Package 'SGCS'

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Title Spatial Graph based Clustering Summaries for spatial point patterns

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Depends spatstat

Description Graph based clustering summaries for spatial point
patterns. Includes Connectivity function, Cumulative
connectivity function and clustering function, plus the triplet intensity function T.

License GPL (>= 2)

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SGCS-package *Spatial point process statistics based on a geometric graph.*

Description

Three statistical spatial point pattern measures, based on a graph structure over the point pattern data.

Date: 2009-09-08
License: GPL v2 or later

```
Functions
------------------
confun      -  Connectivity function
cumconfun   -  Cumulative connectivity function
clustfun    -  Clustering function
Tfun        -  Triplet intensity function T
```

The connectivity function estimates the probability that two points distance r-apart share a graph component. Cumulative connectivity function is like Ripley's K-function but conditioned on the points sharing a graph component. Clustering function is a functional form of the non-spatial graph index, clustering coefficient. Tfun is the intensity of r-triplets.

The package currently supports only geometric graph, but such graphs as k-nearest neighbours graph can be easily included if somebody is interested.

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References

Rajala, Penttinen: Spatial clustering and graph feature statistics (working title). Schladitz, Baddeley: A Third order point process characteristic, SJS, vol 27, 657-671, 2000.

`SGCS-funs` *Connectivity function, Cumulative Connectivity function and Clustering Function.*

Description

Statistical measures based on edges of a geometric graph structure over a given point pattern data.

Date:	2009-09-08
License:	GPL v2 or later

The graph given components are used as clusters. In this version we use geometric graph, meaning points `x` and `y` are connected if `||x-y||<R` for the given range parameter `R`. Notice that in clustering function, the `R` equals to the parameter `r`. If you have a another clustering structure in mind, you can give the spatgraphs-object using the `prepGraph` parameter.

The main function is `spatial.graph.cluster.Fun`, but the use of shortcuts `confun`, `cumconfun` and `clustfun` is highly encouraged.

In addition, the triplet intensity function T (Schladitz & Baddeley 2000) is also included for now: The `Tfun`.

Usage

```
confun(X, r=NULL, R=NULL, h=NULL, ...)
cumconfun(X, r=NULL, R=NULL, ...)
clustfun(X, r=NULL, ...)
Tfun(X, r=NULL, ...)
spatial.graph.cluster.Fun(X, r=NULL, funtype=1, funpars=0,
  minusRange=NULL, toroidal=FALSE,
      doDists=FALSE, doWeights=FALSE,
  prepGraph=NULL, dbg=FALSE)
```

Arguments

X	All: Point pattern object of class ppp from package spatstat.
r	Vector of the range parameters in which to calculate the function value. if NULL, a range from 0 to 1/3 of window length is used.
R	confun, cumconfun: Clustering radius of the graph. If NULL, R=1/sqrt(lambda).
h	confun: Smoothing parameter in kernel-estimation. Box kernel width = 2h. NULL-> h=0.15*R
...	Parametes for the function art1Fun:
funtype	(shortcuts handle) Which function to calculate. confun=1, cumconfun=2, clustfun=3, Tfun=4.
funpars	(shortcuts handle) Additional function parameter(s): confun fpar=c(R,h), cumconfun fpar=R.
minusRange	clustfun, Tfun: Minus-correction parameter. Rectangular window required, NULL means no correction.
toroidal	clustfun, Tfun: Toroidal correction of rectangular window.
doDists	Precalculate distances for faster computation. Be aware of memory consumption n*(n-1).
doWeights	confun,cumconfun: Precalculate translation correction weights for faster computation. Be aware of memory consumption O(n\^2).
prepGraph	An optional graph-object from spatgraphs to be used as the component division of the points.
dbg	Print additional messages.

Value

Object of class fv, see spatstat for details. Has plot, envelope etc. nice methods.

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