01427E-01
CWOA	Friedman	1.22824E-12	3.77920E-12	3.77920E-12	3.77920E-12
CWOA	Friedman Aligned	1.53052E-10	5.65116E-10	5.65116E-10	5.65116E-10
CWOA	Quade	2.05739E-02	3.83174E-02	3.68718E-02	3.76516E-02
GOTLBO	Friedman	8.01828E-11	2.77556E-10	2.77556E-10	2.77556E-10
GOTLBO	Friedman Aligned	1.18047E-10	4.08623E-10	4.08623E-10	4.08623E-10
GOTLBO	Quade	2.05739E-02	3.83174E-02	3.68718E-02	3.76516E-02
MABC	Friedman	5.45986E-10	2.01595E-09	1.96197E-09	2.01595E-09
MABC	Friedman Aligned	2.04947E-13	5.20251E-13	5.20251E-13	5.20251E-13
MABC	Quade	9.31341E-02	3.58952E-01	3.58952E-01	3.08217E-01
PSO	Friedman	5.45986E-10	2.01595E-09	1.96197E-09	2.01595E-09
PSO	Friedman Aligned	2.12199E-10	7.99827E-10	7.99827E-10	7.99827E-10
PSO	Quade	9.34861E-03	9.38919E-03	9.38919E-03	9.34861E-03
DE	Friedman	3.05182E-05	1.12683E-04	1.12683E-04	1.12678E-04
DE	Friedman Aligned	1.72967E-02	6.40787E-02	6.40787E-02	6.23920E-02
DE	Quade	2.96784E-01	1.0	1.0	7.27477E-01

**Table S93 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	2.29338E-04	7.93891E-04	7.93891E-04	7.93639E-04
IJAYA	Friedman Aligned	4.24809E-02	1.48029E-01	1.48029E-01	1.39519E-01
IJAYA	Quade	3.76114E-01	1.0	1.0	8.04679E-01
NDE	Friedman	4.96635E-03	1.52898E-02	1.52898E-02	1.52024E-02
NDE	Friedman Aligned	2.83997E-01	9.06459E-01	9.06459E-01	6.42247E-01
NDE	Quade	4.27401E-01	1.0	1.0	8.20144E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S94.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.99999E-01	1.0	1.0	9.99999E-01
PSO	Friedman Aligned	1.10006E-03	1.10062E-03	1.10062E-03	1.10006E-03
PSO	Quade	9.99999E-01	1.0	1.0	9.99999E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S94 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	7.09370E-01	1.0	1.0	8.97849E-01
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S95.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Friedman Aligned	1.34914E-10	4.67010E-10	4.67010E-10	4.67010E-10
GOTLBO	Quade	2.14059E-03	3.95545E-03	3.84083E-03	3.94829E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	2.13919E-10	8.06309E-10	8.06309E-10	8.06309E-10
PSO	Quade	7.45736E-04	7.45992E-04	7.45992E-04	7.45736E-04
MABC	Friedman	<1E-13	1.95399E-13	1.95399E-13	1.95399E-13
MABC	Friedman Aligned	4.27647E-12	7.89502E-12	7.89502E-12	7.89502E-12
MABC	Quade	1.76757E-02	6.68978E-02	6.68978E-02	6.50101E-02
WW	Friedman	8.30101E-11	2.55416E-10	2.55416E-10	2.55416E-10
WW	Friedman Aligned	5.25791E-11	1.33470E-10	1.33470E-10	1.33470E-10
WW	Quade	3.93413E-03	1.45414E-02	1.45414E-02	1.44493E-02
ISCA	Friedman	1.77301E-09	6.13733E-09	6.13733E-09	6.13733E-09
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	2.35565E-03	7.30587E-03	7.30587E-03	7.28220E-03
NNA	Friedman	1.99588E-09	7.36942E-09	7.36942E-09	7.36942E-09
NNA	Friedman Aligned	5.32343E-11	1.63798E-10	1.63798E-10	1.63798E-10
NNA	Quade	2.35565E-03	7.25406E-03	7.25406E-03	7.23042E-03
CWOA	Friedman	2.78373E-09	1.04925E-08	1.04925E-08	1.04925E-08
CWOA	Friedman Aligned	1.69719E-10	6.26656E-10	6.26656E-10	6.26656E-10
CWOA	Quade	2.14059E-03	3.95545E-03	3.84083E-03	3.94829E-03
DE	Friedman	7.39494E-09	2.73044E-08	2.73044E-08	2.73044E-08
DE	Friedman Aligned	5.47403E-03	2.02331E-02	2.02331E-02	2.00633E-02
DE	Quade	8.39403E-02	3.15141E-01	3.15141E-01	2.76546E-01

**Table S95 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	1.15930E-07	4.01296E-07	4.01296E-07	4.01296E-07
IJAYA	Friedman Aligned	1.53493E-02	5.32586E-02	5.32586E-02	5.21360E-02
IJAYA	Quade	1.19590E-01	4.22010E-01	4.22010E-01	3.56536E-01
NDE	Friedman	9.60841E-06	2.95644E-05	2.95644E-05	2.95640E-05
NDE	Friedman Aligned	1.43525E-01	4.49397E-01	4.49397E-01	3.79176E-01
NDE	Quade	1.45931E-01	4.57073E-01	4.57073E-01	3.84528E-01
TLBO	Friedman	1.30872E-01	3.35738E-01	3.35738E-01	2.99567E-01
TLBO	Friedman Aligned	7.63709E-01	1.0	1.0	9.74324E-01
TLBO	Quade	5.80649E-01	1.0	1.0	8.89865E-01
EBLSHADE	Friedman	9.93529E-01	1.0	1.0	9.99909E-01
EBLSHADE	Friedman Aligned	8.82085E-01	1.0	1.0	9.80682E-01
EBLSHADE	Quade	9.83928E-01	1.0	1.0	9.99512E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S96.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S96 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S97.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.73246E-08	9.73246E-08	9.73246E-08	9.73246E-08
PSO	Friedman Aligned	1.70370E-10	6.29058E-10	6.29058E-10	6.29058E-10
PSO	Quade	2.46974E-01	2.80583E-01	2.80583E-01	2.46974E-01
GOTLBO	Friedman	6.35961E-07	1.17408E-06	1.17408E-06	1.17408E-06
GOTLBO	Friedman Aligned	5.77172E-11	1.77591E-10	1.77591E-10	1.77591E-10
GOTLBO	Quade	3.41083E-01	7.45945E-01	7.07294E-01	5.37051E-01
CWOA	Friedman	1.92373E-05	4.88336E-05	4.88336E-05	4.88325E-05
CWOA	Friedman Aligned	8.61309E-11	2.98146E-10	2.98146E-10	2.98146E-10
CWOA	Quade	3.41083E-01	7.45945E-01	7.07294E-01	5.37051E-01
NNA	Friedman	2.54032E-05	7.81643E-05	7.81643E-05	7.81616E-05
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	3.41083E-01	9.81080E-01	9.41198E-01	6.43922E-01
ISCA	Friedman	2.83482E-05	9.81294E-05	9.81294E-05	9.81251E-05
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	3.41083E-01	9.81080E-01	9.41198E-01	6.43922E-01
WW	Friedman	4.57580E-04	1.68973E-03	1.68973E-03	1.68849E-03
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	3.41083E-01	1.0	1.0	7.60671E-01
MABC	Friedman	1.94748E-02	7.37379E-02	7.37379E-02	7.14482E-02
MABC	Friedman Aligned	7.15972E-09	2.69866E-08	2.69866E-08	2.69866E-08
MABC	Quade	5.96552E-01	1.0	1.0	9.67332E-01
DE	Friedman	7.88581E-01	1.0	1.0	9.96777E-01
DE	Friedman Aligned	8.62956E-01	1.0	1.0	9.99350E-01
DE	Quade	9.44493E-01	1.0	1.0	9.99977E-01

**Table S97 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S98.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $I_{\text{ph}}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.04976E-01	1.0	1.0	9.04976E-01
PSO	Friedman Aligned	1.47451E-09	2.72216E-09	2.72216E-09	2.72216E-09
PSO	Quade	9.99878E-01	1.0	1.0	9.99878E-01
GOTLBO	Friedman	9.39917E-01	1.0	1.0	9.94436E-01
GOTLBO	Friedman Aligned	1.04059E-07	2.64149E-07	2.64149E-07	2.64149E-07
GOTLBO	Quade	9.99979E-01	1.0	1.0	1.0
CWOA	Friedman	9.99718E-01	1.0	1.0	1.0
CWOA	Friedman Aligned	5.38809E-11	5.38809E-11	5.38809E-11	5.38809E-11
CWOA	Quade	9.99979E-01	1.0	1.0	1.0
NNA	Friedman	9.99909E-01	1.0	1.0	1.0
NNA	Friedman Aligned	1.31567E-02	4.06680E-02	4.06680E-02	3.99318E-02
NNA	Quade	9.99994E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S98 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	5.21317E-02	1.83435E-01	1.83435E-01	1.69170E-01
WW	Quade	1.0	1.0	1.0	1.0

**Table S99.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $I_{\text{ph}}$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	9.33915E-01	1.0	1.0	9.33915E-01
PSO	Friedman Aligned	4.34003E-10	4.34003E-10	4.34003E-10	4.34003E-10
PSO	Quade	9.99928E-01	1.0	1.0	9.99928E-01
GOTLBO	Friedman	9.59537E-01	1.0	1.0	9.97318E-01
GOTLBO	Friedman Aligned	2.86941E-02	7.36566E-02	7.36566E-02	7.12394E-02
GOTLBO	Quade	9.99991E-01	1.0	1.0	1.0
CWOA	Friedman	9.99963E-01	1.0	1.0	1.0
CWOA	Friedman Aligned	3.00592E-04	5.55010E-04	5.55010E-04	5.54869E-04
CWOA	Quade	9.99991E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0

**Table S99 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S100.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.67662E-01	1.0	1.0	9.67662E-01
PSO	Friedman Aligned	1.24911E-01	1.32747E-01	1.32747E-01	1.24911E-01
PSO	Quade	9.99999E-01	1.0	1.0	9.99999E-01
GOTLBO	Friedman	9.81485E-01	1.0	1.0	9.99367E-01
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S100 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S101.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $I_{ph}$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.92009E-01	4.88192E-01	4.88192E-01	3.92009E-01
PSO	Friedman Aligned	9.14469E-12	9.14469E-12	9.14469E-12	9.14469E-12
PSO	Quade	9.97302E-01	1.0	1.0	9.97302E-01
GOTLBO	Friedman	5.10410E-01	1.0	1.0	7.32463E-01
GOTLBO	Friedman Aligned	4.73013E-03	1.20291E-02	1.20291E-02	1.19636E-02
GOTLBO	Quade	9.98614E-01	1.0	1.0	9.99995E-01
ISCA	Friedman	8.70839E-01	1.0	1.0	9.97589E-01
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	9.98614E-01	1.0	1.0	1.0
NNA	Friedman	8.70839E-01	1.0	1.0	9.97192E-01
NNA	Friedman Aligned	9.40262E-01	1.0	1.0	9.99828E-01
NNA	Quade	9.98614E-01	1.0	1.0	1.0
CWOA	Friedman	8.70839E-01	1.0	1.0	9.94458E-01
CWOA	Friedman Aligned	2.40580E-05	4.44153E-05	4.44153E-05	4.44144E-05
CWOA	Quade	9.98614E-01	1.0	1.0	9.99995E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S101 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S102.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.12065E-07	1.12065E-07	1.12065E-07	1.12065E-07
PSO	Friedman Aligned	9.63011E-11	2.44457E-10	2.36238E-10	2.44457E-10
PSO	Quade	1.61148E-01	1.74539E-01	1.74539E-01	1.61148E-01
NNA	Friedman	1.32148E-02	2.45341E-02	2.45341E-02	2.42601E-02
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	8.03072E-01	1.0	1.0	9.50205E-01
ISCA	Friedman	2.56447E-02	6.57499E-02	6.57499E-02	6.38197E-02
ISCA	Friedman Aligned	1.65848E-09	6.12362E-09	6.12362E-09	6.12362E-09
ISCA	Quade	8.03072E-01	1.0	1.0	9.58241E-01
WW	Friedman	2.56658E-02	7.96836E-02	7.96836E-02	7.68862E-02
WW	Friedman Aligned	5.78214E-09	2.17942E-08	2.17942E-08	2.17942E-08
WW	Quade	8.03072E-01	1.0	1.0	9.56969E-01
CWOA	Friedman	7.51644E-02	2.66458E-01	2.66458E-01	2.36988E-01
CWOA	Friedman Aligned	9.81004E-12	1.81108E-11	1.81108E-11	1.81108E-11
CWOA	Quade	8.03072E-01	1.0	1.0	9.70509E-01
GOTLBO	Friedman	1.36860E-01	5.25381E-01	5.25381E-01	4.19245E-01
GOTLBO	Friedman Aligned	8.50149E-10	2.94282E-09	2.94282E-09	2.94282E-09
GOTLBO	Quade	8.03072E-01	1.0	1.0	9.95652E-01
IJAYA	Friedman	1.60075E-01	6.27579E-01	6.27579E-01	4.81863E-01
IJAYA	Friedman Aligned	9.63011E-11	2.44457E-10	2.36238E-10	2.44457E-10
IJAYA	Quade	8.03072E-01	1.0	1.0	9.95652E-01
MABC	Friedman	4.30602E-01	1.0	1.0	8.74997E-01
MABC	Friedman Aligned	2.44538E-03	9.03334E-03	9.03334E-03	8.99941E-03
MABC	Quade	8.68097E-01	1.0	1.0	9.99435E-01

**Table S102 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S103.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
IJAYA	Friedman	4.61853E-13	4.61853E-13	4.61853E-13	4.61853E-13
IJAYA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
IJAYA	Quade	1.77868E-02	6.59918E-02	5.94563E-02	6.41177E-02
GOTLBO	Friedman	6.49480E-13	1.19904E-12	1.19904E-12	1.19904E-12
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.77868E-02	6.59918E-02	5.94563E-02	6.41177E-02
MABC	Friedman	7.57246E-13	1.92224E-12	1.92224E-12	1.92224E-12
MABC	Friedman Aligned	1.47660E-10	4.54338E-10	4.54338E-10	4.54338E-10
MABC	Quade	3.24065E-02	1.20412E-01	1.20412E-01	1.14530E-01
CWOA	Friedman	3.15142E-12	9.69669E-12	9.69669E-12	9.69669E-12
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	9.53581E-03	2.92630E-02	2.92630E-02	2.88853E-02
WW	Friedman	4.24027E-11	1.46779E-10	1.46779E-10	1.46779E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	9.53581E-03	2.05775E-02	2.05775E-02	2.03861E-02
ISCA	Friedman	5.89440E-11	2.17639E-10	2.17639E-10	2.17639E-10
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	9.53581E-03	2.25189E-02	2.25189E-02	2.22920E-02
NNA	Friedman	2.68345E-10	1.01145E-09	1.01145E-09	1.01145E-09
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	9.53581E-03	1.76760E-02	1.76760E-02	1.75335E-02
DE	Friedman	4.09489E-10	1.51196E-09	1.51196E-09	1.51196E-09
DE	Friedman Aligned	8.23115E-11	2.96018E-10	2.84924E-10	2.96018E-10
DE	Quade	7.19727E-02	2.51985E-01	2.51985E-01	2.27835E-01

**Table S103 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	1.40866E-09	4.87613E-09	4.87613E-09	4.87613E-09
PSO	Friedman Aligned	8.01715E-11	2.96018E-10	2.84924E-10	2.96018E-10
PSO	Quade	1.23157E-04	1.23164E-04	1.23164E-04	1.23157E-04
NDE	Friedman	8.11697E-06	2.49753E-05	2.49753E-05	2.49751E-05
NDE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NDE	Quade	1.39601E-01	4.36892E-01	4.36892E-01	3.70384E-01
TLBO	Friedman	1.57702E-01	4.05499E-01	4.05499E-01	3.53159E-01
TLBO	Friedman Aligned	9.86791E-02	2.52471E-01	2.52471E-01	2.31820E-01
TLBO	Quade	6.59156E-01	1.0	1.0	9.34925E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S104.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
MABC	Friedman	4.24327E-13	4.24327E-13	4.24327E-13	4.24327E-13
MABC	Friedman Aligned	1.30897E-10	4.93382E-10	4.67194E-10	4.93382E-10
MABC	Quade	2.61883E-02	9.71881E-02	9.71881E-02	9.33364E-02
IJAYA	Friedman	1.17484E-12	2.16893E-12	2.16893E-12	2.16893E-12
IJAYA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
IJAYA	Quade	1.40454E-02	5.20574E-02	4.69358E-02	5.08871E-02
GOTLBO	Friedman	2.08219E-12	5.28555E-12	5.28555E-12	5.28555E-12
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.40454E-02	5.20574E-02	4.69358E-02	5.08871E-02
CWOA	Friedman	1.27601E-11	3.92619E-11	3.92619E-11	3.92619E-11
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	7.23714E-03	2.25799E-02	2.25799E-02	2.23546E-02
DE	Friedman	1.39301E-10	4.82194E-10	4.57383E-10	4.82194E-10
DE	Friedman Aligned	1.37839E-10	4.93382E-10	4.77135E-10	4.93382E-10
DE	Quade	5.97508E-02	2.08782E-01	2.08782E-01	1.92059E-01
WW	Friedman	1.39301E-10	4.82194E-10	4.57383E-10	4.82194E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	7.23714E-03	1.56830E-02	1.56830E-02	1.55717E-02
ISCA	Friedman	1.59993E-10	6.03050E-10	6.03050E-10	6.03050E-10
ISCA	Friedman Aligned	2.51032E-06	7.72406E-06	7.72406E-06	7.72404E-06
ISCA	Quade	7.23714E-03	1.72329E-02	1.72329E-02	1.70999E-02
NNA	Friedman	6.61310E-10	2.44176E-09	2.44176E-09	2.44176E-09
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	7.23714E-03	1.34020E-02	1.34020E-02	1.33199E-02

**Table S104 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	2.30556E-09	7.98080E-09	7.98080E-09	7.98080E-09
PSO	Friedman Aligned	1.30897E-10	4.93382E-10	4.67194E-10	4.93382E-10
PSO	Quade	8.49909E-05	8.49943E-05	8.49943E-05	8.49909E-05
NDE	Friedman	2.70991E-06	8.33820E-06	8.33820E-06	8.33817E-06
NDE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NDE	Quade	1.18862E-01	3.71008E-01	3.71008E-01	3.22508E-01
TLBO	Friedman	9.99240E-02	2.55682E-01	2.55682E-01	2.34510E-01
TLBO	Friedman Aligned	2.97627E-04	7.55533E-04	7.55533E-04	7.55343E-04
TLBO	Quade	6.04542E-01	1.0	9.88447E-01	9.05102E-01
EBLSHADE	Friedman	8.44298E-01	1.0	9.33322E-01	9.67726E-01
EBLSHADE	Friedman Aligned	5.75004E-02	1.06394E-01	1.06394E-01	1.03564E-01
EBLSHADE	Quade	9.49745E-01	1.0	9.88447E-01	9.95999E-01
STLBO	Friedman	9.33322E-01	1.0	9.33322E-01	9.67726E-01
STLBO	Friedman Aligned	9.97074E-01	9.97074E-01	9.97074E-01	9.97074E-01
STLBO	Quade	9.88447E-01	1.0	9.88447E-01	9.95999E-01

**Table S105.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	5.48450E-13	5.48450E-13	5.48450E-13	5.48450E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	5.93630E-02	6.10542E-02	6.10542E-02	5.93630E-02
NNA	Friedman	6.21587E-06	1.14755E-05	1.14755E-05	1.14754E-05
NNA	Friedman Aligned	8.83864E-11	3.26350E-10	3.26350E-10	3.26350E-10
NNA	Quade	5.46368E-01	1.0	1.0	7.67608E-01
ISCA	Friedman	2.15654E-05	5.47435E-05	5.47435E-05	5.47421E-05
ISCA	Friedman Aligned	5.41510E-11	2.04108E-10	2.04108E-10	2.04108E-10
ISCA	Quade	5.46368E-01	1.0	1.0	7.94113E-01
WW	Friedman	2.54032E-05	7.81643E-05	7.81643E-05	7.81616E-05
WW	Friedman Aligned	2.52162E-11	9.31060E-11	9.31060E-11	9.31060E-11
WW	Quade	5.46368E-01	1.0	1.0	7.87852E-01
CWOA	Friedman	1.70294E-04	5.89510E-04	5.89510E-04	5.89355E-04
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	5.46368E-01	1.0	1.0	8.32107E-01
GOTLBO	Friedman	5.51957E-04	2.03830E-03	2.03830E-03	2.03648E-03
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	5.46368E-01	1.0	1.0	9.41246E-01
IJAYA	Friedman	8.19698E-04	3.09021E-03	3.09021E-03	3.08612E-03
IJAYA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
IJAYA	Quade	5.46368E-01	1.0	1.0	9.41246E-01
MABC	Friedman	6.69221E-03	2.47416E-02	2.47416E-02	2.44879E-02
MABC	Friedman Aligned	1.31135E-09	4.53928E-09	4.53928E-09	4.53928E-09
MABC	Quade	6.42995E-01	1.0	1.0	9.77698E-01

**Table S105 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	9.84763E-02	3.46279E-01	3.46279E-01	3.01524E-01
DE	Friedman Aligned	2.46722E-11	8.54037E-11	8.54037E-11	8.54037E-11
DE	Quade	8.43172E-01	1.0	1.0	9.98360E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S106.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.23303E-05	3.23308E-05	3.23308E-05	3.23303E-05
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	3.74066E-01	4.60169E-01	4.60169E-01	3.74066E-01
NNA	Friedman	2.44230E-01	5.05979E-01	5.05979E-01	4.03667E-01
NNA	Friedman Aligned	3.04347E-08	9.36452E-08	9.36452E-08	9.36452E-08
NNA	Quade	9.60869E-01	1.0	1.0	9.97479E-01
ISCA	Friedman	3.34378E-01	9.86196E-01	9.86196E-01	6.44147E-01
ISCA	Friedman Aligned	2.68086E-11	6.80527E-11	6.80527E-11	6.80527E-11
ISCA	Quade	9.60869E-01	1.0	1.0	9.98098E-01
WW	Friedman	3.34378E-01	1.0	1.0	6.85519E-01
WW	Friedman Aligned	2.27968E-11	4.20863E-11	4.20863E-11	4.20863E-11
WW	Quade	9.60869E-01	1.0	1.0	9.98033E-01
CWOA	Friedman	5.44864E-01	1.0	1.0	9.34440E-01
CWOA	Friedman Aligned	2.33931E-04	8.09818E-04	8.09818E-04	8.09527E-04
CWOA	Quade	9.60869E-01	1.0	1.0	9.99016E-01
GOTLBO	Friedman	7.04380E-01	1.0	1.0	9.88888E-01
GOTLBO	Friedman Aligned	3.35103E-03	1.26406E-02	1.26406E-02	1.25723E-02
GOTLBO	Quade	9.60869E-01	1.0	1.0	9.99985E-01
IJAYA	Friedman	7.42795E-01	1.0	1.0	9.94013E-01
IJAYA	Friedman Aligned	9.34352E-04	3.45078E-03	3.45078E-03	3.44558E-03
IJAYA	Quade	9.60869E-01	1.0	1.0	9.99985E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0

**Table S106 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S107.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	1.24342E-03	1.24413E-03	1.24413E-03	1.24342E-03
NNA	Friedman	1.15463E-13	2.13163E-13	2.13163E-13	2.13163E-13
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	5.08290E-02	9.59217E-02	9.59217E-02	9.18149E-02
ISCA	Friedman	1.69346E-13	4.29878E-13	4.29878E-13	4.29878E-13
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	5.08290E-02	1.14968E-01	1.14968E-01	1.09199E-01
WW	Friedman	2.55462E-13	7.86038E-13	7.86038E-13	7.86038E-13
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	5.08290E-02	1.07920E-01	1.07920E-01	1.02778E-01
CWOA	Friedman	6.62297E-12	2.29257E-11	2.29257E-11	2.29257E-11
CWOA	Friedman Aligned	1.32214E-10	4.88175E-10	4.88175E-10	4.88175E-10
CWOA	Quade	5.08290E-02	1.41499E-01	1.41499E-01	1.32919E-01
GOTLBO	Friedman	5.56590E-11	2.05510E-10	2.05510E-10	2.05510E-10
GOTLBO	Friedman Aligned	1.58709E-10	5.98211E-10	5.07874E-10	5.98211E-10
GOTLBO	Quade	7.32625E-02	2.76054E-01	2.47539E-01	2.44918E-01
IJAYA	Friedman	1.24403E-10	4.68905E-10	4.68905E-10	4.68905E-10
IJAYA	Friedman Aligned	1.58709E-10	5.98211E-10	5.07874E-10	5.98211E-10
IJAYA	Quade	7.32625E-02	2.76054E-01	2.47539E-01	2.44918E-01
MABC	Friedman	6.40678E-09	2.36558E-08	2.36558E-08	2.36558E-08
MABC	Friedman Aligned	1.58709E-10	5.98211E-10	5.07874E-10	5.98211E-10
MABC	Quade	1.14751E-01	4.33578E-01	4.33578E-01	3.62399E-01

**Table S107 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.86918E-06	6.47023E-06	6.47023E-06	6.47021E-06
DE	Friedman Aligned	7.73811E-11	2.67858E-10	2.67858E-10	2.67858E-10
DE	Quade	2.13275E-01	7.65059E-01	7.65059E-01	5.64100E-01
NDE	Friedman	3.24249E-03	9.98062E-03	9.98062E-03	9.94333E-03
NDE	Friedman Aligned	1.10920E-09	3.41294E-09	3.41294E-09	3.41294E-09
NDE	Quade	3.50848E-01	1.0	1.0	7.35391E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S108.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.14886E-03	1.14947E-03	1.14947E-03	1.14886E-03
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	6.23178E-01	9.40245E-01	9.40245E-01	6.23178E-01
NNA	Friedman	7.90699E-01	1.0	1.0	9.44276E-01
NNA	Friedman Aligned	1.74782E-12	3.22675E-12	3.22675E-12	3.22675E-12
NNA	Quade	9.96635E-01	1.0	1.0	9.99973E-01
ISCA	Friedman	8.58987E-01	1.0	1.0	9.93075E-01
ISCA	Friedman Aligned	5.51352E-08	1.39958E-07	1.39958E-07	1.39958E-07
ISCA	Quade	9.96635E-01	1.0	1.0	9.99986E-01
WW	Friedman	8.58987E-01	1.0	1.0	9.95414E-01
WW	Friedman Aligned	3.83622E-04	1.18053E-03	1.18053E-03	1.17991E-03
WW	Quade	9.96635E-01	1.0	1.0	9.99983E-01
CWOA	Friedman	9.69231E-01	1.0	1.0	9.99994E-01
CWOA	Friedman Aligned	7.64084E-01	1.0	1.0	9.93258E-01
CWOA	Quade	9.96635E-01	1.0	1.0	9.99997E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S108 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	9.20605E-01	1.0	1.0	9.99913E-01
IJAYA	Quade	9.99972E-01	1.0	1.0	1.0

**Table S109.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
MABC	Friedman	7.82263E-13	7.82263E-13	7.82263E-13	7.82263E-13
MABC	Friedman Aligned	1.30815E-10	4.93071E-10	4.68469E-10	4.93071E-10
MABC	Quade	2.72384E-02	1.01106E-01	1.01106E-01	9.69411E-02
IJAYA	Friedman	7.82263E-13	1.19904E-12	1.19904E-12	1.19904E-12
IJAYA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
IJAYA	Quade	1.46704E-02	5.43832E-02	4.90263E-02	5.31067E-02
GOTLBO	Friedman	1.18350E-12	3.00426E-12	3.00426E-12	3.00426E-12
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.46704E-02	5.43832E-02	4.90263E-02	5.31067E-02
CWOA	Friedman	7.72016E-12	2.37543E-11	2.37543E-11	2.37543E-11
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	7.61417E-03	2.36840E-02	2.36840E-02	2.34363E-02
WW	Friedman	9.08066E-11	3.14331E-10	3.14331E-10	3.14331E-10
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	7.61417E-03	1.64871E-02	1.64871E-02	1.63641E-02
ISCA	Friedman	1.23284E-10	4.55202E-10	4.55202E-10	4.55202E-10
ISCA	Friedman Aligned	2.50662E-06	7.71268E-06	7.71268E-06	7.71266E-06
ISCA	Quade	7.61417E-03	1.81029E-02	1.81029E-02	1.79562E-02
DE	Friedman	1.84419E-10	6.95118E-10	6.95118E-10	6.95118E-10
DE	Friedman Aligned	1.37739E-10	4.93071E-10	4.76787E-10	4.93071E-10
DE	Quade	6.18417E-02	2.16161E-01	2.16161E-01	1.98262E-01
NNA	Friedman	4.55458E-10	1.68169E-09	1.68169E-09	1.68169E-09
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	7.61417E-03	1.41024E-02	1.41024E-02	1.40116E-02

**Table S109 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	1.92899E-09	6.67728E-09	6.67728E-09	6.67728E-09
PSO	Friedman Aligned	1.30815E-10	4.93071E-10	4.68469E-10	4.93071E-10
PSO	Quade	9.09831E-05	9.09869E-05	9.09869E-05	9.09831E-05
NDE	Friedman	4.08314E-06	1.25635E-05	1.25635E-05	1.25635E-05
NDE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NDE	Quade	1.22455E-01	3.82395E-01	3.82395E-01	3.30971E-01
TLBO	Friedman	1.18855E-01	3.04601E-01	3.04601E-01	2.74721E-01
TLBO	Friedman Aligned	3.01915E-04	7.66418E-04	7.66418E-04	7.66223E-04
TLBO	Quade	6.14412E-01	1.0	1.0	9.11000E-01
EBLSHADE	Friedman	9.04828E-01	1.0	1.0	9.86993E-01
EBLSHADE	Friedman Aligned	5.79889E-02	1.07300E-01	1.07300E-01	1.04422E-01
EBLSHADE	Quade	9.59583E-01	1.0	1.0	9.97324E-01
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S110.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S110 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S111.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	6.27525E-04	6.27707E-04	6.27707E-04	6.27525E-04
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	6.31482E-01	9.60899E-01	9.60899E-01	6.31482E-01
NNA	Friedman	6.91741E-01	1.0	1.0	8.86116E-01
NNA	Friedman Aligned	3.06237E-11	5.65361E-11	5.65361E-11	5.65361E-11
NNA	Quade	9.96978E-01	1.0	1.0	9.99978E-01
ISCA	Friedman	7.77272E-01	1.0	1.0	9.77902E-01
ISCA	Friedman Aligned	5.16236E-07	1.31045E-06	1.31045E-06	1.31045E-06
ISCA	Quade	9.96978E-01	1.0	1.0	9.99989E-01
WW	Friedman	7.77272E-01	1.0	1.0	9.84073E-01
WW	Friedman Aligned	1.81771E-03	5.59646E-03	5.59646E-03	5.58239E-03
WW	Quade	9.96978E-01	1.0	1.0	9.99987E-01
CWOA	Friedman	9.25970E-01	1.0	1.0	9.99878E-01
CWOA	Friedman Aligned	9.53239E-01	1.0	1.0	9.99975E-01
CWOA	Quade	9.96978E-01	1.0	1.0	9.99998E-01
GOTLBO	Friedman	9.90942E-01	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S111 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S112.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	3.32214E-02	3.37419E-02	3.37419E-02	3.32214E-02
PSO	Friedman Aligned	2.88658E-12	2.88658E-12	2.88658E-12	2.88658E-12
PSO	Quade	9.10497E-01	1.0	1.0	9.10497E-01
NNA	Friedman	9.99834E-01	1.0	1.0	1.0
NNA	Friedman Aligned	5.04334E-01	1.0	1.0	7.26301E-01
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S112 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S113.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.22987E-02	9.64801E-02	9.64801E-02	9.22987E-02
PSO	Friedman Aligned	3.98146E-10	3.98146E-10	3.98146E-10	3.98146E-10
PSO	Quade	9.54610E-01	1.0	1.0	9.54610E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S113 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	1.0	1.0	1.0	1.0
WW	Quade	1.0	1.0	1.0	1.0

**Table S114.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	4.36171E-03	4.37052E-03	4.37052E-03	4.36171E-03
PSO	Friedman Aligned	5.39684E-08	9.96340E-08	9.96340E-08	9.96340E-08
PSO	Quade	8.53378E-01	1.0	1.0	8.53378E-01
NNA	Friedman	9.47047E-01	1.0	1.0	9.95593E-01
NNA	Friedman Aligned	9.03118E-10	9.03118E-10	9.03118E-10	9.03118E-10
NNA	Quade	9.99981E-01	1.0	1.0	1.0
ISCA	Friedman	9.73183E-01	1.0	1.0	9.99898E-01
ISCA	Friedman Aligned	4.17781E-06	1.06052E-05	1.06052E-05	1.06052E-05
ISCA	Quade	9.99981E-01	1.0	1.0	1.0
WW	Friedman	9.73183E-01	1.0	1.0	9.99955E-01
WW	Friedman Aligned	7.30958E-03	2.25482E-02	2.25482E-02	2.23207E-02
WW	Quade	9.99981E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S114 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S115.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm,  $R_s$  evaluation task).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	2.42446E-02	2.45202E-02	2.45202E-02	2.42446E-02
PSO	Friedman Aligned	3.88231E-08	3.88231E-08	3.88231E-08	3.88231E-08
PSO	Quade	9.32459E-01	1.0	1.0	9.32459E-01
NNA	Friedman	9.99213E-01	1.0	1.0	9.99998E-01
NNA	Friedman Aligned	3.27961E-03	6.06308E-03	6.06308E-03	6.04626E-03
NNA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	9.99986E-01	1.0	1.0	1.0
ISCA	Friedman Aligned	2.53096E-01	7.16378E-01	7.16378E-01	5.23253E-01
ISCA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0

