Package 'TrajDataMining'

January 15, 2018

Type Package

Title Trajectories Data Mining

Version 0.1.5

Date 2018-01-08

Description Contains a set of methods for trajectory data preparation, such as filtering, compressing and clustering, and for trajectory pattern discovery.

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LazyData TRUE

Encoding UTF-8

Depends R (>= 3.0.0)

Imports sp, trajectories, rgdal, xts, rgeos, ggplot2, spacetime, RPostgreSQL, geosphere, methods, magrittr

Suggests testthat, knitr, rmarkdown, covr

VignetteBuilder knitr

URL https://github.com/INPEtrajectories/TrajDataMining

RoxygenNote 6.0.1

NeedsCompilation no

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Repository CRAN

Date/Publication 2018-01-15 13:45:13 UTC

R topics documented:

A1 . . . 2
A2 . . . 3
createSpatialCluster . . . 3
DataSourceInfo-class . . . 4
directionCluster . . . 5
douglasPeucker . . . 6
douglasPeuckerRP . . . 7
IndexToTrack . . . 7
LimitedNeighborhood . . . 8
owMeratniaBy . . . 9
owMeratniaByCollection . . . 10
partner . . . 11
RightSize . . . 12
sendPartnerPairsToDB . . . 13
singledifftrack-class . . . 14
SlowestNeighborhood . . . 14
speedCluster . . . 15
speedFilter . . . 16
tracksCollection . . . 16

Index **18**

A1 *A trajectory of elephant sea*

Description

object that contains distance, duration, speed and direction.

Usage

```
A1
```

Format

A trajectory with 2218 rows and 7 columns:

id id each point of trajectory

x latitude

y longitude]

time time stamps of the track points

endtime end time stamps of the track points

timeindex time index

ones ones of the track

A2 *A trajectory of elephant sea*

Description

A object that contains distance, duration, speed and direction.

Usage

```
A2
```

Format

A trajectory with 2148 rows and 7 columns:

id id each point of trajectory

x latitude

y longitude]

time time stamps of the track points

endtime end time stamps of the track points

timeindex id of time stamps

ones ones of the track

createSpatialCluster *Create Spatial Cluster*

Description

Method for create a spatial cluster

Usage

```
createSpatialCluster(A3, clusterlist)

## S4 method for signature 'Track,list'
createSpatialCluster(A3, clusterlist)
```

Arguments

A3	Track object
clusterlist	list of cluster positions create spatial objects

Value

cluster of polygons

Author(s)

Deigo Monteiro

Examples

```
spcluster<-createSpatialCluster(A1,speedCluster(A1,mean(A1@connections$speed),
12,min(A1@connections$speed)+4))
```

`DataSourceInfo-class` *Data Source Info*

Description

Class to connect in a database

Slots

`user` User of database

`title` Title of database

`accessDriver` The database access driver

`host` Host of the database (e.g. localhost)

`port` Port the database (e.g. 5432)

`timeout` Timeout time of connection

`password` Password of database

`db` Database name

`encoding` Encoding of database (e.g.CP1252)

`dbtype` The type of the database (e.g. POSTGIS)

`path` Path of the database

directionCluster *Direction Cluster*

Description

That given a Track and maximum change parameter, returns regions where direction changed more than the defined parameter

Usage

```
directionCluster(track, minD, minT, tolerance)

## S4 method for signature 'Track,numeric,numeric,numeric'
directionCluster(track, minD, minT,
  tolerance)
```

Arguments

track	Represents a single trajectory followed by a person, animal or object
minD	Is the minimun direction change
minT	Is the minimun period at the speed
tolerance	Is the maximum change parameter

Value

returns regions where direction changed more than the defined parameter

Author(s)

Diego Monteiro

Examples

```
cluster<-createSpatialCluster(A1,directionCluster(A1,5,10,2))
```

douglasPeucker *Douglas Peucker*

Description

Douglas-Peucker which reduces trajectories by preserving spatial precisions

Usage

```
douglasPeucker(A1, dist)

## S4 method for signature 'Track,numeric'
douglasPeucker(A1, dist)
```

