Wilcoxon Signed Ranks test.

KEEL non-parametric statistical module

January 16, 2017

1 Detailed results for SVRCC

1.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
MORF	161.0	139.0	≥ 0.2	0.74248
ST	203.5	96.5	0.13177	0.121529
MTS	286.0	14.0	1.3114E-5	0.000096
MTSC	300.0	0.0	1.192E-7	0.000017
RC	201.0	99.0	0.1515	0.141175
ERC	297.0	3.0	5.96E-7	0.000025
ERCC	300.0	0.0	1.192E-7	0.000017
SVR	5.0	295.0	≥ 0.2	1
SVRRC	300.0	0.0	1.192E-7	0.000017

Table 1: Results obtained by the Wilcoxon test for algorithm SVRCC

1.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
MORF	[-37 , 29.45]	0.9049
ST	[-50.35 , 2.6]	0.9049
MTS	[-163.3 , -23.5]	0.9049
MTSC	[-1,211.4 , -127.35]	0.9049
RC	[-44.3 , 3.5]	0.9049
ERC	[-984.7 , -107.45]	0.9049
ERCC	[-13,336.45 , -1,435.45]	0.9049
SVR	[6.2 , 44.6]	0.9049
SVRRC	[-1,192.55 , -170.65]	0.9049

Table 2: Confidence intervals for algorithm SVRCC (α=0.90)

α=0.95	Confidence interval	Exact confidence
MORF	[-39.1 , 39.55]	0.95094
ST	[-58.4 , 3.55]	0.95094
MTS	[-187.35 , -18.75]	0.95094
MTSC	[-1,317 , -89.6]	0.95094
RC	[-47.55 , 4.6]	0.95094
ERC	[-1,009.95 , -38.2]	0.95094
ERCC	[-13,822.55 , -564.5]	0.95094
SVR	[5.65 , 49.5]	0.95094
SVRRC	[-1,440 , -152.55]	0.95094

Table 3: Confidence intervals for algorithm SVRCC (α=0.95)

2 Detailed results for MORF

2.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	139.0	161.0	≥ 0.2	1
ST	114.0	186.0	≥ 0.2	1
MTS	200.0	100.0	0.15998	0.149061
MTSC	267.0	33.0	3.728E-4	0.000788
RC	120.0	180.0	≥ 0.2	1
ERC	234.0	66.0	0.015044	0.015766
ERCC	297.0	3.0	5.96E-7	0.000025
SVR	75.0	225.0	≥ 0.2	1
SVRRC	234.0	66.0	0.015044	0.015766

Table 4: Results obtained by the Wilcoxon test for algorithm MORF

2.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[-29.45 , 37]	0.9049
ST	[-78.3 , 38.85]	0.9049
MTS	[-190.55 , 9.5]	0.9049
MTSC	[-1,245.4 , -85.7]	0.9049
RC	[-70.1 , 37.85]	0.9049
ERC	[-1,015.8 , -58.35]	0.9049
ERCC	[-13,355.3 , -1,393.15]	0.9049
SVR	[11.4 , 43.45]	0.9049
SVRRC	[-1,221.65 , -168.6]	0.9049

Table 5: Confidence intervals for algorithm MORF (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[-39.55 , 39.1]	0.95094
ST	[-88.4 , 41.55]	0.95094
MTS	[-203.75 , 13.25]	0.95094
MTSC	[-1,338.5 , -75.75]	0.95094
RC	[-84.25 , 41.4]	0.95094
ERC	[-1,069.7 , -25.2]	0.95094
ERCC	[-13,897.75 , -554.85]	0.95094
SVR	[6 , 46.75]	0.95094
SVRRC	[-1,458.2 , -98.6]	0.95094

Table 6: Confidence intervals for algorithm MORF (α=0.95)

3 Detailed results for ST

3.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	96.5	203.5	≥ 0.2	1
MORF	186.0	114.0	≥ 0.2	0.297014
MTS	300.0	0.0	1.192E-7	0.000017
MTSC	300.0	0.0	1.192E-7	0.000017
RC	78.0	222.0	≥ 0.2	1
ERC	300.0	0.0	1.192E-7	0.000017
ERCC	300.0	0.0	1.192E-7	0.000017
SVR	78.5	221.5	≥ 0.2	1
SVRRC	288.5	11.5	7.45E-6	0.000067

