Wilcoxon Signed Ranks test.

KEEL non-parametric statistical module

December 26, 2016

1 Detailed results for SVRCC

1.1 Results

VS	R^+	R^-	Exact P-value	Asymptotic P-value
MORF	290.0	10.0	5.126E-6	0.00006
ST	261.0	39.0	8.462E-4	0.001388
MTS	239.0	61.0	0.009576	0.010554
MTSC	261.0	39.0	8.462E-4	0.001444
RC	275.0	25.0	1.0764E-4	0.000336
ERC	261.0	39.0	8.462E-4	0.001444
ERCC	254.0	46.0	0.002	0.002829
SVR	291.0	9.0	3.934E-6	0.00005
SVRRC	222.5	77.5	0.03806	0.036332

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	[-0.1595 , -0.0335]	0.9049
ST	[-0.10385 , -0.02805]	0.9049
MTS	[-0.0892 , -0.0198]	0.9049
MTSC	[-0.0978 , -0.0286]	0.9049
RC	[-0.09595 , -0.03095]	0.9049
ERC	[-0.09785 , -0.0263]	0.9049
ERCC	[-0.09195 , -0.02385]	0.9049
SVR	[-0.01885 , -0.00725]	0.9049
SVRRC	[-0.00695 , -0.00085]	0.9049

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

α=0.95	Confidence interval	Exact confidence
MORF	[-0.1664 , -0.02955]	0.95094
ST	[-0.11895 , -0.0242]	0.95094
MTS	[-0.1122 , -0.01535]	0.95094
MTSC	[-0.10355 , -0.02395]	0.95094
RC	[-0.10365 , -0.0266]	0.95094
ERC	[-0.1032 , -0.02215]	0.95094
ERCC	[-0.0978 , -0.0188]	0.95094
SVR	[-0.02035 , -0.0065]	0.95094
SVRRC	[-0.0074 , -0.00025]	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	10.0	290.0	≥ 0.2	1
ST	63.0	237.0	≥ 0.2	1
MTS	88.5	211.5	≥ 0.2	1
MTSC	87.0	213.0	≥ 0.2	1
RC	118.0	182.0	≥ 0.2	1
ERC	85.0	215.0	≥ 0.2	1
ERCC	55.0	245.0	≥ 0.2	1
SVR	30.0	270.0	≥ 0.2	1
SVRRC	25.0	275.0	≥ 0.2	1

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	[0.0335 , 0.1595]	0.9049
ST	[0.0075 , 0.02995]	0.9049
MTS	[0.00025 , 0.0282]	0.9049
MTSC	[0.0021 , 0.0307]	0.9049
RC	[-0.00715 , 0.02425]	0.9049
ERC	[0.0016 , 0.02955]	0.9049
ERCC	[0.00895 , 0.03775]	0.9049
SVR	[0.0237 , 0.1472]	0.9049
SVRRC	[0.0298 , 0.15805]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.02955 , 0.1664]	0.95094
ST	[0.0049 , 0.03285]	0.95094
MTS	[-0.00145 , 0.0315]	0.95094
MTSC	[-0.001 , 0.03375]	0.95094
RC	[-0.00925 , 0.02715]	0.95094
ERC	[-0.00045 , 0.0331]	0.95094
ERCC	[0.0071 , 0.0402]	0.95094
SVR	[0.02045 , 0.15515]	0.95094
SVRRC	[0.0268 , 0.16375]	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	39.0	261.0	≥ 0.2	1
MORF	237.0	63.0	0.011516	0.012419
MTS	140.5	159.5	≥ 0.2	1
MTSC	145.5	154.5	≥ 0.2	1
RC	209.5	90.5	0.09224	0.085354
ERC	168.5	131.5	≥ 0.2	0.585889
ERCC	65.5	210.5	≥ 0.2	1
SVR	54.0	246.0	≥ 0.2	1
SVRRC	41.0	259.0	≥ 0.2	1

