Package ‘robustETM’

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Type Package

Title Robust Methods using Exponential Tilt Model

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Imports stats

Description Testing homogeneity for generalized exponential tilt model. This package includes a collection of functions for (1) implementing methods for testing homogeneity for generalized exponential tilt model; and (2) implementing existing methods under comparison.

Depends R (>= 2.5.0)

License GPL (>= 2)

LazyLoad no

NeedsCompilation yes

Repository CRAN

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description

the package robustETM consists of the functions to perform pseudolikelihood based EM test for homogeneity in generalized exponential tilt mixture models.

details

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testing for homogeneity in generalized exponential tilt mixture model

Motivated by analyses of DNA methylation data, we propose a semiparametric mixture model, namely the generalized exponential tilt mixture model, to account for heterogeneity between differentially methylated and non-differentially methylated subjects in the cancer group, and capture the differences in higher order moments (e.g. mean and variance) between subjects in cancer and normal groups. A pairwise pseudolikelihood is constructed to eliminate the unknown nuisance function. To circumvent boundary and non-identifiability problems as in parametric mixture models, we modify the pseudolikelihood by adding a penalty function. In addition, test with simple asymptotic distribution has computational advantages over permutational test for high-dimensional genetic and epigenetic data. We propose a pseudolikelihood based expectation-maximization test, and show the proposed test follows a simple chi-squared limiting distribution.

the methods contains in function sim are:

- The proposed PLEMT test (pseudolikelihood based EM test)
- The t-test
- The modified empirical likelihood ratio test
- The empirical likelihood ratio test
- The logistic regression test
- The Wilcoxon test
- The F test
- The KS test
### sim

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#### References

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#### Tests under comparison for testing for homogeneity in generalized exponential tilt mixture models

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#### Description
The function conducts the pseudolikelihood based EM test for homogeneity in generalized exponential tilt mixture models

#### Usage

```r
sim(itr, K, cc, i.n, isetting, lambda, distn)
```

#### Arguments

- `itr`: random seed
- `K`: Number of grid values for proportion parameter lambda
- `cc`: Tuning parameter C for penalty function
- `isetting`: Type I error or power scenarios I II and III for simulation study
- `lambda`: Proportion parameter lambda
- `i.n`: Sample size setting
- `distn`: Distribution

#### Value

- `mplrt_EM.TS`: Test statistic for the proposed PLEMT test
- `qin.TS`: Test statistic for empirical likelihood ratio test
- `liu.TS`: Test statistic for modified empirical likelihood ratio test
- `t.TS`: Test statistic for t-test
- `wilcox.p`: p-value for wilcoxon test
- `logist.TS`: Test statistic for logistic regression test
Author(s)
Chuan Hong, Yong Chen, Yang Ning, Hao Wu

References

Examples
```r
# not run
#myresult=sim(itr=1234, K=10, cc=20, i.n=2, isetting=1, lambda=0.3, distn="norm")
```
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