Table 7: Results obtained by the Wilcoxon test for algorithm ST

3.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[-2.6 , 50.35]	0.9049
MORF	[-38.85 , 78.3]	0.9049
MTS	[-123 , -43.8]	0.9049
MTSC	[-1,159.6 , -148.85]	0.9049
RC	[0.8 , 3.05]	0.9049
ERC	[-937.35 , -102.8]	0.9049
ERCC	[-13,286.9 , -1,430.4]	0.9049
SVR	[2.05 , 90.3]	0.9049
SVRRC	[-1,242.8 , -238]	0.9049

Table 8: Confidence intervals for algorithm ST (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[-3.55 , 58.4]	0.95094
MORF	[-41.55 , 88.4]	0.95094
MTS	[-147.8 , -35.85]	0.95094
MTSC	[-1,277.45 , -130.55]	0.95094
RC	[0.7 , 5.85]	0.95094
ERC	[-989.5 , -90.45]	0.95094
ERCC	[-13,847 , -637.9]	0.95094
SVR	[0.6 , 93.35]	0.95094
SVRRC	[-1,402.75 , -147.6]	0.95094

Table 9: Confidence intervals for algorithm ST (α=0.95)

4 Detailed results for MTS

4.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	14.0	286.0	≥ 0.2	1
MORF	100.0	200.0	≥ 0.2	1
ST	0.0	300.0	≥ 0.2	1
MTSC	300.0	0.0	1.192E-7	0.000017
RC	0.0	300.0	≥ 0.2	1
ERC	278.0	22.0	6.39E-5	0.000241
ERCC	300.0	0.0	1.192E-7	0.000017
SVR	0.0	300.0	≥ 0.2	1
SVRRC	255.0	45.0	0.0017796	0.002576

Table 10: Results obtained by the Wilcoxon test for algorithm MTS

4.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[23.5 , 163.3]	0.9049
MORF	[-9.5 , 190.55]	0.9049
ST	[43.8 , 123]	0.9049
MTSC	[-1,052.75 , -109.1]	0.9049
RC	[45.2 , 126.6]	0.9049
ERC	[-827.65 , -50.9]	0.9049
ERCC	[-13,179.8 , -1,400]	0.9049
SVR	[38.7 , 199.6]	0.9049
SVRRC	[-1,148.7 , -183.65]	0.9049

Table 11: Confidence intervals for algorithm MTS (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[18.75 , 187.35]	0.95094
MORF	[-13.25 , 203.75]	0.95094
ST	[35.85 , 147.8]	0.95094
MTSC	[-1,137.15 , -94.15]	0.95094
RC	[38.45 , 146.7]	0.95094
ERC	[-845.5 , -42.75]	0.95094
ERCC	[-13,706.7 , -594.1]	0.95094
SVR	[24.8 , 225.2]	0.95094
SVRRC	[-1,238.15 , -116.15]	0.95094

Table 12: Confidence intervals for algorithm MTS (α=0.95)

5 Detailed results for MTSC

5.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	0.0	300.0	≥ 0.2	1
MORF	33.0	267.0	≥ 0.2	1
ST	0.0	300.0	≥ 0.2	1
MTS	0.0	300.0	≥ 0.2	1
RC	0.0	300.0	≥ 0.2	1
ERC	90.0	210.0	≥ 0.2	1
ERCC	300.0	0.0	1.192E-7	0.000017
SVR	0.0	300.0	≥ 0.2	1
SVRRC	103.0	197.0	≥ 0.2	1

Table 13: Results obtained by the Wilcoxon test for algorithm MTSC

5.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[127.35 , 1,211.4]	0.9049
MORF	[85.7 , 1,245.4]	0.9049
ST	[148.85 , 1,159.6]	0.9049
MTS	[109.1 , 1,052.75]	0.9049
RC	[150.6 , 1,168.9]	0.9049
ERC	[1 , 150.15]	0.9049
ERCC	[-12,117.3 , -1,264.2]	0.9049
SVR	[136.35 , 1,249.15]	0.9049
SVRRC	[-25.55 , 218.2]	0.9049

Table 14: Confidence intervals for algorithm MTSC (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[89.6 , 1,317]	0.95094
MORF	[75.75 , 1,338.5]	0.95094
ST	[130.55 , 1,277.45]	0.95094
MTS	[94.15 , 1,137.15]	0.95094
RC	[132.05 , 1,283.85]	0.95094
ERC	[-5.3 , 164.6]	0.95094
ERCC	[-12,569.55 , -486.85]	0.95094
SVR	[113.8 , 1,359.95]	0.95094
SVRRC	[-96.25 , 229.1]	0.95094

Table 15: Confidence intervals for algorithm MTSC (α=0.95)

