R documentation

of ‘pknng/man/pknng.Rd’

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pknng *Connects a set of point using a K-nearest neighbours graph*

Description

Given a dataset this method calculates the k-nn graph returning a distance/similarity matrix. For a conectivity parameter the algorithm calculates all nearest neighbours graphs, then it conects them using a penalization. Finally it calculates alledges distances using Dijkstra algorithm.

Usage

```
pknng(X,k,diss=T,cte=3,mu="mean",method="euclidean",conn="one",penalize=1)
```

Arguments

`X` Dataset where cols representes dimensions and rows the number of points or an n by n distance/similarity matrix.

`k` k indicates the number of neighbours used to calculate all nearest neighbours graphs.

`diss` Boolean value indicating if it is a distance/similarity matrix or not. Default value is TRUE.

`cte` For penalize=2 or 3 it indicates the value of the lineal constant or the value of the polynomial exponent

`mu` In the penalized form a penalized weigth (w) is obtained as w = w exp(w/mu) (exponencial penalization), w = wK (lineal penalization) and w = w (w/mu)^K (polynomic penalization). Values of mu can be: "mean", "median" , "1q" (first quartile), "3q" (thrid quartile)

`method` if diss is FALSE. Method defines the metric/similarity used betweeen paterns, currently available: "euclidean", "mi.1" or "mi.2" mutual information, "corr" correlation coefficient.

`conn` Method used for connection, "one" minimum spaning tree, "ttr" == connects each graph to all others using the closest points, "all" == conects every point from each graph to all other point not belonging to the same graph.

`penalize` Integer type. penalize=0 for non penalized conection, penalize=1 conects using exponencial penalization, penalize=2 conects using lineal penalization,penalize=3 conects using polynomic penalization.

Value

`pknng` returns a distance/similarity matrix.

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Examples

```
## Calculates knn-graph (k=3) using euclidean metric, penalization and MST for groups union
## See also test examples

library(pknng)
data(Three.Rings.LowNoise)

d.iso.a<-pknng(data[,-3],3,diss=F,mu="mean",method="euclidean",conn="one",penalize=1)
HCmethod<-"average"

a<-hclust(as.dist(d.iso.a),method = HCmethod)
label.a<-cutree(a,k=5)
plot(data[,1],data[,2],col=data[,3],pch=16,cex=0.5)
title("True labels")

x11()
plot(data[,1],data[,2],col=label.a,pch=16,cex=0.5)
title("Clustering Result")

see tests files in pknng/tests
```

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