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	286.0	14.0	1.3114E-5	0.000096
ST	259.0	41.0	0.0010926	0.001757
MTS	247.0	53.0	0.004336	0.005341
MTSC	251.0	49.0	0.002814	0.00361
RC	270.0	30.0	2.392E-4	0.000576
ERC	255.0	45.0	0.0017796	0.002576
ERCC	246.0	54.0	0.00481	0.005831
SVR	296.0	4.0	8.344E-7	0.000028
SVRRC	284.0	16.0	2.014E-5	0.000115

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	[-0.08545 , -0.02895]	0.9049
ST	[-0.0894 , -0.0225]	0.9049
MTS	[-0.07365 , -0.0165]	0.9049
MTSC	[-0.08285 , -0.01895]	0.9049
RC	[-0.0963 , -0.0293]	0.9049
ERC	[-0.09275 , -0.02025]	0.9049
ERCC	[-0.07915 , -0.0157]	0.9049
SVR	[-0.0145 , -0.0069]	0.9049
SVRRC	[-0.0049 , -0.00185]	0.9049

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

α=0.95	Confidence interval	Exact confidence
MORF	[-0.0976 , -0.02595]	0.95094
ST	[-0.09765 , -0.01775]	0.95094
MTS	[-0.0886 , -0.012]	0.95094
MTSC	[-0.09465 , -0.016]	0.95094
RC	[-0.1132 , -0.02445]	0.95094
ERC	[-0.10965 , -0.01525]	0.95094
ERCC	[-0.0912 , -0.01235]	0.95094
SVR	[-0.01535 , -0.00645]	0.95094
SVRRC	[-0.0054 , -0.0016]	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	14.0	286.0	≥ 0.2	1
ST	89.0	211.0	≥ 0.2	1
MTS	97.0	203.0	≥ 0.2	1
MTSC	85.0	215.0	≥ 0.2	1
RC	139.0	161.0	≥ 0.2	1
ERC	105.0	195.0	≥ 0.2	1
ERCC	66.0	234.0	≥ 0.2	1
SVR	33.5	266.5	≥ 0.2	1
SVRRC	26.5	273.5	≥ 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	[0.02895 , 0.08545]	0.9049
ST	[0.00105 , 0.02285]	0.9049
MTS	[-0.00155 , 0.0235]	0.9049
MTSC	[0.00115 , 0.0241]	0.9049
RC	[-0.0116 , 0.0162]	0.9049
ERC	[-0.0041 , 0.02165]	0.9049
ERCC	[0.00375 , 0.0286]	0.9049
SVR	[0.0191 , 0.0686]	0.9049
SVRRC	[0.02505 , 0.0815]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.02595 , 0.0976]	0.95094
ST	[-0.00175 , 0.02515]	0.95094
MTS	[-0.0039 , 0.02605]	0.95094
MTSC	[-0.0005 , 0.02705]	0.95094
RC	[-0.0144 , 0.0192]	0.95094
ERC	[-0.0066 , 0.02495]	0.95094
ERCC	[0.0024 , 0.0305]	0.95094
SVR	[0.0159 , 0.08635]	0.95094
SVRRC	[0.02135 , 0.0933]	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	41.0	259.0	≥ 0.2	1
MORF	211.0	89.0	0.08392	0.078893
MTS	150.0	150.0	≥ 0.2	0.988602
MTSC	152.0	148.0	≥ 0.2	0.942441
RC	236.5	63.5	0.012060000000000001	0.012609
ERC	171.0	129.0	≥ 0.2	0.537573
ERCC	70.5	229.5	≥ 0.2	1
SVR	54.0	222.0	≥ 0.2	1
SVRRC	54.0	246.0	≥ 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	[0.0225 , 0.0894]	0.9049
MORF	[-0.02285 , -0.00105]	0.9049
MTS	[-0.00525 , 0.01015]	0.9049