6 Detailed results for RC

6.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	99.0	201.0	≥ 0.2	1
MORF	180.0	120.0	≥ 0.2	0.38352
ST	222.0	78.0	0.03948	0.036949
MTS	300.0	0.0	1.192E-7	0.000017
MTSC	300.0	0.0	1.192E-7	0.000017
ERC	300.0	0.0	1.192E-7	0.000017
ERCC	300.0	0.0	1.192E-7	0.000017
SVR	71.0	229.0	≥ 0.2	1
SVRRC	293.0	7.0	2.264E-6	0.000039

Table 16: Results obtained by the Wilcoxon test for algorithm RC

6.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[-3.5 , 44.3]	0.9049
MORF	[-37.85 , 70.1]	0.9049
ST	[-3.05 , -0.8]	0.9049
MTS	[-126.6 , -45.2]	0.9049
MTSC	[-1,168.9 , -150.6]	0.9049
ERC	[-943.45 , -101.75]	0.9049
ERCC	[-13,292.8 , -1,431.75]	0.9049
SVR	[2 , 82.2]	0.9049
SVRRC	[-1,226.5 , -235.95]	0.9049

Table 17: Confidence intervals for algorithm RC (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[-4.6 , 47.55]	0.95094
MORF	[-41.4 , 84.25]	0.95094
ST	[-5.85 , -0.7]	0.95094
MTS	[-146.7 , -38.45]	0.95094
MTSC	[-1,283.85 , -132.05]	0.95094
ERC	[-1,001.3 , -91.95]	0.95094
ERCC	[-13,853.4 , -639.2]	0.95094
SVR	[1.35 , 89.55]	0.95094
SVRRC	[-1,398.45 , -149]	0.95094

Table 18: Confidence intervals for algorithm RC (α=0.95)

7 Detailed results for ERC

7.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	3.0	297.0	≥ 0.2	1
MORF	66.0	234.0	≥ 0.2	1
ST	0.0	300.0	≥ 0.2	1
MTS	22.0	278.0	≥ 0.2	1
MTSC	210.0	90.0	0.08938	0.083886
RC	0.0	300.0	≥ 0.2	1
ERCC	300.0	0.0	1.192E-7	0.000017
SVR	0.0	300.0	≥ 0.2	1
SVRRC	173.0	127.0	≥ 0.2	0.501948

Table 19: Results obtained by the Wilcoxon test for algorithm ERC

7.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[107.45 , 984.7]	0.9049
MORF	[58.35 , 1,015.8]	0.9049
ST	[102.8 , 937.35]	0.9049
MTS	[50.9 , 827.65]	0.9049
MTSC	[-150.15 , -1]	0.9049
RC	[101.75 , 943.45]	0.9049
ERCC	[-12,347.8 , -1,305.55]	0.9049
SVR	[113.7 , 1,024.7]	0.9049
SVRRC	[-155.1 , 10.8]	0.9049

Table 20: Confidence intervals for algorithm ERC (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[38.2 , 1,009.95]	0.95094
MORF	[25.2 , 1,069.7]	0.95094
ST	[90.45 , 989.5]	0.95094
MTS	[42.75 , 845.5]	0.95094
MTSC	[-164.6 , 5.3]	0.95094
RC	[91.95 , 1,001.3]	0.95094
ERCC	[-12,828.05 , -545.85]	0.95094
SVR	[60.95 , 1,075.7]	0.95094
SVRRC	[-169.85 , 14.8]	0.95094

Table 21: Confidence intervals for algorithm ERC (α=0.95)

8 Detailed results for ERCC

8.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	0.0	300.0	≥ 0.2	1
MORF	3.0	297.0	≥ 0.2	1
ST	0.0	300.0	≥ 0.2	1
MTS	0.0	300.0	≥ 0.2	1
MTSC	0.0	300.0	≥ 0.2	1
RC	0.0	300.0	≥ 0.2	1
ERC	0.0	300.0	≥ 0.2	1
SVR	0.0	300.0	≥ 0.2	1
SVRRC	0.0	300.0	≥ 0.2	1

Table 22: Results obtained by the Wilcoxon test for algorithm ERCC

8.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[1,435.45 , 13,336.45]	0.9049
MORF	[1,393.15 , 13,355.3]	0.9049
ST	[1,430.4 , 13,286.9]	0.9049
MTS	[1,400 , 13,179.8]	0.9049
MTSC	[1,264.2 , 12,117.3]	0.9049
RC	[1,431.75 , 13,292.8]	0.9049
ERC	[1,305.55 , 12,347.8]	0.9049
SVR	[1,438.7 , 13,376.95]	0.9049
SVRRC	[1,283.65 , 12,358.95]	0.9049