Arguments

A1	Represents a single trajectory followed by a person, animal or object
dist	Distance time series

Value

reduces trajectories by preserving spatial precisions

Author(s)

Diego Monteiro

Examples

```
## Not run:
library(ggplot2)

dist <- max(A1@connections$distance)

douglasp <- douglasPeucker(A1,dist)

df <- data.frame(x=douglasp@sp@coords[,1],y=douglasp@sp@coords[,2])
ggplot(df,aes(x=df$x,y=df$y))+geom_path(aes(group = 1))

## End(Not run)
```

douglasPeuckerRP *Douglas Peucker RP*

Description

Method that reduces a trajectory spatially with first point and last point

Usage

```
douglasPeuckerRP(A1, firstp, lastp, dist)

## S4 method for signature 'Track,numeric,numeric,numeric'
douglasPeuckerRP(A1, firstp, lastp,
  dist)
```

Arguments

A1	track object
firstp	given first point
lastp	given last point
dist	distance

Author(s)

Diego Monteiro

Examples

```
doug <- douglasPeuckerRP(A1,20,200,2000)
```

IndexToTrack *Conversão de index pra track*

Description

Conversão de index pra track

Usage

```
IndexToTrack(A1, index)
```

Arguments

A1	Track object
index	An index list

Value

track object

LimitedNeighborhood *Limited Neighborhood*

Description

Check the limite of Neighborhood

Usage

```
LimitedNeighborhood(track, ini, minT, cln, cl, avg, sl)
```

Arguments

track	Represents a single trajectory followed by a person, animal or object
ini	Order list of track speed
minT	Is the minimun period at the speed
cln	Cluster identification
cl	Empty list
avg	Average value of speed
sl	Is the speed limit

Author(s)

Diego Monteiro

owMeratniaBy *Ow Meratnia By*

Description

Method that reduces trajectories spatiotemporally

Usage

```
owMeratniaBy(A1, dist, speed)

## S4 method for signature 'Track,numeric,numeric'
owMeratniaBy(A1, dist, speed)
```

Arguments

A1	Represents a single trajectory followed by a person, animal or object.
dist	Distance time series
speed	Speed of track

Value

Reduces trajectories spatiotemporally

Author(s)

Diego Monteiro

Examples

```
## Not run:
library(ggplot2)

speed <- max (A1@connections$speed)

distance <- max (A1@connections$distance)

ow <- owMeratniaBy(A1,distance,speed)

df <- data.frame(x=ow@sp@coords[,1],y=ow@sp@coords[,2])

ggplot(df,aes(x=df$x,y=df$y))+geom_path(aes(group = 1), arrow = arrow(),color='blue')

## End(Not run)
```

owMeratniaByCollection *Ow Meratnial By Collection*

Description

Method that reduces a set of trajectories spatiotemporally

Usage

```
owMeratniaByCollection(A1, dist, speed)

## S4 method for signature 'TracksCollection,numeric,numeric'
owMeratniaByCollection(A1, dist,
  speed)
```

Arguments

A1	Represents a collection of trajectories followed by different persons, animals or objects
dist	Distance time series
speed	Speed of object

Value

Trajectory spatiotemporally reduced

Author(s)

Diego Monteiro

Examples

```
library(magrittr)

library(sp)

library(ggplot2)
ow <-owMeratniaByCollection(tracksCollection,13804.84 ,0.03182201) %>% coordinates()

df <- data.frame(x=ow[,1],y=ow[,2])

ggplot(df,aes(x=x,y=y))+geom_path(aes(group = 1), arrow = arrow(),color='blue')
```

partner *Partner*

Description

Method to recognize trajectories that stay together, based on trajectory distance time series analysis