MTSC	[-0.00245 , 0.00555]	0.9049
RC	[-0.00755 , -0.0014]	0.9049
ERC	[-0.00385 , 0.00285]	0.9049
ERCC	[0.0007 , 0.008]	0.9049
SVR	[0.01165 , 0.0712]	0.9049
SVRRC	[0.01615 , 0.08685]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.01775 , 0.09765]	0.95094
MORF	[-0.02515 , 0.00175]	0.95094
MTS	[-0.0072 , 0.01145]	0.95094
MTSC	[-0.00305 , 0.0069]	0.95094
RC	[-0.0086 , -0.001]	0.95094
ERC	[-0.0042 , 0.00385]	0.95094
ERCC	[0.0003 , 0.0091]	0.95094
SVR	[0.00905 , 0.08295]	0.95094
SVRRC	[0.01255 , 0.093]	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	53.0	247.0	≥ 0.2	1
MORF	203.0	97.0	0.13552	0.125017
ST	150.0	150.0	≥ 0.2	0.988602
MTSC	149.0	151.0	≥ 0.2	1
RC	192.0	84.0	0.10454	0.097395
ERC	156.0	144.0	≥ 0.2	0.852669
ERCC	127.0	173.0	≥ 0.2	1
SVR	75.0	225.0	≥ 0.2	1
SVRRC	58.0	242.0	≥ 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	[0.0165 , 0.07365]	0.9049
MORF	[-0.0235 , 0.00155]	0.9049
ST	[-0.01015 , 0.00525]	0.9049
MTSC	[-0.0065 , 0.0079]	0.9049
RC	[-0.0174 , -0.00005]	0.9049
ERC	[-0.01255 , 0.0098]	0.9049
ERCC	[-0.00315 , 0.0096]	0.9049
SVR	[0.0075 , 0.0629]	0.9049
SVRRC	[0.01115 , 0.07035]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.012 , 0.0886]	0.95094
MORF	[-0.02605 , 0.0039]	0.95094
ST	[-0.01145 , 0.0072]	0.95094
MTSC	[-0.00825 , 0.00935]	0.95094
RC	[-0.0221 , 0.00205]	0.95094
ERC	[-0.01375 , 0.01195]	0.95094
ERCC	[-0.0044 , 0.0148]	0.95094
SVR	[0.00375 , 0.07255]	0.95094
SVRRC	[0.00745 , 0.0867]	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	49.0	251.0	≥ 0.2	1
MORF	215.0	85.0	0.06464	0.061286
ST	148.0	152.0	≥ 0.2	1
MTS	151.0	149.0	≥ 0.2	0.965815
RC	198.0	78.0	0.06982	0.06371
ERC	163.5	136.5	≥ 0.2	0.688101
ERCC	61.0	239.0	≥ 0.2	1
SVR	71.0	229.0	≥ 0.2	1
SVRRC	61.0	239.0	≥ 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	[0.01895 , 0.08285]	0.9049
MORF	[-0.0241 , -0.00115]	0.9049
ST	[-0.00555 , 0.00245]	0.9049
MTS	[-0.0079 , 0.0065]	0.9049
RC	[-0.01305 , -0.00025]	0.9049
ERC	[-0.0059 , 0.0019]	0.9049
ERCC	[0.0009 , 0.00495]	0.9049
SVR	[0.01 , 0.0683]	0.9049
SVRRC	[0.0138 , 0.07995]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.016 , 0.09465]	0.95094
MORF	[-0.02705 , 0.0005]	0.95094
ST	[-0.0069 , 0.00305]	0.95094
MTS	[-0.00935 , 0.00825]	0.95094
RC	[-0.02 , 0.0004]	0.95094
ERC	[-0.00735 , 0.00255]	0.95094
ERCC	[0.0007 , 0.00515]	0.95094
SVR	[0.00655 , 0.0795]	0.95094
SVRRC	[0.01005 , 0.09075]	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	30.0	270.0	≥ 0.2	1
