

data/Chi2Merge.csv

May 9, 2011

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

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Table 1: Average Rankings of the algorithms (Friedman)

Algorithm	Ranking
C45Rules $_G M_t st$	5.928571428571429
OCEC $_G M_t st$	2.678571428571428
Ripper $_G M_t st$	4.321428571428571
Gassist $_G M_t st$	7.000000000000002
REGAL $_G M_t st$	4.904761904761902
UCS $_G M_t st$	6.107142857142858
REGALTC $_G M_t st$	3.5952380952380953
SIA $_G M_t st$	5.416666666666666
Oblique-DT $_G M_t st$	5.047619047619046

Friedman statistic (distributed according to chi-square with 8 degrees of freedom: 78.93650793650781. P-value computed by Friedman

Test: 4.624267635477963E-11.

Iman and Davenport statistic (distributed according to F-distribution with 8 and 328 degrees of freedom: 12.589873417721494. P-value computed by Iman and Davenport Test: 8.869724029859255E-16.

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

Algorithm	Ranking
C45Rules $_G M_t st$	221.2380952380952
OCEC $_G M_t st$	104.58333333333334
Ripper $_G M_t st$	159.08333333333334
GAssist $_G M_t st$	268.3571428571429
REGAL $_G M_t st$	199.40476190476193
UCS $_G M_t st$	230.7976190476191
REGALTC $_G M_t st$	115.28571428571428
SIA $_G M_t st$	196.58333333333331
Oblique-DT $_G M_t st$	210.16666666666667

Aligned Friedman statistic (distributed according to chi-square with 8 degrees of freedom: 38.03931917441491. P-value computed by Aligned Friedman Test: 7.4034524100152765E-6.

Table 3: Average Rankings of the algorithms (Quade)

Algorithm	Ranking
C45Rules $_G M_t st$	5.374861572535991
OCEC $_G M_t st$	2.4274640088593586
Ripper $_G M_t st$	4.335548172757475
GAssist $_G M_t st$	6.975636766334443
REGAL $_G M_t st$	5.506644518272425
UCS $_G M_t st$	6.086378737541528
REGALTC $_G M_t st$	3.381506090808416
SIA $_G M_t st$	5.781838316722039
Oblique-DT $_G M_t st$	5.130121816168328

Quade statistic (distributed according to F-distribution with 8 and 328 degrees of freedom: 10.228764331116873. P-value computed by Quade Test: 8.940629245482728E-13.

Table 4: Contrast Estimation

C45Rules $G_{Mf, st}$	0.00000000	C45Rules $G_{Mf, st}$	0.01497056	OCBC $G_{Mf, st}$	-0.06123944	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
OCBC $G_{Mf, st}$	0.06123944	OCBC $G_{Mf, st}$	-0.06123944	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
GAssist $G_{Mf, st}$	0.01943056	GAssist $G_{Mf, st}$	0.01943056	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
REGAL $G_{Mf, st}$	-0.02476944	REGAL $G_{Mf, st}$	-0.02476944	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
UCS $G_{Mf, st}$	0.00088722	UCS $G_{Mf, st}$	0.00088722	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
REGALTC $G_{Mf, st}$	-0.04894222	REGALTC $G_{Mf, st}$	-0.04894222	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
SIA $G_{Mf, st}$	-0.01567000	SIA $G_{Mf, st}$	-0.01567000	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056
Oblique-DT $G_{Mf, st}$	-0.01497056	Oblique-DT $G_{Mf, st}$	-0.01497056	Ripper $G_{Mf, st}$	-0.03737611	Ripper $G_{Mf, st}$	-0.03737611	GAssist $G_{Mf, st}$	0.01943056	REGAL $G_{Mf, st}$	-0.02476944	UCS $G_{Mf, st}$	0.00088722	REGALTC $G_{Mf, st}$	-0.04894222	SIA $G_{Mf, st}$	-0.01567000	Oblique-DT $G_{Mf, st}$	-0.01497056

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	GAssist $_G M_t st$	7.231133086473086	4.789806616338233E-13	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.0460494744561
7	UCS $_G M_t st$	5.737097324805092	9.631291710047965E-9	0.0071428571428571435	0.007300831979014655	0.0075128293213784685	0.012741455098566168	0.0460494744561
6	C45Rules $_G M_t st$	5.4382901724714925	5.379431304483515E-8	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490193694	0.0460494744561
5	SIA $_G M_t st$	4.581709669115176	4.6118988895952375E-6	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.0460494744561
4	Oblique-DT $_G M_t st$	3.9641748876257368	7.365024517435375E-5	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.0460494744561
3	REGAL $_G M_t st$	3.7251291657588577	1.9521523826168745E-4	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.0460494744561
2	Ripper $_G M_t st$	2.7490258014691062	0.00597726809246341	0.025	0.025320565519103666	0.025	0.04388935252272508	0.0460494744561
1	REGALTC $_G M_t st$	1.5338767153124733	0.12505998533266915	0.05	0.0500000000000000044	0.05	0.0500000000000000044	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 ≤ 0.05 .

Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.025 .

Hommel's procedure rejects those hypotheses that have a p-value ≤ 0.05 .

Holland's procedure rejects those hypotheses that have a p-value $\leq 0.0500000000000000044$.

Rom's procedure rejects those hypotheses that have a p-value ≤ 0.025 .

Finner's procedure rejects those hypotheses that have a p-value $\leq 0.0500000000000000044$.

Li's procedure rejects those hypotheses that have a p-value ≤ 0.04604947445617531 .

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	GAssist $_G M_t st$	6.868773833591343	6.475607466758905E-12	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.0182352909523
7	UCS $_G M_t st$	5.2935044111116917	1.1999434618598635E-7	0.0071428571428571435	0.007300831979014655	0.0075128293213784685	0.012741455098566168	0.0182352909523
6	C45Rules $_G M_t st$	4.892572130214548	9.952662198116047E-7	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490195694	0.0182352909523
5	Oblique-DT $_G M_t st$	4.428229638011313	9.5009716438236E-6	0.01	0.010206218313011495	0.010515350115740741	0.02532056519103666	0.0182352909523
4	REGAL $_G M_t st$	3.97686876386967	6.982867659038468E-5	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.0182352909523
3	SIA $_G M_t st$	3.8585363223081974	1.14406811701308812E-4	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.0182352909523
2	Ripper $_G M_t st$	2.285763364845618	0.02226810600290276	0.025	0.02532056519103666	0.025	0.04388935252272508	0.0182352909523
1	REGALTC $_G M_t st$	0.4488644091297962	0.6535294719050865	0.05	0.050000000000000044	0.05	0.050000000000000044	0.0182352909523

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 ≤ 0.05 .

Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.025 .

Hommel's procedure rejects those hypotheses that have a p-value ≤ 0.05 .

Holland's procedure rejects those hypotheses that have a p-value $\leq 0.050000000000000044$.

Rom's procedure rejects those hypotheses that have a p-value ≤ 0.025 .

Finner's procedure rejects those hypotheses that have a p-value $\leq 0.050000000000000044$.

Li's procedure rejects those hypotheses that have a p-value ≤ 0.01823529095236387 .

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	GAssist $_G M_t st$	3.3147926485546377	9.171112581803281E-4	0.00625	0.006391150954545011	0.006574125233361166	0.006391150954545011	0.02700776043293
7	UCS $_G M_t st$	2.6666849064583675	0.007660345424466925	0.0071428571428571435	0.007300831979014655	0.0075128293213784685	0.012741455098566168	0.02700776043293
6	SIA $_G M_t st$	2.444730200261017	0.014496053793404776	0.008333333333333333	0.008512444610847103	0.008764162596519848	0.019051173490195694	0.02700776043293
5	REGAL $_G M_t st$	2.2441638566608626	0.02482186059229654	0.01	0.010206218313011495	0.010515350115740741	0.025320565519103666	0.02700776043293
4	C45Rules $_G M_t st$	2.1481180019790997	0.03170438247899673	0.0125	0.012741455098566168	0.013109375000000001	0.031549888917161595	0.02700776043293
3	Oblique-DT $_G M_t st$	1.9697471289986828	0.04886735871281243	0.016666666666666666	0.016952427508441503	0.016666666666666666	0.03773939976903784	0.02700776043293
2	Ripper $_G M_t st$	1.3906471228292272	0.16433245936707666	0.025	0.025320565519103666	0.025	0.04388935252272508	0.02700776043293
1	REGALTC $_G M_t st$	0.6953235614146128	0.4868525517742737	0.05	0.0500000000000000044	0.05	0.0500000000000000044	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 $\leq 0.0071428571428571435$.

Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.00625 .

Hommel's procedure rejects those hypotheses that have a p-value $\leq 0.0071428571428571435$.

Holland's procedure rejects those hypotheses that have a p-value $\leq 0.007300831979014655$.

