

Package ‘HiCseg’

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Type Package

Title Detection of domains in HiC data

Version 1.1

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Description

This package allows you to detect domains in HiC data by rephrasing this problem as a two-dimensional segmentation issue.

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Depends R (>= 2.10)

NeedsCompilation yes

Repository CRAN

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HiCseg-package	<i>Analysis of HiC data</i>
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Description

Two-dimensional segmentation for analyzing HiC data

Details

Package: HiCsegv6
Type: Package
Version: 1.0
Date: 2014-03-25
License: GPL-2

Author(s)

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Examples

```
library(HiCseg)
data(matrix)
n=200
Kmax=10
res=HiCseg_linkC_R(n,Kmax,"G",matrix,"D")
print(res)
```

HiCseg_linkC_R *Link between C and R*

Description

This function makes the link between C language and the R software. It consists in a two-dimensional segmentation approach.

Usage

```
HiCseg_linkC_R(size_mat, nb_change_max, distrib, mat_data, model)
```

Arguments

size_mat	Size of the data matrix
nb_change_max	Maximal number of change-points
distrib	Distribution of the data: "B" is for Negative Binomial distribution, "P" is for the Poisson distribution and "G" is for the Gaussian distribution.
mat_data	Matrix of data
model	Type of model: "D" for block-diagonal and "Dplus" for the extended block-diagonal model.

Value

Contains three attributes :

t_hat	Contains the estimated change-points
J	Values of the log-likelihood for different number of change-points up to some constants
t_est_mat	It gives the matrix of the estimated change-points for different number of change-points: in the first line when there is no change-point, in the second line when there is one change-point, in the third line when there are two change-points....

Author(s)

Celine Levy-Leduc

References

The method developed in this package is described in the paper "Two-dimensional segmentation for analyzing HiC data" by C. Levy-Leduc, M. Delattre, T. Mary-Huard and S. Robin, submitted to ECCB 2014.

Examples

```
## The function is currently defined as
HiCseg_linkC_R <-
function(size_mat,nb_change_max,distrib,mat_data,model)
{
  K=nb_change_max^2

  tmp=.C("Fonction_HiC_R",as.integer(size_mat),as.integer(nb_change_max),
        as.character(distrib),as.double(as.vector(mat_data)),
        t_hat=as.integer(rep(0,nb_change_max)),J=as.double(rep(0.0,nb_change_max)),
        t_est=as.integer(rep(0,K)),as.character(model))

  t_est_mat=matrix(tmp$t_est,ncol=nb_change_max,byrow=T)

  return(list(t_hat=tmp$t_hat,J=tmp$J,t_est_mat=t_est_mat))
}
```

matrix

Matrix of data

Description

Matrix of size 200x200 containing Gaussian data satisfying model D with change-points 40,80,120,160.

Usage

```
data(matrix)
```

Format

The format is: num [1:200, 1:200] 6.77 7.69 8.44 8.95 6.81 ... - attr(*, "dimnames")=List of 2 ..\$:
NULL ..\$: chr [1:200] "V1" "V2" "V3" "V4" ...

Examples

```
library(HiCseg)
data(matrix)
```

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