**Table S115 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S116.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	3.23303E-05	3.23308E-05	3.23308E-05	3.23303E-05
WW	Friedman Aligned	3.09062E-10	8.13039E-10	7.96436E-10	8.13039E-10
WW	Quade	7.59275E-01	1.0	1.0	7.97323E-01
CWOA	Friedman	1.22067E-04	2.25367E-04	2.25367E-04	2.25343E-04
CWOA	Friedman Aligned	3.09062E-10	7.84543E-10	7.65346E-10	7.84543E-10
CWOA	Quade	7.59275E-01	1.0	1.0	7.97323E-01
NNA	Friedman	1.53477E-04	3.89619E-04	3.89619E-04	3.89550E-04
NNA	Friedman Aligned	3.09062E-10	8.13039E-10	7.74680E-10	8.13039E-10
NNA	Quade	7.59275E-01	1.0	1.0	7.81433E-01
ISCA	Friedman	1.56918E-04	4.82851E-04	4.82851E-04	4.82746E-04
ISCA	Friedman Aligned	3.09062E-10	8.13039E-10	7.65346E-10	8.13039E-10
ISCA	Quade	7.59275E-01	1.0	1.0	7.59275E-01
GOTLBO	Friedman	2.31597E-03	8.02254E-03	8.02254E-03	7.99400E-03
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	7.59275E-01	1.0	1.0	9.45886E-01
PSO	Friedman	6.30413E-02	2.36852E-01	2.36852E-01	2.13709E-01
PSO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
PSO	Quade	8.41580E-01	1.0	1.0	9.98890E-01
MABC	Friedman	6.64164E-01	1.0	1.0	9.83637E-01
MABC	Friedman Aligned	3.09062E-10	8.13039E-10	7.65346E-10	8.13039E-10
MABC	Quade	9.59880E-01	1.0	1.0	9.99995E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S116 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S117.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm, RMSPE value).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
ISCA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	1.45556E-03	1.45654E-03	1.45654E-03	1.45556E-03
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.45556E-03	1.77232E-03	1.77232E-03	1.77088E-03
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.45556E-03	2.10264E-03	2.10264E-03	2.10063E-03
WW	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	1.45556E-03	2.18579E-03	2.18579E-03	2.18364E-03
MABC	Friedman	1.41904E-12	4.91207E-12	4.91207E-12	4.91207E-12
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	2.56699E-02	9.73363E-02	9.73363E-02	9.33686E-02
PSO	Friedman	4.78499E-12	1.76676E-11	1.76676E-11	1.76676E-11
PSO	Friedman Aligned	1.80279E-10	6.65645E-10	6.65645E-10	6.65645E-10
PSO	Quade	1.10383E-02	4.08787E-02	4.08787E-02	4.01550E-02
DE	Friedman	1.99447E-10	7.51762E-10	7.51762E-10	7.51762E-10
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	4.08670E-02	1.52102E-01	1.52102E-01	1.42782E-01
GOTLBO	Friedman	1.22587E-09	4.52629E-09	4.52629E-09	4.52629E-09
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	2.30921E-03	7.99910E-03	7.99910E-03	7.97072E-03

**Table S117 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	1.01726E-06	3.52129E-06	3.52129E-06	3.52128E-06
IJAYA	Friedman Aligned	3.40542E-06	1.17880E-05	1.17880E-05	1.17879E-05
IJAYA	Quade	1.25398E-01	4.42937E-01	4.42937E-01	3.71110E-01
NDE	Friedman	3.37287E-03	1.03821E-02	1.03821E-02	1.03418E-02
NDE	Friedman Aligned	1.50714E-02	4.64546E-02	4.64546E-02	4.56516E-02
NDE	Quade	3.66833E-01	1.0	1.0	7.54932E-01
TLBO	Friedman	4.20792E-01	1.0	1.0	7.49986E-01
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	7.93916E-01	1.0	1.0	9.81856E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S118.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm, RMSPE value).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
ISCA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	1.09625E-03	1.09680E-03	1.09680E-03	1.09625E-03
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.09625E-03	1.34054E-03	1.34054E-03	1.33971E-03
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.09625E-03	1.59708E-03	1.59708E-03	1.59592E-03
MABC	Friedman	2.33813E-13	7.19425E-13	7.19425E-13	7.19425E-13
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	2.11738E-02	8.02031E-02	8.02031E-02	7.74983E-02
PSO	Friedman	2.85766E-11	9.89189E-11	9.89189E-11	9.89189E-11
PSO	Friedman Aligned	1.82294E-10	6.73084E-10	6.73084E-10	6.73084E-10
PSO	Quade	8.90739E-03	3.29680E-02	3.29680E-02	3.24964E-02
DE	Friedman	3.71229E-11	1.37069E-10	1.37069E-10	1.37069E-10
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	3.41907E-02	1.27086E-01	1.27086E-01	1.20544E-01
WW	Friedman	3.79121E-10	1.42899E-09	1.42899E-09	1.42899E-09
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	1.09625E-03	1.66392E-03	1.66392E-03	1.66267E-03
GOTLBO	Friedman	3.71983E-09	1.37348E-08	1.37348E-08	1.37348E-08
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.80120E-03	6.23839E-03	6.23839E-03	6.22112E-03

**Table S118 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	2.38212E-07	8.24579E-07	8.24579E-07	8.24578E-07
IJAYA	Friedman Aligned	1.92652E-06	6.66873E-06	6.66873E-06	6.66871E-06
IJAYA	Quade	1.08536E-01	3.82291E-01	3.82291E-01	3.28134E-01
NDE	Friedman	1.31676E-03	4.05218E-03	4.05218E-03	4.04603E-03
NDE	Friedman Aligned	1.08197E-02	3.33332E-02	3.33332E-02	3.29189E-02
NDE	Quade	3.30743E-01	1.0	1.0	7.09355E-01
TLBO	Friedman	2.78642E-01	7.24406E-01	7.24406E-01	5.63564E-01
TLBO	Friedman Aligned	9.40972E-01	1.0	1.0	9.99241E-01
TLBO	Quade	7.45664E-01	1.0	1.0	9.69051E-01
EBLSHADE	Friedman	8.09315E-01	1.0	1.0	9.53081E-01
EBLSHADE	Friedman Aligned	9.40972E-01	1.0	1.0	9.99241E-01
EBLSHADE	Quade	9.56989E-01	1.0	1.0	9.96998E-01
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S119.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
CWOA	Friedman	2.04947E-13	2.04947E-13	2.04947E-13	2.04947E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	6.08936E-02	7.94811E-02	7.94811E-02	7.66710E-02
NNA	Friedman	2.51132E-13	4.63629E-13	4.63629E-13	4.63629E-13
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	6.08936E-02	7.13516E-02	7.13516E-02	6.90638E-02
ISCA	Friedman	2.84809E-13	7.22977E-13	7.22977E-13	7.22977E-13
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	6.08936E-02	6.26749E-02	6.26749E-02	6.08936E-02
WW	Friedman	2.98039E-13	9.17044E-13	9.17044E-13	9.17044E-13
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	6.08936E-02	7.99347E-02	7.99347E-02	7.71198E-02
GOTLBO	Friedman	3.48809E-11	1.20741E-10	1.20741E-10	1.20741E-10
GOTLBO	Friedman Aligned	1.79116E-10	6.61351E-10	6.61351E-10	6.61351E-10
GOTLBO	Quade	6.08936E-02	2.03799E-01	2.03799E-01	1.86283E-01
PSO	Friedman	4.01794E-08	1.48355E-07	1.48355E-07	1.48355E-07
PSO	Friedman Aligned	1.19200E-10	4.49293E-10	4.49293E-10	4.49293E-10
PSO	Quade	1.63536E-01	6.32903E-01	6.32903E-01	4.82809E-01
MABC	Friedman	4.55403E-05	1.71654E-04	1.71654E-04	1.71641E-04
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	2.71658E-01	1.0	1.0	6.97232E-01
DE	Friedman	8.96693E-04	3.31144E-03	3.31144E-03	3.30687E-03
DE	Friedman Aligned	1.27875E-12	4.72156E-12	4.72156E-12	4.72156E-12
DE	Quade	3.50621E-01	1.0	1.0	7.96911E-01

**Table S119 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	7.33717E-02	2.56942E-01	2.56942E-01	2.31857E-01
IJAYA	Friedman Aligned	4.02808E-02	1.40313E-01	1.40313E-01	1.32656E-01
IJAYA	Quade	6.43209E-01	1.0	1.0	9.71773E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S120.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.04014E-03	1.04064E-03	1.04064E-03	1.04014E-03
WW	Friedman Aligned	3.59772E-11	1.24536E-10	1.24536E-10	1.24536E-10
WW	Quade	8.97219E-01	1.0	1.0	9.18511E-01
CWOA	Friedman	2.86600E-03	5.29751E-03	5.29751E-03	5.28467E-03
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	8.97219E-01	1.0	1.0	9.18511E-01
ISCA	Friedman	3.24679E-03	9.70884E-03	9.70884E-03	9.66653E-03
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	8.97219E-01	1.0	1.0	8.97219E-01
NNA	Friedman	3.24679E-03	8.25217E-03	8.25217E-03	8.22129E-03
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	8.97219E-01	1.0	1.0	9.09994E-01
GOTLBO	Friedman	2.71581E-02	9.48059E-02	9.48059E-02	9.09078E-02
GOTLBO	Friedman Aligned	1.40579E-09	5.19061E-09	5.19061E-09	5.19061E-09
GOTLBO	Quade	8.97219E-01	1.0	1.0	9.87898E-01
PSO	Friedman	3.11831E-01	1.0	1.0	7.48395E-01
PSO	Friedman Aligned	1.73195E-13	5.32907E-13	5.32907E-13	5.32907E-13
PSO	Quade	9.43078E-01	1.0	1.0	9.99975E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S120** (*continued*)

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S121.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.96287E-13	1.96287E-13	1.96287E-13	1.96287E-13
PSO	Friedman Aligned	1.80688E-10	6.67154E-10	6.67154E-10	6.67154E-10
PSO	Quade	2.94896E-02	1.09763E-01	1.09763E-01	1.04634E-01
GOTLBO	Friedman	6.25031E-11	1.15390E-10	1.15390E-10	1.15390E-10
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	7.28397E-03	2.52705E-02	2.52705E-02	2.49885E-02
MABC	Friedman	1.09197E-09	2.77193E-09	2.77193E-09	2.77193E-09
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	6.15993E-02	2.35585E-01	2.35585E-01	2.13090E-01
ISCA	Friedman	1.25475E-09	3.86077E-09	3.86077E-09	3.86077E-09
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	5.44202E-03	5.45574E-03	5.45574E-03	5.44202E-03
NNA	Friedman	1.37295E-09	4.75250E-09	4.75250E-09	4.75250E-09
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	5.44202E-03	6.49673E-03	6.49673E-03	6.47742E-03
CWOA	Friedman	2.09713E-09	7.74326E-09	7.74326E-09	7.74326E-09
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	5.44202E-03	7.55156E-03	7.55156E-03	7.52569E-03
WW	Friedman	9.53069E-09	3.59234E-08	3.59234E-08	3.59234E-08
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	5.44202E-03	7.76630E-03	7.76630E-03	7.73921E-03
DE	Friedman	4.24571E-08	1.56765E-07	1.56765E-07	1.56765E-07
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	9.15391E-02	3.44207E-01	3.44207E-01	2.98458E-01

**Table S121 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	6.97445E-05	2.41426E-04	2.41426E-04	2.41402E-04
IJAYA	Friedman Aligned	3.05560E-06	1.05771E-05	1.05771E-05	1.05770E-05
IJAYA	Quade	2.37971E-01	8.57542E-01	8.57542E-01	6.09662E-01
NDE	Friedman	4.44651E-02	1.37531E-01	1.37531E-01	1.30599E-01
NDE	Friedman Aligned	1.41555E-02	4.36271E-02	4.36271E-02	4.29185E-02
NDE	Quade	5.71073E-01	1.0	1.0	9.26061E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	9.91583E-01	1.0	1.0	9.99995E-01
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S122.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	9.04976E-01	1.0	1.0	9.04976E-01
WW	Friedman Aligned	1.67999E-12	1.67999E-12	1.67999E-12	1.67999E-12
WW	Quade	9.99991E-01	1.0	1.0	9.99997E-01
ISCA	Friedman	9.32174E-01	1.0	1.0	9.97839E-01
ISCA	Friedman Aligned	7.66599E-08	1.94598E-07	1.94598E-07	1.94598E-07
ISCA	Quade	9.99991E-01	1.0	1.0	9.99991E-01
NNA	Friedman	9.32174E-01	1.0	1.0	9.97323E-01
NNA	Friedman Aligned	3.08669E-09	5.69850E-09	5.69850E-09	5.69850E-09
NNA	Quade	9.99991E-01	1.0	1.0	9.99995E-01
CWOA	Friedman	9.32174E-01	1.0	1.0	9.93041E-01
CWOA	Friedman Aligned	2.23479E-06	6.87627E-06	6.87627E-06	6.87625E-06
CWOA	Quade	9.99991E-01	1.0	1.0	9.99997E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S122 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S123.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm, RMSPE value).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
ISCA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	1.09625E-03	1.09680E-03	1.09680E-03	1.09625E-03
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	1.09625E-03	1.34054E-03	1.34054E-03	1.33971E-03
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	1.09625E-03	1.59708E-03	1.59708E-03	1.59592E-03
MABC	Friedman	2.33813E-13	7.19425E-13	7.19425E-13	7.19425E-13
MABC	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
MABC	Quade	2.11738E-02	8.02031E-02	8.02031E-02	7.74983E-02
PSO	Friedman	2.85766E-11	9.89189E-11	9.89189E-11	9.89189E-11
PSO	Friedman Aligned	1.82294E-10	6.73084E-10	6.73084E-10	6.73084E-10
PSO	Quade	8.90739E-03	3.29680E-02	3.29680E-02	3.24964E-02
DE	Friedman	3.71229E-11	1.37069E-10	1.37069E-10	1.37069E-10
DE	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
DE	Quade	3.41907E-02	1.27086E-01	1.27086E-01	1.20544E-01
WW	Friedman	3.79121E-10	1.42899E-09	1.42899E-09	1.42899E-09
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	1.09625E-03	1.66392E-03	1.66392E-03	1.66267E-03
GOTLBO	Friedman	3.71983E-09	1.37348E-08	1.37348E-08	1.37348E-08
GOTLBO	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
GOTLBO	Quade	1.80120E-03	6.23839E-03	6.23839E-03	6.22112E-03

**Table S123 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
IJAYA	Friedman	2.38212E-07	8.24579E-07	8.24579E-07	8.24578E-07
IJAYA	Friedman Aligned	1.92652E-06	6.66873E-06	6.66873E-06	6.66871E-06
IJAYA	Quade	1.08536E-01	3.82291E-01	3.82291E-01	3.28134E-01
NDE	Friedman	1.31676E-03	4.05218E-03	4.05218E-03	4.04603E-03
NDE	Friedman Aligned	1.08197E-02	3.33332E-02	3.33332E-02	3.29189E-02
NDE	Quade	3.30743E-01	1.0	1.0	7.09355E-01
TLBO	Friedman	2.78642E-01	7.24406E-01	7.24406E-01	5.63564E-01
TLBO	Friedman Aligned	9.40972E-01	1.0	1.0	9.99241E-01
TLBO	Quade	7.45664E-01	1.0	1.0	9.69051E-01
EBLSHADE	Friedman	8.09315E-01	1.0	1.0	9.53081E-01
EBLSHADE	Friedman Aligned	9.40972E-01	1.0	1.0	9.99241E-01
EBLSHADE	Quade	9.56989E-01	1.0	1.0	9.96998E-01
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0

**Table S124.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.37121E-01	1.46648E-01	1.46648E-01	1.37121E-01
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	9.87878E-01	1.0	1.0	9.91564E-01
ISCA	Friedman	2.08923E-01	5.89641E-01	5.89641E-01	4.55419E-01
ISCA	Friedman Aligned	7.82109E-10	1.98535E-09	1.98535E-09	1.98535E-09
ISCA	Quade	9.87878E-01	1.0	1.0	9.87878E-01
NNA	Friedman	2.08923E-01	5.49729E-01	5.49729E-01	4.31038E-01
NNA	Friedman Aligned	7.43077E-09	2.28639E-08	2.28639E-08	2.28639E-08
NNA	Quade	9.87878E-01	1.0	1.0	9.90189E-01
CWOA	Friedman	2.08923E-01	4.24958E-01	4.24958E-01	3.51222E-01
CWOA	Friedman Aligned	3.54082E-11	6.53690E-11	6.53690E-11	6.53690E-11
CWOA	Quade	9.87878E-01	1.0	1.0	9.91564E-01
GOTLBO	Friedman	5.28655E-01	1.0	1.0	9.25997E-01
GOTLBO	Friedman Aligned	3.35675E-04	1.16207E-03	1.16207E-03	1.16147E-03
GOTLBO	Quade	9.87878E-01	1.0	1.0	9.99741E-01
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S124 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S125.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	7.01424E-09	7.01424E-09	7.01424E-09	7.01424E-09
WW	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
WW	Quade	3.33895E-01	4.68680E-01	4.61937E-01	3.80571E-01
CWOA	Friedman	4.86623E-08	8.98381E-08	8.98381E-08	8.98381E-08
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	3.33895E-01	4.68680E-01	4.61937E-01	3.80571E-01
NNA	Friedman	7.50035E-08	1.90393E-07	1.90393E-07	1.90393E-07
NNA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
NNA	Quade	3.33895E-01	4.37241E-01	4.37241E-01	3.59435E-01
ISCA	Friedman	8.49143E-08	2.61275E-07	2.61275E-07	2.61275E-07
ISCA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
ISCA	Quade	3.33895E-01	4.00024E-01	4.00024E-01	3.33895E-01
GOTLBO	Friedman	3.57285E-06	1.23676E-05	1.23676E-05	1.23675E-05
GOTLBO	Friedman Aligned	2.09884E-10	7.74957E-10	7.74957E-10	7.74957E-10
GOTLBO	Quade	3.33895E-01	9.45824E-01	9.45824E-01	6.31865E-01
PSO	Friedman	5.02694E-04	1.85635E-03	1.85635E-03	1.85485E-03
PSO	Friedman Aligned	7.43825E-11	2.57478E-10	2.57478E-10	2.57478E-10
PSO	Quade	4.98202E-01	1.0	1.0	9.21610E-01
MABC	Friedman	4.25676E-02	1.62057E-01	1.62057E-01	1.51226E-01
MABC	Friedman Aligned	6.05896E-09	2.23716E-08	2.23716E-08	2.23716E-08
MABC	Quade	6.69600E-01	1.0	1.0	9.84613E-01
DE	Friedman	2.05603E-01	7.92421E-01	7.92421E-01	5.72528E-01
DE	Friedman Aligned	8.71728E-10	3.28574E-09	3.28574E-09	3.28574E-09
DE	Quade	7.68822E-01	1.0	1.0	9.95518E-01

**Table S125 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S126.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	9.99926E-01	1.0	1.0	9.99926E-01
WW	Friedman Aligned	6.29593E-01	9.56165E-01	9.56165E-01	6.29593E-01
WW	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	9.99990E-01	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	9.99996E-01	1.0	1.0	1.0
NNA	Friedman Aligned	9.94434E-01	1.0	1.0	9.99931E-01
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0

**Table S126 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S127.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm, RMSPE value).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
WW	Friedman	9.99981E-01	1.0	1.0	9.99981E-01
WW	Friedman Aligned	9.68408E-01	1.0	1.0	9.68408E-01
WW	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	9.99999E-01	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0

**Table S127 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S128.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm, RMSPE value).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	9.99999E-01	1.0	1.0	9.99999E-01
WW	Friedman Aligned	1.65346E-01	1.79488E-01	1.79488E-01	1.65346E-01
WW	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0

**Table S128 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	9.50839E-01	1.0	1.0	9.99523E-01
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	7.72845E-01	1.0	1.0	9.35186E-01
NNA	Quade	1.0	1.0	1.0	1.0

**Table S129.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm, RMSPE value).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S129 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S130.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (DE is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	4.50560E-01	7.36426E-01	7.16850E-01	5.32330E-01
PSO	Friedman Aligned	1.31972E-02	4.07936E-02	4.07936E-02	4.00528E-02
PSO	Quade	9.99988E-01	1.0	1.0	9.99998E-01
CWOA	Friedman	4.50560E-01	7.36426E-01	7.16850E-01	5.32330E-01
CWOA	Friedman Aligned	2.07247E-05	3.82613E-05	3.82613E-05	3.82606E-05
CWOA	Quade	9.99988E-01	1.0	1.0	1.0
WW	Friedman	4.50560E-01	5.85271E-01	5.85271E-01	4.50560E-01
WW	Friedman Aligned	2.92524E-07	2.92524E-07	2.92524E-07	2.92524E-07
WW	Quade	9.99988E-01	1.0	1.0	9.99988E-01
GOTLBO	Friedman	5.52020E-01	1.0	1.0	9.15482E-01
GOTLBO	Friedman Aligned	7.67176E-01	1.0	1.0	9.95399E-01
GOTLBO	Quade	9.99988E-01	1.0	1.0	1.0
NNA	Friedman	5.52020E-01	1.0	1.0	9.15482E-01
NNA	Friedman Aligned	6.53162E-04	1.65844E-03	1.65844E-03	1.65719E-03
NNA	Quade	9.99988E-01	1.0	1.0	1.0
ISCA	Friedman	5.52204E-01	1.0	1.0	9.48515E-01
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	9.99988E-01	1.0	1.0	1.0
MABC	Friedman	8.42576E-01	1.0	1.0	9.99059E-01
MABC	Friedman Aligned	4.90703E-01	1.0	1.0	9.03246E-01
MABC	Quade	9.99988E-01	1.0	1.0	1.0
IJAYA	Friedman	8.42576E-01	1.0	1.0	9.99059E-01
IJAYA	Friedman Aligned	9.62004E-01	1.0	1.0	9.99996E-01
IJAYA	Quade	9.99988E-01	1.0	1.0	1.0

**Table S130 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S131.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (EBLSHADE is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	1.30508E-05	2.46344E-05	2.46344E-05	2.46341E-05
PSO	Friedman Aligned	4.90853E-11	1.24601E-10	1.24601E-10	1.24601E-10
PSO	Quade	7.93250E-01	1.0	7.98639E-01	8.40980E-01
CWOA	Friedman	1.30508E-05	2.35507E-05	2.35507E-05	2.35504E-05
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	7.93250E-01	1.0	7.98639E-01	8.86126E-01
WW	Friedman	1.30508E-05	1.30509E-05	1.30509E-05	1.30508E-05
WW	Friedman Aligned	8.76076E-10	3.03257E-09	3.03257E-09	3.03257E-09
WW	Quade	7.93250E-01	1.0	7.98639E-01	7.93250E-01
NNA	Friedman	1.25380E-04	3.85802E-04	3.85802E-04	3.85735E-04
NNA	Friedman Aligned	1.73171E-09	6.52721E-09	6.52721E-09	6.52721E-09
NNA	Quade	7.93250E-01	1.0	7.98639E-01	9.19984E-01
GOTLBO	Friedman	1.26295E-04	4.37193E-04	4.37193E-04	4.37109E-04
GOTLBO	Friedman Aligned	5.58257E-11	1.71771E-10	1.71771E-10	1.71771E-10
GOTLBO	Quade	7.93250E-01	1.0	7.98639E-01	9.19984E-01
ISCA	Friedman	2.06680E-04	7.63167E-04	7.63167E-04	7.62912E-04
ISCA	Friedman Aligned	1.83740E-08	6.36024E-08	6.36024E-08	6.36024E-08
ISCA	Quade	7.93250E-01	1.0	7.98639E-01	9.19984E-01
MABC	Friedman	1.40828E-03	5.30987E-03	4.55132E-03	5.29780E-03
MABC	Friedman Aligned	3.00493E-12	5.54756E-12	5.54756E-12	5.54756E-12
MABC	Quade	7.93250E-01	1.0	7.98639E-01	9.19984E-01
IJAYA	Friedman	1.40828E-03	5.30987E-03	4.55132E-03	5.29780E-03
IJAYA	Friedman Aligned	8.76076E-10	3.10840E-09	3.10840E-09	3.10840E-09
IJAYA	Quade	7.93250E-01	1.0	7.98639E-01	9.19984E-01

**Table S131 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	5.62340E-03	1.94825E-02	1.94825E-02	1.93313E-02
DE	Friedman Aligned	2.45853E-09	9.07765E-09	9.07765E-09	9.07765E-09
DE	Quade	7.93250E-01	1.0	7.98639E-01	9.19984E-01
NDE	Friedman	2.09529E-02	6.46277E-02	6.46277E-02	6.30782E-02
NDE	Friedman Aligned	2.37713E-02	7.33451E-02	5.14343E-02	7.13523E-02
NDE	Quade	7.93250E-01	1.0	7.98639E-01	9.19984E-01
TLBO	Friedman	3.98503E-01	1.0	4.07382E-01	7.24836E-01
TLBO	Friedman Aligned	2.88150E-02	7.33451E-02	5.14343E-02	7.15329E-02
TLBO	Quade	7.93250E-01	1.0	7.98639E-01	9.77197E-01
STLBO	Friedman	3.98503E-01	1.0	4.07382E-01	7.24836E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	7.98639E-01	1.0	7.98639E-01	9.77197E-01
ADELII	Friedman	4.07382E-01	1.0	4.07382E-01	7.24836E-01
ADELII	Friedman Aligned	2.88150E-02	7.33451E-02	5.14343E-02	7.15329E-02
ADELII	Quade	7.93250E-01	1.0	7.98639E-01	9.77197E-01

**Table S132.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ADELI is the control algorithm, Comp parameter).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	6.31318E-04	1.04935E-03	1.04935E-03	1.04885E-03
PSO	Friedman Aligned	1.18842E-10	3.01677E-10	3.01677E-10	3.01677E-10
PSO	Quade	9.62893E-01	1.0	1.0	9.76795E-01
CWOA	Friedman	6.31318E-04	1.02471E-03	1.02471E-03	1.02423E-03
CWOA	Friedman Aligned	4.50306E-12	8.31335E-12	8.31335E-12	8.31335E-12
CWOA	Quade	9.62893E-01	1.0	1.0	9.87201E-01
WW	Friedman	6.31318E-04	6.31502E-04	6.31502E-04	6.31318E-04
WW	Friedman Aligned	4.21371E-10	1.29653E-09	1.29653E-09	1.29653E-09
WW	Quade	9.62893E-01	1.0	1.0	9.62893E-01
GOTLBO	Friedman	3.28358E-03	1.09916E-02	1.09916E-02	1.09381E-02
GOTLBO	Friedman Aligned	1.53943E-05	5.68406E-05	5.68406E-05	5.68392E-05
GOTLBO	Quade	9.62893E-01	1.0	1.0	9.93168E-01
NNA	Friedman	3.28358E-03	1.01148E-02	1.01148E-02	1.00689E-02
NNA	Friedman Aligned	5.08038E-13	5.08038E-13	5.08038E-13	5.08038E-13
NNA	Quade	9.62893E-01	1.0	1.0	9.93168E-01
ISCA	Friedman	4.57816E-03	1.69249E-02	1.69249E-02	1.68001E-02
ISCA	Friedman Aligned	8.26661E-04	2.86188E-03	2.86188E-03	2.85861E-03
ISCA	Quade	9.62893E-01	1.0	1.0	9.93168E-01
MABC	Friedman	2.05485E-02	7.78229E-02	6.67054E-02	7.52749E-02
MABC	Friedman Aligned	1.46218E-06	5.06140E-06	5.06140E-06	5.06139E-06
MABC	Quade	9.62893E-01	1.0	1.0	9.93168E-01
IJAYA	Friedman	2.05485E-02	7.78229E-02	6.67054E-02	7.52749E-02
IJAYA	Friedman Aligned	1.09560E-04	4.12967E-04	4.12967E-04	4.12893E-04
IJAYA	Quade	9.62893E-01	1.0	1.0	9.93168E-01

**Table S132 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	5.66909E-02	1.97993E-01	1.97993E-01	1.82921E-01
DE	Friedman Aligned	2.35433E-04	8.69330E-04	8.69330E-04	8.69015E-04
DE	Quade	9.62893E-01	1.0	1.0	9.93168E-01
NDE	Friedman	1.46638E-01	4.59328E-01	4.59328E-01	3.86093E-01
NDE	Friedman Aligned	9.58524E-01	1.0	1.0	9.99944E-01
NDE	Quade	9.62893E-01	1.0	1.0	9.93168E-01
TLBO	Friedman	9.45602E-01	1.0	1.0	9.99383E-01
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	9.49185E-01	1.0	1.0	9.99383E-01
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S133.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NDE is the control algorithm, Comp parameter).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.55714E-01	2.24134E-01	2.20690E-01	2.02484E-01
PSO	Friedman Aligned	2.45681E-10	6.23651E-10	6.23651E-10	6.23651E-10
PSO	Quade	9.99775E-01	1.0	1.0	9.99926E-01
CWOA	Friedman	1.55714E-01	2.24134E-01	2.20690E-01	2.02484E-01
CWOA	Friedman Aligned	2.18658E-12	4.03677E-12	4.03677E-12	4.03677E-12
CWOA	Quade	9.99775E-01	1.0	1.0	9.99984E-01
WW	Friedman	1.55714E-01	1.68167E-01	1.68167E-01	1.55714E-01
WW	Friedman Aligned	2.49057E-10	7.66329E-10	7.66329E-10	7.66329E-10
WW	Quade	9.99775E-01	1.0	1.0	9.99775E-01
GOTLBO	Friedman	2.56546E-01	8.77639E-01	8.77639E-01	6.02847E-01
GOTLBO	Friedman Aligned	2.54839E-05	9.40951E-05	9.40951E-05	9.40913E-05
GOTLBO	Quade	9.99775E-01	1.0	1.0	9.99998E-01
NNA	Friedman	2.56546E-01	8.71786E-01	8.71786E-01	5.98341E-01
NNA	Friedman Aligned	1.12288E-12	1.12288E-12	1.12288E-12	1.12288E-12
NNA	Quade	9.99775E-01	1.0	1.0	9.99998E-01
ISCA	Friedman	2.68694E-01	1.0	1.0	6.85071E-01
ISCA	Friedman Aligned	1.22826E-03	4.25249E-03	4.25249E-03	4.24526E-03
ISCA	Quade	9.99775E-01	1.0	1.0	9.99998E-01
MABC	Friedman	5.32517E-01	1.0	1.0	9.43079E-01
MABC	Friedman Aligned	2.55400E-06	8.84079E-06	8.84079E-06	8.84076E-06
MABC	Quade	9.99775E-01	1.0	1.0	9.99998E-01
IJAYA	Friedman	5.32517E-01	1.0	1.0	9.43079E-01
IJAYA	Friedman Aligned	1.72659E-04	6.50817E-04	6.50817E-04	6.50635E-04
IJAYA	Quade	9.99775E-01	1.0	1.0	9.99998E-01

**Table S133 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	7.62590E-01	1.0	1.0	9.93109E-01
DE	Friedman Aligned	3.62802E-04	1.33967E-03	1.33967E-03	1.33892E-03
DE	Quade	9.99775E-01	1.0	1.0	9.99998E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S134.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (MABC is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	8.30603E-01	1.0	1.0	8.84463E-01
PSO	Friedman Aligned	2.77918E-01	9.53341E-01	9.53341E-01	6.32817E-01
PSO	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	8.30603E-01	1.0	1.0	8.84463E-01
CWOA	Friedman Aligned	3.58148E-03	6.62200E-03	6.62200E-03	6.60193E-03
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	8.30603E-01	1.0	1.0	8.30603E-01
WW	Friedman Aligned	1.46115E-04	1.46124E-04	1.46124E-04	1.46115E-04
WW	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	8.60298E-01	1.0	1.0	9.97657E-01
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	8.60298E-01	1.0	1.0	9.99247E-01
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	8.60298E-01	1.0	1.0	9.97657E-01
NNA	Friedman Aligned	4.14291E-02	1.06884E-01	1.06884E-01	1.01840E-01
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S134 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S135.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (TLBO is the control algorithm, Comp parameter).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.92560E-04	1.62336E-03	1.62336E-03	1.62216E-03
PSO	Friedman Aligned	1.04019E-10	2.64048E-10	2.64048E-10	2.64048E-10
PSO	Quade	9.62491E-01	1.0	1.0	9.76514E-01
CWOA	Friedman	9.92560E-04	1.58954E-03	1.58954E-03	1.58839E-03
CWOA	Friedman Aligned	5.11791E-12	9.44844E-12	9.44844E-12	9.44844E-12
CWOA	Quade	9.62491E-01	1.0	1.0	9.87026E-01
WW	Friedman	9.92560E-04	9.93015E-04	9.93015E-04	9.92560E-04
WW	Friedman Aligned	4.62743E-10	1.42383E-09	1.42383E-09	1.42383E-09
WW	Quade	9.62491E-01	1.0	1.0	9.62491E-01
GOTLBO	Friedman	4.77179E-03	1.58963E-02	1.58963E-02	1.57845E-02
GOTLBO	Friedman Aligned	1.40291E-05	5.17999E-05	5.17999E-05	5.17987E-05
GOTLBO	Quade	9.62491E-01	1.0	1.0	9.93062E-01
NNA	Friedman	4.77179E-03	1.47067E-02	1.47067E-02	1.46098E-02
NNA	Friedman Aligned	4.38760E-13	4.38760E-13	4.38760E-13	4.38760E-13
NNA	Quade	9.62491E-01	1.0	1.0	9.93062E-01
ISCA	Friedman	6.51265E-03	2.40890E-02	2.40890E-02	2.38367E-02
ISCA	Friedman Aligned	7.68321E-04	2.65989E-03	2.65989E-03	2.65706E-03
ISCA	Quade	9.62491E-01	1.0	1.0	9.93062E-01
MABC	Friedman	2.77009E-02	1.05088E-01	9.00750E-02	1.00471E-01
MABC	Friedman Aligned	1.31956E-06	4.56772E-06	4.56772E-06	4.56771E-06
MABC	Quade	9.62491E-01	1.0	1.0	9.93062E-01
IJAYA	Friedman	2.77009E-02	1.05088E-01	9.00750E-02	1.00471E-01
IJAYA	Friedman Aligned	1.00742E-04	3.79729E-04	3.79729E-04	3.79667E-04
IJAYA	Quade	9.62491E-01	1.0	1.0	9.93062E-01