MORF	161.0	139.0	≥ 0.2	0.74248
ST	63.5	236.5	≥ 0.2	1
MTS	84.0	192.0	≥ 0.2	1
MTSC	78.0	198.0	≥ 0.2	1
ERC	59.5	240.5	≥ 0.2	1
ERCC	40.0	260.0	≥ 0.2	1
SVR	45.0	255.0	≥ 0.2	1
SVRRC	35.0	265.0	≥ 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	[0.0293 , 0.0963]	0.9049
MORF	[-0.0162 , 0.0116]	0.9049
ST	[0.0014 , 0.00755]	0.9049
MTS	[0.00005 , 0.0174]	0.9049
MTSC	[0.00025 , 0.01305]	0.9049
ERC	[0.00065 , 0.0056]	0.9049
ERCC	[0.00225 , 0.0139]	0.9049
SVR	[0.02005 , 0.08295]	0.9049
SVRRC	[0.0226 , 0.0916]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.02445 , 0.1132]	0.95094
MORF	[-0.0192 , 0.0144]	0.95094
ST	[0.001 , 0.0086]	0.95094
MTS	[-0.00205 , 0.0221]	0.95094
MTSC	[-0.0004 , 0.02]	0.95094
ERC	[0.00055 , 0.0075]	0.95094
ERCC	[0.00175 , 0.018]	0.95094
SVR	[0.01565 , 0.09745]	0.95094
SVRRC	[0.01865 , 0.10955]	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	45.0	255.0	≥ 0.2	1
MORF	195.0	105.0	≥ 0.2	0.193601
ST	129.0	171.0	≥ 0.2	1
MTS	144.0	156.0	≥ 0.2	1
MTSC	136.5	163.5	≥ 0.2	1
RC	240.5	59.5	0.008317	0.008826
ERCC	73.0	203.0	≥ 0.2	1
SVR	68.0	232.0	≥ 0.2	1
SVRRC	59.0	241.0	≥ 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	[0.02025 , 0.09275]	0.9049
MORF	[-0.02165 , 0.0041]	0.9049
ST	[-0.00285 , 0.00385]	0.9049
MTS	[-0.0098 , 0.01255]	0.9049
MTSC	[-0.0019 , 0.0059]	0.9049
RC	[-0.0056 , -0.00065]	0.9049
ERCC	[0.0002 , 0.0119]	0.9049
SVR	[0.01215 , 0.07925]	0.9049
SVRRC	[0.01475 , 0.09015]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.01525 , 0.10965]	0.95094
MORF	[-0.02495 , 0.0066]	0.95094
ST	[-0.00385 , 0.0042]	0.95094
MTS	[-0.01195 , 0.01375]	0.95094
MTSC	[-0.00255 , 0.00735]	0.95094
RC	[-0.0075 , -0.00055]	0.95094
ERCC	[-0 , 0.01285]	0.95094
SVR	[0.0077 , 0.0913]	0.95094
SVRRC	[0.0112 , 0.104]	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	54.0	246.0	≥ 0.2	1
MORF	234.0	66.0	0.015044	0.015766
ST	229.5	70.5	0.02203	0.021326
MTS	173.0	127.0	≥ 0.2	0.501948
MTSC	239.0	61.0	0.009576	0.010008
RC	260.0	40.0	9.626E-4	0.001532
ERC	203.0	73.0	0.04844	0.046351
SVR	78.0	222.0	≥ 0.2	1
SVRRC	65.0	235.0	≥ 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	[0.0157 , 0.07915]	0.9049
MORF	[-0.0286 , -0.00375]	0.9049
ST	[-0.008 , -0.0007]	0.9049
MTS	[-0.0096 , 0.00315]	0.9049
MTSC	[-0.00495 , -0.0009]	0.9049
RC	[-0.0139 , -0.00225]	0.9049
ERC	[-0.0119 , -0.0002]	0.9049
SVR	[0.00565 , 0.0633]	0.9049