Table 23: Confidence intervals for algorithm ERCC (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[564.5 , 13,822.55]	0.95094
MORF	[554.85 , 13,897.75]	0.95094
ST	[637.9 , 13,847]	0.95094
MTS	[594.1 , 13,706.7]	0.95094
MTSC	[486.85 , 12,569.55]	0.95094
RC	[639.2 , 13,853.4]	0.95094
ERC	[545.85 , 12,828.05]	0.95094
SVR	[606.8 , 13,903.75]	0.95094
SVRRC	[394.5 , 12,676.1]	0.95094

Table 24: Confidence intervals for algorithm ERCC (α=0.95)

9 Detailed results for SVR

9.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	295.0	5.0	1.192E-6	0.00003
MORF	225.0	75.0	0.03148	0.030995
ST	221.5	78.5	0.04098	0.038969
MTS	300.0	0.0	1.192E-7	0.000017
MTSC	300.0	0.0	1.192E-7	0.000017
RC	229.0	71.0	0.02294	0.022633
ERC	300.0	0.0	1.192E-7	0.000017
ERCC	300.0	0.0	1.192E-7	0.000017
SVRRC	300.0	0.0	1.192E-7	0.000017

Table 25: Results obtained by the Wilcoxon test for algorithm SVR

9.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[-44.6 , -6.2]	0.9049
MORF	[-43.45 , -11.4]	0.9049
ST	[-90.3 , -2.05]	0.9049
MTS	[-199.6 , -38.7]	0.9049
MTSC	[-1,249.15 , -136.35]	0.9049
RC	[-82.2 , -2]	0.9049
ERC	[-1,024.7 , -113.7]	0.9049
ERCC	[-13,376.95 , -1,438.7]	0.9049
SVRRC	[-1,233.55 , -211.9]	0.9049

Table 26: Confidence intervals for algorithm SVR (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[-49.5 , -5.65]	0.95094
MORF	[-46.75 , -6]	0.95094
ST	[-93.35 , -0.6]	0.95094
MTS	[-225.2 , -24.8]	0.95094
MTSC	[-1,359.95 , -113.8]	0.95094
RC	[-89.55 , -1.35]	0.95094
ERC	[-1,075.7 , -60.95]	0.95094
ERCC	[-13,903.75 , -606.8]	0.95094
SVRRC	[-1,482.6 , -156.05]	0.95094

Table 27: Confidence intervals for algorithm SVR (α=0.95)

10 Detailed results for SVRRC

10.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
SVRCC	0.0	300.0	≥ 0.2	1
MORF	66.0	234.0	≥ 0.2	1
ST	11.5	288.5	≥ 0.2	1
MTS	45.0	255.0	≥ 0.2	1
MTSC	197.0	103.0	0.1875	0.174736
RC	7.0	293.0	≥ 0.2	1
ERC	127.0	173.0	≥ 0.2	1
ERCC	300.0	0.0	1.192E-7	0.000017
SVR	0.0	300.0	≥ 0.2	1

Table 28: Results obtained by the Wilcoxon test for algorithm SVRRC

10.2 Confidence intervals for Median of diferences

α=0.90	Confidence interval	Exact confidence
SVRCC	[170.65 , 1,192.55]	0.9049
MORF	[168.6 , 1,221.65]	0.9049
ST	[238 , 1,242.8]	0.9049
MTS	[183.65 , 1,148.7]	0.9049
MTSC	[-218.2 , 25.55]	0.9049
RC	[235.95 , 1,226.5]	0.9049
ERC	[-10.8 , 155.1]	0.9049
ERCC	[-12,358.95 , -1,283.65]	0.9049
SVR	[211.9 , 1,233.55]	0.9049

Table 29: Confidence intervals for algorithm SVRRC (α=0.90)

α=0.95	Confidence interval	Exact confidence
SVRCC	[152.55 , 1,440]	0.95094
MORF	[98.6 , 1,458.2]	0.95094
ST	[147.6 , 1,402.75]	0.95094
MTS	[116.15 , 1,238.15]	0.95094
MTSC	[-229.1 , 96.25]	0.95094
RC	[149 , 1,398.45]	0.95094
ERC	[-14.8 , 169.85]	0.95094
ERCC	[-12,676.1 , -394.5]	0.95094
SVR	[156.05 , 1,482.6]	0.95094

Table 30: Confidence intervals for algorithm SVRRC (α=0.95)