Package 'moveNT'

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Title An R package for the analysis of movement data using network theory

Version 0.0.0.9000

Description
This package provides a series of functions to analyse movement data using network theory.

Depends R (>= 3.3.2)

License GPL (>=3)

Encoding UTF-8

LazyData true

RoxygenNote 6.0.1.9000

R topics documented:

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adj2stack	*Calculation of network metrics*

Description

Transform an adjancency matrix to a series of network metrics at the node-level (weight, degree, betweenness, transitivity, eccenctricity) and graph level (diameter, transitivity, density, and modularity)

Usage

```
adj2stack(adjmov, grph = T)
```

Arguments

adjmov	Adjacency matrix, need to be an object produced by function traj2adj
grph	Whether node level metrics are to be plotted

Value

A raster stack object

Examples

```
traj1<-sim_mov(type="OU", npatches=3, grph=T)
stck<-adj2stack(traj2adj(traj1, res=100), grph=T)
```

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clustnet	*Normal mixture model for clustering of node level metrics*

Description

Apply a normal mixture model to a node-level metric

Usage

```
clustnet(stack, id = 2, nclust = 2, grph = T)
```

Arguments

stack	An object produce by the function adj2stack
id	Metric to be used (2=Weight, 3=Degree, 4=Betweenness, 5=Transitivity, 6=Eccentricity)
grph	Whether resulting classification should be plotted

Value

A list object containing a Mclust object and a raster object

Examples

```
traj1<-sim_mov(type="OU", npatches=3, grph=T)
stck<-adj2stack(traj2adj(traj1, res=100), grph=T)
cl<-clustnet(stck, id=2, nclust=2, grph=T)
summary(cl[[1]])
```

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graphmet   *Summarize graph-level metrics*

Description

Summarize graph-level metrics from an object generated by adj2stack

Usage

```
graphmet(grid)
```

Arguments

grid   An object generated by the function adj2stack

id   Metric to be used (2=Weight, 3=Degree, 4=Betweenness, 5=Transitivity, 6=Eccentricity)

Value

A vector

Examples

```
traj1<-sim_mov(type="OU", npatches=3, grph=T)
stck<-adj2stack(traj2adj(traj1, res=quant(traj1)), grph=T)
graphmet(stck)
```

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quant   *Sample quantile of distance for ltraj object*

Description

Wrapper function that extract the sample quantile of distance

Usage

```
quant(x, p = 0.5)
```

Arguments

x   A ltraj object

p   Probability, default=0.5 (median)

Value

A vector of length p

Examples

```
traj1<-sim_mov(type="OU", npatches=3, grph=T)
stck<-adj2stack(traj2adj(traj1, res=quant(traj1)), grph=T)
```

---

sim_mov   *Simulation of patch-based movement trajectory*

Description

Simulate a movement trajectory with user defined number of patches and interpatch movement

Usage

```
sim_mov(type = c("2states", "OU"), npatches = 5, ratio = 5,
  nswitch = 150, ncore = 200, spacecore = 200,
  seq_visit = sample(1:npatches, nswitch, replace = T), stepDist = "gamma",
  angleDist = "vm", stepPar = c(0.5, 3, 1, 5), anglePar = c(pi, 0, 0.5,
  2), s = diag(40, 2), grph = F)
```

Arguments

type	whether movement within patches should be based on a 2states process (from package moveHMM) or a Bivariate Ornstein-Uhlenbeck process (OU) (from package adehabitatLT)
npatches	Number of patches, default=5
ratio	Ratio (in percent) of locations associated to interpatch movement, default=5
nswitch	Number of switch/depart from patches, default=150
ncore	Number of locations within a patch per visit, default=200
spacecore	Minimum distance between center of patches, default=200
seq_visit	Specify the sequence of visit among patches, default is random sequence
stepDist	Distribution for step length if 2states specified in type, see simData of moveHMM package
angleDist	Distribution for turn angle if 2states specified in type, see simData of moveHMM package
stepPar	Parameters for step length distribution if 2states specified in type, see simData of moveHMM package
anglePar	Parameters for turn angle distribution if 2states specified in type, see simData of moveHMM package
s	Parameters for the OU process, see simm.mou of adehabitatLT package
grph	Whether a graph of the trajectory should be produced, default=F

Value

A ltraj (adehabitatLT) object

Examples

```
traj1<-sim_mov(type="OU", npatches=3, grph=T)
traj2<-sim_mov(type="2states", npatches=2, grph=T)
```

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traj2adj   *Generation of adjacency matrix from movement data*

Description

Transform an ltraj object to an adjacency matrix using a user-specified grid size

Usage

```
traj2adj(mov, res = 100, grid = NULL)
```

Arguments

mov	Movement trajectory, need to be a ltraj object
res	Grid size
grid	User specified grid (a raster), needs to have a larger extent than the movement trajectory

Value

A list of object containing the adjacency matrix, the grid use, and patch/corridor identification (only useful if sim_mov was used)

Examples

```
traj1<-sim_mov(type="OU", npatches=3, grph=T)
adj<-traj2adj(traj1, res=100)
```

---

val   *Extract occupied cells in a raster object*

Description

Extract only occupied cells in a raster object,

Usage

```
val(grid, id)
```

Arguments

grid	An object generated by the function adj2stack
id	Metric to be used (2=Weight, 3=Degree, 4=Betweenness, 5=Transitivity, 6=Eccentricity)

Value

A vector

Examples

```
traj1<-sim_mov(type="OU", npatches=3, grph=T)
stck<-adj2stack(traj2adj(traj1, res=quant(traj1)), grph=T)
mean(val(stck, 2))
```

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