**Table S135 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	7.29030E-02	2.55281E-01	2.55281E-01	2.30511E-01
DE	Friedman Aligned	2.17370E-04	8.02629E-04	8.02629E-04	8.02360E-04
DE	Quade	9.62491E-01	1.0	1.0	9.93062E-01
NDE	Friedman	1.80006E-01	5.66315E-01	5.66315E-01	4.56998E-01
NDE	Friedman Aligned	9.48516E-01	1.0	1.0	9.99891E-01
NDE	Quade	9.62491E-01	1.0	1.0	9.93062E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	9.92596E-01	1.0	1.0	9.99996E-01
ADELII	Quade	9.99595E-01	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S136.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (GOTLBO is the control algorithm, Comp parameter).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.98888E-01	1.0	1.0	9.99669E-01
PSO	Friedman Aligned	9.17453E-02	2.91753E-01	2.91753E-01	2.56282E-01
PSO	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	9.98888E-01	1.0	1.0	9.99669E-01
CWOA	Friedman Aligned	4.72107E-04	8.71757E-04	8.71757E-04	8.71408E-04
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	9.98888E-01	1.0	1.0	9.98888E-01
WW	Friedman Aligned	1.21443E-05	1.21444E-05	1.21444E-05	1.21443E-05
WW	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	9.99965E-01	1.0	1.0	1.0
NNA	Friedman Aligned	8.38840E-03	2.13627E-02	2.13627E-02	2.11564E-02
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.0	1.0	1.0	1.0
ADELII	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0

**Table S136 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	9.12281E-01	1.0	1.0	9.99780E-01
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S137.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (STLBO is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	8.87311E-04	1.45708E-03	1.45708E-03	1.45612E-03
PSO	Friedman Aligned	1.30579E-10	4.01781E-10	4.01781E-10	4.01781E-10
PSO	Quade	9.30369E-01	1.0	1.0	9.53136E-01
CWOA	Friedman	8.87311E-04	1.42576E-03	1.42576E-03	1.42483E-03
CWOA	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
CWOA	Quade	9.30369E-01	1.0	1.0	9.71605E-01
WW	Friedman	8.87311E-04	8.87675E-04	8.87675E-04	8.87311E-04
WW	Friedman Aligned	1.11147E-09	4.18940E-09	4.18940E-09	4.18940E-09
WW	Quade	9.30369E-01	1.0	1.0	9.30369E-01
GOTLBO	Friedman	4.35052E-03	1.45102E-02	1.45102E-02	1.44170E-02
GOTLBO	Friedman Aligned	1.44695E-11	3.67302E-11	3.67302E-11	3.67302E-11
GOTLBO	Quade	9.30369E-01	1.0	1.0	9.83227E-01
NNA	Friedman	4.35052E-03	1.34064E-02	1.34064E-02	1.33258E-02
NNA	Friedman Aligned	3.90710E-09	1.44262E-08	1.44262E-08	1.44262E-08
NNA	Quade	9.30369E-01	1.0	1.0	9.83227E-01
ISCA	Friedman	5.96940E-03	2.20764E-02	2.20764E-02	2.18643E-02
ISCA	Friedman Aligned	4.50262E-09	1.55860E-08	1.55860E-08	1.55860E-08
ISCA	Quade	9.30369E-01	1.0	1.0	9.83227E-01
MABC	Friedman	2.57340E-02	9.75806E-02	8.36406E-02	9.35933E-02
MABC	Friedman Aligned	5.23914E-13	9.67226E-13	9.67226E-13	9.67226E-13
MABC	Quade	9.30369E-01	1.0	1.0	9.83227E-01
IJAYA	Friedman	2.57340E-02	9.75806E-02	8.36406E-02	9.35933E-02
IJAYA	Friedman Aligned	2.18045E-10	7.54772E-10	7.54772E-10	7.54772E-10
IJAYA	Quade	9.30369E-01	1.0	1.0	9.83227E-01

**Table S137 (continued)**

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	6.85289E-02	2.39794E-01	2.39794E-01	2.17870E-01
DE	Friedman Aligned	7.42368E-10	2.74105E-09	2.74105E-09	2.74105E-09
DE	Quade	9.30369E-01	1.0	1.0	9.83227E-01
NDE	Friedman	1.71181E-01	5.37924E-01	5.37924E-01	4.38814E-01
NDE	Friedman Aligned	1.22573E-02	3.77682E-02	2.72258E-02	3.72367E-02
NDE	Quade	9.30369E-01	1.0	1.0	9.83227E-01
TLBO	Friedman	9.89408E-01	1.0	1.0	9.99990E-01
TLBO	Friedman Aligned	1.52045E-02	3.86414E-02	2.72258E-02	3.81458E-02
TLBO	Quade	9.44870E-01	1.0	1.0	9.99362E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	8.12763E-01	8.12763E-01	8.12763E-01	8.12763E-01
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELII	Friedman	1.0	1.0	1.0	1.0
ADELII	Friedman Aligned	1.52045E-02	3.86414E-02	2.72258E-02	3.81458E-02
ADELII	Quade	9.44870E-01	1.0	1.0	9.99362E-01

**Table S138.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (PSO is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S138 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	8.54143E-01	1.0	1.0	9.92455E-01
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	3.93493E-01	8.88533E-01	8.88533E-01	6.02734E-01
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	8.06951E-02	8.38658E-02	8.38658E-02	8.06951E-02
WW	Quade	1.0	1.0	1.0	1.0

**Table S139.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (IJAYA is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	8.30603E-01	1.0	1.0	8.84463E-01
PSO	Friedman Aligned	2.55584E-02	7.93472E-02	7.93472E-02	7.65731E-02
PSO	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	8.30603E-01	1.0	1.0	8.84463E-01
CWOA	Friedman Aligned	5.81546E-05	1.07365E-04	1.07365E-04	1.07360E-04
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	8.30603E-01	1.0	1.0	8.30603E-01
WW	Friedman Aligned	9.75209E-07	9.75209E-07	9.75209E-07	9.75209E-07
WW	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	8.60298E-01	1.0	1.0	9.97657E-01
GOTLBO	Friedman Aligned	8.87840E-01	1.0	1.0	9.99690E-01
GOTLBO	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	8.60298E-01	1.0	1.0	9.99247E-01
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	8.60298E-01	1.0	1.0	9.97657E-01
NNA	Friedman Aligned	1.53028E-03	3.88684E-03	3.88684E-03	3.87999E-03
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0

**Table S139 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	6.38258E-01	1.0	1.0	9.70394E-01
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S140.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (ISCA is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	9.93692E-01	1.0	1.0	9.97469E-01
PSO	Friedman Aligned	4.05630E-03	1.24985E-02	1.24985E-02	1.24284E-02
PSO	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	9.93692E-01	1.0	1.0	9.97469E-01
CWOA	Friedman Aligned	3.47277E-06	6.41127E-06	6.41127E-06	6.41126E-06
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	9.93692E-01	1.0	1.0	9.93692E-01
WW	Friedman Aligned	3.59568E-08	3.59568E-08	3.59568E-08	3.59568E-08
WW	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	9.96887E-01	1.0	1.0	1.0
GOTLBO	Friedman Aligned	5.31817E-01	1.0	1.0	9.39316E-01
GOTLBO	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	9.96887E-01	1.0	1.0	1.0
NNA	Friedman Aligned	1.47184E-04	3.73641E-04	3.73641E-04	3.73578E-04
NNA	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	8.75367E-01	1.0	1.0	9.99542E-01
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0

**Table S140 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	2.80474E-01	1.0	1.0	6.79991E-01
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	7.88732E-01	1.0	1.0	9.97148E-01
IJAYA	Quade	1.0	1.0	1.0	1.0

**Table S141.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (NNA is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
PSO	Friedman	9.99446E-01	1.0	1.0	9.99855E-01
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	9.99446E-01	1.0	1.0	9.99855E-01
CWOA	Friedman Aligned	9.57624E-01	1.0	1.0	9.97079E-01
CWOA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	9.99446E-01	1.0	1.0	9.99446E-01
WW	Friedman Aligned	6.15608E-01	9.21781E-01	9.21781E-01	6.15608E-01
WW	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
ADELI	Friedman Aligned	1.0	1.0	1.0	1.0
ADELI	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0

**Table S141 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0

**Table S142.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (CWOA is the control algorithm, Comp parameter).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBSHADE	Friedman	1.0	1.0	1.0	1.0
EBSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S142 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
WW	Friedman Aligned	9.96187E-01	1.0	1.0	9.96187E-01
WW	Quade	1.0	1.0	1.0	1.0

**Table S143.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in single-IV case (WW is the control algorithm, Comp parameter).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
DE	Friedman Aligned	1.0	1.0	1.0	1.0
DE	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
EBLSHADE	Friedman Aligned	1.0	1.0	1.0	1.0
EBLSHADE	Quade	1.0	1.0	1.0	1.0
ADEL1	Friedman	1.0	1.0	1.0	1.0
ADEL1	Friedman Aligned	1.0	1.0	1.0	1.0
ADEL1	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
NDE	Friedman Aligned	1.0	1.0	1.0	1.0
NDE	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
MABC	Friedman Aligned	1.0	1.0	1.0	1.0
MABC	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
TLBO	Friedman Aligned	1.0	1.0	1.0	1.0
TLBO	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
GOTLBO	Friedman Aligned	1.0	1.0	1.0	1.0
GOTLBO	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
STLBO	Friedman Aligned	1.0	1.0	1.0	1.0
STLBO	Quade	1.0	1.0	1.0	1.0

**Table S143 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
PSO	Friedman	1.0	1.0	1.0	1.0
PSO	Friedman Aligned	1.0	1.0	1.0	1.0
PSO	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
IJAYA	Friedman Aligned	1.0	1.0	1.0	1.0
IJAYA	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
ISCA	Friedman Aligned	1.0	1.0	1.0	1.0
ISCA	Quade	1.0	1.0	1.0	1.0
NNA	Friedman	1.0	1.0	1.0	1.0
NNA	Friedman Aligned	1.0	1.0	1.0	1.0
NNA	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
CWOA	Friedman Aligned	1.0	1.0	1.0	1.0
CWOA	Quade	1.0	1.0	1.0	1.0

**Table S144.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $I_{01}$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
ADELI versus WW	<1E-13	<1E-13	<1E-13
ADELI versus NDE	1.17195E-12	1.15907E-12	1.00453E-12
STLBO versus CWOA	1.17195E-12	1.15907E-12	1.00453E-12
TLBO versus PSO	1.21236E-12	1.17240E-12	1.03917E-12
STLBO versus GOTLBO	1.21236E-12	1.17240E-12	1.03917E-12
ADELI versus DE	1.73772E-12	1.64224E-12	1.48948E-12
STLBO versus DE	1.83875E-12	1.71752E-12	1.57607E-12
ADELI versus CWOA	3.83915E-12	3.50164E-12	3.29070E-12
EBLSHADE versus GOTLBO	4.20286E-12	3.78719E-12	3.60245E-12
STLBO versus NDE	5.01110E-12	4.46043E-12	4.29523E-12
ADELI versus GOTLBO	5.41522E-12	4.76064E-12	4.64162E-12
EBLSHADE versus CWOA	5.98099E-12	5.19229E-12	5.12657E-12
EBLSHADE versus ISCA	1.17195E-11	1.00453E-11	1.00453E-11
EBLSHADE versus DE	1.45282E-11	1.22931E-11	1.06966E-11
EBLSHADE versus NDE	4.17053E-11	3.43725E-11	3.07061E-11
STLBO versus ISCA	8.17133E-11	6.64482E-11	6.01625E-11
TLBO versus WW	8.82197E-11	7.07696E-11	6.49529E-11
TLBO versus MABC	1.07900E-10	8.53717E-11	7.94431E-11
EBLSHADE versus MABC	3.09961E-10	2.38431E-10	2.28213E-10
ADELI versus NNA	3.24570E-10	2.46102E-10	2.38969E-10
ADELI versus ISCA	3.83410E-10	2.86504E-10	2.82291E-10
STLBO versus MABC	1.58351E-09	1.16588E-09	1.16588E-09
STLBO versus NNA	1.83408E-09	1.33021E-09	1.33021E-09
TLBO versus ISCA	3.49326E-09	2.49519E-09	2.22648E-09
ADELI versus MABC	5.83612E-09	4.10452E-09	3.71972E-09
EBLSHADE versus NNA	1.23520E-08	8.55140E-09	7.87272E-09
EBLSHADE versus PSO	1.47150E-08	1.00256E-08	9.37877E-09
STLBO versus PSO	5.32586E-08	3.57008E-08	3.39450E-08
ADELI versus PSO	1.50038E-07	9.89261E-08	9.56286E-08
TLBO versus GOTLBO	2.16253E-07	1.40208E-07	1.37831E-07
EBLSHADE versus WW	2.39169E-07	1.52438E-07	1.52438E-07
TLBO versus CWOA	2.89034E-07	1.81043E-07	1.77867E-07
TLBO versus DE	5.91345E-07	3.63905E-07	3.63905E-07
STLBO versus WW	6.86296E-07	4.14794E-07	4.14794E-07
TLBO versus NDE	1.37158E-06	8.13904E-07	7.68687E-07
TLBO versus NNA	1.17758E-04	6.72904E-05	6.59964E-05
NNA versus WW	2.21281E-02	1.24015E-02	1.24015E-02
IJAYA versus WW	2.36193E-01	1.29777E-01	1.24585E-01
NNA versus PSO	2.36193E-01	1.29777E-01	1.24585E-01
NDE versus WW	4.04596E-01	2.13413E-01	2.13413E-01
DE versus WW	6.28685E-01	3.24706E-01	3.24706E-01

**Table S144 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
CWOA versus WW	8.94683E-01	4.52257E-01	4.52257E-01
GOTLBO versus WW	1.0	5.07626E-01	5.07626E-01
IJAYA versus PSO	1.0	8.15876E-01	7.97333E-01
NNA versus MABC	1.0	9.64793E-01	9.64793E-01
DE versus EBL SHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus GOTLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus PSO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
DE versus ISCA	1.0	1.0	1.0
DE versus NNA	1.0	1.0	1.0
DE versus CWOA	1.0	1.0	1.0
EBL SHADE versus ADELI	1.0	1.0	1.0
EBL SHADE versus TLBO	1.0	1.0	1.0
EBL SHADE versus STLBO	1.0	1.0	1.0
EBL SHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBL SHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBL SHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus MABC	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus GOTLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus PSO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
NDE versus ISCA	1.0	1.0	1.0
NDE versus NNA	1.0	1.0	1.0
NDE versus CWOA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus GOTLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0

**Table S144 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus PSO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
MABC versus ISCA	1.0	1.0	1.0
MABC versus NNA	1.0	1.0	1.0
MABC versus CWOA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus PSO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0
IJAYA versus NDE	1.0	1.0	1.0

**Table S144 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus MABC	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus GOTLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
IJAYA versus ISCA	1.0	1.0	1.0
IJAYA versus NNA	1.0	1.0	1.0
IJAYA versus CWOA	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus PSO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S144 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S145.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $n_1$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
EBLSHADE versus CWOA	<1E-13	<1E-13	<1E-13
ADELI versus PSO	<1E-13	<1E-13	<1E-13
ADELI versus NNA	<1E-13	<1E-13	<1E-13
ADELI versus CWOA	<1E-13	<1E-13	<1E-13
STLBO versus CWOA	<1E-13	<1E-13	<1E-13
TLBO versus ISCA	1.61648E-12	1.52767E-12	1.38556E-12
EBLSHADE versus MABC	2.99050E-12	2.79332E-12	2.56328E-12
STLBO versus MABC	1.78622E-11	1.64881E-11	1.53104E-11
TLBO versus GOTLBO	2.46918E-11	2.25211E-11	2.11644E-11
EBLSHADE versus GOTLBO	5.12426E-11	4.61746E-11	4.39222E-11
ADELI versus MABC	7.56515E-11	6.73381E-11	6.48441E-11
TLBO versus WW	2.00969E-10	1.76676E-10	1.72260E-10
STLBO versus GOTLBO	2.49909E-10	2.16954E-10	2.14207E-10
TLBO versus MABC	4.53444E-10	3.88666E-10	3.88666E-10
EBLSHADE versus ISCA	5.43381E-10	4.59784E-10	4.00072E-10
ADELI versus GOTLBO	8.75044E-10	7.30806E-10	6.44263E-10
TLBO versus PSO	1.00018E-09	8.24324E-10	7.36396E-10
TLBO versus NNA	2.04728E-09	1.66482E-09	1.50734E-09
STLBO versus ISCA	2.18167E-09	1.75013E-09	1.60628E-09
ADELI versus ISCA	6.57190E-09	5.19974E-09	4.83865E-09
NDE versus CWOA	3.36109E-08	2.62239E-08	2.47465E-08
TLBO versus CWOA	5.32586E-08	4.09682E-08	3.92124E-08
EBLSHADE versus WW	5.60533E-08	4.25019E-08	4.12700E-08
STLBO versus WW	1.57318E-07	1.17556E-07	1.15828E-07
EBLSHADE versus PSO	1.72868E-07	1.27276E-07	1.27276E-07
EBLSHADE versus NNA	2.86887E-07	2.08072E-07	2.08072E-07
ADELI versus DE	3.33882E-07	2.34818E-07	2.12804E-07
ADELI versus WW	3.58848E-07	2.48433E-07	2.28717E-07
STLBO versus PSO	4.47114E-07	3.04627E-07	2.84974E-07
STLBO versus NNA	7.15762E-07	4.79796E-07	4.56200E-07
STLBO versus DE	1.19373E-06	7.73959E-07	7.60841E-07
NDE versus NNA	2.07377E-06	1.32174E-06	1.32174E-06
NDE versus PSO	4.36970E-06	2.73706E-06	2.68905E-06
EBLSHADE versus DE	4.99510E-06	3.01902E-06	3.01902E-06
DE versus CWOA	6.39569E-06	3.79524E-06	3.58440E-06
IJAYA versus CWOA	7.30359E-06	4.25374E-06	4.09322E-06
NDE versus WW	1.94193E-05	1.10967E-05	1.08833E-05
ADELI versus NDE	4.70344E-05	2.63600E-05	2.63600E-05
STLBO versus NDE	1.40958E-04	7.74492E-05	7.43513E-05
DE versus NNA	2.26316E-04	1.21862E-04	1.19375E-04
IJAYA versus NNA	2.54404E-04	1.34191E-04	1.34191E-04

**Table S145 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
DE versus PSO	4.27764E-04	2.20933E-04	2.20933E-04
EBLSHADE versus NDE	4.79400E-04	2.42334E-04	2.42334E-04
IJAYA versus PSO	4.79400E-04	2.42334E-04	2.42334E-04
TLBO versus DE	1.30442E-03	6.16374E-04	6.16374E-04
DE versus WW	1.53460E-03	7.08277E-04	7.08277E-04
IJAYA versus WW	1.70903E-03	7.70003E-04	7.51222E-04
NDE versus ISCA	1.90225E-03	8.36152E-04	8.36152E-04
NDE versus GOTLBO	9.80133E-03	4.20057E-03	4.20057E-03
NDE versus MABC	4.80428E-02	2.00618E-02	2.00618E-02
TLBO versus NDE	5.02234E-02	2.04205E-02	2.04205E-02
DE versus ISCA	6.82680E-02	2.70071E-02	2.70071E-02
IJAYA versus ISCA	7.44356E-02	2.86291E-02	2.86291E-02
DE versus GOTLBO	2.55477E-01	9.54529E-02	9.54529E-02
IJAYA versus GOTLBO	2.76188E-01	1.00156E-01	9.71211E-02
MABC versus CWOA	4.52529E-01	1.59131E-01	1.59131E-01
DE versus MABC	8.94683E-01	3.04782E-01	3.04782E-01
IJAYA versus MABC	9.58593E-01	3.16020E-01	3.16020E-01
GOTLBO versus CWOA	1.0	4.72336E-01	4.72336E-01
MABC versus NNA	1.0	9.34584E-01	9.34584E-01
DE versus EBLSHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
EBLSHADE versus ADELI	1.0	1.0	1.0
EBLSHADE versus TLBO	1.0	1.0	1.0
EBLSHADE versus STLBO	1.0	1.0	1.0
EBLSHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBLSHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBLSHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBLSHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0

**Table S145 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus TLBO	1.0	1.0	1.0
MABC versus GOTLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0
MABC versus PSO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
MABC versus ISCA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus PSO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0

**Table S145 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus PSO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S145 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S146.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $R_{p1}$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
EBLSHADE versus GOTLBO	<1E-13	<1E-13	<1E-13
EBLSHADE versus PSO	<1E-13	<1E-13	<1E-13
ADELI versus GOTLBO	<1E-13	<1E-13	<1E-13
ADELI versus PSO	<1E-13	<1E-13	<1E-13
STLBO versus GOTLBO	<1E-13	<1E-13	<1E-13
STLBO versus PSO	<1E-13	<1E-13	<1E-13
TLBO versus WW	1.43463E-12	1.34004E-12	1.22968E-12
ADELI versus MABC	1.33360E-11	1.23102E-11	1.14309E-11
STLBO versus MABC	2.69549E-11	2.45852E-11	2.31042E-11
EBLSHADE versus MABC	3.50373E-11	3.15721E-11	3.00320E-11
TLBO versus CWOA	4.11355E-10	3.66151E-10	3.52590E-10
TLBO versus NNA	8.18143E-10	7.19247E-10	7.01266E-10
TLBO versus ISCA	1.06888E-09	9.27929E-10	9.16183E-10
EBLSHADE versus WW	2.63616E-09	2.25957E-09	2.25957E-09
STLBO versus WW	3.17823E-09	2.68927E-09	2.34002E-09
TLBO versus PSO	4.31959E-09	3.60757E-09	3.18036E-09
ADELI versus WW	5.17792E-09	4.26752E-09	3.81232E-09
TLBO versus GOTLBO	1.10887E-08	9.01722E-09	8.16424E-09
NDE versus GOTLBO	8.94170E-08	7.17301E-08	6.58345E-08
ADELI versus DE	1.61452E-07	1.27742E-07	1.18871E-07
EBLSHADE versus CWOA	2.62028E-07	2.04440E-07	1.92922E-07
NDE versus PSO	2.89034E-07	2.22334E-07	2.12805E-07
STLBO versus DE	2.89034E-07	2.22334E-07	2.12805E-07
STLBO versus CWOA	3.00115E-07	2.22334E-07	2.20964E-07
TLBO versus MABC	3.10670E-07	2.25321E-07	2.25321E-07
EBLSHADE versus DE	3.58779E-07	2.56271E-07	2.28673E-07
EBLSHADE versus NNA	4.09653E-07	2.88108E-07	2.61097E-07
ADELI versus CWOA	4.28007E-07	2.96312E-07	2.72795E-07
STLBO versus NNA	4.67004E-07	3.18178E-07	2.97651E-07
EBLSHADE versus ISCA	4.87704E-07	3.26922E-07	3.10844E-07
STLBO versus ISCA	5.54974E-07	3.59818E-07	3.53720E-07
ADELI versus NNA	6.57947E-07	4.12121E-07	4.04891E-07
ADELI versus ISCA	7.78206E-07	4.78896E-07	4.78896E-07
NDE versus ISCA	1.37158E-06	8.28976E-07	8.28976E-07
NDE versus NNA	1.80779E-06	1.07275E-06	1.01315E-06
NDE versus CWOA	3.57169E-06	2.08021E-06	2.00172E-06
IJAYA versus GOTLBO	6.81498E-05	3.89427E-05	3.81938E-05
DE versus GOTLBO	1.10876E-04	6.21395E-05	6.21395E-05
IJAYA versus PSO	1.78805E-04	9.82446E-05	9.43149E-05
ADELI versus NDE	1.78805E-04	9.82446E-05	9.43149E-05
DE versus PSO	2.85820E-04	1.50762E-04	1.50762E-04

**Table S146 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
STLBO versus NDE	2.85820E-04	1.50762E-04	1.50762E-04
EBLSHADE versus NDE	3.40016E-04	1.71876E-04	1.71876E-04
TLBO versus DE	5.36975E-04	2.65537E-04	2.65537E-04
IJAYA versus ISCA	6.35902E-04	3.07469E-04	3.00481E-04
NDE versus WW	7.11295E-04	3.36107E-04	3.36107E-04
IJAYA versus NNA	7.95190E-04	3.67011E-04	3.67011E-04
DE versus ISCA	9.92197E-04	4.36131E-04	4.36131E-04
DE versus NNA	1.23530E-03	5.29414E-04	5.29414E-04
IJAYA versus CWOA	1.37722E-03	5.75102E-04	5.75102E-04
DE versus CWOA	2.11615E-03	8.60411E-04	8.60411E-04
MABC versus GOTLBO	4.80428E-02	1.90060E-02	1.90060E-02
IJAYA versus WW	8.83504E-02	3.39809E-02	3.39809E-02
MABC versus PSO	9.61775E-02	3.59344E-02	3.59344E-02
TLBO versus NDE	1.00327E-01	3.63824E-02	3.59344E-02
DE versus WW	1.23672E-01	4.34891E-02	4.34891E-02
MABC versus ISCA	2.36193E-01	8.04614E-02	8.04614E-02
MABC versus NNA	2.76188E-01	9.10511E-02	9.10511E-02
MABC versus CWOA	4.04596E-01	1.28937E-01	1.28937E-01
NDE versus MABC	7.25121E-01	2.23114E-01	2.23114E-01
DE versus EBLSHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
EBLSHADE versus ADELI	1.0	1.0	1.0
EBLSHADE versus TLBO	1.0	1.0	1.0
EBLSHADE versus STLBO	1.0	1.0	1.0
EBLSHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBLSHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBLSHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBLSHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0

**Table S146 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus PSO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0
IJAYA versus NDE	1.0	1.0	1.0

**Table S146 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus MABC	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus PSO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S146 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S147.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $I_{02}$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
ADELI versus PSO	<1E-13	<1E-13	<1E-13
STLBO versus PSO	<1E-13	<1E-13	<1E-13
STLBO versus GOTLBO	1.43463E-12	1.40310E-12	1.22968E-12
STLBO versus ISCA	1.43463E-12	1.40310E-12	1.22968E-12
STLBO versus MABC	1.61648E-12	1.54543E-12	1.38556E-12
ADELI versus MABC	1.85896E-12	1.75682E-12	1.59339E-12
STLBO versus NNA	2.14184E-12	2.00062E-12	1.83586E-12
ADELI versus GOTLBO	2.16205E-12	2.00062E-12	1.85318E-12
ADELI versus ISCA	2.16205E-12	2.00062E-12	1.85318E-12
EBLSHADE versus CWOA	2.18225E-12	2.00062E-12	1.87050E-12
STLBO versus WW	2.30349E-12	2.05036E-12	1.97442E-12
EBLSHADE versus WW	2.50555E-12	2.20268E-12	2.14762E-12
EBLSHADE versus NNA	2.74802E-12	2.38565E-12	2.35545E-12
EBLSHADE versus DE	9.09273E-12	7.69385E-12	6.69464E-12
ADELI versus NNA	1.17195E-11	9.78773E-12	8.62865E-12
ADELI versus WW	1.27702E-11	1.05249E-11	9.40226E-12
EBLSHADE versus GOTLBO	1.59022E-11	1.29314E-11	1.17082E-11
EBLSHADE versus ISCA	1.59022E-11	1.29314E-11	1.17082E-11
EBLSHADE versus MABC	1.89533E-11	1.49960E-11	1.39546E-11
STLBO versus CWOA	2.48535E-11	1.93912E-11	1.82987E-11
STLBO versus DE	9.52514E-11	7.22236E-11	7.01301E-11
ADELI versus CWOA	1.19539E-10	8.93259E-11	8.80123E-11
ADELI versus DE	4.11355E-10	2.93825E-10	2.78092E-10
TLBO versus PSO	3.83430E-10	2.78092E-10	2.78092E-10
ADELI versus NDE	1.03645E-09	7.28932E-10	6.60594E-10
STLBO versus NDE	5.20274E-09	3.60189E-09	3.31603E-09
TLBO versus DE	5.63195E-09	3.83716E-09	3.58960E-09
TLBO versus CWOA	2.12347E-08	1.40009E-08	1.35342E-08
EBLSHADE versus NDE	4.90997E-08	3.18339E-08	3.12943E-08
TLBO versus WW	1.73724E-07	1.10725E-07	1.10725E-07
TLBO versus NNA	1.86904E-07	1.17072E-07	1.15018E-07
EBLSHADE versus PSO	6.57947E-07	4.04891E-07	4.04891E-07
TLBO versus GOTLBO	7.84454E-07	4.74120E-07	4.74120E-07
TLBO versus ISCA	7.84454E-07	4.74120E-07	4.74120E-07
TLBO versus MABC	9.02777E-07	5.25793E-07	5.05952E-07
TLBO versus NDE	4.03987E-04	2.30850E-04	2.26410E-04
NDE versus PSO	2.90375E-03	1.62737E-03	1.62737E-03
MABC versus PSO	2.36193E-01	1.29777E-01	1.24585E-01
GOTLBO versus PSO	2.55477E-01	1.37564E-01	1.34757E-01
ISCA versus PSO	2.55477E-01	1.37564E-01	1.34757E-01
NNA versus PSO	5.43931E-01	2.80932E-01	2.80932E-01

**Table S147 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus PSO	5.64095E-01	2.85147E-01	2.85147E-01
CWOA versus PSO	1.0	7.32936E-01	7.32936E-01
DE versus EBL SHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus GOTLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus PSO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
DE versus ISCA	1.0	1.0	1.0
DE versus NNA	1.0	1.0	1.0
DE versus CWOA	1.0	1.0	1.0
DE versus WW	1.0	1.0	1.0
EBL SHADE versus ADELI	1.0	1.0	1.0
EBL SHADE versus TLBO	1.0	1.0	1.0
EBL SHADE versus STLBO	1.0	1.0	1.0
EBL SHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBL SHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBL SHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus MABC	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus GOTLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
NDE versus ISCA	1.0	1.0	1.0
NDE versus NNA	1.0	1.0	1.0
NDE versus CWOA	1.0	1.0	1.0
NDE versus WW	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus GOTLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0

**Table S147 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus ISCA	1.0	1.0	1.0
MABC versus NNA	1.0	1.0	1.0
MABC versus CWOA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus MABC	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0

**Table S147 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus GOTLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
IJAYA versus PSO	1.0	1.0	1.0
IJAYA versus ISCA	1.0	1.0	1.0
IJAYA versus NNA	1.0	1.0	1.0
IJAYA versus CWOA	1.0	1.0	1.0
IJAYA versus WW	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0

**Table S147 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus DE	1.0	1.0	1.0
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S148.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $n_2$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
EBLSHADE versus PSO	<1E-13	<1E-13	<1E-13
ADELI versus PSO	<1E-13	<1E-13	<1E-13
STLBO versus PSO	<1E-13	<1E-13	<1E-13
STLBO versus ISCA	1.73772E-12	1.68043E-12	1.48948E-12
EBLSHADE versus ISCA	2.50555E-12	2.39542E-12	2.14762E-12
ADELI versus ISCA	5.90017E-12	5.57598E-12	5.05729E-12
TLBO versus GOTLBO	3.82299E-11	3.57092E-11	3.27685E-11
TLBO versus NNA	5.54050E-11	5.11431E-11	4.74900E-11
STLBO versus GOTLBO	2.88583E-10	2.63213E-10	2.47357E-10
TLBO versus CWOA	3.57304E-10	3.21966E-10	3.06260E-10
EBLSHADE versus GOTLBO	4.11355E-10	3.66151E-10	3.52590E-10
NDE versus PSO	4.17134E-10	3.66711E-10	3.57543E-10
ADELI versus MABC	4.53444E-10	3.93649E-10	3.88666E-10
ADELI versus GOTLBO	8.18143E-10	7.01266E-10	7.01266E-10
EBLSHADE versus MABC	1.03645E-09	8.76996E-10	7.63100E-10
STLBO versus MABC	1.55916E-09	1.30216E-09	1.14795E-09
NDE versus WW	1.58351E-09	1.30509E-09	1.16588E-09
DE versus WW	2.74625E-09	2.23321E-09	2.02196E-09
IJAYA versus WW	5.20274E-09	4.17362E-09	3.83059E-09
TLBO versus PSO	7.39368E-09	5.84994E-09	5.44370E-09
TLBO versus ISCA	7.72300E-09	6.02564E-09	5.68616E-09
TLBO versus WW	1.48718E-08	1.12764E-08	1.09496E-08
NDE versus CWOA	1.82015E-08	1.36011E-08	1.34011E-08
ADELI versus DE	2.47603E-08	1.82301E-08	1.82301E-08
EBLSHADE versus DE	5.29450E-08	3.72360E-08	3.37451E-08
STLBO versus DE	7.70341E-08	5.33313E-08	4.90986E-08
STLBO versus NNA	9.71903E-08	6.62176E-08	6.19455E-08
NDE versus NNA	1.20281E-07	8.06279E-08	7.66626E-08
EBLSHADE versus NNA	1.23921E-07	8.17061E-08	7.89826E-08
MABC versus WW	1.29493E-07	8.39569E-08	8.25339E-08
ADELI versus NNA	1.98870E-07	1.26753E-07	1.26753E-07
STLBO versus CWOA	3.13904E-07	1.96621E-07	1.93172E-07
STLBO versus WW	3.76647E-07	2.31783E-07	2.31783E-07
EBLSHADE versus CWOA	3.92026E-07	2.36939E-07	2.36939E-07
EBLSHADE versus WW	4.21156E-07	2.49917E-07	2.36939E-07
ADELI versus WW	5.24150E-07	3.05274E-07	2.93755E-07
ADELI versus CWOA	6.04449E-07	3.45400E-07	3.38757E-07
TLBO versus MABC	1.01533E-05	5.69029E-06	5.69029E-06
NDE versus GOTLBO	8.70224E-05	4.78145E-05	4.59019E-05
ISCA versus WW	1.04382E-04	5.62059E-05	5.50588E-05
TLBO versus DE	2.26316E-04	1.16888E-04	1.16888E-04

