

# Results

June 18, 2010

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

Table 1: Average Rankings of the algorithms (Friedman)

Algorithm	Ranking
DE	2.6578947368421058
CHC	1.052631578947368
VXQR1	2.289473684210525

Friedman statistic (distributed according to chi-square with 2 degrees of freedom: 26.868421052631504. P-value computed by Friedman Test: 1.4642210944826317E-6.

Iman and Davenport statistic (distributed according to F-distribution with 2 and 36 degrees of freedom: 43.44680851063789. P-value computed by Iman and Davenport Test: 2.5229993262702134E-10.

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

Algorithm	Ranking
DE	34.236842105263165
CHC	12.421052631578945
VXQR1	40.34210526315789

Aligned Friedman statistic (distributed according to chi-square with 2 degrees of freedom): 13.136219919891504. P-value computed by Aligned Friedman Test: 0.001404449393120677.

Table 3: Average Rankings of the algorithms (Quade)

Algorithm	Ranking
DE	2.563157894736842
CHC	1.0052631578947366
VXQR1	2.431578947368421

Quade statistic (distributed according to F-distribution with 2 and 36 degrees of freedom: 24.272931992193364. P-value computed by Quade Test: 2.1173000850083926E-7.

Table 4: Contrast Estimation

	DE	CHC	VXQR1
DE	0.000	-453.8	199.8
CHC	453.8	0.000	653.7
VXQR1	-199.8	-653.7	0.000

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
2	DE	4.947753344488261	7.507495729163992E-7	0.025	0.025320565519103666	0.025	0.025320565519103666	0.05262432981785556
1	VXQR1	3.812203396572918	1.377334607444819E-4	0.05	0.050000000000000044	0.05	0.050000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value  $\leq 0.025$ .

Hochberg's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

Hommel's procedure rejects all hypotheses.

Rom's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

Li's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

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
2	VXQR1	5.184809310680317	2.1623599441112873E-7	0.025	0.025320565519103666	0.025	0.025320565519103666	0.05262889581554911
1	DE	4.051090403915159	5.0979504567130754E-5	0.05	0.050000000000000044	0.05	0.050000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value  $\leq 0.025$ .

Hochberg's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

Hommel's procedure rejects all hypotheses.

Rom's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

Li's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

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

$i$	algorithm	$z = (R_0 - R_t) / SE$	$p$	Holm/Hochberg/Hommel	Holland	Rom	Finner	Li
2	DE	4.211416909861094	2.5377389738907452E-5	0.025	0.025320565519103666	0.025	0.025320565519103666	0.05262550588795605
1	VXQR1	3.855722914095799	1.1538812883521275E-4	0.05	0.050000000000000044	0.05	0.050000000000000044	0.05

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value  $\leq 0.025$ .

Hochberg's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

Hommel's procedure rejects all hypotheses.

Rom's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

Li's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .

Table 8: Adjusted  $p$ -values (FRIEDMAN)

$i$	algorithm	unadjusted $p$	$p_{Bonf}$	$p_{Holm}$	$p_{Hoch}$	$p_{Homn}$
1	DE	7.507495729163992E-7	1.5014991458327985E-6	1.5014991458327985E-6	1.5014991458327985E-6	1.5014991458327985E-6
2	VXQR1	1.377334607444819E-4	2.754669214889638E-4	1.377334607444819E-4	1.377334607444819E-4	1.377334607444819E-4

Table 9: Adjusted  $p$ -values (FRIEDMAN)

$i$	algorithm	unadjusted $p$	$p_{Hall}$	$p_{Rom}$	$p_{Finn}$	$p_{Li}$
1	DE	7.507495729163992E-7	1.5014985822459082E-6	1.5014991458327985E-6	1.5014985822459082E-6	7.508524267175007E-7
2	VXQR1	1.377334607444819E-4	1.3773346074452686E-4	1.377334607444819E-4	1.3773346074452686E-4	1.3773346074448192E-4



Table 10: Adjusted  $p$ -values (ALIGNED FRIEDMAN)

$i$	algorithm	unadjusted $p$	$p_{Bonf}$	$p_{Holm}$	$p_{Hoch}$	$p_{Hommel}$
1	VXQR1	2.1623599441112873E-7	4.3247198882225746E-7	4.3247198882225746E-7	4.3247198882225746E-7	4.3247198882225746E-7
2	DE	5.0979504567130754E-5	1.0195900913426151E-4	5.0979504567130754E-5	5.0979504567130754E-5	5.0979504567130754E-5

Table 11: Adjusted  $p$ -values (ALIGNED FRIEDMAN)

$i$	algorithm	unadjusted $p$	$p_{Hol}$	$p_{Rom}$	$p_{Finn}$	$p_{Li}$
1	VXQR1	2.1623599441112873E-7	4.3247194214668383E-7	4.3247198882225746E-7	4.3247194214668383E-7	2.1624697181423696E-7
2	DE	5.0979504567130754E-5	5.0979504567116866E-5	5.0979504567130754E-5	5.0979504567116866E-5	5.0979504567130754E-5

Table 12: Adjusted  $p$ -values (QUADE)

$i$	algorithm	unadjusted $p$	$p_{Bonf}$	$p_{Holm}$	$p_{Hoch}$	$p_{Hommel}$
1	DE	2.5377389738907452E-5	5.0754779477814904E-5	5.0754779477814904E-5	5.0754779477814904E-5	5.0754779477814904E-5
2	VXQR1	1.1538812883521275E-4	2.307762576704255E-4	1.1538812883521275E-4	1.1538812883521275E-4	1.1538812883521275E-4

Table 13: Adjusted  $p$ -values (QUADE)

$i$	algorithm	unadjusted $p$	$p_{Holl}$	$p_{Rom}$	$p_{Firm}$	$p_{Li}$
1	DE	2.5377389738907452E-5	5.075413546595797E-5	5.0754779477814904E-5	5.075413546595797E-5	2.537967418213861E-5
2	VXQR1	1.1538812883521275E-4	1.1538812883515881E-4	1.1538812883521275E-4	1.1538812883515881E-4	1.1538812883521275E-4