Package 'RandMeta'

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Type Package

Title Efficient Numerical Algorithm for Exact Inference in Meta Analysis

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Description A novel numerical algorithm that provides functionality for estimating the exact 95% confidence interval of the location parameter in the random effects model, and is much faster than the naive method. Works best when the number of studies is between 6-20.

License GPL-2

LazyData TRUE

RoxygenNote 6.0.1

Depends R (>= 2.10)

NeedsCompilation no

Repository CRAN

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`random.meta` *Exact Inference for Meta Analysis With Random Effects Model*

Description

Computes the point estimator for the center (theta), the p value for testing if the center is zero, and the 95% confidence interval in a random effects model meta analysis. When the number of studies is moderate or small (<=20), the exact inference results are based on the exact computation. When the number of studies is big (>20), the exact inference results are based on Monte-Carlo simulation.

Usage

```
random.meta(y, v, type="DL", B=500, N=10000, Bstep=5, plot.meta=T)
```

Arguments

`y`	A vector of the respective estimators of the study-specific effect from each study. Length should be the same as the number of studies.
`v`	A vector with the variance of each estimator in y. Length should be the same as the number of studies.
`type`	The test method to be used for constructing the CI, choosing from "DL", "wang", "median" and "wilcox". The default is "DL".
`B`	The number of grids used to construct the 95% CI. The default value is 500.
`N`	The number of simulations in the Monte-Carlo simulation. The default value is 10000.
`Bstep`	The number of steps used in searching the endpoint of the 95% CI. The default value is 5, which the user does not need to adjust. A larger value may slow down computation.
`plot.meta`	The logic value for generating the forest plot of the meta analysis. The default value is "TRUE".

Details

The inference results are "exact" if K <= 20 and based on Monte-Carlo simulation if K > 20.

Value

`theta`	The point estimator for the center
`pvalue`	The p value for testing if the center is zero
`ci95`	The 95% CI for the center

Author(s)

Lu Tian and Grace Deng

References

Sifan Liu, Lu Tian, Steve Lee and Min-ge Xie (2016) Exact inference on meta-analysis with generalized fixed-effects and random-effects models. Tech Report.\

Yan Wang and Lu Tian (2017) An efficient numerical algorithm for exact inference in meta analysis. Tech Report.

Examples

```
##### Generate the data for a meta analysis with 8 studies #####
set.seed(100)
K=8
tau=2
v=rchisq(K, 3)
y=rnorm(K)*sqrt(v+tau)+1

##### Exact inference using the DL method #####
fit=random.meta(y, v, type="DL")
fit

##### Exact inference using the Wilcoxon method #####
fit=random.meta(y, v, type="wilcox")
fit
```

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