data/CADD.csv

May 9, 2011

1 Tables of Friedman, Aligned Friedman, Bonferroni-Dunn, Holm, Hochberg and Hommel Tests

Table 1: Average Rankings of the algorithms (Friedman)

Algorithm	Ranking
C45Rules$_G M_t st$	3.4880952380952372
OCEC$_G M_t st$	2.1428571428571423
Ripper$_G M_t st$	3.8333333333333335
GAssist$_G M_t st$	5.809523809523812
REGAL$_G M_t st$	6.166666666666666
UCS$_G M_t st$	7.5952380952380985
REGALTC$_G M_t st$	4.6428571428571415
SIA$_G M_t st$	6.833333333333335
Oblique-DT$_G M_t st$	4.488095238095238

Friedman statistic (distributed according to chi-square with 8 degrees of freedom: 136.15079365079404. P-value computed by Friedman

Test: 6.218070502939099E-11.

Iman and Davenport statistic (distributed according to F-distribution with 8 and 328 degrees of freedom: 27.931972518962848. P-value computed by Iman and Daveport Test: 5.156993377855609E-33.

Table 2: Average Rankings of the algorithms (Aligned Friedman)

Algorithm	Ranking
C45Rules$_G M_t st$	142.05952380952388
OCEC$_G M_t st$	80.69047619047619
Ripper$_G M_t st$	152.07142857142856
GAssist$_G M_t st$	205.47619047619042
REGAL$_G M_t st$	228.26190476190473
UCS$_G M_t st$	295.0
REGALTC$_G M_t st$	171.95238095238102
SIA$_G M_t st$	249.83333333333334
Oblique-DT$_G M_t st$	180.15476190476198

Aligned Friedman statistic (distributed according to chi-square with 8 degrees of freedom: 38.20419288155055. P-value computed by Aligned Friedman Test: 6.901751588350713E-6.

Table 3: Average Rankings of the algorithms (Quade)

Algorithm	Ranking
C45Rules$_G M_t st$	3.6334440753045407
OCEC$_G M_t st$	2.1528239202657806
Ripper$_G M_t st$	4.028792912513843
GAssist$_G M_t st$	5.56699889258029
REGAL$_G M_t st$	5.9169435215946855
UCS$_G M_t st$	7.671096345514953
REGALTC$_G M_t st$	4.858250276854929
SIA$_G M_t st$	6.668881506090807
Oblique-DT$_G M_t st$	4.5027685492801774

Quade statistic (distributed according to F-distribution with 8 and 328 degrees of freedom: 16.071882220231338. P-value computed by Quade Test: 4.9510130816464864E-20.

Table 4: Contrast Estimation

	C45Rules$_G M_t st$	OCEC$_G M_t st$	Ripper$_G M_t st$	GAssist$_G M_t st$	REGAL$_G M_t st$	UCS$_G M_t st$	REGALTC$_G M_t st$	SIA$_G M_t st$	Oblique-DT$_G M_t st$
C45Rules$_G M_t st$	0,00000000	-0,03858944	0,03098500	0,07440278	0,14646500	0,20091333	0,05268611	0,19637000	0,04556722
OCEC$_G M_t st$	0,03858944	0,00000000	0,06957444	0,11299222	0,18505444	0,23950278	0,09127556	0,23495944	0,08415667
Ripper$_G M_t st$	-0,03098500	-0,06957444	0,00000000	0,04341778	0,11548000	0,16992833	0,02170111	0,16538500	0,01458222
GAssist$_G M_t st$	-0,07440278	-0,11299222	-0,04341778	0,00000000	0,07206222	0,12651056	-0,02171667	0,12196722	-0,02883556
REGAL$_G M_t st$	-0,14646500	-0,18505444	-0,11548000	-0,07206222	0,00000000	0,05444833	-0,09377889	0,04990500	-0,10089778
UCS$_G M_t st$	-0,20091333	-0,23950278	-0,16992833	-0,12651056	-0,05444833	0,00000000	-0,14822722	-0,00454333	-0,15534611
REGALTC$_G M_t st$	-0,05268611	-0,09127556	-0,02170111	0,02171667	0,09377889	0,14822722	0,00000000	0,14368389	-0,00711889
SIA$_G M_t st$	-0,19637000	-0,23495944	-0,16538500	-0,12196722	-0,04990500	0,00454333	-0,14368389	0,00000000	-0,15080278
Oblique-DT$_G M_t st$	-0,04556722	-0,08415667	-0,01458222	0,02883556	0,10089778	0,15534611	0,00711889	0,15080278	0,00000000

