

Results

April 5, 2021

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

Table 1: Average Rankings of the algorithms

Algorithm	Ranking
parzen	2.749999999999999
parzen des	1.999999999999993
parzen desthr	1.249999999999996

Friedman statistic considering reduction performance (distributed according to chi-square with 2 degrees of freedom: 24.74999999999805.  
P-value computed by Friedman Test: 4.2228836869551145E-6.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 2 and 42 degrees of freedom: 26.99999999999513.

P-value computed by Iman and Daveport Test: 2.8876144374466767E-8.

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	4.974937185533098	6.526880098667021E-7	0.025
1	parzen des	2.487468592766549	0.01286558129455608	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	4.974937185533098	6.526880098667021E-7	0.05
1	parzen des	2.487468592766549	0.01286558129455608	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	6.526880098667021E-7	1.3053760197334043E-6	1.3053760197334043E-6	1.3053760197334043E-6	1.3053760197334043E-6
2	parzen des	0.01286558129455608	0.02573116258911216	0.01286558129455608	0.01286558129455608	0.01286558129455608

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

$i$	algorithms	$z = (R_0 - R_i)/SE$	$p$	Holm	Shaffer
3	parzen vs. parzen destr	4.974937185533098	6.526880098667021E-7	0.016666666666666666	0.016666666666666666
2	parzen vs. parzen des	2.487468592766549	0.01286558129455608	0.025	0.05
1	parzen des vs. parzen destr	2.487468592766549	0.01286558129455608	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	$z = (R_0 - R_i)/SE$	$p$	Holm	Shaffer
3	parzen vs. parzen desthr	4.97493718553098	6.526880098667021E-7	0.0333333333333333	0.0333333333333333
2	parzen vs. parzen des	2.487468592766549	0.01286558129455608	0.05	0.1
1	parzen des vs. parzen desthr	2.487468592766549	0.01286558129455608	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 $p$	$p_{Neme}$	$p_{Holm}$	$p_{Shaf}$	$p_{Berg}$
1	parzen vs .parzen desthr	6.526880098667021E-7	1.9580640296001065E-6	1.9580640296001065E-6	1.9580640296001065E-6	1.9580640296001065E-6
2	parzen vs .parzen des	0.01286558129455608	0.03859674388366824	0.02573116258911216	0.01286558129455608	0.01286558129455608
3	parzen des vs .parzen desthr	0.01286558129455608	0.03859674388366824	0.02573116258911216	0.01286558129455608	0.01286558129455608