

# Package ‘moveNT’

March 31, 2017

**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

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adj2stack	<i>Calculation of network metrics</i>
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## Description

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

## Usage

adj2stack(adjmov, grph = T)

**Arguments**

adjmov	Adjacency matrix, need to be an object of class adjmov
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	<i>Normal mixture model for clustering of node level metrics</i>
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**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=Ec-centricity)
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	<i>Summarize graph-level metrics</i>
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**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=Ec-centricity)

**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	<i>Sample quantile of distance for ltraj object</i>
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**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)
```

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)
```

**Arguments**

mov	Movement trajectory, need to be a ltraj object
res	Grid size

**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=Ec-centricity)

**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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