Rom's procedure rejects those hypotheses that have a p-value $\leq 0.006574125233361166$.

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 $\leq 0.027007760432932966$.

Table 8: Adjusted p -values (FRIEDMAN)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{ocb}	p_{Hommel}
1	GAssist $_G M_t st$	4.789806616338233E-13	3.831845293070586E-12	3.831845293070586E-12	3.831845293070586E-12	3.831845293070586E-12
2	UCS $_G M_t st$	9.631291710047965E-9	7.705033368038372E-8	6.741904197033576E-8	6.741904197033576E-8	6.741904197033576E-8
3	C45Rules $_G M_t st$	5.379431304483515E-8	4.303545043586812E-7	3.227658782690109E-7	3.227658782690109E-7	3.227658782690109E-7
4	SIA $_G M_t st$	4.611898889592375E-6	3.68951911167619E-5	2.305949444797619E-5	2.305949444797619E-5	2.305949444797619E-5
5	Oblique-DT $_G M_t st$	7.365024517435375E-5	5.8920196139483E-4	2.94600980697415E-4	2.94600980697415E-4	2.94600980697415E-4
6	REGAL $_G M_t st$	1.9521523826168745E-4	0.0015617219060934996	5.856457147850624E-4	5.856457147850624E-4	5.856457147850624E-4
7	Ripper $_G M_t st$	0.00597726809246341	0.04781814473970728	0.01195453618492682	0.01195453618492682	0.01195453618492682
8	REGALTC $_G M_t st$	0.12505998533266915	1.0004798826613532	0.12505998533266915	0.12505998533266915	0.12505998533266915

Table 9: Adjusted p -values (FRIEDMAN)

i	algorithm	unadjusted p	p_{Holl}	p_{Rom}	p_{Finn}	p_{Li}
1	GAssist $_G M_t st$	4.789806616338233E-13	3.83160170258634E-12	3.64292321618769595E-12	3.83160170258634E-12	5.474440002788977E-13
2	UCS $_G M_t st$	9.631291710047965E-9	6.74190403504582E-8	6.409896523697944E-8	3.85251666501379715E-8	1.1007945050597826E-8
3	C45Rules $_G M_t st$	5.379431304483515E-8	3.2276583461499087E-7	3.068993326652582E-7	1.43451494900502251E-7	6.14834261041657E-8
4	SIA $_G M_t st$	4.611898889592375E-6	2.3059281752724203E-5	2.1929364399819404E-5	9.223776509470483E-6	5.271075162430504E-6
5	Oblique-DT $_G M_t st$	7.365024517435375E-5	2.945684361437273E-4	2.8090677539682E-4	1.1783778856122584E-4	8.417039427803476E-5
6	REGAL $_G M_t st$	1.9521523826168745E-4	5.855313952568553E-4	5.856457147850624E-4	2.602785153172915E-4	2.2306865452410916E-4
7	Ripper $_G M_t st$	0.00597726809246341	0.011918808451077734	0.01195453618492682	0.006828241989814909	0.006785277357412537
8	REGALTC $_G M_t st$	0.12505998533266915	0.12505998533266915	0.12505998533266915	0.12505998533266915	0.12505998533266915

Table 10: Adjusted p -values (ALIGNED FRIEDMAN)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{ocb}	p_{omni}
1	GAssist $_G M_t st$	6.475607466758905E-12	5.180485973407124E-11	5.180485973407124E-11	5.180485973407124E-11	5.180485973407124E-11
2	UCS $_G M_t st$	1.1999434618598635E-7	9.599547694878908E-7	8.399604233019045E-7	8.399604233019045E-7	8.399604233019045E-7
3	C45Rules $_G M_t st$	9.952662198116047E-7	7.962129758492838E-6	5.971597318869628E-6	5.971597318869628E-6	5.971597318869628E-6
4	Oblique-DT $_G M_t st$	9.5009716438236E-6	7.60077731505888E-5	4.7504858219118E-5	4.7504858219118E-5	4.7504858219118E-5
5	REGAL $_G M_t st$	6.982867659038468E-5	5.586294127230774E-4	2.793147063615387E-4	2.793147063615387E-4	2.2813623402617624E-4
6	SIAG $_G M_t st$	1.1406811701308812E-4	9.12544936104705E-4	3.4220435103926437E-4	3.4220435103926437E-4	3.4220435103926437E-4
7	Ripper $_G M_t st$	0.02226810600290276	0.178144484802322209	0.04453621200580552	0.04453621200580552	0.04453621200580552
8	REGALTC $_G M_t st$	0.6535294719050865	5.2282235775240692	0.6535294719050865	0.6535294719050865	0.6535294719050865