**Table S148 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
DE versus PSO	4.03987E-04	2.04213E-04	2.04213E-04
IJAYA versus PSO	6.35902E-04	3.14457E-04	3.14457E-04
NDE versus ISCA	3.22321E-03	1.55847E-03	1.52305E-03
GOTLBO versus WW	3.76564E-03	1.77937E-03	1.77937E-03
DE versus CWOA	5.12081E-03	2.36345E-03	2.36345E-03
MABC versus PSO	5.96060E-03	2.68554E-03	2.62004E-03
ADELI versus NDE	6.26838E-03	2.75533E-03	2.75533E-03
IJAYA versus CWOA	7.65642E-03	3.28132E-03	3.28132E-03
EBLSHADE versus NDE	1.02934E-02	4.29835E-03	4.29835E-03
STLBO versus NDE	1.31235E-02	5.33592E-03	5.33592E-03
DE versus NNA	1.74861E-02	6.91757E-03	6.91757E-03
IJAYA versus NNA	2.54443E-02	9.78628E-03	9.78628E-03
MABC versus CWOA	5.48640E-02	2.04986E-02	2.04986E-02
MABC versus NNA	1.58264E-01	5.73924E-02	5.56532E-02
NDE versus MABC	2.98420E-01	1.04939E-01	1.04939E-01
NNA versus WW	3.10137E-01	1.05651E-01	1.05651E-01
ISCA versus PSO	4.69614E-01	1.54818E-01	1.54818E-01
CWOA versus WW	7.78139E-01	2.47978E-01	2.47978E-01
DE versus GOTLBO	9.58593E-01	2.94952E-01	2.94952E-01
IJAYA versus GOTLBO	1.0	3.72867E-01	3.72867E-01
TLBO versus NDE	1.0	4.48866E-01	4.48866E-01
NDE versus DE	1.0	4.59538E-01	4.59538E-01
ISCA versus CWOA	1.0	5.84482E-01	5.84482E-01
PSO versus WW	1.0	8.50607E-01	8.50607E-01
GOTLBO versus PSO	1.0	8.85464E-01	8.85464E-01
MABC versus GOTLBO	1.0	9.99507E-01	9.99507E-01
DE versus EBLSHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
DE versus ISCA	1.0	1.0	1.0
EBLSHADE versus ADELI	1.0	1.0	1.0
EBLSHADE versus TLBO	1.0	1.0	1.0
EBLSHADE versus STLBO	1.0	1.0	1.0
EBLSHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBLSHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus EBLSHADE	1.0	1.0	1.0

**Table S148 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
NDE versus ADELI	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
MABC versus ISCA	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0

**Table S148 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus MABC	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
IJAYA versus ISCA	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S148 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S149.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $R_{p2}$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
STLBO versus ISCA	1.29319E-12	1.29319E-12	1.29319E-12
EBLSHADE versus ISCA	1.98019E-12	1.95843E-12	1.69731E-12
TLBO versus CWOA	2.97029E-12	2.90501E-12	2.54596E-12
EBLSHADE versus GOTLBO	4.95048E-12	4.78728E-12	4.24327E-12
TLBO versus PSO	7.65810E-12	7.32148E-12	6.56408E-12
ADELI versus ISCA	1.07900E-11	1.01972E-11	9.24860E-12
STLBO versus GOTLBO	2.10951E-11	1.97042E-11	1.80815E-11
TLBO versus WW	2.46918E-11	2.27924E-11	2.11644E-11
EBLSHADE versus NNA	5.54050E-11	5.05342E-11	4.74900E-11
TLBO versus MABC	1.17478E-10	1.05859E-10	1.00695E-10
ADELI versus GOTLBO	1.73509E-10	1.54442E-10	1.48722E-10
STLBO versus NNA	2.00969E-10	1.76676E-10	1.72260E-10
ADELI versus NDE	2.13032E-10	1.84940E-10	1.82599E-10
EBLSHADE versus MABC	8.75044E-10	7.50037E-10	7.50037E-10
ADELI versus NNA	1.30252E-09	1.10213E-09	9.59000E-10
STLBO versus NDE	1.98884E-09	1.66101E-09	1.46431E-09
STLBO versus MABC	2.63616E-09	2.17266E-09	1.94091E-09
TLBO versus NNA	2.74625E-09	2.23321E-09	2.02196E-09
EBLSHADE versus WW	2.80640E-09	2.25129E-09	2.06625E-09
EBLSHADE versus NDE	7.72300E-09	6.11050E-09	5.68616E-09
STLBO versus WW	7.83965E-09	6.11665E-09	5.77205E-09
EBLSHADE versus CWOA	1.17394E-08	9.03031E-09	8.64329E-09
ADELI versus MABC	1.31489E-08	9.97004E-09	9.68105E-09
TLBO versus GOTLBO	2.67315E-08	1.99752E-08	1.96815E-08
STLBO versus CWOA	2.99616E-08	2.20597E-08	2.20597E-08
ADELI versus WW	3.51330E-08	2.54811E-08	2.54811E-08
ADELI versus CWOA	1.18085E-07	8.30485E-08	7.52627E-08
EBLSHADE versus PSO	1.23921E-07	8.57914E-08	7.89826E-08
STLBO versus PSO	2.74198E-07	1.86816E-07	1.74764E-07
TLBO versus ISCA	3.58779E-07	2.40501E-07	2.28673E-07
ADELI versus DE	6.81272E-07	4.41704E-07	4.34218E-07
ADELI versus PSO	8.81287E-07	5.61700E-07	5.61700E-07
STLBO versus DE	4.36970E-06	2.68905E-06	2.68905E-06
EBLSHADE versus DE	1.31819E-05	7.96708E-06	7.96708E-06
TLBO versus NDE	2.13413E-04	1.26641E-04	1.19605E-04
DE versus PSO	2.69673E-04	1.57062E-04	1.51136E-04
IJAYA versus PSO	1.61958E-03	9.25474E-04	9.07676E-04
DE versus CWOA	3.22321E-03	1.80641E-03	1.80641E-03
DE versus WW	1.08087E-02	5.82009E-03	5.70131E-03
IJAYA versus CWOA	1.58994E-02	8.38648E-03	8.38648E-03
DE versus MABC	2.54443E-02	1.31416E-02	1.31416E-02

**Table S149 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
TLBO versus DE	4.59507E-02	2.32278E-02	2.32278E-02
IJAYA versus WW	4.80428E-02	2.37574E-02	2.37574E-02
NDE versus PSO	5.48640E-02	2.65276E-02	2.59247E-02
IJAYA versus MABC	1.04642E-01	4.94461E-02	4.94461E-02
DE versus NNA	1.34341E-01	6.20034E-02	6.20034E-02
NDE versus CWOA	3.47844E-01	1.56721E-01	1.52898E-01
DE versus GOTLBO	4.20037E-01	1.84631E-01	1.84631E-01
IJAYA versus NNA	4.69614E-01	2.01263E-01	2.01263E-01
NDE versus WW	8.34597E-01	3.48513E-01	3.48513E-01
IJAYA versus GOTLBO	1.0	5.28247E-01	5.28247E-01
DE versus ISCA	1.0	5.67461E-01	5.67461E-01
NDE versus MABC	1.0	5.88959E-01	5.88959E-01
ADELI versus TLBO	1.0	7.16260E-01	7.16260E-01
ISCA versus PSO	1.0	7.88189E-01	7.64304E-01
DE versus EBL SHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
EBL SHADE versus ADELI	1.0	1.0	1.0
EBL SHADE versus TLBO	1.0	1.0	1.0
EBL SHADE versus STLBO	1.0	1.0	1.0
EBL SHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBL SHADE	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBL SHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus GOTLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
NDE versus ISCA	1.0	1.0	1.0
NDE versus NNA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus GOTLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0

**Table S149 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus PSO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
MABC versus ISCA	1.0	1.0	1.0
MABC versus NNA	1.0	1.0	1.0
MABC versus CWOA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus PSO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0

**Table S149 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
IJAYA versus ISCA	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S149 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S150.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $R_s$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
TLBO versus PSO	<1E-13	<1E-13	<1E-13
TLBO versus NNA	1.61648E-12	1.59872E-12	1.38556E-12
ADELI versus MABC	2.97029E-12	2.90501E-12	2.54596E-12
TLBO versus ISCA	3.55627E-12	3.39995E-12	3.04823E-12
NDE versus PSO	3.83915E-12	3.62821E-12	3.29070E-12
STLBO versus MABC	5.47584E-12	5.11480E-12	4.69358E-12
TLBO versus WW	7.15294E-12	6.60272E-12	6.13110E-12
EBLSHADE versus GOTLBO	9.09273E-12	8.29337E-12	7.79377E-12
EBLSHADE versus MABC	1.59022E-11	1.41547E-11	1.36304E-11
STLBO versus GOTLBO	2.48535E-11	2.15761E-11	2.13030E-11
ADELI versus GOTLBO	4.37259E-11	3.74794E-11	3.74794E-11
EBLSHADE versus CWOA	8.82399E-11	7.46645E-11	6.49678E-11
STLBO versus CWOA	2.16164E-10	1.80533E-10	1.59154E-10
TLBO versus CWOA	2.31804E-10	1.91047E-10	1.70669E-10
ADELI versus CWOA	3.57284E-10	2.90538E-10	2.63055E-10
EBLSHADE versus WW	1.48409E-09	1.19054E-09	1.09269E-09
TLBO versus GOTLBO	2.33768E-09	1.84959E-09	1.72115E-09
EBLSHADE versus ISCA	2.47565E-09	1.93155E-09	1.82273E-09
STLBO versus WW	3.17823E-09	2.44479E-09	2.34002E-09
ADELI versus WW	4.87552E-09	3.69682E-09	3.58967E-09
STLBO versus ISCA	5.17792E-09	3.86922E-09	3.81232E-09
ADELI versus DE	5.20274E-09	3.86922E-09	3.83059E-09
ADELI versus ISCA	7.83965E-09	5.59975E-09	4.99670E-09
STLBO versus DE	9.03653E-09	6.35536E-09	5.75955E-09
EBLSHADE versus NNA	1.31489E-08	9.10308E-09	8.38061E-09
EBLSHADE versus DE	2.29314E-08	1.56236E-08	1.46156E-08
STLBO versus NNA	2.55057E-08	1.70972E-08	1.62564E-08
ADELI versus NNA	3.70334E-08	2.44176E-08	2.36037E-08
EBLSHADE versus PSO	8.87455E-08	5.75383E-08	5.65631E-08
STLBO versus PSO	1.21526E-07	7.74564E-08	7.74564E-08
ADELI versus PSO	1.45251E-07	9.09811E-08	8.93850E-08
TLBO versus MABC	3.58779E-07	2.20787E-07	2.20787E-07
DE versus PSO	7.84454E-07	4.74120E-07	4.74120E-07
NDE versus NNA	8.70224E-05	5.16397E-05	4.87708E-05
TLBO versus DE	1.17758E-04	6.85844E-05	6.59964E-05
ADELI versus NDE	1.89694E-04	1.08397E-04	1.06312E-04
MABC versus PSO	2.26316E-04	1.26836E-04	1.26836E-04
STLBO versus NDE	2.85820E-04	1.57044E-04	1.50762E-04
NDE versus ISCA	4.52878E-04	2.43857E-04	2.38881E-04
EBLSHADE versus NDE	5.68189E-04	2.99704E-04	2.99704E-04
NDE versus WW	7.11295E-04	3.67372E-04	3.67372E-04

**Table S150 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus PSO	4.39395E-03	2.22112E-03	2.22112E-03
NDE versus CWOA	5.96060E-03	2.94755E-03	2.94755E-03
GOTLBO versus PSO	8.04629E-03	3.89051E-03	3.80209E-03
NDE versus GOTLBO	2.31856E-02	1.09558E-02	1.09558E-02
CWOA versus PSO	3.05936E-02	1.41201E-02	1.41201E-02
WW versus PSO	1.71641E-01	7.54467E-02	7.54467E-02
DE versus NNA	1.86050E-01	7.97358E-02	7.97358E-02
TLBO versus NDE	2.27059E-01	9.48159E-02	9.48159E-02
ISCA versus PSO	2.36193E-01	9.60346E-02	9.60346E-02
NDE versus MABC	3.75247E-01	1.48450E-01	1.48450E-01
DE versus ISCA	5.43931E-01	2.09204E-01	2.09204E-01
NNA versus PSO	6.75361E-01	2.52333E-01	2.52333E-01
DE versus WW	7.25121E-01	2.62956E-01	2.54988E-01
DE versus CWOA	1.0	9.47406E-01	9.47406E-01
DE versus EBL SHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus GOTLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
EBL SHADE versus ADELI	1.0	1.0	1.0
EBL SHADE versus TLBO	1.0	1.0	1.0
EBL SHADE versus STLBO	1.0	1.0	1.0
EBL SHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBL SHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBL SHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus GOTLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0

**Table S150 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus IJAYA	1.0	1.0	1.0
MABC versus ISCA	1.0	1.0	1.0
MABC versus NNA	1.0	1.0	1.0
MABC versus CWOA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus MABC	1.0	1.0	1.0

**Table S150 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus GOTLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
IJAYA versus ISCA	1.0	1.0	1.0
IJAYA versus NNA	1.0	1.0	1.0
IJAYA versus CWOA	1.0	1.0	1.0
IJAYA versus WW	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0

**Table S150 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus DE	1.0	1.0	1.0
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S151.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case.  $I_{ph}$  evaluation task.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
EBLSHADE versus GOTLBO	<1E-13	<1E-13	<1E-13
EBLSHADE versus PSO	<1E-13	<1E-13	<1E-13
ADELI versus GOTLBO	<1E-13	<1E-13	<1E-13
STLBO versus GOTLBO	<1E-13	<1E-13	<1E-13
STLBO versus PSO	<1E-13	<1E-13	<1E-13
EBLSHADE versus MABC	1.51545E-12	1.43219E-12	1.29896E-12
STLBO versus MABC	1.61648E-12	1.50990E-12	1.38556E-12
ADELI versus MABC	7.03171E-12	6.49081E-12	6.02718E-12
TLBO versus WW	7.79954E-12	7.11387E-12	6.68532E-12
TLBO versus ISCA	9.09273E-12	8.19345E-12	7.79377E-12
TLBO versus NNA	1.51343E-11	1.34712E-11	1.29723E-11
TLBO versus CWOA	3.43907E-11	3.02336E-11	2.94778E-11
EBLSHADE versus WW	2.18167E-09	1.89398E-09	1.87000E-09
NDE versus PSO	2.53392E-09	2.14409E-09	1.99224E-09
STLBO versus WW	2.32428E-09	1.99224E-09	1.99224E-09
TLBO versus GOTLBO	2.80640E-09	2.34381E-09	2.06625E-09
ADELI versus WW	6.97145E-09	5.74570E-09	5.13283E-09
ADELI versus PSO	1.48718E-08	1.20936E-08	1.09496E-08
TLBO versus MABC	2.29314E-08	1.83955E-08	1.68836E-08
TLBO versus PSO	2.55057E-08	2.01803E-08	1.87789E-08
NDE versus GOTLBO	4.90997E-08	3.83086E-08	3.61503E-08
EBLSHADE versus ISCA	5.89835E-08	4.53719E-08	4.34274E-08
STLBO versus ISCA	6.20553E-08	4.70529E-08	4.56890E-08
EBLSHADE versus NNA	7.97656E-08	5.96050E-08	5.87285E-08
STLBO versus NNA	8.38271E-08	6.17189E-08	6.17189E-08
ADELI versus DE	1.11709E-07	8.10200E-08	8.10200E-08
EBLSHADE versus CWOA	1.30023E-07	9.28738E-08	8.28720E-08
STLBO versus CWOA	1.36403E-07	9.59315E-08	8.69379E-08
ADELI versus ISCA	1.50038E-07	1.03872E-07	9.56286E-08
ADELI versus NNA	1.98870E-07	1.35494E-07	1.26753E-07
ADELI versus CWOA	3.13904E-07	2.10419E-07	2.00071E-07
STLBO versus DE	4.14117E-07	2.73044E-07	2.63942E-07
EBLSHADE versus DE	4.44818E-07	2.88399E-07	2.83511E-07
IJAYA versus PSO	6.81272E-07	4.34218E-07	4.34218E-07
NDE versus CWOA	4.08618E-06	2.51457E-06	2.51457E-06
NDE versus NNA	7.80316E-06	4.63045E-06	4.41426E-06
IJAYA versus GOTLBO	8.90345E-06	5.08769E-06	4.98985E-06
DE versus PSO	1.15721E-05	6.48546E-06	6.48546E-06
NDE versus ISCA	1.15721E-05	6.48546E-06	6.48546E-06
DE versus GOTLBO	1.25050E-04	6.73346E-05	6.59604E-05
ADELI versus NDE	2.39966E-04	1.26575E-04	1.26575E-04

**Table S151 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
NDE versus WW	4.03987E-04	2.08653E-04	2.08653E-04
IJAYA versus CWOA	4.03987E-04	2.08653E-04	2.08653E-04
STLBO versus NDE	6.72589E-04	3.32599E-04	3.32599E-04
EBLSHADE versus NDE	7.11295E-04	3.43923E-04	3.36107E-04
IJAYA versus NNA	7.11295E-04	3.43923E-04	3.36107E-04
IJAYA versus ISCA	9.92197E-04	4.57937E-04	4.57937E-04
TLBO versus DE	1.70903E-03	7.70003E-04	7.51222E-04
DE versus CWOA	3.96494E-03	1.74283E-03	1.74283E-03
DE versus NNA	6.59115E-03	2.82478E-03	2.82478E-03
DE versus ISCA	8.88298E-03	3.70937E-03	3.70937E-03
IJAYA versus WW	1.92207E-02	7.60380E-03	7.60380E-03
NDE versus MABC	5.24960E-02	2.01908E-02	2.01908E-02
MABC versus PSO	1.13790E-01	4.25150E-02	4.25150E-02
DE versus WW	1.23672E-01	4.48482E-02	4.34891E-02
TLBO versus NDE	3.47844E-01	1.22319E-01	1.22319E-01
MABC versus GOTLBO	5.05541E-01	1.72217E-01	1.72217E-01
IJAYA versus MABC	9.58593E-01	3.16020E-01	3.16020E-01
DE versus EBLSHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
EBLSHADE versus ADELI	1.0	1.0	1.0
EBLSHADE versus TLBO	1.0	1.0	1.0
EBLSHADE versus STLBO	1.0	1.0	1.0
EBLSHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBLSHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBLSHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBLSHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0

**Table S151 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus STLBO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
MABC versus ISCA	1.0	1.0	1.0
MABC versus NNA	1.0	1.0	1.0
MABC versus CWOA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus PSO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0

**Table S151 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus PSO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S151 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S152.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case. RMSPE value.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
EBLSHADE versus ISCA	<1E-13	<1E-13	<1E-13
EBLSHADE versus NNA	<1E-13	<1E-13	<1E-13
EBLSHADE versus CWOA	<1E-13	<1E-13	<1E-13
EBLSHADE versus WW	<1E-13	<1E-13	<1E-13
ADELI versus ISCA	<1E-13	<1E-13	<1E-13
ADELI versus NNA	<1E-13	<1E-13	<1E-13
ADELI versus CWOA	<1E-13	<1E-13	<1E-13
STLBO versus ISCA	<1E-13	<1E-13	<1E-13
STLBO versus NNA	<1E-13	<1E-13	<1E-13
STLBO versus CWOA	<1E-13	<1E-13	<1E-13
TLBO versus PSO	1.37401E-12	1.22302E-12	1.17772E-12
NDE versus CWOA	1.43463E-12	1.26121E-12	1.22968E-12
NDE versus NNA	3.51585E-12	3.05223E-12	3.01359E-12
ADELI versus MABC	6.54676E-12	5.53957E-12	5.12657E-12
NDE versus ISCA	5.98099E-12	5.12657E-12	5.12657E-12
STLBO versus MABC	6.54676E-12	5.53957E-12	5.12657E-12
NDE versus WW	8.34510E-12	6.87783E-12	6.14420E-12
EBLSHADE versus MABC	4.96665E-11	4.03881E-11	3.65676E-11
EBLSHADE versus PSO	2.00969E-10	1.61217E-10	1.47967E-10
TLBO versus GOTLBO	8.75044E-10	6.92342E-10	6.44263E-10
ADELI versus PSO	1.00018E-09	7.80360E-10	7.36396E-10
STLBO versus PSO	1.00018E-09	7.80360E-10	7.36396E-10
NDE versus GOTLBO	1.22083E-09	9.25684E-10	8.98853E-10
ADELI versus DE	1.55916E-09	1.16509E-09	1.14795E-09
STLBO versus DE	1.55916E-09	1.16509E-09	1.14795E-09
EBLSHADE versus DE	9.77290E-09	7.08804E-09	7.08804E-09
ADELI versus WW	1.85769E-08	1.32692E-08	1.18402E-08
STLBO versus WW	1.85769E-08	1.32692E-08	1.18402E-08
TLBO versus MABC	2.29314E-08	1.58756E-08	1.46156E-08
TLBO versus ISCA	3.51330E-08	2.39368E-08	2.23925E-08
TLBO versus NNA	4.80531E-08	3.22114E-08	3.06272E-08
IJAYA versus WW	4.90997E-08	3.23734E-08	3.12943E-08
EBLSHADE versus GOTLBO	6.86488E-08	4.45086E-08	4.37542E-08
TLBO versus CWOA	8.80796E-08	5.61386E-08	5.61386E-08
ADELI versus GOTLBO	2.08311E-07	1.30480E-07	1.28191E-07
STLBO versus GOTLBO	2.08311E-07	1.30480E-07	1.28191E-07
TLBO versus WW	4.67004E-07	2.82255E-07	2.82255E-07
IJAYA versus CWOA	6.81272E-07	4.04272E-07	3.81812E-07
IJAYA versus NNA	1.57507E-06	9.17350E-07	8.82733E-07
NDE versus PSO	1.68754E-06	9.64306E-07	9.45762E-07
TLBO versus DE	2.37760E-06	1.33250E-06	1.33250E-06

**Table S152 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus ISCA	2.37760E-06	1.33250E-06	1.33250E-06
IJAYA versus GOTLBO	1.25050E-04	6.32121E-05	6.32121E-05
DE versus WW	2.26316E-04	1.11914E-04	1.11914E-04
DE versus CWOA	1.70903E-03	8.26344E-04	8.07564E-04
NDE versus MABC	2.23150E-03	1.05444E-03	1.05444E-03
DE versus NNA	3.22321E-03	1.48763E-03	1.48763E-03
DE versus ISCA	4.39395E-03	1.97969E-03	1.93141E-03
MABC versus WW	7.28445E-03	3.12191E-03	3.12191E-03
IJAYA versus PSO	2.11160E-02	8.81767E-03	8.81767E-03
MABC versus CWOA	4.01728E-02	1.63340E-02	1.63340E-02
NDE versus DE	5.02234E-02	1.98686E-02	1.98686E-02
MABC versus NNA	6.82680E-02	2.62569E-02	2.62569E-02
DE versus GOTLBO	8.11168E-02	3.03074E-02	3.03074E-02
MABC versus ISCA	8.83504E-02	3.20392E-02	3.10683E-02
ADELI versus NDE	9.21871E-02	3.24174E-02	3.24174E-02
STLBO versus NDE	9.21871E-02	3.24174E-02	3.24174E-02
EBLSHADE versus NDE	2.36193E-01	7.78659E-02	7.78659E-02
MABC versus GOTLBO	9.58593E-01	3.05486E-01	3.05486E-01
PSO versus WW	1.0	3.15856E-01	3.15856E-01
IJAYA versus MABC	1.0	6.25076E-01	6.25076E-01
DE versus PSO	1.0	7.69767E-01	7.69767E-01
TLBO versus NDE	1.0	8.59568E-01	8.59568E-01
PSO versus CWOA	1.0	8.59568E-01	8.59568E-01
DE versus EBL SHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
EBLSHADE versus ADELI	1.0	1.0	1.0
EBLSHADE versus TLBO	1.0	1.0	1.0
EBLSHADE versus STLBO	1.0	1.0	1.0
EBLSHADE versus IJAYA	1.0	1.0	1.0
ADELI versus EBL SHADE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus EBL SHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0

**Table S152 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0
MABC versus PSO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus PSO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0

**Table S152 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus PSO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S152 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S153.** Adjusted  $p$ -values for tests for multiple comparisons among all methods in the single-IV case. Comp parameter.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
EBLSHADE versus WW	9.13562E-05	9.13562E-05	9.13562E-05
EBLSHADE versus CWOA	1.78593E-04	1.76630E-04	1.53079E-04
EBLSHADE versus PSO	2.03794E-04	1.99315E-04	1.74680E-04
EBLSHADE versus NNA	3.51080E-03	3.39506E-03	3.00926E-03
EBLSHADE versus GOTLBO	4.42051E-03	4.22620E-03	3.78901E-03
ADELI versus WW	4.42051E-03	4.22620E-03	3.78901E-03
STLBO versus WW	6.21372E-03	5.80403E-03	5.32605E-03
TLBO versus WW	6.95110E-03	6.41640E-03	5.95809E-03
ADELI versus CWOA	7.77070E-03	7.08756E-03	6.66060E-03
EBLSHADE versus ISCA	8.68102E-03	7.82246E-03	7.44088E-03
ADELI versus PSO	8.68102E-03	7.82246E-03	7.44088E-03
STLBO versus CWOA	1.08120E-02	9.50506E-03	9.26744E-03
TLBO versus PSO	1.34296E-02	1.13635E-02	1.03320E-02
TLBO versus CWOA	1.20540E-02	1.04645E-02	1.03320E-02
STLBO versus PSO	1.20540E-02	1.04645E-02	1.03320E-02
EBLSHADE versus MABC	6.90283E-02	5.76500E-02	5.08231E-02
ADELI versus NNA	9.20449E-02	7.48497E-02	6.77693E-02
ADELI versus GOTLBO	1.11137E-01	8.91541E-02	8.18263E-02
STLBO versus NNA	1.21998E-01	9.65262E-02	8.98230E-02
TLBO versus NNA	1.33831E-01	1.04418E-01	9.85352E-02
STLBO versus GOTLBO	1.46714E-01	1.12857E-01	1.08020E-01
TLBO versus GOTLBO	1.60730E-01	1.21872E-01	1.18339E-01
ADELI versus ISCA	1.92520E-01	1.43861E-01	1.41746E-01
STLBO versus ISCA	2.51119E-01	1.84890E-01	1.84890E-01
TLBO versus ISCA	2.74012E-01	1.98734E-01	1.98734E-01
EBLSHADE versus DE	3.54582E-01	2.53273E-01	2.25997E-01
ADELI versus MABC	1.0	7.11524E-01	6.44819E-01
NDE versus WW	1.0	8.02025E-01	7.50281E-01
STLBO versus MABC	1.0	8.50346E-01	8.08525E-01
TLBO versus MABC	1.0	8.85738E-01	8.70725E-01
EBLSHADE versus NDE	1.0	9.20945E-01	9.04788E-01
DE versus EBL SHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus GOTLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus PSO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
DE versus ISCA	1.0	1.0	1.0

**Table S153 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
DE versus NNA	1.0	1.0	1.0
DE versus CWOA	1.0	1.0	1.0
DE versus WW	1.0	1.0	1.0
EBLSHADE versus ADELI	1.0	1.0	1.0
EBLSHADE versus TLBO	1.0	1.0	1.0
EBLSHADE versus STLBO	1.0	1.0	1.0
EBLSHADE versus IJAYA	1.0	1.0	1.0
ADELI versus DE	1.0	1.0	1.0
ADELI versus EBL SHADE	1.0	1.0	1.0
ADELI versus NDE	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus DE	1.0	1.0	1.0
NDE versus EBL SHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0
NDE versus MABC	1.0	1.0	1.0
NDE versus TLBO	1.0	1.0	1.0
NDE versus GOTLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus PSO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
NDE versus ISCA	1.0	1.0	1.0
NDE versus NNA	1.0	1.0	1.0
NDE versus CWOA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus GOTLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0
MABC versus PSO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
MABC versus ISCA	1.0	1.0	1.0
MABC versus NNA	1.0	1.0	1.0
MABC versus CWOA	1.0	1.0	1.0
MABC versus WW	1.0	1.0	1.0
TLBO versus DE	1.0	1.0	1.0
TLBO versus EBL SHADE	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus NDE	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0

**Table S153 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus PSO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus ISCA	1.0	1.0	1.0
GOTLBO versus NNA	1.0	1.0	1.0
GOTLBO versus CWOA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus DE	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus NDE	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus MABC	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus GOTLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
IJAYA versus PSO	1.0	1.0	1.0
IJAYA versus ISCA	1.0	1.0	1.0

**Table S153 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus NNA	1.0	1.0	1.0
IJAYA versus CWOA	1.0	1.0	1.0
IJAYA versus WW	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus PSO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S153 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0

**Table S154.** The results of the compared algorithms in the IV-set case.

Algorithm, metric	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	Parameter			RMSPE
						$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	
<b><math>T = 260</math> K</b>									
true value	1.50000E-05	6.37044E+00	1.00000E+04	8.96101E-06	2.92308E+00	1.41753E+04	1.00000E+01	9.60000E-04	5.55000E+02
<b>DE</b>									
MEAN	4.69057E-05	6.30708E+00	2.97192E+04	8.65745E-06	2.71501E+00	1.40692E+04	6.56303E+01	1.16043E-03	1.89083E-01
MEDIAN	2.62622E-06	4.91376E+00	2.07122E+03	8.39149E-06	2.74341E+00	1.38837E+04	5.31154E+01	1.10392E-03	1.36102E-01
STD	1.40807E-04	4.83826E+00	1.19197E+05	1.87434E-06	4.85664E-01	1.10024E+03	6.97079E+01	2.23934E-04	9.49094E-02
IQR	1.90272E-05	3.82747E+00	6.99210E+03	2.07603E-06	8.01925E-01	1.32071E+03	8.70225E+01	2.75091E-04	1.61708E-01
<b>EBSHADE</b>									
MEAN	2.01388E-05	5.49038E+00	7.76643E+03	8.16611E-06	2.67787E+00	1.37765E+04	6.74898E+01	1.08004E-03	1.19451E-01
MEDIAN	9.90953E-06	6.12537E+00	6.31620E+03	8.95342E-06	2.88690E+00	1.41506E+04	2.55399E+01	9.97449E-04	1.00133E-01
STD	4.86370E-05	2.63941E+00	1.04179E+04	1.11268E-06	3.26014E-01	5.46121E+02	6.89751E+01	1.75238E-04	4.15560E-02
IQR	1.48880E-05	3.38745E+00	8.60682E+03	1.57957E-06	5.17435E-01	8.15200E+02	1.16329E+02	1.68848E-04	1.82019E-02
<b>ADELI</b>									
MEAN	1.48003E-05	6.35177E+00	9.74887E+03	8.96080E-06	2.92295E+00	1.41751E+04	1.03086E+01	9.60447E-04	9.95037E-02
MEDIAN	1.49998E-05	6.37041E+00	1.00019E+04	8.96101E-06	2.92307E+00	1.41753E+04	1.00025E+01	9.59996E-04	9.95037E-02
STD	5.31369E-07	5.01535E-02	6.44912E+02	5.75513E-10	3.56841E-04	4.83078E-01	8.28714E-01	1.22281E-06	1.83374E-08
IQR	4.36500E-12	3.89500E-07	7.23000E-03	0.00000E+00	2.50000E-09	0.00000E+00	3.90000E-07	6.00000E-13	0.00000E+00
<b>NDE</b>									
MEAN	6.14289E-05	8.48588E+00	5.08184E+04	7.64602E-06	2.41768E+00	1.40726E+04	1.30758E+02	5.01164E-03	2.74711E-01
MEDIAN	3.52725E-06	5.19947E+00	2.31607E+03	8.93042E-06	2.90231E+00	1.41535E+04	4.71911E+01	1.08179E-03	1.16520E-01
STD	1.83406E-04	8.33816E+00	1.97124E+05	5.06371E-06	1.06971E+00	3.43420E+03	1.43461E+02	9.54832E-03	2.62947E-01
IQR	6.55127E-06	2.28483E+00	3.15183E+03	5.42428E-06	1.52579E+00	1.85976E+03	1.87806E+02	1.05710E-03	2.96819E-01
<b>MABC</b>									
MEAN	8.43696E-05	1.14305E+01	1.51025E+04	6.88795E-06	2.05296E+00	1.30822E+04	1.87992E+02	8.73693E-03	3.29820E-01
MEDIAN	1.39100E-06	9.93725E+00	3.91349E+02	6.47851E-06	1.84359E+00	1.27895E+04	1.13315E+02	1.53906E-03	3.53569E-01
STD	1.72156E-04	8.22054E+00	6.94018E+04	2.38962E-06	6.31622E-01	1.22683E+03	1.71735E+02	1.52181E-02	1.09211E-01
IQR	1.18894E-04	1.18583E+01	6.83317E+02	1.03384E-06	3.99133E-01	4.64595E+02	3.59388E+02	6.93289E-03	1.17934E-01
<b>TLBO</b>									
MEAN	1.41354E-05	6.25434E+00	3.61536E+04	8.95928E-06	2.92201E+00	1.41739E+04	1.21722E+01	9.63674E-04	9.95042E-02
MEDIAN	1.49998E-05	6.37041E+00	1.00019E+04	8.96101E-06	2.92307E+00	1.41753E+04	1.00025E+01	9.59996E-04	9.95037E-02
STD	3.64271E-06	4.06928E-01	1.31353E+05	5.98003E-09	3.64405E-03	4.82182E+00	7.40580E+00	1.24785E-05	2.20001E-06
IQR	2.49391E-06	2.38776E-01	2.80094E+03	2.66597E-09	1.73634E-03	2.37254E+00	3.15653E+00	4.50969E-06	2.02140E-07