Usage

```
partner(A1, A2, dist, maxtime, mintime, datasource, tablename)


  ## S4 method for signature
## 'Track,Track,numeric,numeric,numeric,DataSourceInfo,character'
partner(A1,
  A2, dist, maxtime, mintime, datasource, tablename)


  ## S4 method for signature
## 'Track,Track,numeric,numeric,numeric,PostgreSQLConnection,character'
partner(A1,
  A2, dist, maxtime, mintime, datasource, tablename)

## S4 method for signature
## 'Track,Track,numeric,numeric,numeric,logical,missing'
partner(A1, A2,
  dist, maxtime, mintime, datasource, tablename)


  ## S4 method for signature
## 'TracksCollection,missing,numeric,numeric,numeric,missing,missing'
partner(A1,
  A2, dist, maxtime, mintime, datasource, tablename)


  ## S4 method for signature
## 'TracksCollection,
##   TracksCollection,
##   numeric,
##   numeric,
##   numeric,
##   missing,
##   missing'
partner(A1,
  A2, dist, maxtime, mintime, datasource, tablename)
```

```
  ## S4 method for signature
## 'TracksCollection,Track,numeric,numeric,numeric,missing,missing'
partner(A1,
  A2, dist, maxtime, mintime, datasource, tablename)
```

Arguments

A1	Represents a single trajectory followed by a person, animal or object.
A2	Represents a single trajectory followed by a person, animal or object.
dist	Ristance that two objects can stay apart
maxtime	Maximum time period that two objects can stay apart
mintime	Minimum time period that two objects must stay together
datasource	Is object class DataSourceInfo
tablename	The name of the table database

Value

List with begin time and end time stamps of two objects partner

Author(s)

Diego Monteiro

Examples

```
partner(A1,A2,110792,2277,0,FALSE)
```

RightSize *Right size verifier*

Description

Right size verifier

Usage

```
RightSize(diffTracks, begintime, endtime, sizeMultiplier)
```

Arguments

diffTracks	Difftrack
begintime	Begin time
endtime	End time
sizeMultiplier	number will multiplier the diff

Value

boolean

`sendPartnerPairsToDB` *send Partner Pairs To DataBase*

Description

Method that sends found partners to a PostGIS database

Method that sends found partners to a PostGIS database with object DataSourceInfo

Method that sends found partners to a PostGIS database using object PosgreSQLConnection

Usage

```
sendPartnerPairsToDB(dataframe, dataSourceInfo, tablename)

## S4 method for signature 'list,DataSourceInfo,character'
sendPartnerPairsToDB(dataframe,
  dataSourceInfo, tablename)

## S4 method for signature 'list,PostgreSQLConnection,character'
sendPartnerPairsToDB(dataframe,
  dataSourceInfo, tablename)
```

Arguments

`dataframe`	Dataframe list
`dataSourceInfo`	A object class dataSourceInfo
`tablename`	Name of table

Value

send the partners list for a database

singledifftrack-class *Sigle diff track*

Description

My compare method get distances between 2 Track objects for each point in time where they overlap and create a corresponding line

Arguments

tr1	represents a single trajectory followed by a person, animal or object.
tr2	represents a single trajectory followed by a person, animal or object.

Details

@import xts

Value

a difftrack object

Author(s)

Diego Monteiro

SlowestNeighborhood *Slowest Neighborhood*

Description

Method for check slowest neighborhood

Usage

```
SlowestNeighborhood(track, ini, minT, cl)
```

Arguments

track	Represents a single trajectory followed by a person, animal or object
ini	Order list of track speed
minT	Is the minimun period at the speed
cl	Empty list

Author(s)

Diego Monteiro

speedCluster *Speed Cluster*

Description

Method for check the regions where speed was lower than the defined parameter

Usage

```
speedCluster(track, avg, minT, sl)

## S4 method for signature 'Track,numeric,numeric,numeric'
speedCluster(track, avg, minT, sl)
```

