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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R topics documented:

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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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