Table 5: Holm / Hochberg / Holland / Rom / Finner / Li Table for $\alpha = 0.05$ (FRIEDMAN)

i	algorithm	$z = (R_0 - R_i)/SE$	p	Holm/Hochberg/Hommel	Holland	Rom	Finner	Li
8	$\mathrm{UCS}_G M_t st$	9.123578384585878	7.268389365616312E-20	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.051348175883
7	$\mathrm{SIA}_G M_t st$	7.848667867962522	4.204795278704 7204E-15	0.007142857142857 1435	0.007300831979014655	0.007512829321378 4685	0.012741455098566168	0.051348175883
6	$\mathrm{REGAL}_G M_t st$	6.733121165917084	1.660616602240 1707E-11	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490195694	0.051348175883
5	$\mathrm{GAssist}_G M_t st$	6.135506861249893	8.48881018184307E-10	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.051348175883
4	$\mathrm{REGALTC}_G M_t st$	4.183300132670377	2.873076843493005E-5	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.051348175883
3	$\mathrm{Oblique\text{-}DT}_G M_t st$	3.92433393398126	8.697002821510009E-5	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.051348175883
2	$\mathrm{Ripper}_G M_t st$	2.828707708758066	0.0046736362187785345	0.025	0.025320565519103666	0.025	0.04388935252272508	0.051348175883
1	$\mathrm{C45Rules}_G M_t st$	2.2510138809131077	0.024384658221502854	0.05	0.050000000000000044	0.05	0.050000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value ≤ 0.00625.
Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.05.
Hommel's procedure rejects all hypotheses.
Rom's procedure rejects those hypotheses that have a p-value ≤ 0.05.
Li's procedure rejects those hypotheses that have a p-value ≤ 0.05.

Table 6: Holm / Hochberg / Holland / Rom / Finner / Li Table for $\alpha = 0.05$ (ALIGNED FRIEDMAN)

i	algorithm	$z = (R_0 - R_i)/SE$	p	Holm/Hochberg/Hommel	Holland	Rom	Finner	Li
8	$\mathrm{UCS}_G M_t st$	8.988272628648058	2.511464095672529E-19	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.05210225111500
7	$\mathrm{SIA}_G M_t st$	7.093954977659795	1.303325463987559E-12	0.0071428571428571435	0.007300831979014655	0.0075128293213784685	0.012741455098566168	0.05210225111500
6	$\mathrm{REGAL}_G M_t st$	6.189236057367032	6.045649070893803E-10	0.008333333333333333	0.00851244461084710 3	0.008764162596519848	0.019051173490195694	0.05210225111500
5	$\mathrm{GAssist}_G M_t st$	5.233589250832624	1.6624967405572088E-7	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.05210225111500
4	$\mathrm{Oblique\text{-}DT}_G M_t st$	4.171593034793611	3.0247750995881622E-5	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.05210225111500
3	$\mathrm{REGALTC}_G M_t st$	3.827580156161319	1.2940924785338753E-4	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.05210225111500
2	$\mathrm{Ripper}_G M_t st$	2.993760842204963	0.002755618503700166	0.025	0.025320565519103666	0.025	0.04388935252272508	0.05210225111500
1	$\mathrm{C45Rules}_G M_t st$	2.573855427212576	0.010057228814973335	0.05	0.050000000000000044	0.05	0.050000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value ≤ 0.00625.
Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.05.
Hommel's procedure rejects all hypotheses.
Rom's procedure rejects those hypotheses that have a p-value ≤ 0.05.
Li's procedure rejects those hypotheses that have a p-value ≤ 0.05.

Table 7: Holm / Hochberg / Holland / Rom / Finner / Li Table for $\alpha = 0.05$ (QUADE)

i	algorithm	$z = (R_0 - R_i)/SE$	p	Holm/Hochberg/Hommel	Holland	Rom	Finner	Li
8	$\mathrm{UCS}_G M_t st$	4.021819276296022	5.7750361029781945E-5	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.0378662303104
7	$\mathrm{SIA}_G M_t st$	3.291386515901097	9.969483181298817E-4	0.0071428571428571435	0.007300831979014655	0.0075128293213784685	0.012741455098566168	0.0378662303104
6	$\mathrm{REGAL}_G M_t st$	2.743360168599273	0.006081394261116612	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490195694	0.0378662303104
5	$\mathrm{GAssist}_G M_t st$	2.4883140334779523	0.012835034332092583	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.0378662303104
4	$\mathrm{REGALTC}_G M_t st$	1.9717648990550234	0.04863645108492409	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.0378662303104
3	$\mathrm{Oblique\text{-}DT}_G M_t st$	1.7126832238210226	0.08677083311187717	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.0378662303104
2	$\mathrm{Ripper}_G M_t st$	1.3672409901756895	0.17154978112443117	0.025	0.025320565519103666	0.025	0.04388935252272508	0.0378662303104
1	$\mathrm{C45Rules}_G M_t st$	1.0791034261303993	0.2805416241014695	0.05	0.050000000000000044	0.05	0.050000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value ≤ 0.00625.
Holm's procedure rejects those hypotheses that have a p-value ≤ 0.01.
Hochberg's procedure rejects those hypotheses that have a p-value $\leq 0.008333333333333333$.
Hommel's procedure rejects those hypotheses that have a p-value ≤ 0.01.
Holland's procedure rejects those hypotheses that have a p-value $\leq 0.010206218313011495$.
Rom's procedure rejects those hypotheses that have a p-value $\leq 0.008764162596519848$.
Finner's procedure rejects those hypotheses that have a p-value $\leq 0.031549888917161595$.
Li's procedure rejects those hypotheses that have a p-value ≤ 0.03786623031044897.