**Table S154 (continued)**

Algorithm, metric	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	Parameter $R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
<b>GOTLBO</b>									
MEAN	1.38343E-04	1.00611E+01	4.98093E+04	1.17919E-05	3.11751E+00	1.73665E+04	1.16759E+02	1.62579E-02	4.77176E-01
MEDIAN	5.37507E-06	7.28573E+00	4.15155E+02	9.57098E-06	2.85578E+00	1.36144E+04	1.29627E+01	2.67967E-03	3.90311E-01
STD	2.62287E-04	8.16600E+00	1.34161E+05	9.12450E-06	1.71413E+00	9.85001E+03	1.61999E+02	2.76955E-02	2.65655E-01
IQR	1.44051E-04	9.29239E+00	5.05273E+03	1.47588E-05	2.33102E+00	8.67457E+03	2.23950E+02	1.26027E-02	3.34857E-01
<b>STLBO</b>									
MEAN	1.49795E-05	6.36854E+00	9.97536E+03	8.96098E-06	2.92306E+00	1.41753E+04	1.00339E+01	9.60039E-04	9.95037E-02
MEDIAN	1.49998E-05	6.37041E+00	1.00019E+04	8.96101E-06	2.92307E+00	1.41753E+04	1.00025E+01	9.59996E-04	9.95037E-02
STD	1.44843E-07	1.33906E-02	1.89741E+02	1.76253E-10	1.03160E-04	1.40774E-01	2.24315E-01	3.09387E-07	1.68034E-09
IQR	1.45000E-13	1.35000E-08	2.20000E-04	0.00000E+00	0.00000E+00	0.00000E+00	2.00000E-07	3.00000E-13	0.00000E+00
<b>PSO</b>									
MEAN	4.96545E-04	1.91264E+01	4.50294E+05	6.73083E-06	3.11462E+00	1.44364E+04	2.73896E+02	4.28324E-02	3.72144E-01
MEDIAN	3.93736E-04	3.00000E+01	6.26289E+02	6.46051E-06	1.83190E+00	1.27767E+04	4.06458E+02	5.33325E-02	3.85700E-01
STD	4.91736E-04	1.25858E+01	5.01487E+05	7.61651E-06	5.71557E+00	9.27566E+03	2.51077E+02	3.94865E-02	2.22745E-01
IQR	1.00000E-03	2.45495E+01	9.99990E+05	7.18939E-06	2.05427E+00	2.47101E+03	4.96305E+02	6.45831E-02	1.50075E-01
<b>IJAYA</b>									
MEAN	9.42349E-06	5.29024E+00	4.56409E+04	8.85416E-06	2.89893E+00	1.41009E+04	2.95165E+01	1.03031E-03	1.03602E-01
MEDIAN	4.06721E-06	4.99484E+00	2.15019E+03	8.96174E-06	2.92351E+00	1.41640E+04	2.09875E+01	1.03297E-03	9.97036E-02
STD	9.97079E-06	1.37877E+00	1.50209E+05	6.34878E-07	1.40577E-01	3.50896E+02	3.18446E+01	6.87619E-05	1.39971E-02
IQR	1.70485E-05	2.48413E+00	1.00581E+04	1.15569E-07	5.21455E-02	8.11628E+01	4.12794E+01	9.07897E-05	1.38672E-03
<b>ISCA</b>									
MEAN	2.14398E-04	1.13257E+01	4.95872E+04	1.32313E-05	4.09783E+00	1.71151E+04	4.73098E+01	1.38167E-02	8.18085E-01
MEDIAN	4.64450E-05	8.71622E+00	8.29500E+02	1.14849E-05	4.22265E+00	1.40675E+04	6.47950E+00	3.14781E-03	7.88469E-01
STD	2.85623E-04	7.27020E+00	1.37358E+05	1.04956E-05	2.02014E+00	1.02917E+04	9.73633E+01	2.06994E-02	3.51104E-01
IQR	3.31054E-04	1.15029E+01	2.90738E+04	1.70564E-05	3.35400E+00	1.04869E+04	2.36857E+01	1.53414E-02	5.49263E-01
<b>NNA</b>									
MEAN	6.97328E-05	1.11960E+01	3.53652E+04	3.24448E-05	6.99158E+00	1.39565E+04	1.20903E+02	2.02108E-02	7.63030E-01
MEDIAN	4.83914E-07	5.40878E+00	2.85860E+02	7.14148E-06	4.64963E+00	8.24641E+03	8.38115E+00	7.48303E-03	7.72851E-01
STD	1.73519E-04	1.02970E+01	1.47089E+05	8.29188E-05	7.83605E+00	1.43488E+04	2.04252E+02	2.29392E-02	3.27747E-01
IQR	3.03647E-05	1.84023E+01	4.76218E+03	2.75607E-05	5.16022E+00	8.11209E+03	1.42647E+02	2.78367E-02	4.84035E-01
<b>CWOA</b>									
MEAN	4.49032E-04	1.44168E+01	1.85295E+05	2.74796E-04	9.56700E+00	2.60700E+04	1.87729E+02	2.08770E-02	5.30129E-01
MEDIAN	4.09507E-05	8.93518E+00	5.11516E+02	1.47994E-05	5.62832E+00	1.43077E+04	2.18000E+01	5.06958E-03	4.31416E-01

**Table S154 (continued)**

Algorithm, metric	Parameter								
	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
STD	4.90289E-04	1.06173E+01	3.68325E+05	1.40060E-03	9.90648E+00	1.93858E+04	2.42860E+02	3.19845E-02	2.44593E-01
IQR	9.99991E-04	2.02686E+01	3.31672E+04	2.48264E-05	1.35909E+01	3.90139E+04	3.84579E+02	1.75534E-02	3.97857E-01
<b>WW</b>									
MEAN	2.20155E-04	1.11588E+01	4.54647E+04	1.39193E-05	3.35375E+00	1.85707E+04	1.43130E+02	1.81508E-02	4.63896E-01
MEDIAN	1.26821E-05	7.49752E+00	3.58915E+02	7.11711E-06	1.90408E+00	1.19046E+04	4.99410E+01	4.23071E-03	4.19885E-01
STD	3.27795E-04	8.79605E+00	1.95860E+05	2.06209E-05	3.08596E+00	1.40779E+04	1.64633E+02	2.56551E-02	2.32534E-01
IQR	4.03710E-04	1.07669E+01	1.11765E+03	1.81979E-05	3.84336E+00	8.32636E+03	2.54327E+02	2.11628E-02	3.14131E-01
<b>T = 270 K</b>									
true value	1.50000E-05	6.13450E+00	1.00000E+04	1.73488E-05	2.85185E+00	8.35610E+03	2.00000E+01	9.70000E-04	5.55000E+02
<b>DE</b>									
MEAN	3.97827E-05	6.46318E+00	1.47957E+04	1.60419E-05	2.40776E+00	8.07538E+03	7.98556E+01	1.14786E-03	2.22913E-01
MEDIAN	5.77314E-06	5.29869E+00	2.38569E+03	1.56412E-05	2.38705E+00	7.93938E+03	4.24117E+01	1.09825E-03	1.94071E-01
STD	1.11777E-04	4.47231E+00	6.33642E+04	4.08053E-06	5.99120E-01	9.05848E+02	8.63818E+01	1.81649E-04	9.77005E-02
IQR	2.76233E-05	4.99615E+00	5.31820E+03	5.17515E-06	8.98643E-01	1.07949E+03	1.04027E+02	2.48342E-04	1.54062E-01
<b>EBSHADE</b>									
MEAN	1.20138E-05	4.98071E+00	3.38125E+04	1.57012E-05	2.47307E+00	8.03848E+03	1.04170E+02	1.73934E-03	1.36977E-01
MEDIAN	1.01808E-05	5.66058E+00	7.25031E+03	1.71043E-05	2.73316E+00	8.29864E+03	6.89136E+01	9.73795E-04	1.01068E-01
STD	1.60470E-05	1.92840E+00	1.12391E+05	2.60446E-06	4.99355E-01	4.76023E+02	1.05545E+02	4.74130E-03	7.59595E-02
IQR	1.46272E-05	2.85879E+00	8.20152E+03	4.16504E-06	8.06062E-01	7.87928E+02	1.38323E+02	1.21335E-04	4.13082E-02
<b>ADELI</b>									
MEAN	1.50038E-05	6.13482E+00	1.00067E+04	1.73488E-05	2.85185E+00	8.35610E+03	1.99953E+01	9.69990E-04	9.95037E-02
MEDIAN	1.50041E-05	6.13485E+00	1.00072E+04	1.73488E-05	2.85185E+00	8.35610E+03	1.99947E+01	9.69989E-04	9.95037E-02
STD	2.58165E-09	2.27269E-04	3.34077E+00	5.03827E-12	2.93864E-06	2.37866E-03	4.38562E-03	4.30177E-09	2.80056E-12
IQR	1.15000E-13	9.50000E-09	1.65000E-04	0.00000E+00	0.00000E+00	0.00000E+00	1.45000E-07	2.00000E-13	0.00000E+00
<b>NDE</b>									
MEAN	3.60465E-05	7.52609E+00	4.39246E+04	1.72948E-05	2.78308E+00	8.80209E+03	1.01459E+02	4.81775E-03	3.23871E-01
MEDIAN	7.62416E-06	5.53708E+00	4.46543E+03	1.73249E-05	2.84084E+00	8.34608E+03	4.09988E+01	9.94233E-04	9.95174E-02
STD	1.37707E-04	6.43194E+00	1.86180E+05	1.10173E-05	1.24892E+00	3.93863E+03	1.23126E+02	1.04508E-02	3.19557E-01
IQR	1.01408E-05	1.26505E+00	6.36841E+03	3.40922E-07	3.80923E-01	3.04136E+02	7.78842E+01	1.56030E-03	4.32743E-01
<b>MABC</b>									
MEAN	8.35160E-05	1.13300E+01	1.90230E+03	1.52458E-05	1.83437E+00	8.14462E+03	1.71108E+02	6.46840E-03	4.09273E-01
MEDIAN	2.71136E-06	6.75135E+00	4.44996E+02	1.28359E-05	1.49147E+00	7.32573E+03	1.10384E+02	1.51852E-03	4.53471E-01
STD	1.77793E-04	8.72640E+00	6.86129E+03	8.14470E-06	8.54012E-01	2.87251E+03	1.63207E+02	1.15945E-02	1.19907E-01

**Table S154 (continued)**

Algorithm, metric	Parameter								
	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
IQR	3.74323E-05	1.16597E+01	4.56164E+02	3.63794E-06	8.02846E-01	7.22304E+02	2.89850E+02	1.58740E-03	1.09724E-01
<b>TLBO</b>									
MEAN	3.42920E-05	6.14136E+00	1.03102E+04	1.72507E-05	2.82232E+00	8.33313E+03	2.88516E+01	2.91144E-03	1.06683E-01
MEDIAN	1.50041E-05	6.13485E+00	1.00072E+04	1.73488E-05	2.85185E+00	8.35610E+03	1.99947E+01	9.69989E-04	9.95037E-02
STD	1.37902E-04	1.08243E-01	5.07984E+03	6.99104E-07	2.10329E-01	1.63655E+02	6.26792E+01	1.38641E-02	5.12710E-02
IQR	1.65000E-13	1.45000E-08	2.10000E-04	0.00000E+00	0.00000E+00	0.00000E+00	2.80000E-07	3.00000E-13	0.00000E+00
<b>GOTLBO</b>									
MEAN	2.21297E-04	1.02327E+01	5.82929E+04	2.63430E-05	3.18704E+00	1.50645E+04	1.82996E+02	1.79608E-02	5.37131E-01
MEDIAN	4.36767E-05	7.24878E+00	6.00680E+02	1.74105E-05	2.17765E+00	7.65899E+03	3.58986E+01	3.30988E-03	4.68831E-01
STD	3.29794E-04	7.75064E+00	1.71753E+05	2.14681E-05	2.49472E+00	1.31466E+04	2.04525E+02	2.51704E-02	2.56434E-01
IQR	3.04017E-04	1.37737E+01	1.12995E+04	3.81661E-05	4.72482E+00	1.19406E+04	3.96259E+02	2.55133E-02	3.08822E-01
<b>STLBO</b>									
MEAN	1.50041E-05	6.13485E+00	1.00072E+04	1.73488E-05	2.85185E+00	8.35610E+03	1.99947E+01	9.69989E-04	9.95037E-02
MEDIAN	1.50041E-05	6.13485E+00	1.00072E+04	1.73488E-05	2.85185E+00	8.35610E+03	1.99947E+01	9.69989E-04	9.95037E-02
STD	7.11701E-14	6.30226E-09	9.65869E-05	1.02655E-20	4.48508E-16	9.18545E-12	1.22443E-07	1.29342E-13	0.00000E+00
IQR	1.00000E-13	9.00000E-09	1.25000E-04	0.00000E+00	0.00000E+00	0.00000E+00	1.85000E-07	1.50000E-13	0.00000E+00
<b>PSO</b>									
MEAN	5.42121E-04	1.73060E+01	4.04042E+05	2.21554E-04	1.81735E+00	1.15906E+04	3.66525E+02	5.55091E-02	4.57577E-01
MEDIAN	7.65571E-04	1.03874E+01	5.01498E+01	1.23559E-05	1.34967E+00	7.18728E+03	4.67262E+02	5.94252E-02	4.65652E-01
STD	4.73026E-04	1.25113E+01	4.90627E+05	1.39832E-03	1.84670E+00	1.42994E+04	2.48536E+02	4.03759E-02	1.56622E-01
IQR	1.00000E-03	2.44417E+01	9.99990E+05	7.56079E-06	1.03118E+00	8.23241E+02	3.67990E+02	9.82999E-02	8.89681E-02
<b>IJAYA</b>									
MEAN	1.34436E-05	5.56862E+00	7.06023E+04	1.72620E-05	2.85474E+00	8.33257E+03	2.57141E+01	1.01548E-03	1.04705E-01
MEDIAN	8.14670E-06	5.43119E+00	3.84502E+03	1.73289E-05	2.85875E+00	8.35131E+03	5.99943E+00	9.95066E-04	9.97465E-02
STD	1.27047E-05	1.41515E+00	1.75091E+05	8.14931E-07	1.31050E-01	1.78679E+02	3.22800E+01	9.14166E-05	2.34925E-02
IQR	2.05442E-05	2.30946E+00	2.69783E+04	2.64758E-07	8.27546E-02	7.15931E+01	4.59218E+01	6.75688E-05	6.59079E-04
<b>ISCA</b>									
MEAN	2.28542E-04	8.84677E+00	5.20611E+04	3.69271E-05	5.46702E+00	1.50917E+04	6.69038E+01	1.61026E-02	7.96817E-01
MEDIAN	6.51884E-05	7.58798E+00	1.83515E+03	3.69600E-05	5.95693E+00	1.01392E+04	2.54027E+01	5.61353E-03	7.96935E-01
STD	2.94528E-04	5.73257E+00	1.37975E+05	2.35718E-05	2.67474E+00	1.14491E+04	1.03287E+02	2.05783E-02	3.65124E-01
IQR	3.44632E-04	5.30328E+00	2.35572E+04	4.36206E-05	4.77947E+00	1.34149E+04	9.05064E+01	2.15636E-02	6.73399E-01
<b>NNA</b>									
MEAN	1.33163E-04	1.18191E+01	1.34310E+05	3.42653E-05	7.99323E+00	8.49075E+03	1.34474E+02	2.18238E-02	6.45683E-01

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEDIAN		1.80058E-06	9.75274E+00	3.66720E+02	9.51081E-06	5.34996E+00	3.74761E+03	4.70315E+00	7.83039E-03	6.02627E-01
STD		2.67511E-04	8.74011E+00	2.82548E+05	7.36358E-05	8.15039E+00	1.25501E+04	2.14004E+02	2.78684E-02	3.64232E-01
IQR		1.21611E-04	1.40399E+01	7.06111E+04	3.55724E-05	8.30687E+00	5.76668E+03	2.43160E+02	2.34230E-02	4.50381E-01
<b>CWOA</b>										
MEAN		3.93696E-04	1.55911E+01	1.09481E+05	6.65485E-04	9.65336E+00	2.68805E+04	1.94785E+02	2.85699E-02	6.35434E-01
MEDIAN		4.35791E-07	1.54541E+01	2.42849E+02	5.98460E-05	6.62586E+00	1.70441E+04	1.40753E+01	1.75843E-02	6.05750E-01
STD		4.77009E-04	1.16298E+01	2.88059E+05	2.36125E-03	9.53654E+00	2.20374E+04	2.58012E+02	3.27865E-02	2.98087E-01
IQR		1.00000E-03	2.47268E+01	1.68690E+03	5.32964E-05	6.52389E+00	4.28198E+04	3.88437E+02	4.24920E-02	3.42745E-01
<b>WW</b>										
MEAN		2.16269E-04	9.40052E+00	5.15084E+03	2.29466E-05	3.64496E+00	1.32663E+04	1.65863E+02	2.69972E-02	7.00965E-01
MEDIAN		9.75714E-06	7.18348E+00	1.81856E+02	1.20356E-05	3.41832E+00	6.57734E+03	1.20930E+02	1.17396E-02	7.09785E-01
STD		3.51729E-04	7.77397E+00	1.77662E+04	2.79248E-05	2.69874E+00	1.44664E+04	1.70058E+02	3.05017E-02	2.85715E-01
IQR		2.91627E-04	9.53794E+00	9.84394E+02	3.08470E-05	3.24640E+00	6.24479E+03	1.93044E+02	4.65641E-02	5.01708E-01
<b>T = 280 K</b>										
true value		1.50000E-05	5.91541E+00	1.00000E+04	3.20396E-05	2.78571E+00	5.11528E+03	3.00000E+01	9.80000E-04	5.55000E+02
<b>DE</b>										
MEAN		4.03971E-05	6.47375E+00	3.43403E+04	3.19652E-05	2.43732E+00	5.16621E+03	7.48714E+01	1.16245E-03	2.69919E-01
MEDIAN		1.05665E-05	5.55661E+00	2.33187E+03	3.00393E-05	2.24036E+00	4.86298E+03	3.35295E+01	1.11319E-03	2.40187E-01
STD		7.82385E-05	3.76377E+00	1.02886E+05	1.19898E-05	9.93911E-01	1.35207E+03	8.65413E+01	2.04066E-04	1.41998E-01
IQR		3.80577E-05	4.53467E+00	7.58220E+03	1.19566E-05	1.26054E+00	9.83531E+02	1.22586E+02	2.28513E-04	2.65492E-01
<b>EBLSHADE</b>										
MEAN		1.18545E-05	5.14036E+00	8.00183E+03	3.04040E-05	2.56009E+00	4.98407E+03	7.10561E+01	1.03308E-03	1.22161E-01
MEDIAN		1.50050E-05	5.91584E+00	9.18706E+03	3.20374E-05	2.78327E+00	5.11486E+03	2.99905E+01	9.80532E-04	9.95039E-02
STD		1.20503E-05	1.57676E+00	1.06627E+04	3.89328E-06	4.69538E-01	2.80340E+02	7.51483E+01	1.06631E-04	5.98735E-02
IQR		1.34067E-05	2.02795E+00	7.81235E+03	2.27881E-06	2.81145E-01	2.05100E+02	7.09991E+01	6.26323E-05	5.74356E-03
<b>ADELI</b>										
MEAN		1.50050E-05	5.91584E+00	1.00056E+04	3.20396E-05	2.78572E+00	5.11528E+03	2.99905E+01	9.79994E-04	9.95037E-02
MEDIAN		1.50050E-05	5.91584E+00	1.00056E+04	3.20396E-05	2.78572E+00	5.11528E+03	2.99905E+01	9.79994E-04	9.95037E-02
STD		4.68791E-14	4.08594E-09	5.84150E-05	4.15390E-15	1.96039E-10	1.96039E-07	9.17494E-08	7.99019E-14	0.00000E+00
IQR		6.50000E-14	6.00000E-09	8.50000E-05	0.00000E+00	0.00000E+00	0.00000E+00	1.25000E-07	1.50000E-13	0.00000E+00
<b>NDE</b>										
MEAN		2.77117E-05	8.69583E+00	5.56285E+04	5.33777E-05	3.87503E+00	1.31572E+04	8.64157E+01	3.21307E-03	4.11828E-01
MEDIAN		1.05499E-05	5.72903E+00	4.33185E+03	3.20377E-05	2.78288E+00	5.11362E+03	3.69645E+01	1.01834E-03	1.01189E-01

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
STD		8.06873E-05	7.83219E+00	1.96568E+05	3.96424E-05	2.47164E+00	1.51291E+04	9.27014E+01	6.11367E-03	3.61927E-01
IQR		1.36463E-05	2.84525E+00	8.39135E+03	5.06552E-05	1.58487E+00	9.24994E+03	8.21456E+01	1.12110E-03	6.09675E-01
<b>MABC</b>										
MEAN		1.05079E-04	9.48064E+00	1.00918E+04	3.74310E-05	2.17608E+00	7.21156E+03	2.01627E+02	9.75615E-03	4.43772E-01
MEDIAN		8.08438E-06	5.85840E+00	4.74797E+02	2.57093E-05	1.36866E+00	4.37556E+03	1.47165E+02	1.52239E-03	5.30317E-01
STD		2.37915E-04	7.78150E+00	4.30445E+04	2.39975E-05	1.76970E+00	7.87100E+03	1.93659E+02	1.67765E-02	1.98345E-01
IQR		3.18799E-05	1.00038E+01	1.25100E+03	1.56437E-05	2.30682E+00	1.44114E+03	3.72880E+02	5.68043E-03	3.13886E-01
<b>TLBO</b>										
MEAN		1.57491E-05	5.96851E+00	5.39360E+04	3.20421E-05	2.78672E+00	5.11587E+03	2.89571E+01	9.79193E-04	9.95041E-02
MEDIAN		1.50050E-05	5.91584E+00	1.00056E+04	3.20396E-05	2.78572E+00	5.11528E+03	2.99905E+01	9.79994E-04	9.95037E-02
STD		2.73367E-06	2.03931E-01	1.90143E+05	1.22930E-08	4.46177E-03	2.55500E+00	4.17713E+00	3.26380E-06	1.12462E-06
IQR		1.35000E-13	1.10000E-08	1.70000E-04	1.00000E-14	0.00000E+00	0.00000E+00	2.45000E-07	2.00000E-13	0.00000E+00
<b>GOTLBO</b>										
MEAN		1.33014E-04	9.91098E+00	1.75797E+04	6.13097E-05	4.42251E+00	1.28409E+04	1.39907E+02	1.96162E-02	7.08323E-01
MEDIAN		2.95516E-06	6.77589E+00	3.38128E+02	6.45502E-05	3.81116E+00	7.51306E+03	2.34557E+01	2.75168E-03	6.79184E-01
STD		2.77360E-04	7.83704E+00	5.05155E+04	3.90846E-05	3.18270E+00	1.30797E+04	1.77222E+02	2.83219E-02	2.64995E-01
IQR		7.16887E-05	1.22921E+01	1.49611E+03	7.08709E-05	5.29957E+00	1.13359E+04	2.57643E+02	2.71988E-02	3.56115E-01
<b>STLBO</b>										
MEAN		1.50050E-05	5.91584E+00	1.00056E+04	3.20396E-05	2.78572E+00	5.11528E+03	2.99905E+01	9.79994E-04	9.95037E-02
MEDIAN		1.50050E-05	5.91584E+00	1.00056E+04	3.20396E-05	2.78572E+00	5.11528E+03	2.99905E+01	9.79994E-04	9.95037E-02
STD		6.79313E-14	5.71795E-09	8.35703E-05	4.28403E-15	1.96039E-10	2.37635E-07	1.24334E-07	1.13863E-13	0.00000E+00
IQR		1.10000E-13	9.00000E-09	1.35000E-04	4.99999E-15	0.00000E+00	0.00000E+00	2.25000E-07	2.00000E-13	0.00000E+00
<b>PSO</b>										
MEAN		4.90580E-04	1.76613E+01	4.91086E+05	4.20596E-05	2.29212E+00	9.41958E+03	2.84719E+02	3.41257E-02	4.34537E-01
MEDIAN		3.74885E-04	1.53835E+01	2.13639E+04	2.38043E-05	8.18861E-01	4.11017E+03	3.23952E+02	2.60703E-03	5.18227E-01
STD		4.72548E-04	1.22030E+01	5.03958E+05	7.40977E-05	4.49178E+00	1.49906E+04	2.64010E+02	3.85989E-02	2.10950E-01
IQR		1.00000E-03	2.37458E+01	9.99990E+05	7.19490E-06	1.32207E+00	4.12745E+02	5.18089E+02	6.16710E-02	2.58364E-01
<b>IJAYA</b>										
MEAN		1.19277E-05	5.45879E+00	1.63419E+04	3.23995E-05	2.84490E+00	5.15540E+03	2.64533E+01	1.00538E-03	1.00681E-01
MEDIAN		9.05189E-06	5.39475E+00	4.01672E+03	3.23243E-05	2.84374E+00	5.14506E+03	2.20458E+01	1.00048E-03	9.96693E-02
STD		8.87445E-06	9.19306E-01	3.71416E+04	9.63524E-07	1.17815E-01	8.07806E+01	2.35787E+01	2.82317E-05	2.17705E-03
IQR		1.17422E-05	1.28966E+00	4.70664E+03	7.86839E-07	1.18051E-01	8.54310E+01	4.03945E+01	3.36021E-05	9.82662E-04
<b>ISCA</b>										

**Table S154 (continued)**

Algorithm, metric	Parameter								
	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEAN	1.83766E-04	9.86647E+00	4.69925E+04	7.03646E-05	6.07375E+00	1.25942E+04	5.42215E+01	1.47866E-02	8.75664E-01
MEDIAN	5.47205E-05	8.41675E+00	7.75965E+02	6.50218E-05	6.57588E+00	8.94831E+03	8.57698E+00	4.47212E-03	8.50597E-01
STD	2.51264E-04	6.52144E+00	9.88665E+04	5.30048E-05	3.61334E+00	1.15304E+04	9.58071E+01	2.33692E-02	3.68388E-01
IQR	2.53087E-04	8.90420E+00	2.90583E+04	9.40261E-05	6.41914E+00	1.18267E+04	5.34118E+01	1.22838E-02	4.41164E-01
<b>NNA</b>									
MEAN	8.78895E-05	1.14990E+01	2.67358E+04	9.98624E-05	9.76851E+00	7.62042E+03	8.55876E+01	1.72191E-02	6.43180E-01
MEDIAN	8.59411E-07	6.50432E+00	3.25105E+02	1.66778E-05	4.73042E+00	3.19642E+03	1.17920E+01	7.07644E-03	3.43187E-01
STD	2.21259E-04	1.01545E+01	9.73571E+04	1.79068E-04	9.59993E+00	1.23248E+04	1.37935E+02	2.05363E-02	4.44218E-01
IQR	2.08350E-05	1.55855E+01	1.79409E+03	1.03583E-04	1.19909E+01	2.63282E+03	9.10212E+01	1.87243E-02	7.10095E-01
<b>CWOA</b>									
MEAN	3.85449E-04	1.39379E+01	2.70838E+05	8.46368E-04	9.62326E+00	1.74583E+04	2.02366E+02	2.14748E-02	5.27628E-01
MEDIAN	2.19171E-06	8.88450E+00	1.00137E+03	3.09983E-05	5.84803E+00	4.23165E+03	1.00462E+02	4.83641E-03	4.81295E-01
STD	4.74388E-04	1.12526E+01	4.19853E+05	2.68209E-03	9.67793E+00	2.13337E+04	2.37390E+02	3.15758E-02	3.13645E-01
IQR	1.00000E-03	2.48353E+01	4.37554E+05	1.03505E-04	1.37793E+01	4.70393E+04	3.85010E+02	2.62552E-02	3.94971E-01
<b>WW</b>									
MEAN	1.44647E-04	8.49699E+00	2.25207E+04	8.06690E-05	5.87753E+00	1.55260E+04	1.21233E+02	2.13644E-02	7.02521E-01
MEDIAN	2.07544E-05	5.55207E+00	3.49887E+02	2.88009E-05	3.97374E+00	4.18031E+03	3.14306E+01	1.25676E-02	6.55868E-01
STD	2.67028E-04	7.05764E+00	1.39847E+05	1.26299E-04	6.35493E+00	1.97252E+04	1.69308E+02	2.68815E-02	3.07217E-01
IQR	1.14146E-04	6.32558E+00	1.55561E+03	9.78762E-05	7.21343E+00	1.76767E+04	1.56014E+02	2.90273E-02	4.14570E-01
<b>T = 290 K</b>									
true value	1.50000E-05	5.71143E+00	1.00000E+04	5.67193E-05	2.72414E+00	3.23917E+03	4.00000E+01	9.90000E-04	5.55000E+02
<b>DE</b>									
MEAN	3.46159E-05	6.09216E+00	2.19158E+04	6.71648E-05	2.50783E+00	4.83207E+03	8.12931E+01	1.90810E-03	3.32500E-01
MEDIAN	6.48195E-06	5.11255E+00	1.13697E+03	5.54289E-05	1.99172E+00	3.10085E+03	3.25107E+01	1.15795E-03	3.30132E-01
STD	7.76808E-05	3.80964E+00	9.53276E+04	3.25963E-05	1.60899E+00	7.24854E+03	1.03942E+02	5.16092E-03	1.65294E-01
IQR	1.83053E-05	3.87415E+00	2.30838E+03	2.73442E-05	1.84917E+00	9.81403E+02	1.28220E+02	1.95082E-04	2.54569E-01
<b>EBSHADE</b>									
MEAN	1.30826E-05	4.85036E+00	1.48021E+04	5.33603E-05	2.40127E+00	3.10172E+03	8.61806E+01	1.05495E-03	1.38395E-01
MEDIAN	1.39459E-05	5.62019E+00	5.60258E+03	5.66979E-05	2.71612E+00	3.23758E+03	4.22780E+01	9.99182E-04	9.97064E-02
STD	2.41108E-05	2.18769E+00	4.26434E+04	6.94163E-06	5.83161E-01	2.39924E+02	8.03303E+01	8.83941E-05	9.92945E-02
IQR	1.44295E-05	2.39489E+00	8.52726E+03	6.87811E-06	5.03367E-01	2.53025E+02	7.17242E+01	1.17236E-04	1.23223E-02
<b>ADELI</b>									
MEAN	1.50007E-05	5.71149E+00	1.00012E+04	5.67193E-05	2.72414E+00	3.23917E+03	3.99991E+01	9.89998E-04	9.95037E-02

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEDIAN		1.50007E-05	5.71149E+00	1.00012E+04	5.67193E-05	2.72414E+00	3.23917E+03	3.99991E+01	9.89998E-04	9.95037E-02
STD		3.39977E-14	2.89381E-09	3.79566E-05	4.40143E-15	3.25396E-10	3.21491E-12	7.17403E-08	5.82759E-14	0.00000E+00
IQR		4.50000E-14	4.50000E-09	5.00000E-05	5.00000E-15	0.00000E+00	0.00000E+00	1.10000E-07	1.00000E-13	0.00000E+00
<b>NDE</b>										
MEAN		1.58693E-05	5.93582E+00	3.26967E+04	9.19756E-05	4.06791E+00	9.83853E+03	8.59774E+01	4.75296E-03	3.98666E-01
MEDIAN		1.02402E-05	5.51328E+00	7.23087E+03	5.67175E-05	2.72357E+00	3.23868E+03	4.09017E+01	1.00029E-03	1.02070E-01
STD		5.46032E-05	4.99782E+00	1.43416E+05	8.80024E-05	3.93737E+00	1.44569E+04	1.06084E+02	1.20467E-02	3.66697E-01
IQR		1.44796E-05	1.81800E+00	9.63269E+03	4.18079E-05	9.82699E-01	2.05120E+03	3.58207E+01	1.54216E-03	5.76480E-01
<b>MABC</b>										
MEAN		7.01581E-05	1.07377E+01	7.75671E+03	7.08918E-05	2.18311E+00	4.67703E+03	1.36832E+02	3.57349E-03	4.84575E-01
MEDIAN		1.15925E-05	7.28004E+00	6.40583E+02	5.04565E-05	1.19481E+00	2.71026E+03	3.48521E+01	1.18108E-03	5.20898E-01
STD		1.56622E-04	8.52624E+00	2.91632E+04	5.91263E-05	2.99809E+00	6.50252E+03	1.59505E+02	7.09046E-03	2.25041E-01
IQR		7.31985E-05	1.12969E+01	9.98146E+02	3.85287E-05	2.23323E+00	1.51067E+03	2.31349E+02	1.38120E-03	3.80873E-01
<b>TLBO</b>										
MEAN		1.54137E-05	5.73941E+00	2.55179E+04	5.67237E-05	2.72523E+00	3.23963E+03	3.93612E+01	9.89632E-04	9.95041E-02
MEDIAN		1.50007E-05	5.71149E+00	1.00012E+04	5.67193E-05	2.72414E+00	3.23917E+03	3.99991E+01	9.89998E-04	9.95037E-02
STD		2.18704E-06	1.57524E-01	1.00694E+05	1.88543E-08	6.14267E-03	2.47913E+00	3.69459E+00	2.23989E-06	1.70469E-06
IQR		5.50000E-14	5.00000E-09	6.00000E-05	1.00000E-14	1.00000E-09	0.00000E+00	1.45000E-07	1.00000E-13	0.00000E+00
<b>GOTLBO</b>										
MEAN		1.66251E-04	1.09387E+01	1.30215E+04	1.26431E-04	5.70596E+00	1.15678E+04	1.21993E+02	1.80467E-02	7.97421E-01
MEDIAN		2.96412E-05	6.50236E+00	5.39677E+02	1.20935E-04	4.70210E+00	5.70257E+03	2.35265E+01	4.30726E-03	8.63220E-01
STD		2.69063E-04	8.93296E+00	3.44522E+04	8.21815E-05	4.62093E+00	1.38655E+04	1.78454E+02	2.60908E-02	2.69993E-01
IQR		2.53190E-04	1.52243E+01	2.25961E+03	1.49658E-04	8.61052E+00	8.73759E+03	1.66739E+02	2.42244E-02	3.11135E-01
<b>STLBO</b>										
MEAN		1.50007E-05	5.71149E+00	1.00012E+04	5.67193E-05	2.72414E+00	3.23917E+03	3.99991E+01	9.89998E-04	9.95037E-02
MEDIAN		1.50007E-05	5.71149E+00	1.00012E+04	5.67193E-05	2.72414E+00	3.23917E+03	3.99991E+01	9.89998E-04	9.95037E-02
STD		4.68347E-14	3.89338E-09	5.26118E-05	4.40143E-15	3.47540E-10	3.21491E-12	1.00269E-07	6.72718E-14	0.00000E+00
IQR		7.50000E-14	6.00000E-09	7.00000E-05	5.00000E-15	0.00000E+00	0.00000E+00	1.60000E-07	1.00000E-13	0.00000E+00
<b>PSO</b>										
MEAN		5.51686E-04	1.67256E+01	3.70327E+05	1.20269E-04	2.71825E+00	9.83965E+03	3.16996E+02	4.33233E-02	5.35518E-01
MEDIAN		8.26755E-04	1.04606E+01	4.46531E+02	5.06697E-05	5.00000E-01	2.43531E+03	3.96603E+02	5.98563E-02	6.60803E-01
STD		4.75206E-04	1.18695E+01	4.85199E+05	1.72785E-04	6.04477E+00	1.75085E+04	2.61133E+02	3.89563E-02	2.63606E-01
IQR		1.00000E-03	2.42036E+01	9.99990E+05	3.47754E-06	1.65118E+00	5.89695E+02	5.39438E+02	6.62238E-02	4.55138E-01