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	[0.02805 , 0.10385]	0.9049
MORF	[-0.02995 , -0.0075]	0.9049
MTS	[-0.00445 , 0.0097]	0.9049
MTSC	[-0.0032 , 0.00765]	0.9049
RC	[-0.0081 , -0.0001]	0.9049
ERC	[-0.00375 , 0.00455]	0.9049
ERCC	[0.0005 , 0.01545]	0.9049
SVR	[0.01815 , 0.08255]	0.9049
SVRRC	[0.02565 , 0.09765]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.0242 , 0.11895]	0.95094
MORF	[-0.03285 , -0.0049]	0.95094
MTS	[-0.00745 , 0.011]	0.95094
MTSC	[-0.00455 , 0.00925]	0.95094
RC	[-0.0104 , 0.00085]	0.95094
ERC	[-0.00455 , 0.0077]	0.95094
ERCC	[0.0002 , 0.0162]	0.95094
SVR	[0.0153 , 0.09245]	0.95094
SVRRC	[0.02115 , 0.11065]	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	61.0	239.0	≥ 0.2	1
MORF	211.5	88.5	0.08132	0.07544
ST	159.5	140.5	≥ 0.2	0.774313
MTSC	151.0	149.0	≥ 0.2	0.965815
RC	187.0	89.0	0.14242	0.132185
ERC	159.0	141.0	≥ 0.2	0.786061
ERCC	126.0	174.0	≥ 0.2	1
SVR	78.0	222.0	≥ 0.2	1
SVRRC	66.0	234.0	≥ 0.2	1

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	[0.0198 , 0.0892]	0.9049
MORF	[-0.0282 , -0.00025]	0.9049
ST	[-0.0097 , 0.00445]	0.9049
MTSC	[-0.00905 , 0.00755]	0.9049
RC	[-0.02085 , 0.0003]	0.9049
ERC	[-0.0123 , 0.0141]	0.9049
ERCC	[-0.0028 , 0.0133]	0.9049
SVR	[0.00605 , 0.064]	0.9049
SVRRC	[0.01515 , 0.08245]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.01535 , 0.1122]	0.95094
MORF	[-0.0315 , 0.00145]	0.95094
ST	[-0.011 , 0.00745]	0.95094
MTSC	[-0.01135 , 0.01435]	0.95094
RC	[-0.0237 , 0.0074]	0.95094
ERC	[-0.01475 , 0.0163]	0.95094
ERCC	[-0.00475 , 0.01635]	0.95094
SVR	[0.00115 , 0.07655]	0.95094
SVRRC	[0.0099 , 0.1029]	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	39.0	261.0	≥ 0.2	1
MORF	213.0	87.0	0.0738	0.068639
ST	154.5	145.5	≥ 0.2	0.885999
MTS	149.0	151.0	≥ 0.2	1
RC	173.0	127.0	≥ 0.2	0.501948
ERC	145.5	154.5	≥ 0.2	1
ERCC	70.0	230.0	≥ 0.2	1
SVR	55.5	244.5	≥ 0.2	1
SVRRC	43.0	257.0	≥ 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	[0.0286 , 0.0978]	0.9049
MORF	[-0.0307 , -0.0021]	0.9049
ST	[-0.00765 , 0.0032]	0.9049
MTS	[-0.00755 , 0.00905]	0.9049
RC	[-0.00675 , 0.0038]	0.9049
ERC	[-0.0026 , 0.0043]	0.9049
ERCC	[0.00065 , 0.0059]	0.9049
SVR	[0.01755 , 0.07165]	0.9049
SVRRC	[0.02355 , 0.09195]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.02395 , 0.10355]	0.95094
MORF	[-0.03375 , 0.001]	0.95094
ST	[-0.00925 , 0.00455]	0.95094
MTS	[-0.01435 , 0.01135]	0.95094
RC	[-0.00895 , 0.0049]	0.95094
ERC	[-0.00305 , 0.00595]	0.95094
ERCC	[0.0004 , 0.00635]	0.95094
SVR	[0.0132 , 0.0809]	0.95094
SVRRC	[0.01995 , 0.0982]	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	25.0	275.0	≥ 0.2	1
MORF	182.0	118.0	≥ 0.2	0.353111
ST	90.5	209.5	≥ 0.2	1
MTS	89.0	187.0	≥ 0.2	1
MTSC	127.0	173.0	≥ 0.2	1
ERC	88.0	212.0	≥ 0.2	1
ERCC	63.0	237.0	≥ 0.2	1
SVR	46.0	254.0	≥ 0.2	1
SVRRC	31.0	269.0	≥ 0.2	1

