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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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)
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References


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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