Table 8: Adjusted p-values (FRIEDMAN)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Homm}
1	UCS$_G M_t st$	7.268389365616312E-20	5.81471149249305E-19	5.81471149249305E-19	5.81471149249305E-19	5.81471149249305E-19
2	SIA$_G M_t st$	4.2047952787047204E-15	3.3638362229637764E-14	2.943356695093304E-14	2.943356695093304E-14	2.943356695093304E-14
3	REGAL$_G M_t st$	1.6606166022401707E-11	1.3284932817921365E-10	9.963699613441023E-11	9.963699613441023E-11	9.963699613441023E-11
4	GAssist$_G M_t st$	8.48881018184307E-10	6.791048145474456E-9	4.244405090921535E-9	4.244405090921535E-9	4.244405090921535E-9
5	REGALTC$_G M_t st$	2.873076843493005E-5	2.298461474794404E-4	1.149230737397202E-4	1.149230737397202E-4	1.149230737397202E-4
6	Oblique-DT$_G M_t st$	8.697002821510009E-5	6.957602257208007E-4	2.6091008464530026E-4	2.6091008464530026E-4	2.6091008464530026E-4
7	Ripper$_G M_t st$	0.0046736362187785345	0.037389089750228276	0.009347272437557069	0.009347272437557069	0.009347272437557069
8	C45Rules$_G M_t st$	0.024384658221502854	0.1950772657720283	0.024384658221502854	0.024384658221502854	0.024384658221502854

Table 9: Adjusted p-values (FRIEDMAN)

i	algorithm	unadjusted p	p_{Holl}	p_{Rom}	p_{Finn}	p_{Li}
1	UCS$_G M_t st$	7.268389365616312E-20	0.0	5.528027766136871E-19	0.0	7.4500564457775E-20
2	SIA$_G M_t st$	4.2047952787047204E-15	2.953193245502916 4E-14	2.7984099590413808E-14	1.68753899743023 8E-14	4.309890485157372E-15
3	REGAL$_G M_t st$	1.6606166022401707E-11	9.963696534498467E-11	9.47390343316761E-11	4.428313271631623E-11	1.702122272067478E-11
4	GAssist$_G M_t st$	8.48881018184307E-10	4.244404827602466E-9	4.036389700964838E-9	1.6977619310409864E-9	8.700980612894324E-10
5	REGALTC$_G M_t st$	2.873076843493005E-5	1.149181210921002E-4	1.0958099999019805E-4	4.5968833274900867E-5	2.9448001831167782E-5
6	Oblique-DT$_G M_t st$	8.697002821510009E-5	2.608873939456968E-4	2.6091008464530026E-4	1.1595835674638177E-4	8.913582264047043E-5
7	Ripper$_G M_t st$	0.0046736362187785345	0.009325429562051735	0.009347272437557069	0.005339513057682099	0.004767610698150197
8	C45Rules$_G M_t st$	0.024384658221502854	0.02438465822150282	0.024384658221502854	0.02438465822150282	0.024384658221502854

Table 10: Adjusted p-values (ALIGNED FRIEDMAN)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Homm}
1	UCS$_G$ $M_t st$	2.511464095672529E-19	2.009171276538023 3E-18	2.009171276538023 3E-18	2.009171276538023 3E-18	2.009171276538023 3E-18
2	SIA$_G$ $M_t st$	1.303325463987559E-12	1.042660371190047 2E-11	9.123278247912912E-12	9.123278247912912E-12	9.123278247912912E-12
3	REGAL$_G$ $M_t st$	6.045649070893803E-10	4.836519256715043E-9	3.627389442536282E-9	3.627389442536282E-9	3.627389442536282E-9
4	GAssist$_G$ $M_t st$	1.662496740557 2088E-7	1.329997392445767E-6	8.312483702786044E-7	8.312483702786044E-7	8.312483702786044E-7
5	Oblique-DT$_G$ $M_t st$	3.024775099588 1622E-5	2.419820079670529 8E-4	1.209910039835264 9E-4	1.209910039835264 9E-4	1.209910039835264 9E-4
6	REGALTC$_G$ $M_t st$	1.294092478533875 3E-4	0.001035273982827 1003	3.882277435601626E-4	3.882277435601626E-4	3.882277435601626E-4
7	Ripper$_G$ $M_t st$	0.002755618503700166	0.022044948029601327	0.005511237007400332	0.005511237007400332	0.005511237007400332
8	C45Rules$_G$ $M_t st$	0.010057228814973335	0.080457830519786 68	0.010057228814973335	0.010057228814973335	0.010057228814973335