SVRRC	[0.01105 , 0.0765]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.01235 , 0.0912]	0.95094
MORF	[-0.0305 , -0.0024]	0.95094
ST	[-0.0091 , -0.0003]	0.95094
MTS	[-0.0148 , 0.0044]	0.95094
MTSC	[-0.00515 , -0.0007]	0.95094
RC	[-0.018 , -0.00175]	0.95094
ERC	[-0.01285 , 0]	0.95094
SVR	[0.00155 , 0.0773]	0.95094
SVRRC	[0.0076 , 0.086]	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	4.0	296.0	≥ 0.2	1
MORF	266.5	33.5	4.013E-4	0.000794
ST	222.0	54.0	0.009146	0.010168
MTS	225.0	75.0	0.03148	0.030995
MTSC	229.0	71.0	0.02294	0.022633
RC	255.0	45.0	0.0017796	0.002576
ERC	232.0	68.0	0.01787	0.018416
ERCC	222.0	78.0	0.03948	0.038319
SVRRC	40.0	260.0	≥ 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	[0.0069 , 0.0145]	0.9049
MORF	[-0.0686 , -0.0191]	0.9049
ST	[-0.0712 , -0.01165]	0.9049
MTS	[-0.0629 , -0.0075]	0.9049
MTSC	[-0.0683 , -0.01]	0.9049
RC	[-0.08295 , -0.02005]	0.9049
ERC	[-0.07925 , -0.01215]	0.9049
ERCC	[-0.0633 , -0.00565]	0.9049
SVRRC	[0.00335 , 0.0107]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.00645 , 0.01535]	0.95094
MORF	[-0.08635 , -0.0159]	0.95094
ST	[-0.08295 , -0.00905]	0.95094
MTS	[-0.07255 , -0.00375]	0.95094
MTSC	[-0.0795 , -0.00655]	0.95094
RC	[-0.09745 , -0.01565]	0.95094
ERC	[-0.0913 , -0.0077]	0.95094
ERCC	[-0.0773 , -0.00155]	0.95094
SVRRC	[0.0029 , 0.0114]	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	16.0	284.0	≥ 0.2	1
MORF	273.5	26.5	1.3834E-4	0.000377
ST	246.0	54.0	0.00481	0.005831
MTS	242.0	58.0	0.00719	0.008221
MTSC	239.0	61.0	0.009576	0.010279
RC	265.0	35.0	4.944E-4	0.000967
ERC	241.0	59.0	0.00792	0.008941
ERCC	235.0	65.0	0.01378	0.014572
SVR	260.0	40.0	9.626E-4	0.001593

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	[0.00185 , 0.0049]	0.9049
MORF	[-0.0815 , -0.02505]	0.9049
ST	[-0.08685 , -0.01615]	0.9049
MTS	[-0.07035 , -0.01115]	0.9049
MTSC	[-0.07995 , -0.0138]	0.9049
RC	[-0.0916 , -0.0226]	0.9049
ERC	[-0.09015 , -0.01475]	0.9049
ERCC	[-0.0765 , -0.01105]	0.9049
SVR	[-0.0107 , -0.00335]	0.9049

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

α=0.95	Confidence interval	Exact confidence
SVRCC	[0.0016 , 0.0054]	0.95094
MORF	[-0.0933 , -0.02135]	0.95094
ST	[-0.093 , -0.01255]	0.95094
MTS	[-0.0867 , -0.00745]	0.95094
MTSC	[-0.09075 , -0.01005]	0.95094
RC	[-0.10955 , -0.01865]	0.95094
ERC	[-0.104 , -0.0112]	0.95094
ERCC	[-0.086 , -0.0076]	0.95094
SVR	[-0.0114 , -0.0029]	0.95094

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