

Package: soapcheckr (via r-universe)

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Type Package

Title Check knot locations used by soap film smoothers for GAMS

Version 0.1.0

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Description Soapcheckr allows users to easily check if the boundary used and supplied will work when using a soap-film smoother for Generalized Additive Models (GAMs) supported by the package {mgcv}. The package also allows for users to assess if the knots and data points they want to supply the GAM will fit within the boundary.

Imports dplyr, graphics, mgcv, sf, utils

Suggests broom.mixed, fitdistrplus, data.table, ggplot2, gratia, knitr, purrr, rmarkdown, testthat

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Depends R (>= 2.10)

VignetteBuilder knitr

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Repository <https://benjaminhlina.r-universe.dev>

RemoteUrl <https://github.com/dill/soapcheckr>

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autocruncher	<i>Quickly find knots that will cause issues for soap-film smoother Setting up a soap film smoother is often a hard and frustrating process. This function checks that all knots, not just one knot are within the boundary and futher enough away from the boundary to effectively use a soap-film smoother</i>
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Description

Quickly find knots that will cause issues for soap-film smoother Setting up a soap film smoother is often a hard and frustrating process. This function checks that all knots, not just one knot are within the boundary and futher enough away from the boundary to effectively use a soap-film smoother

Usage

```
autocruncher(bnd, knots, k = 10, nmax = 200, xname = "x", yname = "y")
```

Arguments

bnd	A list with sub-lists that will be the boundary the soap-film smoother will smooth in. Coordinates need to be in a reference system that has meaningful units. For example, coordinates could be in UTM's as UTM's rely on metres.
knots	A dataframe with two columns that are the coordinates of the knots that are to be supplied to the soap-film smoother. Coordinates need to be in meaniful units. For example, coordinates could be in UTM's as UTM's rely on metres.
k	If supplying k argument to mgcv: :gam(), provide that same value to autocruncher().
nmax	If supplying nmax argument to mgcv: :gam(), provide that same value to autocruncher().
xname	Column name of x coordinate for the knots object
yname	Column name of y coordinate for the knots object

Value

A vector of the indices of all of the knots that either fall outside the boundary or too close to the boundary and will cause for the soap-film smoother to error.

References

This function is based on soap.r in mgcv, Copyright Simon Wood 2006-2012. Bugs fixes added by David L Miller, 2019

Examples

```
# crunch_ind <- autocruncher(fsb, knots, k=30, xname="v", yname="w"), will add more
crunch_ind <- autocruncher(sissabagama_lake_ls, sissabagama_lake_knots)
```

overlap_polygons	<i>The boundary list of example overlapping polygons</i>
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Description

A list with sub-lists containing the x and y coordinates of 3 overlapping polygons. This list of boundaries is used as an example to demonstrate how soap_check functions when polygons overlap.

Usage

```
overlap_polygons
```

Format

A list containing 3 sub-lists with each sub-list containing two vectors, x and y.

x The x coordinates of each polygon, name needs to be x

y The y coordinates of each polygon, name needs to be y

sissabagama_bath	<i>Sampled bathymetry points for Sissabagama Lake</i>
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Description

The latitude and longitude of sampled depth derived from bathymetric map from the [Wisconsin DNR](#) for Sissabagama Lake in northern Wisconsin.

Usage

```
sissabagama_bath
```

Format

A dataframe containing 445 rows and 3 variables:

x The longitude of each sample

y The latitude of each sample

depth The latitude of each sample

sissabagama_lake_grid_knots

Knots for Sissabagama Lake created through using a grid

Description

The latitude and longitude of knots evenly spaced 200 m away from each other covering the boundary box of Sissabagama lake. Knots included are outside the boundary of the lake.

Usage

sissabagama_lake_grid_knots

Format

A dataframe containing 1,125 rows and 2 variables:

lon The longitude of each knot

lat The latitude of each knot

sissabagama_lake_knots

Knots for Sissabagama Lake

Description

The latitude and longitude of knots evenly spaced 200 m away from each other inside Sissabagama Lake in northern Wisconsin.

Usage

sissabagama_lake_knots

Format

A dataframe containing 420 rows and 2 variables:

lon The longitude of each knot

lat The latitude of each knot

sissabagama_lake_ls *The boundary list of Sissabagama Lake*

Description

A list with sub-lists containing the latitude and longitude of each polygon that make up Sissabagama Lake in northern Wisconsin.

Usage

sissabagama_lake_ls

Format

A list containing 5 sub-lists with each sub-list containing two vectors, x and y.

x The longitude of each polygon, name needs to be x

y The latitude of each polygon, name needs to be y

sissabagama_lake_sf *Sissabagama Lake located in northern Wisconsin*

Description

Sissabagama Lake located in northern Wisconsin. The original shapefile was derived from the Wisconsin DNR's watershed database. Latitude and longitude are in UTM zone 15N.

Usage

sissabagama_lake_sf

Format

Simple feature collection with 1 features and 23 fields:

geometry POLYGON

soap_check	<i>Check if boundary, knots, and data can be modeled using a soap-film smoother</i>
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Description

Setting up a soap film smoother is often a hard and frustrating process. This function checks that the boundary, knots, and data that you feed to a soap-film smoother are “correct”. The function will plot the boundary, knots and data that are trying to be modeled to ensure that they are appropriate

Usage

```
soap_check(
  bnd,
  knots = NULL,
  data = NULL,
  plot = TRUE,
  tol = sqrt(.Machine$double.eps),
  x_name = "x",
  y_name = "y"
)
```

Arguments

bnd	A list with sub-lists that will be the boundary the soap-film smoother will smooth in. Coordinates need to be in meaningful units. For example, coordinates could be in UTM's as UTM's rely on metres.
knots	A dataframe with two columns that are the coordinates of the knots that are to be supplied to the soap-film smoother. Coordinates need to be in meaningful units. For example, coordinates could be in UTM's as UTM's rely on metres.
data	A dataframe with two columns that are the coordinates of the data that are to be supplied to the soap-film smoother. Coordinates need to be in meaningful units. For example, coordinates could be in UTM's as UTM's rely on metres.
plot	logical if plot of boundary, knots, and/or data should be plotted. Default is TRUE
tol	Tolerance value to check if boundaries are complete polygons. Sometimes tolerance needs to be increased (e.g., tol = 1e-6)
x_name	Column name of x coordinate for the knots and/or data object
y_name	Column name of y coordinate for the knots and/or data object

Value

TRUE or FALSE depending on whether the boundary will be able to be used by a soap-film smoother. Additionally if supplying knots and/or data. It will warn the user which knots and/or data fall too close or outside the boundary.

Examples

```
# library(mgcv)
# fsb <- list(fs.boundary())
# soap_check(fsb)

soap_check(sissabagama_lake_ls)
```

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