**Table S154 (continued)**

Algorithm, metric	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	Parameter $R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
<b>IJAYA</b>									
MEAN	1.53256E-05	5.57217E+00	6.45141E+04	5.78551E-05	2.84898E+00	3.29560E+03	2.54323E+01	1.00624E-03	1.02239E-01
MEDIAN	1.19927E-05	5.55220E+00	5.46455E+03	5.71774E-05	2.84170E+00	3.28778E+03	1.58175E+01	1.00069E-03	9.99281E-02
STD	1.08122E-05	9.61495E-01	1.75253E+05	3.24031E-06	1.70219E-01	1.13570E+02	2.69828E+01	2.23760E-05	5.77843E-03
IQR	1.39318E-05	1.27108E+00	7.32249E+03	1.37186E-06	2.20054E-01	8.11578E+01	4.67049E+01	2.48365E-05	1.37587E-03
<b>ISCA</b>									
MEAN	1.88352E-04	1.02924E+01	5.06431E+04	1.51169E-04	7.41483E+00	1.25388E+04	5.27692E+01	1.03213E-02	9.01972E-01
MEDIAN	9.07772E-05	9.01795E+00	2.04181E+03	1.52257E-04	7.14392E+00	5.45077E+03	1.10823E+01	2.17614E-03	9.71728E-01
STD	2.59465E-04	6.07831E+00	1.49793E+05	1.04137E-04	4.94714E+00	1.27191E+04	9.37927E+01	1.70780E-02	3.59380E-01
IQR	2.09978E-04	1.01167E+01	1.25254E+04	1.60292E-04	8.67436E+00	1.91588E+04	5.99782E+01	1.11238E-02	5.64833E-01
<b>NNA</b>									
MEAN	8.20655E-05	1.46746E+01	2.39911E+04	2.05795E-04	1.19841E+01	5.04294E+03	8.92972E+01	1.94127E-02	5.96072E-01
MEDIAN	9.63328E-07	1.23790E+01	2.05760E+02	5.51447E-05	1.04436E+01	1.31096E+03	1.16984E+01	5.67027E-03	3.90102E-01
STD	1.58362E-04	9.20329E+00	9.42769E+04	4.20445E-04	9.72885E+00	1.16526E+04	1.57603E+02	2.55543E-02	4.30474E-01
IQR	6.82542E-05	1.60415E+01	7.11520E+02	2.19951E-04	1.54278E+01	2.16621E+03	1.03763E+02	2.87548E-02	6.38341E-01
<b>CWOA</b>									
MEAN	4.45003E-04	1.31055E+01	2.52782E+05	8.63963E-04	1.48260E+01	2.25333E+04	1.74406E+02	2.75758E-02	5.47280E-01
MEDIAN	5.34909E-05	1.05113E+01	7.43261E+02	1.77091E-04	1.26578E+01	9.92153E+03	1.46206E+01	7.43876E-03	5.61402E-01
STD	4.83552E-04	9.70182E+00	4.11586E+05	2.34060E-03	1.02865E+01	2.31948E+04	2.28218E+02	3.62627E-02	3.43019E-01
IQR	9.99961E-04	1.59179E+01	4.78801E+05	5.36351E-04	1.90108E+01	4.94168E+04	3.41167E+02	3.38596E-02	6.10151E-01
<b>WW</b>									
MEAN	2.37351E-04	1.10534E+01	4.47609E+04	1.77288E-04	7.87023E+00	1.66819E+04	1.10611E+02	2.44292E-02	8.00307E-01
MEDIAN	1.99805E-05	7.52472E+00	4.43570E+02	6.75913E-05	5.60803E+00	2.81063E+03	5.08511E+01	5.88068E-03	8.05164E-01
STD	3.53358E-04	8.94998E+00	1.95926E+05	2.50230E-04	7.65259E+00	2.11348E+04	1.52380E+02	2.93859E-02	3.39355E-01
IQR	3.83407E-04	1.19207E+01	1.79089E+03	1.94079E-04	1.09393E+01	4.81191E+04	1.45186E+02	4.89611E-02	5.48539E-01
<b>T = 300 K</b>									
true value	1.50000E-05	5.52105E+00	1.00000E+04	9.66582E-05	2.66667E+00	2.11460E+03	5.00000E+01	1.00000E-03	5.55000E+02
<b>DE</b>									
MEAN	3.51965E-05	5.50271E+00	2.99166E+04	1.53375E-04	3.42276E+00	6.24026E+03	9.19256E+01	1.27377E-03	3.23885E-01
MEDIAN	3.10794E-06	4.27872E+00	1.70806E+03	1.17255E-04	2.31232E+00	2.20501E+03	2.69548E+01	1.09209E-03	2.73994E-01
STD	9.18538E-05	4.00276E+00	8.48576E+04	7.64279E-05	2.61184E+00	8.85376E+03	1.23941E+02	9.61325E-04	1.87727E-01
IQR	2.23260E-05	4.14692E+00	4.98422E+03	1.15996E-04	4.64682E+00	3.55642E+03	1.26080E+02	1.64768E-04	2.86723E-01
<b>EBLSHADE</b>									

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEAN		2.89803E-05	5.58048E+00	3.60037E+04	9.67198E-05	2.42509E+00	2.16960E+03	8.19111E+01	1.06391E-03	1.51261E-01
MEDIAN		1.50047E-05	5.52143E+00	1.00057E+04	9.66584E-05	2.66669E+00	2.11460E+03	4.99906E+01	9.99993E-04	9.95037E-02
STD		8.05950E-05	3.25435E+00	1.49287E+05	2.30722E-05	8.56891E-01	1.07032E+03	7.94635E+01	2.06469E-04	1.45148E-01
IQR		4.55628E-06	3.63684E-01	5.79534E+03	4.92001E-06	4.10559E-01	2.30690E+02	1.30276E+01	1.85992E-05	1.26108E-02
<b>ADELI</b>										
MEAN		1.50047E-05	5.52143E+00	1.00057E+04	9.66584E-05	2.66669E+00	2.11460E+03	4.99906E+01	9.99993E-04	9.95037E-02
MEDIAN		1.50047E-05	5.52143E+00	1.00057E+04	9.66584E-05	2.66669E+00	2.11460E+03	4.99906E+01	9.99993E-04	9.95037E-02
STD		3.96781E-14	3.12523E-09	4.23079E-05	3.25395E-15	4.15390E-10	1.83709E-12	8.87300E-08	5.32106E-14	1.40159E-17
IQR		6.50000E-14	5.00000E-09	6.00000E-05	0.00000E+00	0.00000E+00	0.00000E+00	1.35000E-07	9.99999E-14	0.00000E+00
<b>NDE</b>										
MEAN		4.82497E-05	6.59966E+00	4.46612E+04	1.47570E-04	4.58182E+00	6.25574E+03	8.39660E+01	2.54601E-03	3.48055E-01
MEDIAN		1.50047E-05	5.52143E+00	9.88441E+03	9.66584E-05	2.66669E+00	2.11460E+03	4.99907E+01	1.00148E-03	9.95052E-02
STD		1.30992E-04	5.27294E+00	1.84293E+05	1.33767E-04	4.80092E+00	1.07478E+04	9.34517E+01	3.89367E-03	4.56456E-01
IQR		8.76603E-06	3.54898E-01	6.23858E+03	1.32674E-06	2.86598E-01	8.04543E+00	1.25602E+01	6.81420E-04	4.22018E-01
<b>MABC</b>										
MEAN		6.94090E-05	8.71378E+00	1.84343E+03	1.44709E-04	2.46263E+00	5.11243E+03	1.84834E+02	8.41390E-03	6.14680E-01
MEDIAN		3.57725E-06	5.74748E+00	5.18707E+02	1.11707E-04	8.93544E-01	1.86541E+03	9.36889E+01	1.50237E-03	6.98864E-01
STD		1.50035E-04	6.92668E+00	4.64035E+03	1.00540E-04	3.26196E+00	8.10759E+03	1.82721E+02	1.61845E-02	2.76627E-01
IQR		6.92923E-05	8.77817E+00	1.04964E+03	6.81027E-05	2.67293E+00	1.68079E+03	3.20176E+02	3.24728E-03	3.73436E-01
<b>TLBO</b>										
MEAN		1.53432E-05	5.54448E+00	2.14158E+04	9.66637E-05	2.66825E+00	2.11506E+03	4.93823E+01	9.99700E-04	9.95042E-02
MEDIAN		1.50047E-05	5.52143E+00	1.00057E+04	9.66584E-05	2.66669E+00	2.11460E+03	4.99906E+01	9.99993E-04	9.95037E-02
STD		1.86055E-06	1.26401E-01	7.99545E+04	3.13636E-08	8.70698E-03	2.57147E+00	3.34853E+00	1.59853E-06	2.66395E-06
IQR		6.50000E-14	5.50000E-09	7.00000E-05	0.00000E+00	1.00000E-09	0.00000E+00	1.55000E-07	9.99999E-14	0.00000E+00
<b>GOTLBO</b>										
MEAN		2.03177E-04	1.12720E+01	3.11353E+04	2.20241E-04	5.42039E+00	9.19891E+03	1.62162E+02	1.67984E-02	8.09807E-01
MEDIAN		8.74259E-05	1.09652E+01	5.27834E+02	2.15163E-04	3.17672E+00	4.08508E+03	5.68037E+01	2.44336E-03	8.48772E-01
STD		2.83682E-04	6.76314E+00	1.02605E+05	1.50741E-04	5.71032E+00	1.26659E+04	1.93759E+02	2.67072E-02	2.25369E-01
IQR		2.64320E-04	9.80581E+00	4.18183E+03	1.92999E-04	8.66259E+00	7.68620E+03	2.88298E+02	1.39422E-02	1.97709E-01
<b>STLBO</b>										
MEAN		1.50047E-05	5.52143E+00	1.00057E+04	9.66584E-05	2.66669E+00	2.11460E+03	4.99906E+01	9.99993E-04	9.95037E-02
MEDIAN		1.50047E-05	5.52143E+00	1.00057E+04	9.66584E-05	2.66669E+00	2.11460E+03	4.99906E+01	9.99993E-04	9.95037E-02
STD		3.80041E-14	3.01967E-09	3.80351E-05	5.27666E-15	5.01762E-10	1.83709E-12	9.57435E-08	5.02542E-14	1.40159E-17

**Table S154 (continued)**

Algorithm, metric	Parameter								
	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
IQR	5.00000E-14	4.00000E-09	5.00000E-05	0.00000E+00	1.00000E-09	0.00000E+00	1.40000E-07	9.99999E-14	0.00000E+00
<b>PSO</b>									
MEAN	4.99841E-04	1.65583E+01	5.86175E+05	1.33541E-04	3.66979E+00	1.00155E+04	2.63100E+02	3.70550E-02	6.66922E-01
MEDIAN	3.46468E-04	1.04476E+01	1.00000E+06	1.09294E-04	5.00000E-01	1.53484E+03	1.10413E+02	1.50444E-03	8.08031E-01
STD	4.85677E-04	1.28935E+01	4.94943E+05	1.33073E-04	8.00745E+00	1.86978E+04	2.55971E+02	4.24542E-02	2.29116E-01
IQR	1.00000E-03	2.57803E+01	9.99581E+05	2.45142E-05	1.96857E+00	2.79560E+02	5.37096E+02	7.10609E-02	2.75491E-01
<b>IJAYA</b>									
MEAN	1.39583E-05	5.16215E+00	3.40167E+04	9.90186E-05	2.82302E+00	2.17471E+03	4.11632E+01	1.02105E-03	1.07285E-01
MEDIAN	9.64908E-06	5.07492E+00	5.00575E+03	9.86551E-05	2.85924E+00	2.16722E+03	2.82659E+01	1.01070E-03	1.00395E-01
STD	1.09228E-05	1.12643E+00	1.02314E+05	1.22530E-05	4.63833E-01	1.69646E+02	4.28823E+01	3.55346E-05	3.84984E-02
IQR	1.75392E-05	1.67109E+00	1.60320E+04	3.63271E-06	3.50526E-01	9.28388E+01	5.43289E+01	3.53854E-05	3.02838E-03
<b>ISCA</b>									
MEAN	2.68071E-04	8.26372E+00	1.05802E+05	2.98667E-04	9.83589E+00	1.19223E+04	8.74530E+01	1.63487E-02	8.78696E-01
MEDIAN	1.26977E-04	6.57343E+00	7.89350E+03	2.72764E-04	8.46807E+00	4.29228E+03	1.66668E+01	2.28548E-03	9.12351E-01
STD	3.00015E-04	4.87900E+00	2.28831E+05	2.21605E-04	7.24243E+00	1.38656E+04	1.37925E+02	2.52095E-02	2.94374E-01
IQR	5.20150E-04	6.25902E+00	1.00183E+05	3.56002E-04	1.09203E+01	1.64469E+04	9.09044E+01	1.40251E-02	3.10670E-01
<b>NNA</b>									
MEAN	7.29041E-05	1.03187E+01	5.23172E+04	2.47645E-04	1.36773E+01	5.69996E+03	8.82562E+01	1.95798E-02	7.48232E-01
MEDIAN	5.69582E-07	6.86258E+00	3.42842E+02	7.70737E-05	1.18282E+01	9.76485E+02	1.34118E+01	9.03104E-03	7.48111E-01
STD	2.01509E-04	8.74179E+00	1.68414E+05	4.06486E-04	9.47471E+00	1.18583E+04	1.46120E+02	2.25199E-02	3.21327E-01
IQR	7.21391E-06	1.30264E+01	2.28832E+03	3.11029E-04	1.43017E+01	2.82092E+03	9.48686E+01	2.68469E-02	6.18640E-01
<b>CWOA</b>									
MEAN	2.90205E-04	1.41316E+01	1.35669E+05	7.80121E-04	1.37397E+01	1.92959E+04	1.81484E+02	2.36425E-02	6.60415E-01
MEDIAN	2.29921E-06	1.22522E+01	5.67376E+02	2.73938E-04	1.30797E+01	3.57410E+03	2.24290E+01	4.45749E-03	7.43557E-01
STD	4.29717E-04	1.07750E+01	2.92205E+05	1.96319E-03	9.94002E+00	2.30073E+04	2.37135E+02	3.34828E-02	2.92262E-01
IQR	7.75671E-04	2.25030E+01	7.84951E+04	6.06509E-04	1.95166E+01	4.96717E+04	3.90461E+02	3.08310E-02	4.81705E-01
<b>WW</b>									
MEAN	2.51084E-04	1.31224E+01	1.01786E+05	3.12718E-04	1.02195E+01	1.81410E+04	1.04869E+02	1.87520E-02	8.27972E-01
MEDIAN	1.65052E-05	1.10316E+01	1.68236E+02	2.79606E-04	8.37853E+00	2.85763E+03	1.91177E+01	5.50126E-03	8.61913E-01
STD	3.51687E-04	9.35477E+00	2.81086E+05	2.51901E-04	8.42864E+00	2.16979E+04	1.68479E+02	2.62596E-02	2.42413E-01
IQR	4.60577E-04	1.61504E+01	5.09554E+03	3.74895E-04	1.34022E+01	4.86799E+04	1.15701E+02	2.44940E-02	2.70548E-01
<b>T = 310 K</b>									
true value	1.50000E-05	5.34295E+00	1.00000E+04	1.59152E-04	2.61290E+00	1.41896E+03	6.00000E+01	1.01000E-03	5.55000E+02

**Table S154 (continued)**

Algorithm, metric	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	Parameter			$I_{ph}$ (A)	RMSPE
						$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)		
<b>DE</b>										
MEAN	5.27913E-05	5.83741E+00	1.08362E+04	2.97902E-04	4.24758E+00	1.14657E+04	8.02052E+01	1.17553E-03	4.17188E-01	
MEDIAN	5.92881E-06	4.57997E+00	2.53709E+03	3.09783E-04	4.52646E+00	3.21489E+03	3.66747E+01	1.13575E-03	4.03099E-01	
STD	1.46997E-04	3.93926E+00	2.64949E+04	1.21598E-04	2.45028E+00	1.66551E+04	9.46525E+01	1.63952E-04	2.10138E-01	
IQR	3.59199E-05	3.71012E+00	5.06135E+03	2.14065E-04	3.92978E+00	9.16739E+03	1.14195E+02	1.80142E-04	3.29481E-01	
<b>EBSHADE</b>										
MEAN	2.03670E-05	4.78862E+00	5.79370E+03	1.87413E-04	2.54298E+00	3.70210E+03	1.17724E+02	1.21428E-03	1.94172E-01	
MEDIAN	9.67504E-06	4.87001E+00	3.29031E+03	1.59151E-04	2.59268E+00	1.41864E+03	7.68485E+01	1.03836E-03	1.03575E-01	
STD	4.21304E-05	2.60373E+00	5.98290E+03	8.13721E-05	1.48032E+00	8.53903E+03	9.62114E+01	8.94416E-04	1.90825E-01	
IQR	1.47762E-05	2.51336E+00	8.27975E+03	2.33299E-05	1.18970E+00	2.20816E+02	9.47566E+01	1.17037E-04	1.05460E-01	
<b>ADELI</b>										
MEAN	1.50078E-05	5.34355E+00	1.00089E+04	1.59151E-04	2.61295E+00	1.41897E+03	5.99840E+01	1.00999E-03	9.95037E-02	
MEDIAN	1.50078E-05	5.34355E+00	1.00089E+04	1.59151E-04	2.61295E+00	1.41897E+03	5.99840E+01	1.00999E-03	9.95037E-02	
STD	2.18820E-14	1.64496E-09	2.04786E-05	0.00000E+00	4.76095E-10	4.59272E-13	6.10734E-08	8.75992E-19	1.40159E-17	
IQR	3.00000E-14	2.00000E-09	3.00000E-05	0.00000E+00	1.00000E-09	0.00000E+00	9.00000E-08	0.00000E+00	0.00000E+00	
<b>NDE</b>										
MEAN	5.03624E-05	6.97618E+00	4.98906E+04	2.36249E-04	4.72704E+00	3.49302E+03	1.04350E+02	4.71088E-03	3.21355E-01	
MEDIAN	1.50078E-05	5.34355E+00	6.77703E+03	1.59151E-04	2.61295E+00	1.41837E+03	5.99865E+01	1.01904E-03	9.95390E-02	
STD	1.46708E-04	5.28828E+00	1.94859E+05	2.56322E-04	5.52670E+00	8.78848E+03	9.93430E+01	1.01918E-02	3.58313E-01	
IQR	8.95872E-06	1.69619E+00	7.28780E+03	1.22426E-06	3.05234E-01	6.68075E+01	5.56161E+01	1.02304E-04	4.31138E-01	
<b>MABC</b>										
MEAN	5.44973E-05	7.78116E+00	3.55852E+03	2.38094E-04	2.67344E+00	3.25170E+03	1.57267E+02	5.89561E-03	6.36940E-01	
MEDIAN	1.76571E-06	4.58855E+00	6.35767E+02	1.95533E-04	7.67802E-01	1.11911E+03	9.53646E+01	1.30397E-03	6.69238E-01	
STD	1.25503E-04	7.57886E+00	1.57680E+04	1.38735E-04	3.14519E+00	5.76172E+03	1.58093E+02	1.85983E-02	3.37739E-01	
IQR	3.32981E-05	7.30264E+00	1.12514E+03	1.43949E-04	3.54424E+00	1.17214E+03	2.42287E+02	9.32032E-04	7.07899E-01	
<b>TLBO</b>										
MEAN	1.56416E-05	5.38308E+00	2.86965E+04	1.59244E-04	2.62248E+00	1.42101E+03	5.84375E+01	1.00961E-03	9.95057E-02	
MEDIAN	1.50078E-05	5.34355E+00	1.00089E+04	1.59151E-04	2.61295E+00	1.41897E+03	5.99840E+01	1.00999E-03	9.95037E-02	
STD	3.34333E-06	2.06338E-01	1.25351E+05	6.16257E-07	5.73996E-02	1.22468E+01	8.56092E+00	1.89663E-06	1.07609E-05	
IQR	4.00000E-14	3.00000E-09	3.00000E-05	0.00000E+00	1.00000E-09	0.00000E+00	8.00000E-08	0.00000E+00	0.00000E+00	
<b>GOTLBO</b>										
MEAN	1.27436E-04	1.07688E+01	4.32346E+04	4.76334E-04	1.03070E+01	5.24197E+03	8.92025E+01	1.16586E-02	7.65122E-01	
MEDIAN	2.25272E-06	8.84283E+00	6.69111E+02	3.91107E-04	9.52303E+00	1.93955E+03	1.45832E+01	1.87400E-03	8.73647E-01	

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
STD		2.48715E-04	8.37863E+00	1.69878E+05	2.86765E-04	7.88097E+00	6.54736E+03	1.40132E+02	2.46066E-02	3.38118E-01
IQR		1.19829E-04	1.20362E+01	2.05705E+03	3.96603E-04	1.10699E+01	6.20911E+03	1.16335E+02	3.99547E-03	5.43553E-01
<b>STLBO</b>										
MEAN		1.50078E-05	5.34355E+00	1.00089E+04	1.59151E-04	2.61295E+00	1.41897E+03	5.99840E+01	1.00999E-03	9.95037E-02
MEDIAN		1.50078E-05	5.34355E+00	1.00089E+04	1.59151E-04	2.61295E+00	1.41897E+03	5.99840E+01	1.00999E-03	9.95037E-02
STD		3.22466E-14	2.57925E-09	2.97295E-05	0.00000E+00	6.00653E-10	3.00327E-07	9.20937E-08	8.75992E-19	1.40159E-17
IQR		4.00000E-14	3.00000E-09	4.00000E-05	0.00000E+00	1.00000E-09	0.00000E+00	1.15000E-07	0.00000E+00	0.00000E+00
<b>PSO</b>										
MEAN		3.58817E-04	1.30453E+01	4.69617E+05	4.51996E-04	6.61931E+00	5.84557E+03	2.97136E+02	4.17000E-02	6.90010E-01
MEDIAN		4.39423E-05	6.48566E+00	1.48109E+03	2.16223E-04	5.00000E-01	1.00695E+03	4.82017E+02	3.19353E-02	7.09783E-01
STD		4.50034E-04	1.19260E+01	4.99383E+05	1.39382E-03	1.11489E+01	1.47241E+04	2.61643E+02	4.06614E-02	3.52375E-01
IQR		1.00000E-03	2.58827E+01	9.99990E+05	7.59159E-05	5.24631E+00	4.28276E+02	5.26325E+02	6.49896E-02	7.72248E-01
<b>IJAYA</b>										
MEAN		1.72494E-05	5.15134E+00	5.28239E+04	1.76356E-04	3.13596E+00	1.60237E+03	3.65969E+01	1.03768E-03	1.15207E-01
MEDIAN		1.24809E-05	5.11996E+00	5.11879E+03	1.67617E-04	3.15428E+00	1.53277E+03	9.21597E+00	1.01903E-03	1.01439E-01
STD		1.99954E-05	1.46947E+00	1.58179E+05	3.23727E-05	8.90283E-01	3.22490E+02	6.22089E+01	7.01828E-05	5.84609E-02
IQR		1.94096E-05	1.79802E+00	9.23729E+03	1.87428E-05	5.93770E-01	1.77576E+02	3.57547E+01	3.49426E-05	5.82171E-03
<b>ISCA</b>										
MEAN		2.24319E-04	1.06260E+01	7.24301E+04	7.45896E-04	1.61161E+01	6.79780E+03	7.35759E+01	8.06081E-03	9.53550E-01
MEDIAN		1.44675E-04	8.77503E+00	3.99817E+03	5.45807E-04	1.61995E+01	2.07570E+03	1.29011E+01	2.15152E-03	9.80318E-01
STD		2.46235E-04	6.61245E+00	1.85597E+05	5.42216E-04	8.76032E+00	1.06816E+04	9.79728E+01	1.59653E-02	2.47794E-01
IQR		3.20991E-04	9.05965E+00	3.63221E+04	7.41526E-04	1.51740E+01	4.33502E+03	1.49216E+02	2.13848E-03	2.71945E-01
<b>NNA</b>										
MEAN		3.53673E-05	1.14526E+01	4.67456E+04	2.48647E-04	1.62427E+01	3.65305E+03	8.87110E+01	1.53823E-02	8.63015E-01
MEDIAN		2.63231E-07	8.97624E+00	3.43780E+02	1.01777E-05	1.46241E+01	5.46250E+02	4.19670E+00	3.84468E-03	7.07078E-01
STD		9.43393E-05	9.00525E+00	1.44633E+05	3.57340E-04	8.88477E+00	8.28385E+03	1.50249E+02	2.12076E-02	2.76059E-01
IQR		7.00772E-06	1.66556E+01	2.66049E+03	3.98779E-04	1.60798E+01	1.45594E+03	1.18683E+02	1.67959E-02	3.64503E-01
<b>CWOA</b>										
MEAN		4.42549E-04	1.23600E+01	1.60225E+05	1.29127E-03	1.48703E+01	1.63984E+04	2.39430E+02	3.45453E-02	8.23218E-01
MEDIAN		5.71073E-05	8.00318E+00	5.11507E+02	4.00117E-04	1.27622E+01	1.02316E+03	1.50944E+02	1.24945E-02	7.45968E-01
STD		4.85517E-04	9.95508E+00	3.36239E+05	2.45881E-03	1.15410E+01	2.22917E+04	2.25625E+02	3.83360E-02	2.24000E-01
IQR		9.99995E-04	1.23539E+01	3.88232E+04	1.27213E-03	2.44326E+01	4.97047E+04	4.73841E+02	6.15521E-02	2.83878E-01
<b>WW</b>										

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEAN		3.04057E-04	1.61944E+01	5.14322E+04	1.09441E-03	1.49717E+01	2.38136E+04	1.32634E+02	1.65234E-02	8.98584E-01
MEDIAN		5.43077E-05	1.38977E+01	3.52454E+02	7.85762E-04	1.34910E+01	5.76096E+03	2.62317E+01	3.69576E-03	8.90367E-01
STD		3.82272E-04	9.56841E+00	1.99483E+05	1.18760E-03	9.78946E+00	2.39948E+04	1.80861E+02	2.29666E-02	1.71250E-01
IQR		6.59899E-04	1.71357E+01	2.73118E+03	1.03855E-03	1.85467E+01	4.91248E+04	2.37493E+02	2.52921E-02	2.73300E-01
<b>T = 320 K</b>										
true value		1.50000E-05	5.17598E+00	1.00000E+04	2.54008E-04	2.56250E+00	9.76205E+02	7.00000E+01	1.02000E-03	5.55000E+02
<b>DE</b>										
MEAN		7.26330E-05	6.85495E+00	9.71347E+03	5.11873E-04	6.80687E+00	7.12817E+03	7.77148E+01	1.25039E-03	5.51930E-01
MEDIAN		9.30567E-06	5.37535E+00	2.34236E+03	3.87326E-04	4.22513E+00	9.36575E+02	2.32693E+01	1.17770E-03	5.19937E-01
STD		1.41165E-04	5.09206E+00	2.98843E+04	4.40747E-04	7.98824E+00	1.31061E+04	9.92735E+01	2.95753E-04	2.79318E-01
IQR		9.23265E-05	8.22767E+00	4.53959E+03	4.05243E-04	5.71293E+00	4.23276E+03	1.18074E+02	1.76734E-04	4.25355E-01
<b>EBSHADE</b>										
MEAN		1.71503E-05	5.83730E+00	9.28327E+03	2.85733E-04	4.98708E+00	2.72951E+03	1.01506E+02	1.30518E-03	2.45268E-01
MEDIAN		5.31441E-06	4.74271E+00	5.98265E+03	2.53282E-04	2.56252E+00	9.64449E+02	6.99971E+01	1.04226E-03	1.05279E-01
STD		3.45535E-05	6.33275E+00	1.42950E+04	1.86435E-04	7.07115E+00	8.27988E+03	9.65207E+01	1.30672E-03	2.72333E-01
IQR		1.48147E-05	2.70705E+00	8.15662E+03	1.00118E-04	2.76648E+00	4.62456E+02	1.21334E+02	9.29293E-05	1.19986E-01
<b>ADELI</b>										
MEAN		1.48621E-05	5.61478E+00	2.25242E+04	2.51868E-04	3.07064E+00	9.56061E+02	7.47471E+01	1.02337E-03	1.17985E-01
MEDIAN		1.50011E-05	5.17607E+00	1.00009E+04	2.54009E-04	2.56252E+00	9.76210E+02	6.99971E+01	1.02000E-03	9.95037E-02
STD		4.41223E-06	3.52838E+00	8.99649E+04	4.07513E-05	3.84228E+00	1.37779E+02	5.04158E+01	2.90272E-05	1.27118E-01
IQR		3.00000E-14	3.00000E-09	3.00000E-05	1.00000E-13	1.00000E-09	1.00000E-07	1.05000E-07	0.00000E+00	0.00000E+00
<b>NDE</b>										
MEAN		4.13673E-05	1.07901E+01	6.78533E+04	2.04782E-04	9.69368E+00	1.17286E+03	6.22102E+01	3.46622E-03	4.73581E-01
MEDIAN		4.58545E-06	5.31060E+00	3.67429E+03	2.48647E-04	2.74733E+00	8.76418E+02	4.95192E+01	1.06238E-03	1.06973E-01
STD		1.60569E-04	1.02441E+01	2.26567E+05	2.68835E-04	9.99184E+00	3.05491E+03	6.52108E+01	9.22788E-03	4.41768E-01
IQR		1.67557E-05	1.13360E+01	9.91554E+03	2.54257E-04	1.68951E+01	7.37479E+02	9.97529E+01	4.05764E-04	9.07812E-01
<b>MABC</b>										
MEAN		9.68675E-05	1.23065E+01	5.44548E+04	2.34224E-04	9.28653E+00	1.45762E+03	1.01078E+02	2.26295E-03	6.93816E-01
MEDIAN		6.95611E-06	8.90569E+00	1.30332E+03	1.19179E-06	5.63072E+00	3.49592E+02	4.22161E+01	1.30592E-03	8.31866E-01
STD		2.07006E-04	9.80658E+00	1.89291E+05	4.77514E-04	8.76429E+00	6.96057E+03	1.36443E+02	2.65048E-03	3.58807E-01
IQR		9.95496E-05	1.38549E+01	5.93767E+03	2.43577E-04	1.36571E+01	4.60622E+02	1.30006E+02	1.01208E-03	7.77650E-01
<b>TLBO</b>										
MEAN		1.39576E-05	5.64122E+00	1.11698E+04	2.38568E-04	3.36379E+00	9.32734E+02	7.13598E+01	1.21300E-03	1.52502E-01

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEDIAN		1.50011E-05	5.17607E+00	1.00009E+04	2.54009E-04	2.56252E+00	9.76210E+02	6.99971E+01	1.02000E-03	9.95037E-02
STD		4.61632E-06	2.97800E+00	1.43867E+04	6.03222E-05	4.02652E+00	1.53019E+02	3.71213E+01	8.92368E-04	2.13885E-01
IQR		5.00000E-14	3.00000E-09	5.00000E-05	1.00000E-13	1.00000E-09	3.00000E-07	1.60000E-07	0.00000E+00	0.00000E+00
<b>GOTLBO</b>										
MEAN		1.33014E-04	1.11720E+01	9.61439E+04	4.86648E-04	1.13031E+01	2.34334E+03	7.61548E+01	1.97709E-03	7.31274E-01
MEDIAN		1.43191E-05	8.41820E+00	5.69572E+03	1.00515E-05	7.80442E+00	4.17426E+02	5.16922E+00	1.37460E-03	8.05013E-01
STD		2.04914E-04	8.48535E+00	1.99332E+05	1.43244E-03	8.32415E+00	5.50450E+03	1.30764E+02	1.41306E-03	3.09462E-01
IQR		2.26827E-04	1.17431E+01	7.07113E+04	5.69483E-04	1.39522E+01	5.75727E+02	6.56241E+01	8.65017E-04	4.17941E-01
<b>STLBO</b>										
MEAN		1.47069E-05	5.66281E+00	9.81358E+03	2.49028E-04	3.10051E+00	9.58697E+02	6.90416E+01	1.02752E-03	1.17304E-01
MEDIAN		1.50011E-05	5.17607E+00	1.00009E+04	2.54009E-04	2.56252E+00	9.76210E+02	6.99971E+01	1.02000E-03	9.95037E-02
STD		2.10056E-06	3.47605E+00	1.33786E+03	3.55683E-05	3.84200E+00	1.25065E+02	6.82386E+00	5.37231E-05	1.27123E-01
IQR		5.00000E-14	4.00000E-09	4.00000E-05	1.00000E-13	1.00000E-09	2.00000E-07	1.65000E-07	0.00000E+00	0.00000E+00
<b>PSO</b>										
MEAN		4.28573E-04	1.30514E+01	4.71916E+05	9.60042E-04	1.61376E+01	7.21107E+03	1.66622E+02	3.06821E-02	6.92880E-01
MEDIAN		7.20290E-05	6.97497E+00	1.15796E+04	1.01463E-10	1.89715E+01	5.47520E+02	1.00000E-01	1.19046E-03	9.26404E-01
STD		4.75991E-04	1.18202E+01	5.02611E+05	2.69650E-03	1.43659E+01	1.72395E+04	2.31369E+02	4.12168E-02	4.05119E-01
IQR		1.00000E-03	2.70695E+01	9.99990E+05	2.78904E-04	2.95000E+01	7.48530E+02	4.52731E+02	6.71751E-02	8.68329E-01
<b>IJAYA</b>										
MEAN		3.91128E-05	5.61085E+00	4.68665E+04	3.90409E-04	6.29427E+00	2.01458E+03	3.98225E+01	1.13848E-03	3.18674E-01
MEDIAN		4.47984E-06	4.22549E+00	3.88912E+03	3.32444E-04	4.72130E+00	1.13989E+03	1.23042E+01	1.05966E-03	1.88337E-01
STD		8.74753E-05	4.06095E+00	1.49984E+05	2.47406E-04	5.68530E+00	2.38276E+03	7.24754E+01	2.18656E-04	2.86962E-01
IQR		2.04562E-05	3.30507E+00	1.76595E+04	3.35026E-04	4.20486E+00	1.21482E+03	3.93728E+01	1.36508E-04	2.40580E-01
<b>ISCA</b>										
MEAN		2.40725E-04	1.14031E+01	1.01573E+05	8.05252E-04	1.28256E+01	2.55507E+03	6.48675E+01	4.68183E-03	8.40888E-01
MEDIAN		4.92732E-05	8.72217E+00	4.41892E+03	2.25511E-04	1.24327E+01	4.97558E+02	6.77838E+00	1.53815E-03	8.39373E-01
STD		3.21900E-04	7.43918E+00	2.01809E+05	1.61867E-03	7.66339E+00	7.86467E+03	1.03697E+02	1.05459E-02	2.42200E-01
IQR		3.80371E-04	1.09995E+01	9.82014E+04	9.42977E-04	1.23849E+01	9.51094E+02	8.07893E+01	1.00389E-03	2.70310E-01
<b>NNA</b>										
MEAN		6.69980E-05	1.57615E+01	3.49472E+04	4.15971E-04	1.82391E+01	9.56393E+02	7.28741E+01	6.16946E-03	9.84641E-01
MEDIAN		2.29885E-07	1.51050E+01	3.17890E+02	1.86967E-07	1.90479E+01	3.31800E+02	1.09340E+01	2.45555E-03	1.00726E+00
STD		1.38456E-04	8.78396E+00	1.20768E+05	1.10718E-03	8.39411E+00	3.22574E+03	1.15489E+02	7.97423E-03	1.49736E-01
IQR		6.39691E-05	1.52349E+01	7.94627E+02	7.53367E-05	1.28133E+01	3.08576E+02	8.80296E+01	5.50315E-03	1.01562E-02

