

Results

April 6, 2021

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

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Table 1: Average Rankings of the algorithms

Algorithm	Ranking
parzen	2.9545454545453
parzen des	1.9545454545454
parzen destr	1.09090909090906

Friedman statistic considering reduction performance (distributed according to chi-square with 2 degrees of freedom: 38.2727272726954.  
P-value computed by Friedman Test: 4.942269260510557E-9.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 2 and 42 degrees of freedom: 140.3333333332433.

P-value computed by Iman and Davenport Test: 2.53745847591088E-19.

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

Table 2: Holm / Hochberg Table for  $\alpha = 0.05$

$i$	algorithm	$z = (R_0 - R_i)/SE$	$p$	Holm/Hochberg/Hommel
2	parzen	6.180982563844149	6.37038531465702E-10	0.025
1	parzen des	2.864357773488753	0.004178557568166526	0.05

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

Table 3: Holm / Hochberg Table for  $\alpha = 0.10$

$i$	algorithm	$z = (R_0 - R_i)/SE$	$p$	Holm/Hochberg/Hommel
2	parzen	6.180982563844149	6.37038531465702E-10	0.05
1	parzen des	2.864357773488753	0.004178557568166526	0.1

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value  $\leq 0.05$ .  
Hochberg's procedure rejects those hypotheses that have a p-value  $\leq 0.1$ .  
Hommel's procedure rejects all hypotheses.

Table 4: Adjusted  $p$ -values

$i$	algorithm	unadjusted $p$	$p_{Bonf}$	$p_{Holm}$	$p_{Hoch}$	$p_{Hommel}$
1	parzen	6.37038531465702E-10	1.274077062931404E-9	1.274077062931404E-9	1.274077062931404E-9	1.274077062931404E-9
2	parzen des	0.004178557568166526	0.008357115136333053	0.004178557568166526	0.004178557568166526	0.004178557568166526

Table 5: Holm / Shaffer Table for  $\alpha = 0.05$

$i$	algorithms	$z = (R_0 - R_i)/SE$	$p$	Holm	Shaffer
3	parzen vs. parzen desthr	6.180982563844149	6.37038531465702E-10	0.016666666666666666	0.016666666666666666
2	parzen vs. parzen des	3.3166247903553963	9.111188771537253E-4	0.025	0.05
1	parzen des vs. parzen desthr	2.864357773488753	0.004178557568166526	0.05	0.05

Nemenyi's procedure rejects those hypotheses that have a p-value  $\leq 0.016666666666666666$ .  
Shaffer's procedure rejects those hypotheses that have a p-value  $\leq 0.016666666666666666$ .  
Bergmann's procedure rejects these hypotheses:

- parzen vs. parzen des
- parzen vs. parzen desthr
- parzen des vs. parzen desthr

Table 6: Holm / Shaffer Table for  $\alpha = 0.10$

$i$	algorithms	$z = (R_0 - R_k)/SE$	$p$	Holm	Shaffer
3	parzen vs. parzen desthr	6.180982563844149	6.37038531465702E-10	0.0333333333333333	0.0333333333333333
2	parzen vs. parzen des	3.3166247903553963	9.111188771537253E-4	0.05	0.1
1	parzen des vs. parzen desthr	2.864357773488753	0.004178557568166526	0.1	0.1

Nemenyi's procedure rejects those hypotheses that have a p-value  $\leq 0.0333333333333333$ .  
 Shaffer's procedure rejects those hypotheses that have a p-value  $\leq 0.0333333333333333$ .  
 Bergmann's procedure rejects these hypotheses:

- parzen vs. parzen des
- parzen vs. parzen desthr
- parzen des vs. parzen desthr

Table 7: Adjusted  $p$ -values

$i$	hypothesis	unadjusted $p$	$p_{Nemc}$	$p_{Holm}$	$p_{Shaf}$	$p_{Berg}$
1	parzen vs .parzen desthr	6.37038531465702E-10	1.911115594397106E-9	1.911115594397106E-9	1.911115594397106E-9	1.911115594397106E-9
2	parzen vs .parzen des	9.111188771537253E-4	0.002733356631461176	0.0018222377543074507	9.111188771537253E-4	9.111188771537253E-4
3	parzen des vs .parzen desthr	0.004178557568166526	0.012535672704499578	0.004178557568166526	0.004178557568166526	0.004178557568166526