

Output tables for the test of Multiple comparisons.

January 15, 2017

1 **Average rankings of Friedman test**

Average ranks obtained by applying the Friedman procedure

Algorithm	Ranking
SVRCC	2.8333
MORF	6.4167
ST	5.8958
MTS	6.6042
MTSC	6.4792
RC	7.5208
ERC	5.8958
ERCC	4.8542
SVR	4.7917
SVRRC	3.7083

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 9 degrees of freedom: 48.843182.
P-value computed by Friedman Test: 1.7763642512491629E-7.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 9 and 207 degrees of freedom: 6.720594.

P-value computed by Iman and Davenport Test: 1.939949417233838E-8.

2 Post hoc comparisons

Results achieved on post hoc comparisons for $\alpha = 0.05$, $\alpha = 0.10$ and adjusted p-values.

2.1 P-values for $\alpha = 0.05$

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.001111 .

Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.001351 .

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm
45	SVRCC vs. RC	5.363227	0	0.001111
44	RC vs. SVRRC	4.362091	0.000013	0.001136
43	SVRCC vs. MTS	4.314418	0.000016	0.001163
42	SVRCC vs. MTSC	4.171399	0.00003	0.00119
41	SVRCC vs. MORF	4.099889	0.000041	0.00122
40	SVRCC vs. ERC	3.503975	0.000458	0.00125
39	SVRCC vs. ST	3.503975	0.000458	0.001282
38	MTS vs. SVRRC	3.313282	0.000922	0.001316
37	MTSC vs. SVRRC	3.170263	0.001523	0.001351
36	RC vs. SVR	3.12259	0.001793	0.001389
35	MORF vs. SVRRC	3.098753	0.001943	0.001429
34	RC vs. ERCC	3.05108	0.00228	0.001471
33	ERC vs. SVRRC	2.502839	0.01232	0.001515
32	ST vs. SVRRC	2.502839	0.01232	0.001563
31	SVRCC vs. ERCC	2.312147	0.02077	0.001613
30	SVRCC vs. SVR	2.240637	0.02505	0.001667
29	MTS vs. SVR	2.073781	0.0381	0.001724
28	MTS vs. ERCC	2.002271	0.045256	0.001786
27	MTSC vs. SVR	1.930762	0.053513	0.001852
26	MORF vs. SVR	1.859252	0.062991	0.001923
25	MTSC vs. ERCC	1.859252	0.062991	0.002
24	ST vs. RC	1.859252	0.062991	0.002083
23	RC vs. ERC	1.859252	0.062991	0.002174
22	MORF vs. ERCC	1.787742	0.073818	0.002273
21	ERCC vs. SVRRC	1.311011	0.189854	0.002381
20	ERC vs. SVR	1.263338	0.206468	0.0025
19	ST vs. SVR	1.263338	0.206468	0.002632
18	MORF vs. RC	1.263338	0.206468	0.002778
17	SVR vs. SVRRC	1.239501	0.21516	0.002941
16	ERC vs. ERCC	1.191828	0.233329	0.003125
15	ST vs. ERCC	1.191828	0.233329	0.003333
14	MTSC vs. RC	1.191828	0.233329	0.003571
13	MTS vs. RC	1.048809	0.294266	0.003846
12	SVRCC vs. SVRRC	1.001136	0.316761	0.004167
11	ST vs. MTS	0.810443	0.417685	0.004545
10	MTS vs. ERC	0.810443	0.417685	0.005
9	ST vs. MTSC	0.667424	0.504501	0.005556
8	MTSC vs. ERC	0.667424	0.504501	0.00625
7	MORF vs. ST	0.595914	0.551233	0.007143
6	MORF vs. ERC	0.595914	0.551233	0.008333
5	MORF vs. MTS	0.214529	0.830134	0.01
4	MTS vs. MTSC	0.143019	0.886275	0.0125
3	MORF vs. MTSC	0.07151	0.942992	0.016667
2	ERCC vs. SVR	0.07151	0.942992	0.025
1	ST vs. ERC	0	1	0.05

Table 2: P-values Table for $\alpha = 0.05$

2.2 P-values for $\alpha = 0.10$

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.002222 .

Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.00303 .