**Table S154 (continued)**

Algorithm, metric	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	Parameter $R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
<b>CWOA</b>									
MEAN	2.85745E-04	1.19415E+01	2.36128E+05	1.70647E-03	1.61498E+01	4.55409E+03	1.67886E+02	1.63148E-02	8.05619E-01
MEDIAN	2.10437E-07	7.25140E+00	3.33189E+03	7.36514E-09	1.63437E+01	4.57514E+02	3.94865E+01	3.86311E-03	1.00102E+00
STD	4.25718E-04	1.04561E+01	4.08767E+05	3.63302E-03	1.07295E+01	1.30381E+04	2.04233E+02	2.52596E-02	3.83244E-01
IQR	6.98652E-04	1.72536E+01	1.38863E+05	3.24691E-04	1.93018E+01	4.59135E+02	3.38072E+02	1.85643E-02	2.98172E-01
<b>WW</b>									
MEAN	3.31199E-04	1.20148E+01	1.09691E+05	9.46532E-04	1.88406E+01	1.13513E+04	1.65089E+02	7.69268E-03	8.85889E-01
MEDIAN	7.55199E-05	8.16182E+00	5.92042E+03	1.03281E-04	1.76841E+01	4.54399E+02	3.17310E+01	1.99298E-03	9.38947E-01
STD	4.04170E-04	9.61501E+00	2.70733E+05	1.96931E-03	1.07836E+01	2.05170E+04	2.01020E+02	1.60335E-02	1.95426E-01
IQR	7.43216E-04	1.88668E+01	5.37071E+04	9.34889E-04	2.16190E+01	3.18900E+03	3.04741E+02	5.46747E-03	2.07929E-01
<b>T = 330 K</b>									
true value	1.50000E-05	5.01914E+00	1.00000E+04	3.94074E-04	2.51515E+00	6.86999E+02	8.00000E+01	1.03000E-03	5.55000E+02
<b>DE</b>									
MEAN	1.45306E-05	3.89436E+00	2.47670E+04	5.78041E-04	5.44376E+00	4.27040E+03	6.52316E+01	1.10383E-03	2.22987E-01
MEDIAN	1.73918E-06	3.39358E+00	2.56468E+03	4.54094E-04	4.29295E+00	7.60487E+02	4.38098E+01	1.08083E-03	1.82846E-01
STD	4.59785E-05	2.23582E+00	8.59814E+04	3.89995E-04	4.19410E+00	8.03184E+03	6.86059E+01	7.72389E-05	1.14500E-01
IQR	1.43496E-05	2.83764E+00	3.01045E+03	6.55659E-04	5.61193E+00	2.83648E+03	9.94062E+01	9.05259E-05	1.56753E-01
<b>EBSHADE</b>									
MEAN	1.75078E-05	4.96861E+00	4.17918E+04	3.86868E-04	2.48324E+00	9.25031E+02	8.41984E+01	1.03766E-03	1.07256E-01
MEDIAN	1.49977E-05	5.01897E+00	9.99808E+03	3.94074E-04	2.51510E+00	6.86993E+02	8.00063E+01	1.03000E-03	9.95440E-02
STD	1.49573E-05	1.04815E+00	1.59351E+05	1.19518E-04	1.42077E+00	1.93935E+03	5.14499E+01	2.22986E-05	1.68043E-02
IQR	7.59136E-06	6.29958E-01	5.22619E+03	4.44594E-05	7.97547E-01	1.44843E+02	1.87124E+01	7.79881E-06	5.89057E-03
<b>ADELI</b>									
MEAN	1.49977E-05	5.01897E+00	9.99808E+03	3.94074E-04	2.51510E+00	6.86993E+02	8.00063E+01	1.03000E-03	9.95037E-02
MEDIAN	1.49977E-05	5.01897E+00	9.99808E+03	3.94074E-04	2.51510E+00	6.86993E+02	8.00063E+01	1.03000E-03	9.95037E-02
STD	2.58472E-14	1.79433E-09	2.14585E-05	5.01762E-14	1.22266E-09	1.68616E-07	8.63717E-08	8.75992E-19	4.20476E-17
IQR	4.50000E-14	3.00000E-09	3.40000E-05	1.00000E-13	2.00000E-09	2.50000E-07	1.35000E-07	0.00000E+00	0.00000E+00
<b>NDE</b>									
MEAN	6.11227E-05	5.76490E+00	1.42779E+04	3.85317E-04	6.79009E+00	5.42006E+02	1.06737E+02	1.35544E-03	4.04987E-01
MEDIAN	1.50078E-05	5.01917E+00	9.99808E+03	3.94074E-04	2.63162E+00	6.86981E+02	8.00063E+01	1.03000E-03	9.95166E-02
STD	1.85101E-04	3.64751E+00	1.70935E+04	4.45975E-04	8.48920E+00	2.64055E+02	7.60261E+01	7.79399E-04	4.47829E-01
IQR	1.10713E-05	8.15665E-01	8.37131E+03	9.34878E-05	1.51087E+00	3.87830E+02	3.92110E+01	2.92655E-04	7.97824E-01
<b>MABC</b>									

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEAN		5.39823E-05	5.67309E+00	2.17155E+04	7.60613E-04	5.39419E+00	3.76996E+03	9.74361E+01	1.15927E-03	3.77969E-01
MEDIAN		1.73048E-06	3.38347E+00	1.97362E+03	3.78054E-04	1.49757E+00	4.52821E+02	6.05965E+01	1.12335E-03	1.90273E-01
STD		1.01742E-04	4.61636E+00	5.53297E+04	1.02115E-03	7.17947E+00	1.03683E+04	1.04887E+02	1.42125E-04	3.37441E-01
IQR		6.00519E-05	6.12117E+00	5.11232E+03	6.35138E-04	7.10702E+00	3.85734E+02	1.20090E+02	1.54021E-04	4.74666E-01
<b>TLBO</b>										
MEAN		1.62028E-05	5.08992E+00	6.21055E+04	3.95709E-04	2.56797E+00	6.94133E+02	7.65114E+01	1.02926E-03	9.95078E-02
MEDIAN		1.49977E-05	5.01897E+00	9.99808E+03	3.94074E-04	2.51510E+00	6.86993E+02	8.00063E+01	1.03000E-03	9.95037E-02
STD		4.33790E-06	2.53111E-01	2.09274E+05	8.23971E-06	2.29696E-01	3.14381E+01	1.34179E+01	2.58832E-06	1.53698E-05
IQR		3.00000E-14	2.00000E-09	2.45000E-05	1.00000E-13	2.00000E-09	3.00000E-07	1.25000E-07	0.00000E+00	0.00000E+00
<b>GOTLBO</b>										
MEAN		9.37257E-05	7.10471E+00	6.70223E+04	5.29326E-04	1.07708E+01	3.56947E+03	4.72598E+01	1.15025E-03	4.60479E-01
MEDIAN		2.04085E-05	6.15577E+00	5.91727E+03	6.32428E-05	6.99296E+00	3.81620E+02	8.22560E+00	1.12897E-03	4.61259E-01
STD		1.76969E-04	5.58795E+00	1.69100E+05	8.20384E-04	9.11626E+00	8.85932E+03	7.57204E+01	1.35393E-04	2.91012E-01
IQR		1.08575E-04	6.47745E+00	3.28656E+04	7.59814E-04	1.40217E+01	5.37263E+02	5.89234E+01	1.67432E-04	5.24704E-01
<b>STLBO</b>										
MEAN		1.49977E-05	5.01897E+00	9.99808E+03	3.94074E-04	2.51510E+00	6.86993E+02	8.00063E+01	1.03000E-03	9.95037E-02
MEDIAN		1.49977E-05	5.01897E+00	9.99808E+03	3.94074E-04	2.51510E+00	6.86993E+02	8.00063E+01	1.03000E-03	9.95037E-02
STD		2.26499E-14	1.70052E-09	1.95374E-05	5.40152E-14	1.05867E-09	1.62432E-07	7.70108E-08	8.75992E-19	4.20476E-17
IQR		3.50000E-14	2.00000E-09	2.90000E-05	1.00000E-13	1.50000E-09	3.00000E-07	1.00000E-07	0.00000E+00	0.00000E+00
<b>PSO</b>										
MEAN		4.60127E-04	1.70258E+01	5.69538E+05	1.51389E-03	1.51710E+01	1.00330E+04	9.78458E+01	1.05787E-02	6.21580E-01
MEDIAN		3.85429E-05	2.73182E+01	1.00000E+06	5.04845E-04	8.31005E+00	4.55418E+02	1.00000E-01	1.12840E-03	8.35733E-01
STD		4.95539E-04	1.31314E+01	4.99142E+05	2.97363E-03	1.43395E+01	1.99360E+04	1.64276E+02	2.22018E-02	4.47494E-01
IQR		1.00000E-03	2.71327E+01	9.97390E+05	8.84969E-04	2.95000E+01	5.25256E+02	9.00247E+01	1.25410E-04	7.55484E-01
<b>IJAYA</b>										
MEAN		1.38133E-05	4.48901E+00	5.04708E+04	5.76225E-04	5.16229E+00	2.29083E+03	3.79302E+01	1.05043E-03	1.07312E-01
MEDIAN		9.12089E-06	4.51095E+00	4.70321E+03	4.99642E-04	4.81956E+00	9.89840E+02	5.08097E+00	1.03456E-03	1.02820E-01
STD		1.32242E-05	1.29283E+00	1.35368E+05	2.06684E-04	2.56985E+00	5.49333E+03	5.92073E+01	3.46902E-05	1.19947E-02
IQR		2.86775E-05	2.64207E+00	4.06013E+04	2.28061E-04	2.56737E+00	8.19351E+02	4.41926E+01	5.33229E-05	8.22927E-03
<b>ISCA</b>										
MEAN		2.26209E-04	1.14464E+01	5.94864E+04	1.38330E-03	1.33611E+01	1.69970E+03	5.82906E+01	1.22280E-03	6.39507E-01
MEDIAN		1.13127E-04	9.35167E+00	8.68900E+03	3.61387E-04	1.35306E+01	2.64162E+02	5.04152E+00	1.20421E-03	6.14736E-01
STD		2.43224E-04	6.56184E+00	1.36856E+05	2.32389E-03	8.45890E+00	4.50884E+03	8.83865E+01	1.23423E-04	2.76647E-01

**Table S154 (continued)**

Algorithm, metric	Parameter								
	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
IQR	3.68853E-04	1.25112E+01	5.22940E+04	1.40752E-03	1.30999E+01	3.31939E+02	1.03615E+02	1.85733E-04	3.45443E-01
<b>NNA</b>									
MEAN	1.63359E-04	1.20815E+01	3.09979E+04	5.55116E-04	1.65569E+01	1.52684E+03	3.60443E+01	2.93885E-03	9.88136E-01
MEDIAN	1.04304E-05	1.00021E+01	3.04719E+03	6.77431E-07	1.81328E+01	2.81254E+02	1.58449E+00	1.51113E-03	1.05385E+00
STD	2.62048E-04	9.07136E+00	7.59872E+04	1.53947E-03	8.81570E+00	7.09037E+03	7.03684E+01	4.21691E-03	3.19298E-01
IQR	1.97503E-04	1.71852E+01	1.50456E+04	9.03172E-05	1.64293E+01	3.01169E+02	4.01732E+01	1.19544E-03	5.90619E-01
<b>CWOA</b>									
MEAN	2.46426E-04	1.19620E+01	1.57158E+05	2.52922E-03	1.67977E+01	8.38181E+03	1.17385E+02	1.08732E-02	8.99587E-01
MEDIAN	8.04574E-07	5.93122E+00	4.02858E+02	6.82975E-08	1.67288E+01	3.87396E+02	1.61285E+01	1.81969E-03	1.18886E+00
STD	4.07629E-04	1.08393E+01	3.62591E+05	4.02230E-03	1.02405E+01	1.73997E+04	1.63622E+02	2.08707E-02	5.50075E-01
IQR	2.59201E-04	1.96042E+01	3.76037E+03	3.37860E-03	1.82677E+01	5.99772E+02	2.25262E+02	8.06087E-03	1.12231E+00
<b>WW</b>									
MEAN	3.95696E-04	1.52501E+01	1.17694E+05	1.68950E-03	1.58443E+01	9.56900E+03	5.49070E+01	2.52344E-03	9.20130E-01
MEDIAN	2.68794E-04	1.44738E+01	5.51686E+03	2.00828E-04	1.33873E+01	2.59880E+02	9.46265E+00	1.28744E-03	9.28054E-01
STD	3.66344E-04	8.90406E+00	2.97119E+05	2.99688E-03	1.16357E+01	1.91461E+04	9.96093E+01	5.61169E-03	2.45900E-01
IQR	7.20546E-04	1.60080E+01	1.84651E+04	1.61225E-03	2.55228E+01	8.84961E+02	5.02754E+01	3.15797E-04	2.74302E-01
<b>T = 340 K</b>									
true value	1.50000E-05	4.87151E+00	1.00000E+04	5.95785E-04	2.47059E+00	4.93568E+02	9.00000E+01	1.04000E-03	5.55000E+02
<b>DE</b>									
MEAN	8.79836E-06	3.65610E+00	4.32122E+04	8.49896E-04	4.92352E+00	3.60831E+03	1.00566E+02	1.08551E-03	1.35532E-01
MEDIAN	2.84057E-06	3.55733E+00	3.59710E+03	7.54123E-04	3.33097E+00	5.94661E+02	9.01178E+01	1.06011E-03	1.17021E-01
STD	1.06895E-05	1.42220E+00	1.43409E+05	4.03068E-04	4.08878E+00	7.72464E+03	8.11411E+01	5.68810E-05	3.75107E-02
IQR	1.56516E-05	2.59431E+00	8.96510E+03	5.98051E-04	6.34835E+00	7.61002E+02	1.52281E+02	8.46358E-05	4.51257E-02
<b>EBSHADE</b>									
MEAN	1.56192E-05	4.83515E+00	3.91746E+04	6.65425E-04	3.09205E+00	1.15850E+03	8.34612E+01	1.04287E-03	1.01161E-01
MEDIAN	1.49976E-05	4.87135E+00	9.99775E+03	5.95786E-04	2.47050E+00	4.93562E+02	9.00067E+01	1.04000E-03	9.95037E-02
STD	6.60123E-06	5.81929E-01	1.46878E+05	2.33913E-04	2.04792E+00	2.77162E+03	4.25142E+01	1.41186E-05	4.90941E-03
IQR	3.00000E-14	2.00000E-09	3.10000E-05	3.05100E-10	3.67700E-06	1.03980E-03	1.81758E-03	0.00000E+00	3.28653E-05
<b>ADELI</b>									
MEAN	1.49976E-05	4.87135E+00	9.99775E+03	5.95786E-04	2.47050E+00	4.93562E+02	9.00067E+01	1.04000E-03	9.95037E-02
MEDIAN	1.49976E-05	4.87135E+00	9.99775E+03	5.95786E-04	2.47050E+00	4.93562E+02	9.00067E+01	1.04000E-03	9.95037E-02
STD	1.75790E-14	1.20033E-09	1.44102E-05	1.58770E-13	1.88638E-09	2.36046E-07	7.01952E-08	4.37996E-19	2.80318E-17
IQR	3.00000E-14	2.00000E-09	2.00000E-05	2.00000E-13	2.50000E-09	3.50000E-07	9.50000E-08	0.00000E+00	0.00000E+00

**Table S154 (continued)**

Algorithm, metric	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	Parameter			$I_{ph}$ (A)	RMSPE
						$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)		
<b>NDE</b>										
MEAN	5.19566E-05	6.32741E+00	1.01777E+05	7.49865E-04	6.14737E+00	3.19477E+03	9.81832E+01	1.44226E-03	4.34404E-01	
MEDIAN	1.49976E-05	4.87135E+00	9.44930E+03	5.94386E-04	2.49628E+00	4.86725E+02	9.19468E+01	1.04114E-03	9.95162E-02	
STD	1.13956E-04	3.87363E+00	2.62762E+05	1.08270E-03	6.81281E+00	1.09933E+04	6.38884E+01	1.68412E-03	5.32427E-01	
IQR	1.62475E-05	1.06716E+00	5.52351E+03	5.72239E-05	3.63839E+00	2.55027E+02	3.17248E+01	1.34534E-04	7.99543E-01	
<b>MABC</b>										
MEAN	3.05581E-05	4.98028E+00	1.49162E+04	8.47970E-04	5.32265E+00	1.73528E+03	7.46422E+01	1.13665E-03	3.43734E-01	
MEDIAN	8.92925E-06	4.37730E+00	2.39072E+03	6.82367E-04	2.24432E+00	4.00197E+02	4.31606E+01	1.10525E-03	1.92311E-01	
STD	7.52263E-05	2.99108E+00	5.44402E+04	8.74395E-04	6.76070E+00	4.91942E+03	7.94419E+01	1.22484E-04	2.88013E-01	
IQR	2.23641E-05	2.59100E+00	2.86691E+03	7.54359E-04	5.55762E+00	9.20921E+02	1.24436E+02	1.28490E-04	3.67714E-01	
<b>TLBO</b>										
MEAN	1.53838E-05	4.89280E+00	1.25704E+04	6.15385E-04	2.64219E+00	6.40423E+02	8.70706E+01	1.03980E-03	9.95045E-02	
MEDIAN	1.49976E-05	4.87135E+00	9.99775E+03	5.95786E-04	2.47050E+00	4.93562E+02	9.00067E+01	1.04000E-03	9.95037E-02	
STD	2.68729E-06	1.57238E-01	1.84404E+04	1.16517E-04	9.77835E-01	9.97852E+02	1.74971E+01	1.61384E-06	4.14976E-06	
IQR	3.50000E-14	2.50000E-09	2.85000E-05	2.50000E-13	3.00000E-09	4.00000E-07	1.35000E-07	0.00000E+00	0.00000E+00	
<b>GOTLBO</b>										
MEAN	7.05291E-05	6.29116E+00	6.24839E+04	1.21424E-03	1.05849E+01	1.63539E+03	5.38159E+01	1.14769E-03	4.18351E-01	
MEDIAN	1.10034E-05	4.66909E+00	5.15583E+03	1.66807E-04	1.03613E+01	2.55793E+02	1.07162E+01	1.11812E-03	3.34591E-01	
STD	1.20510E-04	4.33286E+00	1.66931E+05	2.15218E-03	7.87951E+00	4.68805E+03	8.00930E+01	1.49792E-04	2.63800E-01	
IQR	9.38915E-05	6.34208E+00	1.31582E+04	1.05895E-03	1.27241E+01	2.87702E+02	7.69059E+01	1.25037E-04	4.79425E-01	
<b>STLBO</b>										
MEAN	1.49976E-05	4.87135E+00	9.99775E+03	5.95786E-04	2.47050E+00	4.93562E+02	9.00067E+01	1.04000E-03	9.95037E-02	
MEDIAN	1.49976E-05	4.87135E+00	9.99775E+03	5.95786E-04	2.47050E+00	4.93562E+02	9.00067E+01	1.04000E-03	9.95037E-02	
STD	2.36013E-14	1.58745E-09	1.95492E-05	1.84008E-13	2.30617E-09	2.92226E-07	9.85905E-08	4.37996E-19	2.80318E-17	
IQR	3.00000E-14	2.00000E-09	2.80000E-05	2.00000E-13	3.00000E-09	3.50000E-07	1.60000E-07	0.00000E+00	0.00000E+00	
<b>PSO</b>										
MEAN	2.21654E-04	7.60539E+00	6.08521E+05	2.63718E-03	1.83391E+01	8.99448E+03	1.20009E+02	8.55564E-03	3.69785E-01	
MEDIAN	4.95093E-07	2.72447E+00	1.00000E+06	1.00000E-10	3.00000E+01	2.84474E+02	5.91392E+00	1.06647E-03	1.37158E-01	
STD	4.12710E-04	1.00243E+01	4.92238E+05	4.19354E-03	1.41426E+01	1.91723E+04	1.47369E+02	2.37014E-02	4.72023E-01	
IQR	5.71259E-05	3.98140E+00	9.98330E+05	3.14477E-03	2.95000E+01	4.15526E+02	2.85662E+02	1.83505E-04	7.52508E-02	
<b>IJAYA</b>										
MEAN	1.54049E-05	4.63641E+00	5.41300E+04	8.56276E-04	5.61286E+00	1.57011E+03	3.83416E+01	1.05076E-03	1.06501E-01	
MEDIAN	1.25971E-05	4.70015E+00	6.57438E+03	7.77851E-04	5.26519E+00	8.15414E+02	9.49987E+00	1.04056E-03	1.01111E-01	

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
STD		1.20534E-05	1.01749E+00	1.20224E+05	2.73197E-04	2.51098E+00	2.81445E+03	4.94703E+01	2.19246E-05	1.32839E-02
IQR		2.32307E-05	1.92994E+00	2.01415E+04	2.51877E-04	3.19813E+00	4.57840E+02	6.33788E+01	3.31586E-05	7.69143E-03
<b>ISCA</b>										
MEAN		2.55178E-04	1.16722E+01	6.74738E+04	1.70713E-03	1.36118E+01	1.13345E+03	2.73746E+01	1.19290E-03	6.60133E-01
MEDIAN		2.14839E-04	1.18740E+01	1.28698E+04	2.07337E-04	1.32083E+01	1.60565E+02	3.69136E+00	1.15263E-03	6.57795E-01
STD		2.28558E-04	5.81717E+00	1.81817E+05	2.46664E-03	8.85857E+00	3.92061E+03	5.34016E+01	1.62653E-04	2.62856E-01
IQR		3.65748E-04	9.65155E+00	3.88236E+04	2.85296E-03	1.51416E+01	2.29861E+02	2.17020E+01	1.37760E-04	3.71118E-01
<b>NNA</b>										
MEAN		1.96823E-04	1.25891E+01	3.25799E+04	1.24805E-03	1.50060E+01	8.16217E+02	2.41474E+01	1.56126E-03	1.02250E+00
MEDIAN		2.77596E-05	1.03837E+01	1.53188E+03	1.28826E-06	1.46694E+01	1.03892E+02	1.15011E+00	1.25925E-03	1.00020E+00
STD		2.85104E-04	9.20725E+00	1.34996E+05	2.47821E-03	9.64705E+00	2.69099E+03	5.58393E+01	9.32773E-04	4.15987E-01
IQR		3.10832E-04	1.69993E+01	7.93101E+03	5.60656E-04	1.77378E+01	2.84312E+02	1.43782E+01	5.05524E-04	8.02560E-01
<b>CWOA</b>										
MEAN		2.35026E-04	9.96170E+00	1.19886E+05	2.12417E-03	1.51872E+01	4.68752E+03	1.09268E+02	1.63127E-02	9.94650E-01
MEDIAN		2.98697E-07	5.01116E+00	1.19836E+03	1.77957E-07	1.55980E+01	2.90983E+02	1.69384E+01	1.44070E-03	1.10043E+00
STD		3.84494E-04	9.69983E+00	3.22577E+05	3.65337E-03	9.89640E+00	1.34771E+04	1.47383E+02	2.88413E-02	6.49101E-01
IQR		2.84441E-04	1.39057E+01	5.93316E+03	3.66564E-03	1.72990E+01	3.30445E+02	2.38480E+02	9.50611E-03	1.40045E+00
<b>WW</b>										
MEAN		2.48175E-04	1.06628E+01	1.96112E+05	1.58121E-03	1.20454E+01	3.56004E+03	3.25340E+01	2.31363E-03	7.41655E-01
MEDIAN		4.99052E-05	7.05898E+00	4.60904E+03	1.29376E-04	6.28470E+00	2.23731E+02	6.46792E+00	1.18070E-03	8.16433E-01
STD		3.37471E-04	8.26648E+00	3.79195E+05	2.87210E-03	1.11226E+01	1.17953E+04	5.64323E+01	7.62385E-03	4.03780E-01
IQR		4.75198E-04	1.34104E+01	6.21178E+04	1.35656E-03	1.99688E+01	2.49973E+02	2.49406E+01	2.18951E-04	6.19593E-01
<b>T = 350 K</b>										
true value		1.50000E-05	4.73233E+00	1.00000E+04	8.79718E-04	2.42857E+00	3.61363E+02	1.00000E+02	1.05000E-03	5.55000E+02
<b>DE</b>										
MEAN		8.69397E-06	3.43654E+00	2.58081E+04	1.14107E-03	6.15066E+00	1.49222E+03	9.12705E+01	1.09968E-03	1.22682E-01
MEDIAN		5.41709E-07	2.70681E+00	2.17421E+03	9.53584E-04	4.58884E+00	3.40978E+02	8.89378E+01	1.10859E-03	1.17118E-01
STD		1.31687E-05	1.42887E+00	9.42210E+04	7.70324E-04	5.19901E+00	2.84500E+03	7.64629E+01	4.34113E-05	2.12294E-02
IQR		1.53139E-05	2.52440E+00	3.81052E+03	8.76618E-04	6.50400E+00	5.64781E+02	1.40120E+02	8.01679E-05	2.92000E-02
<b>EBSL SHADE</b>										
MEAN		1.76605E-05	4.88026E+00	3.82528E+04	8.62261E-04	2.66469E+00	4.13813E+02	8.96591E+01	1.04911E-03	1.00169E-01
MEDIAN		1.50032E-05	4.73254E+00	1.00036E+04	8.79718E-04	2.42874E+00	3.61374E+02	9.99915E+01	1.05000E-03	9.95037E-02
STD		6.78709E-06	3.72693E-01	1.43101E+05	2.07871E-04	1.03168E+00	3.40682E+02	2.82531E+01	3.18981E-06	1.90530E-03

**Table S154 (continued)**

Algorithm, metric	Parameter								
	$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
IQR	3.00000E-14	2.00000E-09	2.00000E-05	1.35000E-12	5.00000E-09	9.50000E-07	1.75000E-07	0.00000E+00	0.00000E+00
<b>ADELI</b>									
MEAN	1.50032E-05	4.73254E+00	1.00036E+04	8.79718E-04	2.42874E+00	3.61374E+02	9.99915E+01	1.05000E-03	9.95037E-02
MEDIAN	1.50032E-05	4.73254E+00	1.00036E+04	8.79718E-04	2.42874E+00	3.61374E+02	9.99915E+01	1.05000E-03	9.95037E-02
STD	1.76302E-14	1.29645E-09	1.54869E-05	8.07922E-13	4.86000E-09	5.93461E-07	1.07962E-07	6.56994E-19	4.20476E-17
IQR	3.00000E-14	2.00000E-09	2.00000E-05	1.25000E-12	7.50000E-09	9.00000E-07	1.55000E-07	0.00000E+00	0.00000E+00
<b>NDE</b>									
MEAN	2.14512E-05	4.81662E+00	1.04285E+04	1.14885E-03	6.32159E+00	1.36983E+03	7.88813E+01	1.10430E-03	2.34604E-01
MEDIAN	1.50032E-05	4.73254E+00	1.00036E+04	8.79718E-04	2.42932E+00	3.61374E+02	9.99893E+01	1.05000E-03	9.95046E-02
STD	3.70972E-05	1.67544E+00	6.54716E+03	1.22991E-03	6.91420E+00	3.79787E+03	3.39401E+01	1.54948E-04	3.51097E-01
IQR	4.48012E-06	3.07542E-01	3.79454E+03	3.58447E-04	4.86176E+00	2.12881E+02	4.00536E+01	4.36090E-06	2.15188E-05
<b>MABC</b>									
MEAN	2.30593E-05	4.20685E+00	5.03637E+04	9.30677E-04	7.43217E+00	9.34217E+02	6.84413E+01	1.15569E-03	2.03232E-01
MEDIAN	3.56101E-06	3.58582E+00	3.21006E+03	4.51102E-04	3.12914E+00	2.41633E+02	2.99907E+01	1.07626E-03	1.16524E-01
STD	5.84140E-05	2.65468E+00	1.56967E+05	1.44826E-03	8.28260E+00	2.76505E+03	7.66201E+01	4.11432E-04	2.55094E-01
IQR	2.23295E-05	3.10343E+00	1.00377E+04	1.06199E-03	9.60657E+00	1.87791E+02	1.19346E+02	9.81028E-05	4.82567E-02
<b>TLBO</b>									
MEAN	1.56730E-05	4.76234E+00	1.08441E+04	1.03596E-03	3.20617E+00	3.32055E+03	9.26285E+01	1.04986E-03	9.95092E-02
MEDIAN	1.50032E-05	4.73254E+00	1.00036E+04	8.79718E-04	2.42874E+00	3.61374E+02	9.99915E+01	1.05000E-03	9.95037E-02
STD	3.25043E-06	2.51594E-01	2.68810E+03	3.74343E-04	1.95642E+00	9.48578E+03	2.73570E+01	3.85660E-06	2.34852E-05
IQR	6.50000E-14	4.50000E-09	5.00000E-05	2.55000E-12	1.40000E-08	1.95000E-06	3.90000E-07	1.00000E-12	5.79900E-08
<b>GOTLBO</b>									
MEAN	8.54154E-05	6.75483E+00	7.62391E+04	9.60102E-04	1.30100E+01	8.50839E+02	3.61071E+01	1.12442E-03	3.83567E-01
MEDIAN	1.65454E-05	5.07993E+00	7.12981E+03	5.27489E-05	1.21436E+01	1.72948E+02	4.66429E+00	1.10108E-03	3.10471E-01
STD	1.20562E-04	4.04633E+00	2.03734E+05	1.92009E-03	9.04385E+00	2.68740E+03	5.87908E+01	1.02163E-04	2.63264E-01
IQR	1.53143E-04	6.63110E+00	3.53413E+04	1.08914E-03	1.34751E+01	1.86087E+02	4.67860E+01	6.56280E-05	4.41560E-01
<b>STLBO</b>									
MEAN	1.50032E-05	4.73254E+00	1.00036E+04	8.79718E-04	2.42874E+00	3.61374E+02	9.99915E+01	1.05000E-03	9.95037E-02
MEDIAN	1.50032E-05	4.73254E+00	1.00036E+04	8.79718E-04	2.42874E+00	3.61374E+02	9.99915E+01	1.05000E-03	9.95037E-02
STD	2.22781E-14	1.63515E-09	2.00841E-05	1.16780E-12	6.68085E-09	8.41544E-07	1.40198E-07	2.37635E-13	4.20476E-17
IQR	3.00000E-14	2.50000E-09	3.00000E-05	1.65000E-12	1.00000E-08	1.25000E-06	2.00000E-07	0.00000E+00	0.00000E+00
<b>PSO</b>									
MEAN	7.25675E-05	5.02539E+00	5.11025E+05	3.33443E-03	1.95109E+01	1.39492E+04	1.45821E+02	1.28303E-02	4.38373E-01

**Table S154 (continued)**

Algorithm,		Parameter								
metric		$I_{01}$ (A)	$n_1$	$R_{p1}$ ( $\Omega$ )	$I_{02}$ (A)	$n_2$	$R_{p2}$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$I_{ph}$ (A)	RMSPE
MEDIAN		3.23114E-06	3.46955E+00	5.06623E+05	2.10611E-04	3.00000E+01	1.24223E+02	1.35643E+02	1.04811E-03	1.28175E-01
STD		2.41560E-04	6.45878E+00	5.03626E+05	4.30218E-03	1.29049E+01	2.24223E+04	1.40544E+02	2.67301E-02	6.33459E-01
IQR		9.41973E-06	2.62292E+00	9.98589E+05	1.00000E-02	2.78744E+01	4.99897E+04	2.34377E+02	1.68255E-04	3.61187E-02
<b>IJAYA</b>										
MEAN		1.43859E-05	4.46263E+00	3.48681E+04	1.30829E-03	7.82133E+00	1.91100E+03	3.77466E+01	1.06194E-03	1.05522E-01
MEDIAN		1.24540E-05	4.57213E+00	5.25571E+03	1.14765E-03	7.56814E+00	6.10271E+02	7.61560E+00	1.05579E-03	1.01940E-01
STD		1.05876E-05	9.28048E-01	1.24185E+05	5.39619E-04	4.34077E+00	5.55987E+03	5.83388E+01	2.29665E-05	8.17914E-03
IQR		1.75718E-05	1.44702E+00	1.39039E+04	8.14092E-04	6.11684E+00	6.08394E+02	4.41557E+01	3.08393E-05	7.09278E-03
<b>ISCA</b>										
MEAN		1.50131E-04	8.89807E+00	1.05563E+05	1.66180E-03	1.26885E+01	1.02562E+03	1.85482E+01	1.16642E-03	6.40744E-01
MEDIAN		1.02769E-04	8.64490E+00	8.75361E+03	2.95090E-04	1.20682E+01	1.60420E+02	3.87085E+00	1.13401E-03	6.56746E-01
STD		1.46524E-04	4.20787E+00	2.05815E+05	2.57694E-03	7.86932E+00	2.84644E+03	2.83567E+01	1.02773E-04	2.73669E-01
IQR		2.03003E-04	6.41871E+00	9.58805E+04	2.42769E-03	1.25917E+01	2.60129E+02	1.85336E+01	1.35898E-04	4.19912E-01
<b>NNA</b>										
MEAN		1.26054E-04	9.98644E+00	3.29076E+04	7.01347E-04	1.53889E+01	3.75533E+02	2.62488E+01	1.82813E-03	8.34411E-01
MEDIAN		2.01088E-05	7.29681E+00	2.34230E+03	1.62772E-06	1.44230E+01	1.02973E+02	1.74503E+00	1.16825E-03	7.94328E-01
STD		1.96453E-04	7.54130E+00	1.04300E+05	2.00796E-03	8.35224E+00	1.19007E+03	5.34795E+01	3.35504E-03	4.65190E-01
IQR		2.19288E-04	1.02398E+01	1.93101E+04	7.10653E-05	1.34784E+01	1.88704E+02	2.92703E+01	3.06791E-04	5.98379E-01
<b>CWOA</b>										
MEAN		3.07406E-04	1.16799E+01	8.55418E+04	2.30518E-03	1.55286E+01	3.57714E+03	8.52064E+01	1.13903E-02	9.48378E-01
MEDIAN		2.08594E-05	5.76655E+00	1.40068E+03	1.47191E-05	1.56516E+01	2.52279E+02	8.12653E+00	1.26817E-03	9.98901E-01
STD		4.19368E-04	1.02479E+01	2.70365E+05	3.71354E-03	1.05186E+01	1.18680E+04	1.22897E+02	2.46765E-02	7.48635E-01
IQR		6.88717E-04	1.71049E+01	4.39332E+03	2.28832E-03	2.06732E+01	3.39655E+02	1.50975E+02	5.18315E-03	1.65244E+00
<b>WW</b>										
MEAN		2.75714E-04	1.09139E+01	2.74259E+05	4.00199E-03	1.03581E+01	5.08693E+03	5.04411E+01	1.38793E-03	8.71434E-01
MEDIAN		9.77243E-05	8.34191E+00	7.01043E+03	1.64437E-03	7.66904E+00	1.07109E+02	1.62179E+01	1.18914E-03	8.46548E-01
STD		3.45977E-04	7.80210E+00	4.31976E+05	4.22991E-03	1.00880E+01	1.49616E+04	6.79048E+01	9.43810E-04	4.00295E-01
IQR		4.33127E-04	1.11635E+01	6.58580E+05	9.77137E-03	1.61542E+01	1.93634E+02	9.05761E+01	2.32756E-04	6.04344E-01

