

Package ‘correctR’

August 20, 2023

Type Package

Title Corrected Test Statistics for Comparing Machine Learning Models on Correlated Samples

Version 0.1.3

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Description Calculate a set of corrected test statistics for cases when samples are not independent, such as when classification accuracy values are obtained over resamples or through k-fold cross-validation, as proposed by Nadeau and Bengio (2003) <doi:10.1023/A:1024068626366> and presented in Bouckaert and Frank (2004) <doi:10.1007/978-3-540-24775-3_3>.

BugReports <https://github.com/hendersontrent/correctR/issues>

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Encoding UTF-8

Depends R (>= 3.5.0)

Imports stats

Suggests knitr, markdown, rmarkdown, pkgdown, testthat (>= 3.0.0)

RoxygenNote 7.2.2

VignetteBuilder knitr

Config/testthat/edition 3

URL <https://hendersontrent.github.io/correctR/>

NeedsCompilation no

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Repository CRAN

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correctR	<i>Corrections For Correlated Test Statistics</i>
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Description

Corrections For Correlated Test Statistics

kfold_ttest	<i>Compute correlated t-statistic and p-value for k-fold cross-validated results</i>
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Description

Compute correlated t-statistic and p-value for k-fold cross-validated results

Usage

```
kfold_ttest(x, y, n, k)
```

Arguments

x	numeric vector of values for model A
y	numeric vector of values for model B
n	integer denoting total sample size
k	integer denoting number of folds used in k-fold

Value

object of class `data.frame`

Author(s)

Trent Henderson

References

Nadeau, C., and Bengio, Y. Inference for the Generalization Error. *Machine Learning* 52, (2003).
 Corani, G., Benavoli, A., Demsar, J., Mangili, F., and Zaffalon, M. Statistical comparison of classifiers through Bayesian hierarchical modelling. *Machine Learning*, 106, (2017).

repkfold_ttest	<i>Compute correlated t-statistic and p-value for repeated k-fold cross-validated results</i>
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Description

Compute correlated t-statistic and p-value for repeated k-fold cross-validated results

Usage

```
repkfold_ttest(data, n1, n2, k, r)
```

Arguments

data	data.frame of values for model A and model B over repeated k-fold cross-validation. Four named columns are expected: "model", "values", "k", and "k"
n1	integer denoting train set size
n2	integer denoting test set size
k	integer denoting number of folds used in k-fold
r	integer denoting number of repeats per fold

Value

object of class data.frame

Author(s)

Trent Henderson

References

Nadeau, C., and Bengio, Y. Inference for the Generalization Error. *Machine Learning* 52, (2003).

Bouckaert, R. R., and Frank, E. Evaluating the Replicability of Significance Tests for Comparing Learning Algorithms. *Advances in Knowledge Discovery and Data Mining. PAKDD 2004. Lecture Notes in Computer Science*, 3056, (2004).

resampled_ttest *Compute correlated t-statistic and p-value for resampled data*

Description

Compute correlated t-statistic and p-value for resampled data

Usage

```
resampled_ttest(x, y, n, n1, n2)
```

Arguments

x	numeric vector of values for model A
y	numeric vector of values for model B
n	integer denoting number of repeat samples. Defaults to length(x)
n1	integer denoting train set size
n2	integer denoting test set size

Value

object of class `data.frame`

Author(s)

Trent Henderson

References

Nadeau, C., and Bengio, Y. Inference for the Generalization Error. *Machine Learning* 52, (2003).
Bouckaert, R. R., and Frank, E. Evaluating the Replicability of Significance Tests for Comparing Learning Algorithms. *Advances in Knowledge Discovery and Data Mining. PAKDD 2004. Lecture Notes in Computer Science*, 3056, (2004).

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