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm
45	SVRCC vs. RC	5.363227	0	0.002222
44	RC vs. SVRRC	4.362091	0.000013	0.002273
43	SVRCC vs. MTS	4.314418	0.000016	0.002326
42	SVRCC vs. MTSC	4.171399	0.00003	0.002381
41	SVRCC vs. MORF	4.099889	0.000041	0.002439
40	SVRCC vs. ERC	3.503975	0.000458	0.0025
39	SVRCC vs. ST	3.503975	0.000458	0.002564
38	MTS vs. SVRRC	3.313282	0.000922	0.002632
37	MTSC vs. SVRRC	3.170263	0.001523	0.002703
36	RC vs. SVR	3.12259	0.001793	0.002778
35	MORF vs. SVRRC	3.098753	0.001943	0.002857
34	RC vs. ERCC	3.05108	0.00228	0.002941
33	ERC vs. SVRRC	2.502839	0.01232	0.00303
32	ST vs. SVRRC	2.502839	0.01232	0.003125
31	SVRCC vs. ERCC	2.312147	0.02077	0.003226
30	SVRCC vs. SVR	2.240637	0.02505	0.003333
29	MTS vs. SVR	2.073781	0.0381	0.003448
28	MTS vs. ERCC	2.002271	0.045256	0.003571
27	MTSC vs. SVR	1.930762	0.053513	0.003704
26	MORF vs. SVR	1.859252	0.062991	0.003846
25	MTSC vs. ERCC	1.859252	0.062991	0.004
24	ST vs. RC	1.859252	0.062991	0.004167
23	RC vs. ERC	1.859252	0.062991	0.004348
22	MORF vs. ERCC	1.787742	0.073818	0.004545
21	ERCC vs. SVRRC	1.311011	0.189854	0.004762
20	ERC vs. SVR	1.263338	0.206468	0.005
19	ST vs. SVR	1.263338	0.206468	0.005263
18	MORF vs. RC	1.263338	0.206468	0.005556
17	SVR vs. SVRRC	1.239501	0.21516	0.005882
16	ERC vs. ERCC	1.191828	0.233329	0.00625
15	ST vs. ERCC	1.191828	0.233329	0.006667
14	MTSC vs. RC	1.191828	0.233329	0.007143
13	MTS vs. RC	1.048809	0.294266	0.007692
12	SVRCC vs. SVRRC	1.001136	0.316761	0.008333
11	ST vs. MTS	0.810443	0.417685	0.009091
10	MTS vs. ERC	0.810443	0.417685	0.01
9	ST vs. MTSC	0.667424	0.504501	0.011111
8	MTSC vs. ERC	0.667424	0.504501	0.0125
7	MORF vs. ST	0.595914	0.551233	0.014286
6	MORF vs. ERC	0.595914	0.551233	0.016667
5	MORF vs. MTS	0.214529	0.830134	0.02
4	MTS vs. MTSC	0.143019	0.886275	0.025
3	MORF vs. MTSC	0.07151	0.942992	0.033333
2	ERCC vs. SVR	0.07151	0.942992	0.05
1	ST vs. ERC	0	1	0.1

Table 3: P-values Table for $\alpha = 0.10$

2.3 Adjusted p-values

i	hypothesis	unadjusted p	p_{Neme}	p_{Holm}
1	SVRCC vs .RC	0	0.000004	0.000004
2	RC vs .SVRRC	0.000013	0.00058	0.000567
3	SVRCC vs .MTS	0.000016	0.00072	0.000688
4	SVRCC vs .MTSC	0.00003	0.001362	0.001271
5	SVRCC vs .MORF	0.000041	0.00186	0.001695
6	SVRCC vs .ERC	0.000458	0.020627	0.018335
7	SVRCC vs .ST	0.000458	0.020627	0.018335
8	MTS vs .SVRRC	0.000922	0.041494	0.035039
9	MTSC vs .SVRRC	0.001523	0.068535	0.056351
10	RC vs .SVR	0.001793	0.08067	0.064536
11	MORF vs .SVRRC	0.001943	0.087452	0.068018
12	RC vs .ERCC	0.00228	0.102609	0.077527
13	ERC vs .SVRRC	0.01232	0.554407	0.406565
14	ST vs .SVRRC	0.01232	0.554407	0.406565
15	SVRCC vs .ERCC	0.02077	0.934632	0.643857
16	SVRCC vs .SVR	0.02505	1.127232	0.751488
17	MTS vs .SVR	0.0381	1.714484	1.10489
18	MTS vs .ERCC	0.045256	2.0365	1.267155
19	MTSC vs .SVR	0.053513	2.408064	1.444838
20	MORF vs .SVR	0.062991	2.834614	1.637777
21	MTSC vs .ERCC	0.062991	2.834614	1.637777
22	ST vs .RC	0.062991	2.834614	1.637777
23	RC vs .ERC	0.062991	2.834614	1.637777
24	MORF vs .ERCC	0.073818	3.321791	1.637777
25	ERCC vs .SVRRC	0.189854	8.543431	3.986935
26	ERC vs .SVR	0.206468	9.291049	4.129355
27	ST vs .SVR	0.206468	9.291049	4.129355
28	MORF vs .RC	0.206468	9.291049	4.129355
29	SVR vs .SVRRC	0.21516	9.682195	4.129355
30	ERC vs .ERCC	0.233329	10.499787	4.129355
31	ST vs .ERCC	0.233329	10.499787	4.129355
32	MTSC vs .RC	0.233329	10.499787	4.129355
33	MTS vs .RC	0.294266	13.241975	4.129355
34	SVRCC vs .SVRRC	0.316761	14.254254	4.129355
35	ST vs .MTS	0.417685	18.795847	4.59454
36	MTS vs .ERC	0.417685	18.795847	4.59454
37	ST vs .MTSC	0.504501	22.702566	4.59454
38	MTSC vs .ERC	0.504501	22.702566	4.59454
39	MORF vs .ST	0.551233	24.805467	4.59454
40	MORF vs .ERC	0.551233	24.805467	4.59454
41	MORF vs .MTS	0.830134	37.356052	4.59454
42	MTS vs .MTSC	0.886275	39.882369	4.59454
43	MORF vs .MTSC	0.942992	42.434645	4.59454
44	ERCC vs .SVR	0.942992	42.434645	4.59454
45	ST vs .ERC	1	45	4.59454

Table 4: Adjusted p -values