**Table S155.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (DE is the control algorithm).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
NNA	Friedman	2.29810E-08	2.29810E-08	2.29810E-08	2.29810E-08
	Friedman Aligned	8.47789E-11	1.56515E-10	1.55951E-10	1.56515E-10
	Quade	3.76631E-01	1.0	1.0	6.58260E-01
CWOA	Friedman	1.05597E-07	1.94949E-07	1.94949E-07	1.94949E-07
	Friedman Aligned	1.54745E-10	4.76139E-10	4.58363E-10	4.76139E-10
	Quade	3.76631E-01	7.78425E-01	7.78425E-01	5.52832E-01
PSO	Friedman	2.13595E-07	5.42203E-07	5.42203E-07	5.42202E-07
	Friedman Aligned	2.39185E-10	8.83146E-10	8.83146E-10	8.83146E-10
	Quade	3.76631E-01	4.64129E-01	4.64129E-01	3.76631E-01
ISCA	Friedman	1.19223E-06	3.66839E-06	3.66839E-06	3.66838E-06
	Friedman Aligned	1.54745E-10	4.76139E-10	4.58363E-10	4.76139E-10
	Quade	4.25757E-01	1.0	1.0	8.18550E-01
WW	Friedman	6.91165E-06	2.39250E-05	2.39250E-05	2.39247E-05
	Friedman Aligned	8.47789E-11	1.56515E-10	1.55951E-10	1.56515E-10
	Quade	4.84274E-01	1.0	1.0	8.98952E-01
GOTLBO	Friedman	1.16713E-02	4.32304E-02	4.32304E-02	4.24216E-02
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	8.25712E-01	1.0	1.0	9.98420E-01
MABC	Friedman	1.64623E-01	6.46181E-01	6.46181E-01	4.92358E-01
	Friedman Aligned	2.85170E-09	1.07487E-08	1.07487E-08	1.07487E-08
	Quade	8.53843E-01	1.0	1.0	9.99289E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S155 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S156.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (EBLSHADE is the control algorithm).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
WW	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.30617E-03	4.52317E-03	4.52317E-03	4.51409E-03
MABC	Friedman	2.68452E-13	4.95604E-13	4.95604E-13	4.95604E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.18584E-02	4.48199E-02	4.48199E-02	4.39681E-02
GOTLBO	Friedman	1.68209E-10	4.26991E-10	4.26991E-10	4.26991E-10
	Friedman Aligned	5.52549E-11	2.04018E-10	2.04018E-10	2.04018E-10
	Quade	9.21013E-03	3.40914E-02	3.40914E-02	3.35872E-02
DE	Friedman	6.52150E-10	2.00661E-09	1.86258E-09	2.00661E-09
	Friedman Aligned	1.86733E-09	6.46383E-09	6.46383E-09	6.46383E-09
	Quade	3.78658E-02	1.40848E-01	1.40848E-01	1.32837E-01
ISCA	Friedman	6.52150E-10	2.00661E-09	1.86258E-09	2.00661E-09
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	7.54340E-04	2.32165E-03	2.32165E-03	2.31923E-03
PSO	Friedman	1.13825E-09	4.20278E-09	4.20278E-09	4.20278E-09
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.64554E-04	1.64567E-04	1.64567E-04	1.64554E-04
CWOA	Friedman	1.53596E-09	5.78937E-09	5.78937E-09	5.78937E-09
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	2.55177E-04	4.71146E-04	4.71146E-04	4.71045E-04
NNA	Friedman	3.01406E-09	1.11288E-08	1.11288E-08	1.11288E-08
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	3.45157E-04	8.76285E-04	8.76285E-04	8.75936E-04

**Table S156 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
IJAYA	Friedman	4.00976E-06	1.38799E-05	1.38799E-05	1.38799E-05
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.52655E-01	5.41737E-01	5.41737E-01	4.36390E-01
NDE	Friedman	1.44050E-01	4.51073E-01	4.51073E-01	3.80347E-01
	Friedman Aligned	4.74587E-01	1.0	1.0	8.61961E-01
	Quade	6.69739E-01	1.0	1.0	9.66920E-01
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S157.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (ADELI is the control algorithm).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
MABC	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	5.85354E-04	2.20663E-03	2.20663E-03	2.20455E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	2.06564E-06	2.06565E-06	2.06565E-06	2.06564E-06
ISCA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.68471E-05	5.18374E-05	5.18374E-05	5.18362E-05
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	6.17579E-06	1.56771E-05	1.56771E-05	1.56769E-05
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	3.96937E-06	7.32807E-06	7.32807E-06	7.32805E-06
WW	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	3.45304E-05	1.19530E-04	1.19530E-04	1.19523E-04
IJAYA	Friedman	3.39792E-13	1.28075E-12	1.28075E-12	1.28075E-12
	Friedman Aligned	5.86654E-11	2.16611E-10	2.16611E-10	2.16611E-10
	Quade	1.88316E-02	6.53767E-02	6.53767E-02	6.36893E-02
DE	Friedman	3.97017E-11	1.46591E-10	1.46591E-10	1.46591E-10
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	2.72842E-03	1.00795E-02	1.00795E-02	1.00372E-02

**Table S157 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
GOTLBO	Friedman	7.91529E-10	2.73991E-09	2.73991E-09	2.73991E-09
	Friedman Aligned	7.86484E-11	2.72244E-10	2.72244E-10	2.72244E-10
	Quade	4.08003E-04	1.50664E-03	1.50664E-03	1.50565E-03
NDE	Friedman	2.43840E-05	7.50278E-05	7.50278E-05	7.50257E-05
	Friedman Aligned	4.29787E-02	1.32910E-01	1.32910E-01	1.26431E-01
	Quade	1.90667E-01	6.00708E-01	6.00708E-01	4.78428E-01
EBLSHADE	Friedman	8.35516E-03	2.12229E-02	2.12229E-02	2.10732E-02
	Friedman Aligned	2.36221E-01	6.11673E-01	6.11673E-01	4.95434E-01
	Quade	4.32702E-01	1.0	8.37312E-01	7.62830E-01
STLBO	Friedman	3.89796E-01	7.32328E-01	5.00736E-01	5.98252E-01
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	8.19430E-01	1.0	8.37312E-01	9.57572E-01
TLBO	Friedman	5.00736E-01	7.32328E-01	5.00736E-01	5.98252E-01
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	8.37312E-01	1.0	8.37312E-01	9.57572E-01

**Table S158.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (NDE is the control algorithm).

Algorithm	Test	Finner	post-hoc procedure		
			Holm	Hochberg	Holland
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	5.41163E-11	1.87326E-10	1.87326E-10	1.87326E-10
	Quade	3.10829E-03	7.89971E-03	7.89971E-03	7.87141E-03
GOTLBO	Friedman	3.00204E-13	5.54223E-13	5.54223E-13	5.54223E-13
	Friedman Aligned	4.81828E-11	1.77906E-10	1.44500E-10	1.77906E-10
	Quade	4.64595E-02	1.73741E-01	1.73741E-01	1.61093E-01
MABC	Friedman	4.61314E-10	1.17103E-09	1.17103E-09	1.17103E-09
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	5.59004E-02	2.13496E-01	2.13496E-01	1.94925E-01
WW	Friedman	6.25900E-10	1.92585E-09	1.92585E-09	1.92585E-09
	Friedman Aligned	4.81828E-11	1.77906E-10	1.44500E-10	1.77906E-10
	Quade	9.17697E-03	3.18566E-02	3.18566E-02	3.14092E-02
ISCA	Friedman	2.74325E-09	9.49587E-09	9.49587E-09	9.49587E-09
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	5.89940E-03	1.81892E-02	1.81892E-02	1.80410E-02
PSO	Friedman	9.70417E-09	3.58308E-08	3.58308E-08	3.58308E-08
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.85637E-03	1.85796E-03	1.85796E-03	1.85637E-03
CWOA	Friedman	1.66888E-08	6.29039E-08	6.29039E-08	6.29039E-08
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	2.51164E-03	4.64181E-03	4.64181E-03	4.63194E-03
DE	Friedman	2.78979E-06	1.03008E-05	1.03008E-05	1.03007E-05
	Friedman Aligned	4.81828E-11	1.77906E-10	1.44500E-10	1.77906E-10
	Quade	1.39964E-01	5.31682E-01	5.31682E-01	4.26920E-01

**Table S158 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
IJAYA	Friedman	2.78592E-03	9.64770E-03	9.64770E-03	9.61054E-03
	Friedman Aligned	6.97744E-12	2.41527E-11	2.41527E-11	2.41527E-11
	Quade	3.98964E-01	1.0	1.0	8.28345E-01
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S159.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (MABC is the control algorithm).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
NNA	Friedman	1.84192E-04	1.84208E-04	1.84208E-04	1.84192E-04
	Friedman Aligned	2.16462E-08	7.49292E-08	7.49292E-08	7.49292E-08
	Quade	7.49843E-01	1.0	1.0	9.37539E-01
CWOA	Friedman	4.68826E-04	8.65696E-04	8.65696E-04	8.65353E-04
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	7.49843E-01	1.0	1.0	8.86660E-01
PSO	Friedman	6.95410E-04	1.76574E-03	1.76574E-03	1.76433E-03
	Friedman Aligned	9.16590E-11	2.82028E-10	2.82028E-10	2.82028E-10
	Quade	7.49843E-01	1.0	1.0	7.49843E-01
ISCA	Friedman	2.17168E-03	6.68712E-03	6.68712E-03	6.66704E-03
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	7.49843E-01	1.0	1.0	9.84244E-01
WW	Friedman	6.72782E-03	2.33370E-02	2.33370E-02	2.30964E-02
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	7.90139E-01	1.0	1.0	9.95504E-01
GOTLBO	Friedman	4.97246E-01	1.0	1.0	9.21057E-01
	Friedman Aligned	2.83114E-07	1.04534E-06	1.04534E-06	1.04534E-06
	Quade	9.92459E-01	1.0	1.0	1.00000E+00
DE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S159 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S160.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (TLBO is the control algorithm).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	7.88357E-11	2.72893E-10	2.72893E-10	2.72893E-10
	Quade	9.04101E-04	3.33903E-03	3.33903E-03	3.33416E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	6.15979E-06	6.15981E-06	6.15981E-06	6.15979E-06
ISCA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	4.38663E-05	1.34975E-04	1.34975E-04	1.34967E-04
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.69424E-05	4.30078E-05	4.30078E-05	4.30070E-05
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.12542E-05	2.07771E-05	2.07771E-05	2.07769E-05
DE	Friedman	9.58345E-13	3.53850E-12	3.53850E-12	3.53850E-12
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	5.39136E-03	1.99273E-02	1.99273E-02	1.97625E-02
IJAYA	Friedman	4.01779E-11	1.51440E-10	1.51440E-10	1.51440E-10
	Friedman Aligned	6.08664E-11	2.24738E-10	2.24738E-10	2.24738E-10
	Quade	3.27993E-02	1.14117E-01	1.14117E-01	1.09026E-01
MABC	Friedman	3.86006E-09	1.42525E-08	1.42525E-08	1.42525E-08
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.26435E-03	4.76701E-03	4.76701E-03	4.75728E-03

**Table S160 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
WW	Friedman	1.00418E-08	3.47602E-08	3.47602E-08	3.47602E-08
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	8.64072E-05	2.99110E-04	2.99110E-04	2.99070E-04
NDE	Friedman	4.04427E-04	1.24445E-03	1.24445E-03	1.24387E-03
	Friedman Aligned	4.22263E-02	1.30571E-01	1.30571E-01	1.24316E-01
	Quade	2.72841E-01	8.69448E-01	8.69448E-01	6.24816E-01
EBLSHADE	Friedman	5.10673E-02	1.30152E-01	1.30152E-01	1.24587E-01
	Friedman Aligned	2.33358E-01	6.04098E-01	6.04098E-01	4.90618E-01
	Quade	5.61708E-01	1.0	1.0	8.76795E-01
STLBO	Friedman	8.41920E-01	1.0	1.0	9.66810E-01
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	9.65693E-01	1.0	1.0	9.98023E-01
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	9.96305E-01	1.0	1.0	9.99968E-01
	Quade	1.0	1.0	1.0	1.0

**Table S161.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (GOTLBO is the control algorithm).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
NNA	Friedman	1.52876E-02	1.53966E-02	1.53966E-02	1.52876E-02
	Friedman Aligned	<1E-13	1.64313E-13	1.64313E-13	1.64313E-13
	Quade	8.40301E-01	1.0	1.0	9.71745E-01
CWOA	Friedman	2.63386E-02	4.91760E-02	4.91760E-02	4.80826E-02
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	8.40301E-01	1.0	1.0	9.40882E-01
PSO	Friedman	3.19246E-02	8.20536E-02	8.20536E-02	7.90607E-02
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	8.40301E-01	1.0	1.0	8.40301E-01
ISCA	Friedman	6.74279E-02	2.12506E-01	2.12506E-01	1.93294E-01
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	8.40301E-01	1.0	1.0	9.94931E-01
WW	Friedman	1.38347E-01	5.00951E-01	5.00951E-01	4.02758E-01
	Friedman Aligned	1.15463E-13	3.99680E-13	3.99680E-13	3.99680E-13
	Quade	8.62992E-01	1.0	1.0	9.98972E-01
DE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S161 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S162.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (STLBO is the control algorithm).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	1.35278E-10	5.09895E-10	5.09895E-10	5.09895E-10
	Quade	1.11445E-03	4.11614E-03	4.11614E-03	4.10873E-03
PSO	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	8.22938E-06	8.22941E-06	8.22941E-06	8.22938E-06
NNA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	2.21284E-05	5.61727E-05	5.61727E-05	5.61713E-05
CWOA	Friedman	<1E-13	<1E-13	<1E-13	<1E-13
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.48311E-05	2.73807E-05	2.73807E-05	2.73803E-05
DE	Friedman	2.32081E-13	8.03357E-13	8.03357E-13	8.03357E-13
	Friedman Aligned	1.74950E-09	6.45968E-09	6.45968E-09	6.45968E-09
	Quade	6.44257E-03	2.38175E-02	2.38175E-02	2.35824E-02
IJAYA	Friedman	2.17645E-10	8.03613E-10	8.03613E-10	8.03613E-10
	Friedman Aligned	3.63299E-09	1.25757E-08	1.25757E-08	1.25757E-08
	Quade	3.78757E-02	1.31885E-01	1.31885E-01	1.25109E-01
MABC	Friedman	1.75608E-09	6.61909E-09	6.61909E-09	6.61909E-09
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.54776E-03	5.83595E-03	5.83595E-03	5.82137E-03
WW	Friedman	7.44635E-09	2.74942E-08	2.74942E-08	2.74942E-08
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	1.10078E-04	3.81053E-04	3.81053E-04	3.80989E-04

**Table S162 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
ISCA	Friedman	1.32325E-08	4.58048E-08	4.58048E-08	4.58048E-08
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	5.64886E-05	1.73815E-04	1.73815E-04	1.73801E-04
NDE	Friedman	9.57698E-04	2.94709E-03	2.94709E-03	2.94383E-03
	Friedman Aligned	2.69373E-03	8.29097E-03	8.29097E-03	8.26522E-03
	Quade	2.98714E-01	9.55486E-01	9.55486E-01	6.64392E-01
EBLSHADE	Friedman	8.62842E-02	2.20533E-01	2.20533E-01	2.04719E-01
	Friedman Aligned	3.10807E-02	7.90881E-02	7.90881E-02	7.70214E-02
	Quade	5.99120E-01	1.0	1.0	9.01765E-01
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	3.64522E-01	6.83937E-01	3.45600E-01	5.66995E-01
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	3.64522E-01	6.83937E-01	3.45600E-01	5.66995E-01
	Quade	1.0	1.0	1.0	1.0

**Table S163.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (PSO is the control algorithm).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NNA	Friedman	9.99983E-01	1.0	1.0	9.99983E-01
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	9.99995E-01	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S163 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
GOTLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S164.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (IJAYA is the control algorithm).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
NNA	Friedman	2.30926E-13	2.30926E-13	2.30926E-13	2.30926E-13
	Friedman Aligned	1.12499E-10	3.46150E-10	3.31155E-10	3.46150E-10
	Quade	8.09700E-02	2.12264E-01	2.12264E-01	1.92925E-01
CWOA	Friedman	1.65112E-12	3.04823E-12	3.04823E-12	3.04823E-12
	Friedman Aligned	1.89312E-10	6.98998E-10	6.38521E-10	6.98998E-10
	Quade	7.67278E-02	1.46479E-01	1.46479E-01	1.37035E-01
PSO	Friedman	4.53770E-12	1.15188E-11	1.15188E-11	1.15188E-11
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	7.25355E-02	7.50831E-02	7.50831E-02	7.25355E-02
ISCA	Friedman	4.61124E-11	1.41884E-10	1.41884E-10	1.41884E-10
	Friedman Aligned	1.89312E-10	6.98998E-10	6.38521E-10	6.98998E-10
	Quade	1.18124E-01	3.79398E-01	3.79398E-01	3.20761E-01
WW	Friedman	4.92686E-10	1.70545E-09	1.70545E-09	1.70545E-09
	Friedman Aligned	1.12499E-10	3.46150E-10	3.31155E-10	3.46150E-10
	Quade	1.50884E-01	5.48728E-01	5.48728E-01	4.32304E-01
GOTLBO	Friedman	1.73282E-05	6.39812E-05	6.39812E-05	6.39794E-05
	Friedman Aligned	<1E-13	<1E-13	<1E-13	<1E-13
	Quade	4.00601E-01	1.0	1.0	8.48902E-01
MABC	Friedman	1.41255E-03	5.32597E-03	5.32597E-03	5.31383E-03
	Friedman Aligned	2.50170E-13	6.35048E-13	6.35048E-13	6.35048E-13
	Quade	4.31768E-01	1.0	1.0	8.81218E-01
DE	Friedman	1.45627E-01	5.53869E-01	5.53869E-01	4.40731E-01
	Friedman Aligned	6.44412E-02	2.40977E-01	2.40977E-01	2.18038E-01
	Quade	6.85516E-01	1.0	1.0	9.86037E-01

**Table S164 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S165.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (ISCA is the control algorithm).

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	9.96127E-01	1.0	1.0	9.99999E-01
	Friedman Aligned	7.63492E-05	7.63519E-05	7.63519E-05	7.63492E-05
	Quade	9.99856E-01	1.0	1.0	9.99856E-01
NNA	Friedman	9.96127E-01	1.0	1.0	9.96127E-01
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	9.99856E-01	1.0	1.0	1.00000E+00
CWOA	Friedman	9.96127E-01	1.0	1.0	9.99961E-01
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	9.99856E-01	1.0	1.0	9.99998E-01
DE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S165 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S166.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (NNA is the control algorithm).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
DE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S166 (continued)**

Algorithm	Test	post-hoc procedure			
		Finner	Holm	Hochberg	Holland
PSO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	4.32987E-13	4.32987E-13	4.32987E-13	4.32987E-13
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.32960E-02	2.46857E-02	2.46857E-02	2.44083E-02
	Quade	1.0	1.0	1.0	1.0
CWOA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.65948E-02	4.23968E-02	4.23968E-02	4.15892E-02
	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	9.98955E-01	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S167.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (CWOA is the control algorithm).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NNA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
MABC	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S167 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
PSO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	3.02243E-05	3.02247E-05	3.02247E-05	3.02243E-05
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ISCA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	9.99995E-01	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
WW	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S168.** Adjusted  $p$ -values for multiple comparisons  $1 \times N$  tests in IV-set case (WW is the control algorithm).

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
NNA	Friedman	9.28732E-01	1.0	1.0	9.28732E-01
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	9.97795E-01	1.0	1.0	9.99987E-01
PSO	Friedman	9.31953E-01	1.0	1.0	9.98494E-01
	Friedman Aligned	1.31051E-12	1.31051E-12	1.31051E-12	1.31051E-12
	Quade	9.97795E-01	1.0	1.0	9.97795E-01
CWOA	Friedman	9.31953E-01	1.0	1.0	9.92999E-01
	Friedman Aligned	2.65438E-02	6.80793E-02	6.80793E-02	6.60112E-02
	Quade	9.97795E-01	1.0	1.0	9.99875E-01
ISCA	Friedman	9.79287E-01	1.0	1.0	9.99993E-01
	Friedman Aligned	2.18559E-02	4.07276E-02	4.07276E-02	3.99759E-02
	Quade	9.97795E-01	1.0	1.0	1.0
DE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
EBLSHADE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
ADELI	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
NDE	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S168 (continued)**

Algorithm	Test	Finner	Holm	post-hoc procedure	
				Hochberg	Holland
MABC	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
TLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
GOTLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
STLBO	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0
IJAYA	Friedman	1.0	1.0	1.0	1.0
	Friedman Aligned	1.0	1.0	1.0	1.0
	Quade	1.0	1.0	1.0	1.0

**Table S169.** Adjusted *p*-values for tests for multiple comparisons among all methods in the IV-set case.

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
EBLSHADE versus WW	<1E-13	<1E-13	<1E-13
ADELI versus MABC	<1E-13	<1E-13	<1E-13
ADELI versus PSO	<1E-13	<1E-13	<1E-13
ADELI versus ISCA	<1E-13	<1E-13	<1E-13
ADELI versus NNA	<1E-13	<1E-13	<1E-13
ADELI versus CWOA	<1E-13	<1E-13	<1E-13
ADELI versus WW	<1E-13	<1E-13	<1E-13
NDE versus NNA	<1E-13	<1E-13	<1E-13
TLBO versus GOTLBO	<1E-13	<1E-13	<1E-13
TLBO versus PSO	<1E-13	<1E-13	<1E-13
TLBO versus ISCA	<1E-13	<1E-13	<1E-13
TLBO versus NNA	<1E-13	<1E-13	<1E-13
TLBO versus CWOA	<1E-13	<1E-13	<1E-13
STLBO versus GOTLBO	<1E-13	<1E-13	<1E-13
STLBO versus PSO	<1E-13	<1E-13	<1E-13
STLBO versus NNA	<1E-13	<1E-13	<1E-13
STLBO versus CWOA	<1E-13	<1E-13	<1E-13
IJAYA versus NNA	1.61648E-12	1.31450E-12	1.19016E-12
EBLSHADE versus MABC	3.75833E-12	3.01492E-12	2.76712E-12
NDE versus GOTLBO	4.20286E-12	3.32534E-12	3.09441E-12
STLBO versus DE	8.12284E-12	6.33760E-12	5.98055E-12
IJAYA versus CWOA	2.31157E-11	1.75273E-11	1.70193E-11
TLBO versus DE	4.02505E-11	3.00773E-11	2.96350E-11
IJAYA versus PSO	9.52918E-11	7.01599E-11	7.01599E-11
IJAYA versus ISCA	1.29115E-09	9.36436E-10	9.36436E-10
ADELI versus DE	2.22329E-09	1.56363E-09	1.41704E-09
EBLSHADE versus GOTLBO	3.53238E-09	2.44550E-09	2.25141E-09
NDE versus MABC	9.68759E-09	6.49388E-09	6.17451E-09
IJAYA versus WW	1.72440E-08	1.13697E-08	1.09907E-08
NDE versus WW	1.75252E-08	1.13697E-08	1.11699E-08
EBLSHADE versus DE	1.82602E-08	1.16384E-08	1.16384E-08
EBLSHADE versus ISCA	1.88327E-08	1.17963E-08	1.16384E-08
EBLSHADE versus PSO	4.78066E-08	2.94194E-08	2.94194E-08
ADELI versus GOTLBO	4.98663E-08	3.01390E-08	3.01390E-08
EBLSHADE versus CWOA	7.52618E-08	4.46609E-08	4.21797E-08
STLBO versus MABC	8.60481E-08	5.01159E-08	4.82248E-08
NDE versus ISCA	9.60138E-08	5.48650E-08	5.38099E-08
DE versus NNA	1.60867E-07	9.01562E-08	9.01562E-08
EBLSHADE versus NNA	1.68788E-07	9.27404E-08	9.01562E-08
TLBO versus MABC	2.16163E-07	1.16396E-07	1.14020E-07
NDE versus PSO	4.07575E-07	2.14985E-07	2.14985E-07

**Table S169 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
STLBO versus WW	4.16995E-07	2.15371E-07	2.15371E-07
TLBO versus WW	6.32636E-07	3.19794E-07	3.19794E-07
NDE versus CWOA	8.17751E-07	4.04382E-07	4.04382E-07
STLBO versus ISCA	8.33647E-07	4.04382E-07	4.04382E-07
DE versus CWOA	1.47836E-06	6.98567E-07	6.98567E-07
DE versus PSO	4.48549E-06	2.07023E-06	2.07023E-06
DE versus ISCA	3.33823E-05	1.50404E-05	1.46735E-05
NDE versus DE	1.56228E-04	6.86718E-05	6.86718E-05
DE versus WW	2.41908E-04	1.03675E-04	1.03675E-04
IJAYA versus GOTLBO	7.27786E-04	2.95913E-04	2.95913E-04
MABC versus NNA	1.28945E-03	5.10114E-04	5.10114E-04
ADELI versus NDE	1.70688E-03	6.56493E-04	6.56493E-04
MABC versus CWOA	6.56486E-03	2.45281E-03	2.45281E-03
MABC versus PSO	1.46075E-02	5.29723E-03	5.13671E-03
TLBO versus NDE	2.83112E-02	9.95560E-03	9.95560E-03
MABC versus ISCA	6.08528E-02	2.07301E-02	2.07301E-02
STLBO versus NDE	6.70463E-02	2.21032E-02	2.21032E-02
IJAYA versus MABC	6.92376E-02	2.21032E-02	2.21032E-02
GOTLBO versus NNA	1.07776E-01	3.31618E-02	3.31618E-02
MABC versus WW	2.35963E-01	6.74180E-02	6.74180E-02
GOTLBO versus CWOA	3.72918E-01	1.02450E-01	1.02450E-01
DE versus GOTLBO	4.91746E-01	1.29691E-01	1.29691E-01
ADELI versus EBL SHADE	6.43762E-01	1.62709E-01	1.62709E-01
GOTLBO versus PSO	6.78807E-01	1.64107E-01	1.64107E-01
GOTLBO versus ISCA	1.0	4.46263E-01	4.46263E-01
TLBO versus EBL SHADE	1.0	8.67680E-01	8.67680E-01
DE versus EBL SHADE	1.0	1.0	1.0
DE versus ADELI	1.0	1.0	1.0
DE versus NDE	1.0	1.0	1.0
DE versus MABC	1.0	1.0	1.0
DE versus TLBO	1.0	1.0	1.0
DE versus STLBO	1.0	1.0	1.0
DE versus IJAYA	1.0	1.0	1.0
EBL SHADE versus ADELI	1.0	1.0	1.0
EBL SHADE versus NDE	1.0	1.0	1.0
EBL SHADE versus TLBO	1.0	1.0	1.0
EBL SHADE versus STLBO	1.0	1.0	1.0
EBL SHADE versus IJAYA	1.0	1.0	1.0
ADELI versus TLBO	1.0	1.0	1.0
ADELI versus STLBO	1.0	1.0	1.0
ADELI versus IJAYA	1.0	1.0	1.0
NDE versus EBL SHADE	1.0	1.0	1.0
NDE versus ADELI	1.0	1.0	1.0

**Table S169 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
NDE versus TLBO	1.0	1.0	1.0
NDE versus STLBO	1.0	1.0	1.0
NDE versus IJAYA	1.0	1.0	1.0
MABC versus DE	1.0	1.0	1.0
MABC versus EBL SHADE	1.0	1.0	1.0
MABC versus ADELI	1.0	1.0	1.0
MABC versus NDE	1.0	1.0	1.0
MABC versus TLBO	1.0	1.0	1.0
MABC versus GOTLBO	1.0	1.0	1.0
MABC versus STLBO	1.0	1.0	1.0
MABC versus IJAYA	1.0	1.0	1.0
TLBO versus ADELI	1.0	1.0	1.0
TLBO versus STLBO	1.0	1.0	1.0
TLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus DE	1.0	1.0	1.0
GOTLBO versus EBL SHADE	1.0	1.0	1.0
GOTLBO versus ADELI	1.0	1.0	1.0
GOTLBO versus NDE	1.0	1.0	1.0
GOTLBO versus MABC	1.0	1.0	1.0
GOTLBO versus TLBO	1.0	1.0	1.0
GOTLBO versus STLBO	1.0	1.0	1.0
GOTLBO versus IJAYA	1.0	1.0	1.0
GOTLBO versus WW	1.0	1.0	1.0
STLBO versus EBL SHADE	1.0	1.0	1.0
STLBO versus ADELI	1.0	1.0	1.0
STLBO versus TLBO	1.0	1.0	1.0
STLBO versus IJAYA	1.0	1.0	1.0
PSO versus DE	1.0	1.0	1.0
PSO versus EBL SHADE	1.0	1.0	1.0
PSO versus ADELI	1.0	1.0	1.0
PSO versus NDE	1.0	1.0	1.0
PSO versus MABC	1.0	1.0	1.0
PSO versus TLBO	1.0	1.0	1.0
PSO versus GOTLBO	1.0	1.0	1.0
PSO versus STLBO	1.0	1.0	1.0
PSO versus IJAYA	1.0	1.0	1.0
PSO versus ISCA	1.0	1.0	1.0
PSO versus NNA	1.0	1.0	1.0
PSO versus CWOA	1.0	1.0	1.0
PSO versus WW	1.0	1.0	1.0
IJAYA versus DE	1.0	1.0	1.0
IJAYA versus EBL SHADE	1.0	1.0	1.0
IJAYA versus ADELI	1.0	1.0	1.0

**Table S169 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
IJAYA versus NDE	1.0	1.0	1.0
IJAYA versus TLBO	1.0	1.0	1.0
IJAYA versus STLBO	1.0	1.0	1.0
ISCA versus DE	1.0	1.0	1.0
ISCA versus EBL SHADE	1.0	1.0	1.0
ISCA versus ADELI	1.0	1.0	1.0
ISCA versus NDE	1.0	1.0	1.0
ISCA versus MABC	1.0	1.0	1.0
ISCA versus TLBO	1.0	1.0	1.0
ISCA versus GOTLBO	1.0	1.0	1.0
ISCA versus STLBO	1.0	1.0	1.0
ISCA versus PSO	1.0	1.0	1.0
ISCA versus IJAYA	1.0	1.0	1.0
ISCA versus NNA	1.0	1.0	1.0
ISCA versus CWOA	1.0	1.0	1.0
ISCA versus WW	1.0	1.0	1.0
NNA versus DE	1.0	1.0	1.0
NNA versus EBL SHADE	1.0	1.0	1.0
NNA versus ADELI	1.0	1.0	1.0
NNA versus NDE	1.0	1.0	1.0
NNA versus MABC	1.0	1.0	1.0
NNA versus TLBO	1.0	1.0	1.0
NNA versus GOTLBO	1.0	1.0	1.0
NNA versus STLBO	1.0	1.0	1.0
NNA versus PSO	1.0	1.0	1.0
NNA versus IJAYA	1.0	1.0	1.0
NNA versus ISCA	1.0	1.0	1.0
NNA versus CWOA	1.0	1.0	1.0
NNA versus WW	1.0	1.0	1.0
CWOA versus DE	1.0	1.0	1.0
CWOA versus EBL SHADE	1.0	1.0	1.0
CWOA versus ADELI	1.0	1.0	1.0
CWOA versus NDE	1.0	1.0	1.0
CWOA versus MABC	1.0	1.0	1.0
CWOA versus TLBO	1.0	1.0	1.0
CWOA versus GOTLBO	1.0	1.0	1.0
CWOA versus STLBO	1.0	1.0	1.0
CWOA versus PSO	1.0	1.0	1.0
CWOA versus IJAYA	1.0	1.0	1.0
CWOA versus ISCA	1.0	1.0	1.0
CWOA versus NNA	1.0	1.0	1.0
CWOA versus WW	1.0	1.0	1.0
WW versus DE	1.0	1.0	1.0

**Table S169 (continued)**

Hypothesis	post-hoc procedure		
	Nemenyi	Holm	Shaffer
WW versus EBL SHADE	1.0	1.0	1.0
WW versus ADELI	1.0	1.0	1.0
WW versus NDE	1.0	1.0	1.0
WW versus MABC	1.0	1.0	1.0
WW versus TLBO	1.0	1.0	1.0
WW versus GOTLBO	1.0	1.0	1.0
WW versus STLBO	1.0	1.0	1.0
WW versus PSO	1.0	1.0	1.0
WW versus IJAYA	1.0	1.0	1.0
WW versus ISCA	1.0	1.0	1.0
WW versus NNA	1.0	1.0	1.0
WW versus CWOA	1.0	1.0	1.0