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	[0.03095 , 0.09595]	0.9049
MORF	[-0.02425 , 0.00715]	0.9049
ST	[0.0001 , 0.0081]	0.9049
MTS	[-0.0003 , 0.02085]	0.9049
MTSC	[-0.0038 , 0.00675]	0.9049
ERC	[0.0002 , 0.0052]	0.9049
ERCC	[0.0016 , 0.0111]	0.9049
SVR	[0.0195 , 0.0753]	0.9049
SVRRC	[0.02725 , 0.08845]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.0266 , 0.10365]	0.95094
MORF	[-0.02715 , 0.00925]	0.95094
ST	[-0.00085 , 0.0104]	0.95094
MTS	[-0.0074 , 0.0237]	0.95094
MTSC	[-0.0049 , 0.00895]	0.95094
ERC	[-0.0002 , 0.0076]	0.95094
ERCC	[0.00105 , 0.0134]	0.95094
SVR	[0.01575 , 0.0846]	0.95094
SVRRC	[0.0231 , 0.09695]	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	39.0	261.0	≥ 0.2	1
MORF	215.0	85.0	0.06464	0.061286
ST	131.5	168.5	≥ 0.2	1
MTS	141.0	159.0	≥ 0.2	1
MTSC	154.5	145.5	≥ 0.2	0.885999
RC	212.0	88.0	0.07872	0.070049
ERCC	91.0	209.0	≥ 0.2	1
SVR	65.0	235.0	≥ 0.2	1
SVRRC	46.0	254.0	≥ 0.2	1

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	[0.0263 , 0.09785]	0.9049
MORF	[-0.02955 , -0.0016]	0.9049
ST	[-0.00455 , 0.00375]	0.9049
MTS	[-0.0141 , 0.0123]	0.9049
MTSC	[-0.0043 , 0.0026]	0.9049
RC	[-0.0052 , -0.0002]	0.9049
ERCC	[0 , 0.00905]	0.9049
SVR	[0.0168 , 0.07605]	0.9049
SVRRC	[0.02265 , 0.09085]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.02215 , 0.1032]	0.95094
MORF	[-0.0331 , 0.00045]	0.95094
ST	[-0.0077 , 0.00455]	0.95094
MTS	[-0.0163 , 0.01475]	0.95094
MTSC	[-0.00595 , 0.00305]	0.95094
RC	[-0.0076 , 0.0002]	0.95094
ERCC	[-0.00045 , 0.0104]	0.95094
SVR	[0.0137 , 0.08255]	0.95094
SVRRC	[0.01915 , 0.09705]	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	46.0	254.0	≥ 0.2	1
MORF	245.0	55.0	0.00533	0.006361
ST	210.5	65.5	0.02655	0.02583
MTS	174.0	126.0	≥ 0.2	0.483927
MTSC	230.0	70.0	0.02112	0.020986
RC	237.0	63.0	0.011516	0.012109
ERC	209.0	91.0	0.0951	0.089131
SVR	68.0	232.0	≥ 0.2	1
SVRRC	51.0	249.0	≥ 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	[0.02385 , 0.09195]	0.9049
MORF	[-0.03775 , -0.00895]	0.9049
ST	[-0.01545 , -0.0005]	0.9049
MTS	[-0.0133 , 0.0028]	0.9049
MTSC	[-0.0059 , -0.00065]	0.9049
RC	[-0.0111 , -0.0016]	0.9049
ERC	[-0.00905 , -0]	0.9049
SVR	[0.01395 , 0.0679]	0.9049
SVRRC	[0.02075 , 0.08425]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.0188 , 0.0978]	0.95094
MORF	[-0.0402 , -0.0071]	0.95094
ST	[-0.0162 , -0.0002]	0.95094
MTS	[-0.01635 , 0.00475]	0.95094
MTSC	[-0.00635 , -0.0004]	0.95094
RC	[-0.0134 , -0.00105]	0.95094
ERC	[-0.0104 , 0.00045]	0.95094
SVR	[0.0074 , 0.0764]	0.95094
SVRRC	[0.01585 , 0.09465]	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	9.0	291.0	≥ 0.2	1
MORF	270.0	30.0	2.392E-4	0.000576
ST	246.0	54.0	0.00481	0.005831
MTS	222.0	78.0	0.03948	0.038319
MTSC	244.5	55.5	0.005613999999999999	0.006449
RC	254.0	46.0	0.002	0.002829
ERC	235.0	65.0	0.01378	0.014572
ERCC	232.0	68.0	0.01787	0.018416
SVRRC	17.0	259.0	≥ 0.2	1