Table 11: Adjusted p-values (ALIGNED FRIEDMAN)

i	algorithm	unadjusted p	p_{Holl}	p_{Rom}	p_{Finn}	p_{Li}
1	UCS$_G$ $M_t st$	2.511464095672529E-19	0.0	1.9101127576090363E-18	0.0	2.536979074725846E-19
2	SIA$_G$ $M_t st$	1.303325463987559E-12	9.123035660252299E-12	8.673998906630 88E-12	5.213163234429885E-12	1.316566474267675 7E-12
3	REGAL$_G$ $M_t st$	6.045649070893803E-10	3.627389721927443E-9	3.449074001259666E-9	1.612173127380961E-9	6.107069260139799E-10
4	GAssist$_G$ $M_t st$	1.662496740557 2088E-7	8.312480938021949E-7	7.905094562988292E-7	3.324993204101 2897E-7	1.679386435005372 7E-7
5	Oblique-DT$_G$ $M_t st$	3.024775099588 1622E-5	1.209855145357652 3E-4	1.153668691142088E-4	4.839596242700 5834E-5	3.055411654389380 4E-5
6	REGALTC$_G$ $M_t st$	1.294092478533875 3E-4	3.881775054671577E-4	3.882277435601626E-4	1.725419421967355 8E-4	1.307068821960103 3E-4
7	Ripper$_G$ $M_t st$	0.002755618503700166	0.005503643574062522	0.005511237007400332	0.003148657929171 0726	0.002775886948466014
8	C45Rules$_G$ $M_t st$	0.010057228814973335	0.010057228814973285	0.010057228814973335	0.010057228814973285	0.010057228814973335

Table 12: Adjusted p-values (QUADE)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Homm}
1	UCS$_G M_t st$	5.7750361029781945E-5	4.620028882382556E-4	4.620028882382556E-4	4.620028882382556E-4	4.620028882382556E-4
2	SIA$_G M_t st$	9.969483181298817E-4	0.007975586545039054	0.006978638226909172	0.006978638226909172	0.006978638226909172
3	REGAL$_G M_t st$	0.006081394261116612	0.0486511540889329	0.036488365566699675	0.036488365566699675	0.036488365566699675
4	GAssist$_G M_t st$	0.012835034332092583	0.10268027465674066	0.06417517166046291	0.06417517166046291	0.06417517166046291
5	REGALTC$_G M_t st$	0.04863645108492409	0.38909160867939274	0.19454580433969637	0.19454580433969637	0.17354166622375433
6	Oblique-DT$_G M_t st$	0.08677083311187717	0.6941666648950173	0.2603124993356315	0.2603124993356315	0.25732467168664674
7	Ripper$_G M_t st$	0.17154978112443117	1.3723982489954494	0.34309956224886234	0.2805416241014695	0.2805416241014695
8	C45Rules$_G M_t st$	0.2805416241014695	2.244332992811756	0.34309956224886234	0.2805416241014695	0.2805416241014695

Table 13: Adjusted p-values (QUADE)

i	algorithm	unadjusted p	p_{Holl}	p_{Rom}	p_{Finn}	p_{Li}
1	UCS$_G M_t st$	5.7750361029781945E-5	4.619095161052522E-4	4.392246799370432E-4	4.619095161052522E-4	8.026277510971162E-5
2	SIA$_G M_t st$	9.969483181298817E-4	0.006957800847976148	0.0066349724949359016	0.00398183379932914 9	0.0013837753495872182
3	REGAL$_G M_t st$	0.006081394261116612	0.03593809296503836	0.03469466816790612	0.016134977250296112	0.00838188960996372
4	GAssist$_G M_t st$	0.012835034332092583	0.06254879944501224	0.06102999039889046	0.02550533055787907	0.01752717442595914
5	REGALTC$_G M_t st$	0.04863645108492409	0.18080738143507047	0.1855025547935126	0.07667538810202967	0.06332089395255328
6	Oblique-DT$_G M_t st$	0.08677083311187717	0.23837827990133764	0.2603124993356315	0.11398780777885653	0.10762551411202596
7	Ripper$_G M_t st$	0.17154978112443117	0.3136702348450221	0.2805416241014695	0.19352633389492435	0.1925344675828936
8	C45Rules$_G M_t st$	0.2805416241014695	0.3136702348450221	0.2805416241014695	0.28054162410146954	0.2805416241014695