Arguments

track	Represents a single trajectory followed by a person, animal or object
avg	Is the average speed of track
minT	Is the minimun period at the speed of track
sl	Is the speed limit of track

Details

Order the speed so it will start with the slowest speed cluster

Value

Returns regions where speed was lower than the defined parameter

Author(s)

Diego Monteiro

Examples

```
avgSpeed <- mean(A1@connections$speed)

minSpeed <- min(A1@connections$speed)

speed <- speedCluster(A1,avgSpeed,minSpeed,586)
```

speedFilter *Speed filter*

Description

A speed filter that filters out trajectory observations whose speeds are above a user-defined maximum velocity

Usage

```
speedFilter(A1, speed)

## S4 method for signature 'Track,numeric'
speedFilter(A1, speed)
```

Arguments

A1	Represents a single trajectory followed by a person, animal or object
speed	Is the maximum speed parameter

Author(s)

Diego Monteiro

Examples

```
library(ggplot2)

speed <- min(A1@connections$speed)

sf <- speedFilter(A1,speed)

df <- data.frame(x=sf@sp@coords[,1],y=sf@sp@coords[,2])

ggplot(df,aes(x=df$x,y=df$y))+geom_path(aes(group = 1), arrow = arrow(),color='blue')
```

tracksCollection *A tracks colleection of a plataform argos*

Description

A dataset containing tracks objects

Usage

```
tracksCollection
```

Format

A trajectory with 7 columns:

id id rows

xmin latitude minimum

xmax latitude maximum

ymin longitude minimum

ymax longitude maximum

tmax maximum time

tmin minimum time

timeindex time index

n ones of the track

Index

∗Topic **datasets**
A1, 2
A2, 3
tracksCollection, 16

A1, 2
A2, 3

createSpatialCluster, 3
createSpatialCluster,Track,list-method *(*createSpatialCluster*)*, 3

DataSourceInfo *(*DataSourceInfo-class*)*, 4
DataSourceInfo-class, 4
directionCluster, 5
directionCluster,Track,numeric,numeric,numeric-method *(*directionCluster*)*, 5
douglasPeucker, 6
douglasPeucker,Track,numeric-method *(*douglasPeucker*)*, 6
douglasPeuckerRP, 7
douglasPeuckerRP,Track,numeric,numeric,numeric-method *(*douglasPeuckerRP*)*, 7

IndexToTrack, 7

LimitedNeighborhood, 8

owMeratniaBy, 9
owMeratniaBy,Track,numeric,numeric-method *(*owMeratniaBy*)*, 9
owMeratniaByCollection, 10
owMeratniaByCollection,TracksCollection,numeric,numeric-method *(*owMeratniaByCollection*)*, 10

partner, 11
partner,Track,Track,numeric,numeric,numeric,DataSourceInfo,character-method *(*partner*)*, 11
partner,Track,Track,numeric,numeric,numeric,logical,missing-method *(*partner*)*, 11
partner,Track,Track,numeric,numeric,numeric,PostgreSQLConn *(*partner*)*, 11
partner,TracksCollection,missing,numeric,numeric,numeric,m *(*partner*)*, 11
partner,TracksCollection,Track,numeric,numeric,numeric,mis *(*partner*)*, 11
partner,TracksCollection,TracksCollection,numeric,numeric, *(*partner*)*, 11

RightSize, 12

sendPartnerPairsToDB, 13
sendPartnerPairsToDB,list,DataSourceInfo,character-method *(*sendPartnerPairsToDB*)*, 13
sendPartnerPairsToDB,list,PostgreSQLConnection,character-m *(*sendPartnerPairsToDB*)*, 13
singledifftrack-class, 14
SlowestNeighborhood, 14
speedCluster, 15
speedCluster,Track,numeric,numeric,numeric-method *(*speedCluster*)*, 15
speedFilter, 16
speedFilter,Track,numeric-method *(*speedFilter*)*, 16

tracksCollection, 16