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	[0.00725 , 0.01885]	0.9049
MORF	[-0.1472 , -0.0237]	0.9049
ST	[-0.08255 , -0.01815]	0.9049
MTS	[-0.064 , -0.00605]	0.9049
MTSC	[-0.07165 , -0.01755]	0.9049
RC	[-0.0753 , -0.0195]	0.9049
ERC	[-0.07605 , -0.0168]	0.9049
ERCC	[-0.0679 , -0.01395]	0.9049
SVRRC	[0.00495 , 0.013]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.0065 , 0.02035]	0.95094
MORF	[-0.15515 , -0.02045]	0.95094
ST	[-0.09245 , -0.0153]	0.95094
MTS	[-0.07655 , -0.00115]	0.95094
MTSC	[-0.0809 , -0.0132]	0.95094
RC	[-0.0846 , -0.01575]	0.95094
ERC	[-0.08255 , -0.0137]	0.95094
ERCC	[-0.0764 , -0.0074]	0.95094
SVRRC	[0.0044 , 0.0144]	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	77.5	222.5	≥ 0.2	1
MORF	275.0	25.0	1.0764E-4	0.000336
ST	259.0	41.0	0.0010926	0.001757
MTS	234.0	66.0	0.015044	0.015766
MTSC	257.0	43.0	0.0013998	0.00213
RC	269.0	31.0	2.782E-4	0.000639
ERC	254.0	46.0	0.002	0.002829
ERCC	249.0	51.0	0.003504	0.004471
SVR	259.0	17.0	4.936E-5	0.00022

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	[0.00085 , 0.00695]	0.9049
MORF	[-0.15805 , -0.0298]	0.9049
ST	[-0.09765 , -0.02565]	0.9049
MTS	[-0.08245 , -0.01515]	0.9049
MTSC	[-0.09195 , -0.02355]	0.9049
RC	[-0.08845 , -0.02725]	0.9049
ERC	[-0.09085 , -0.02265]	0.9049
ERCC	[-0.08425 , -0.02075]	0.9049
SVR	[-0.013 , -0.00495]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.00025 , 0.0074]	0.95094
MORF	[-0.16375 , -0.0268]	0.95094
ST	[-0.11065 , -0.02115]	0.95094
MTS	[-0.1029 , -0.0099]	0.95094
MTSC	[-0.0982 , -0.01995]	0.95094
RC	[-0.09695 , -0.0231]	0.95094
ERC	[-0.09705 , -0.01915]	0.95094
ERCC	[-0.09465 , -0.01585]	0.95094
SVR	[-0.0144 , -0.0044]	0.95094

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