Package 'SK'

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Type Package

Title Segment-Based Ordinary Kriging and Segment-Based Regression Kriging for Spatial Prediction

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Description Segment-based Kriging methods, including segment-based ordinary Kriging (SOK) and segment-based regression Kriging (SRK) for spatial prediction of line segment spatial data as described in Yongze Song (2018) <doi:10.1109/TITS.2018.2805817>. Includes the spatial prediction and spatial visualisation. The descriptions of the methods and case datasets refer to the citation information below.

Imports stats, graphics, rgeos, RColorBrewer, sp, GD, rtop, FitAR, MASS

Depends R (>= 3.4.0)

License GPL-2

LazyData true

Suggests knitr, rmarkdown

VignetteBuilder knitr

RoxygenNote 6.0.1

NeedsCompilation no

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R topics documented:

`bxcxt` *Boxcox transform for a response variable*

Description

Boxcox transform for a response variable

Usage

```
bxcxt(y, x)
```

Arguments

y	A vector of response variable
x	A vector of explanatory variable

Examples

```
vehicles_obs <- vehicles[vehicles@data$obs1pred0 == 1,]
vehicles_obs$transheavy <- bxcxt(vehicles_obs$heavy, vehicles_obs$width)[[1]]
qqnorm(vehicles_obs$heavy)
qqnorm(vehicles_obs$transheavy)
lambda <- bxcxt(vehicles_obs$heavy, vehicles_obs$width)[[2]]
```

`skriging` *Function for Segment-based Kriging models*

Description

Segment-based Kriging models, including Segment-based Ordinary Kriging (SOK) and Segment-based Regression Kriging (SRK), for spatial prediction of line segment spatial data (polyline). The methods are described in Yongze Song (2018) <doi:10.1109/TITS.2018.2805817>.

Usage

```
skriging(formula, polyline = polyline, method = "srk",
          lwd = "width", obspred = "obs1pred0", boxcox = TRUE)
## S3 method for class 'skriging'
print(x, ...)
## S3 method for class 'skriging'
plot(x, studyarea = NULL, ...)
```

Arguments

formula	A skriging formula.
polyline	A shapefile of spatial polyline.
method	A characteor of segment-based Kriging model. The default is "srk", segment-based regression Kriging Another method is "sok", segment-based ordinary Kriging.
lwd	A fixed number or a variable name of polyline of the line width.
obspred	A variable name of polyline to define the observation and prediction lines. Observation is 1 and prediction is 0.
boxcox	A logical parameter to set whether the dependent variable should be transformed with boxcox function. The default is TRUE.
x	A list of skriging result.
studyarea	A shapefile of spatial polygon of study area.
...	new print and plot

Examples

```
## SRK: segment-based regression Kriging
## dataset 'vtest' is a sample of dataset 'vehicles'
srk1 <- skriging(heavy ~ wpai + width, polyline = vtest, method = "srk",
                 lwd = "width", obspred = "obs1pred0", boxcox = TRUE)
srk1
plot(srk1)
```

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vehicles *Spatial dataset of traffic volumes*

Description

The "vehicles" dataset is the spatial data of traffic volumes in Wheatbelt region, Western Australia (WA), Australia, in 2015. The format is polyline. The attributes include road properties (width and length) and traffic volumes of heavy, light and total vehicles. The variable "obs1pred0" defines the the road segments that have observations or to be predicted. More details and data sources can be referred in the Citation Info of the package.

Usage

```
vehicles

vtest
```

Format

vehicles: A Spatial Lines Data Frame with 280 rows and 10 variables.

segmentID Number of road segment

obs1pred0 Observation is 1 and prediction is 0

length Length of road segment

width Width of road segment

heavy Traffic volumes of heavy vehicles

light Traffic volumes of light vehicles

total Total trffic volumes

wpai Weighted population accessibility index

longitude Longitude of the center of road segment

latitude Longitude of the center of road segment

Author(s)

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wheatbelt *Spatial dataset of study area*

Description

The "wheatbelt" dataset is spatial polylon of the study area Wheatbelt region, Western Australia (WA), Australia. More details and data sources can be referred in the Citation Info of the package.

Usage

```
wheatbelt
```

Format

wheatbelt: A Spatial Polygon Data Frame.

Author(s)

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