Table 11: Adjusted p -values (ALIGNED FRIEDMAN)

i	algorithm	unadjusted p	p_{Bonf}	p_{Rom}	p_{inn}	p_{Li}
1	GAssist $_G M_t st$	6.475607466758905E-12	5.1804782685849204E-11	4.925071577506373E-11	5.1804782685849204E-11	1.8690211552031113E-11
2	UCS $_G M_t st$	1.1999434618598635E-7	8.39960121234995E-7	7.985962481839636E-7	4.799772985730755E-7	3.4633336719211124E-7
3	C45Rules $_G M_t st$	9.952662198116047E-7	5.971582460295721E-6	5.678045157484948E-6	2.6540410514863666E-6	2.872577261636077E-6
4	Oblique-DT $_G M_t st$	9.5009716438236E-6	4.7503955543315435E-5	4.5176677615333357E-5	1.900185301928481E-5	2.7421412049115542E-5
5	REGAL $_G M_t st$	6.982867659038468E-5	2.7928545145883277E-4	2.663310668524803E-4	1.1172354202160228E-4	2.0150229324207447E-4
6	SIAG $_G M_t st$	1.1406811701308812E-4	3.42165317917531E-4	3.4220435103926437E-4	1.520879311585066E-4	3.291205617901689E-4
7	Ripper $_G M_t st$	0.02226810600290276	0.04404034346084895	0.04453621200580552	0.025408524700795465	0.06038994546200883
8	REGALTC $_G M_t st$	0.6535294719050865	0.6535294719050865	0.6535294719050865	0.6535294719050865	0.6535294719050866

Table 12: Adjusted p -values (QUADE)

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Homn}
1	GAssist $_G M_t st$	9.171112581803281E-4	0.007336890065442625	0.007336890065442625	0.007336890065442625	0.007336890065442625
2	UCS $_G M_t st$	0.007660345424466925	0.0612827633957354	0.053622417971268474	0.053622417971268474	0.05073618827691671
3	SIA $_G M_t st$	0.014496053793404776	0.11596843034723821	0.08697632276042866	0.08697632276042866	0.07248026896702388
4	REGAL $_G M_t st$	0.02482186059229654	0.19857488473837231	0.1241093029614827	0.1241093029614827	0.09773471742562485
5	C45Rules $_G M_t st$	0.03170438247899673	0.2536350598319738	0.1268175299159869	0.1268175299159869	0.09773471742562485
6	Oblique-DT $_G M_t st$	0.04886735871281243	0.3909388697024994	0.1466020761384373	0.1466020761384373	0.1466020761384373
7	Ripper $_G M_t st$	0.16433245936707666	1.3146596749366133	0.3286649187341533	0.3286649187341533	0.3286649187341533
8	REGALTC $_G M_t st$	0.4868525517742737	3.89482041419419	0.4868525517742737	0.4868525517742737	0.4868525517742737

Table 13: Adjusted p -values (QUADE)

i	algorithm	unadjusted p	p_{Holl}	p_{Rom}	p_{Finn}	p_{Li}
1	GAssist $_G M_t st$	9.171112581803281E-4	0.00733382607332497	0.006975158105646817	0.00733382607332497	0.001784039069141547
2	UCS $_G M_t st$	0.007660345424466925	0.052405732327274857	0.05098176130974177	0.03029109096589855	0.014708584467943054
3	SIA $_G M_t st$	0.014496053793404776	0.08388453533578937	0.08270073514588261	0.038190681592557785	0.027473196842058685
4	REGAL $_G M_t st$	0.02482186059229654	0.11809910033266058	0.11802679092510651	0.04902759642132959	0.046139919481341544
5	C45Rules $_G M_t st$	0.03170438247899673	0.12091298524951455	0.12092255534301492	0.050242468840225096	0.058188998719137276
6	Oblique-DT $_G M_t st$	0.04886735871281243	0.13955471606448755	0.1466020761384373	0.06461992418650886	0.0869503047063963
7	Ripper $_G M_t st$	0.16433245936707666	0.3016597615325214	0.3286649187341533	0.18549178895040286	0.24256432925217924
8	REGALTC $_G M_t st$	0.4868525517742737	0.4868525517742737	0.4868525517742737	0.4868525517742737	0.4868525517742737