Package ‘flowMeans’

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Type Package

Title Non-parametric Flow Cytometry Data Gating

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Description Identifies cell populations in Flow Cytometry data using
non-parametric clustering and segmented-regression-based change
point detection. Note: R 2.11.0 or newer is required.

Imports Biobase, graphics, grDevices, methods, rrcov, stats, feature,
flowCore

Depends R (>= 2.10.0)

License Artistic-2.0

LazyLoad yes

biocViews FlowCytometry, CellBiology, Clustering

NeedsCompilation no

R topics documented:

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flowMeans-package flowMeans Package

Description

Non-parametric Flow Cytometry Data Gating

Details
changepointDetection

Author(s)

Nima Aghaeepour <naghaeep@bccrc.ca>

Examples

library(flowMeans)
data(x)
plot(x[,c(3,4)], res, c("FL1.H", "FL2.H"))

Description

Fits a two-component piecewise linear regression to the minimum distance between merged clusters vs the number of clusters for a list of merged cluster solutions.

Usage

changepointDetection(vect, OrthogonalResiduals = FALSE, PlotFlag = FALSE)

Arguments

vect A vector of minimum distances between clusters chosen to be merged at each iteration.
OrthogonalResiduals Boolean value, indicates if the residuals must be transformed to orthogonal distance or not.
PlotFlag Boolean value, indicating if the regression lines must be visualized.

Value

MinIndex Index of the merging step that produced the final results.
11 First regression line used for finding the changepoint for stopping the merging process.
12 Second regression line used for finding the changepoint for stopping the merging process.
flowMeans

Author(s)
Nima Aghaeepour

Examples

library(flowMeans)
data(x)
ft<-changepointDetection(res@Mins)
plot(res@Mins)
abline(ft$l1)
abline(ft$l2)

Description
Finds a good fit to the data using k-means clustering algorithm. Then merges the adjacent dense spherical clusters to find non-spherical clusters.

Usage
flowMeans(x, varNames=NULL, MaxN = NA, NumC = NA, iter.max = 50, nstart = 10,
Mahalanobis = TRUE, Standardize = TRUE, Update = "Mahalanobis", OrthogonalResiduals=TRUE,
MaxCovN=NA, MaxKernN=NA, addNoise=TRUE)

Arguments
x A matrix, data frame of observations, or object of class flowFrame. Rows correspond to observations and columns correspond to variables.
varNames A character vector specifying the variables (columns) to be included in clustering. When it is left unspecified, all the variables will be used.
MaxN Maximum number of clusters. If set to NA (default) the value will be estimated automatically.
NumC Number of clusters. If set to NA (default) the value will be estimated automatically.
iter.max The maximum number of iterations allowed.
nstart The number of random sets used for initialization.
Mahalanobis Boolean value. If TRUE (default) mahalanobis distance will be used. Otherwise, euclidean distance will be used.
Standardize Boolean value. If TRUE (default) the data will be transformed to the [0,1] interval.
Update String value. If set to "Mahalanobis" the distance function will be updated at each merging iteration with recalculating mahalanobis distances. If set to "Mean" the distance matrix will be updated after each merging step with averaging. If set to "None" the distance matrix will not be updated.
**flowMeans**

**MaxCovN**
Maximum number of points, used for calculating the covariance. If set to NA (default), all the points will be used.

**MaxKernN**
Maximum number of points, used for counting the modes using kernel density estimation. If set to NA (default), all the points will be used.

**addNoise**
Boolean value. Determines if uniform noise must be added to the data to prevent singularity issues or not.

**OrthogonalResiduals**
Boolean value, indicates if the residuals must be transformed to orthogonal distance or not.

**Details**

If Mahalanobis distance is not used (i.e., Mahalanobis=FALSE) then the Update value cannot be set to Mahalanobis (i.e., Update="Mahalanobis")

**Value**

- **Label**
  A vector of integers indicating the cluster to which each point is allocated.

- **Labels**
  A list of vectors of integers indicating the cluster to which each point is allocated at each merging iteration.

- **Mats**
  A list of distance matrixes between clusters at every merging iteration.

- **MaxN**
  Maximum number of clusters

- **Mins**
  A vector of integers indicating the distance between the two clusters chosen to be merged at every iteration.

- **MinIndex**
  Index of the merging step that produced the final results.

- **Line1**
  First regression line used for finding the changepoint for stopping the merging process.

- **Line2**
  Second regression line used for finding the changepoint for stopping the merging process.

**Author(s)**

Nima Aghaeepour

**Examples**

```r
library(flowMeans)
data(x)
plot(x[,c(3,4)], res, c("FL1.H", "FL2.H")
```
plot

Scatterplot of Clustering Results

Description

This method generates scatterplot revealing the cluster assignment.

Usage

## S4 method for signature 'ANY,Populations'
plot(x, y, varNames=NULL, ...)
## S4 method for signature 'flowFrame,Populations'
plot(x, y, varNames=NULL, ...)

Arguments

x  A matrix, data frame of observations, or object of class flowFrame. This is the object on which flowClust was performed.
y  Object returned from flowMeans.
varNames  A character vector specifying the variables (columns) to be included in the plot. When it is left unspecified, all the variables will be used.
...  Extra parameters that will be passed to the generic plot function

Author(s)

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See Also

flowMeans

Examples

library(flowMeans)
data(x)
plot(data.frame(x))

show

Show Method for Populations Class

Description

This method lists out the slots contained in a Populations object.

Usage

## S4 method for signature 'Populations'
show(object)
Arguments

object Object returned from `flowMeans`

Author(s)

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See Also

`flowMeans`

Description

This method prints out various characteristics of the populations found by `flowMeans`.

Usage

```r
## S4 method for signature 'Populations'
summary(object,...)
```

Arguments

object Object returned from `flowMeans`

... Object returned from `flowMeans`

Details

This method prints out various characteristics of the populations found by `flowMeans`.

Author(s)

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See Also

`flowMeans`
**Description**

A flow cytometry sample produced for diagnosis of the Graft versus Host Disease (GvHD)

**Usage**

data(x)

**Format**

A matrix describing expression values of 6 markers and 14936 cells. Each column represents a marker and each row represents a cell.

**Source**


**Examples**

data(x)

## maybe str(x) ; plot(x) ...

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x Sample
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