

Package ‘linearQ’

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Type Package

Title Linear Algorithm for Simulating Quantiles in Multiscale
Change-Point Segmentation Problem

Version 2.0

Date 2019-03-13

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Description It is a linear algorithm to simulate quantiles of multiscale statistics
under null hypothesis for multiscale change-point segmentation.
The reference is in preparation.

License GPL (>= 2)

Imports Rcpp (>= 0.12.13), stepR (>= 1.0-1), stats

LinkingTo Rcpp

NeedsCompilation yes

Repository CRAN

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linearQ-package	<i>Quantile Simulation in Multiscale Chang-Point Segmentation.</i>
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Description

A linear algorithm for simulating quantiles of multiscale statistics under null hypothesis in multiscale change-point segmentation.

Details

Package: linearQ
Type: Package
Version: 1.0
Date: 2018-02-27
License: GPL (>= 2)

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fastQuantile Quantile simulation

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References

Frick, K., Munk, A., and Sieling, H. (2014). Multiscale Change-Point Inference. *J. R. Statist. Soc. B, with discussion and rejoinder by the authors*, 76:495–580. Li, H., Munk, A., and Sieling, H. (2015). FDR-control in multiscale change-point segmentation. arXiv:1412.5844.

Examples

```
# simulate quantiles for multiscale statistics from Normal regression model
seed = 123
q <- fastQuantile(0.9, 500, 100, seed = seed, type = 1)
```

fastQuantile *linear Algorithm for Quantile Simulation*

Description

This is a linear algorithm for quantile simulation under null hypothesis in multiscale change-point segmentation.

Usage

```
fastQuantile(alpha, n, r=round(50/min(alpha, 1-alpha)),
             mType=c("norm-pen", "pois"), seed = 123, ...)
```

Arguments

alpha	a scalar with values in $[0, 1]$; the alpha-quantile of the null distribution of the multiscale statistic via Monte Carlo simulation
n	number of observations
r	number of Monte Carlo simulations
mType	"norm-pen" simulates the multiscale statistic from Normal regression model, "pois" simulates the multiscale statistic from Poission regression model.
seed	data seed
...	further arguments passed to penalty function

Value

A scalar quantile value q .

References

Frick, K., Munk, A., and Sieling, H. (2014). Multiscale Change-Point Inference. *J. R. Statist. Soc. B*, with discussion and rejoinder by the authors, 76:495–580.

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Examples

```
# simulate quantiles for multiscale statistics from Normal regression model
seed = 123
q <- fastQuantile(0.9, 500, 100, mType = "norm-pen")
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