Package ‘GRNNs’

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Title  General Regression Neural Networks Package
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Description This General Regression Neural Networks Package uses various distance functions. It was motivated by Specht (1991, ISBN:1045-9227), and updated from previous published paper Li et al. (2016) <doi:10.1016/j.palaeo.2015.11.005>. This package includes various functions, although "euclidean" distance is used traditionally.
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findSpread

**Description**

Find best spread

**Usage**

```r
findSpread(p_train, v_train, k, fun, scale = TRUE)
```

**Arguments**

- `p_train`: The dataframe of training predictor dataset
- `v_train`: The dataframe of training response variables
- `k`: The numeric number of k folds
- `fun`: The distance function
- `scale`: The logic statements (TRUE/FALSE)

**Value**

Best spread

**Examples**

```r
data("met")
data("physg")
## Not run: best.spread<-findSpread(physg,met,10,"bray",scale=TRUE)
```

findSpreadRdist

**Description**

find best spreads using Rdist

**Usage**

```r
findSpreadRdist(x, y, k, fun, scale = TRUE)
```
findSpreadVegan

Arguments

x The dataframe of training predictor dataset
y The dataframe of training response variables
k The numeric number of k folds
fun The distance function
scale The logic statements (TRUE/FALSE)

Value

The vector of best spreads

findSpreadVegan Find best spread using vegan function

Description

Find best spread using vegan function

Usage

findSpreadVegan(x, y, k, fun, scale = TRUE)

Arguments

x The dataframe of training predictor dataset
y The dataframe of training response variables
k The numeric number of k folds
fun The distance function
scale The logic statements (TRUE/FALSE)

Value

The vector of best spreads
General Regression Neural Networks (GRNNs)

Description


Usage

grnn(p_input, p_train, v_train, fun = "euclidean", best.spread, scale = TRUE)

Arguments

p_input The dataframe of input predictors
p_train The dataframe of training predictor dataset
v_train The dataframe of training response variables
fun The distance function
best.spread The vector of best spreads
scale The logic statements (TRUE/FALSE)

Value

The predictions

Examples

data("met")
data("physg")
best.spread<-c(0.33,0.33,0.31,0.34,0.35,0.35,0.32,0.31,0.29,0.35,0.35)
predict<-physg[1,]
physg.train<-physg[-1,]
met.train<-met[-1,]
prediction<-grnn(predict,physg.train,met.train,fun="euclidean",best.spread, scale=TRUE)
grnn.distance

Description
grnn distance

Usage
grnn.distance(x, y, fun)

Arguments
x     The dataframe of training predictor dataset
y     The dataframe of training response variables
fun   The distance function

Value
The matrix of distance between a and b

Examples
data("physg")
physg.train<-physg[1:10,]
physg.test<-physg[11:30,]
distance<-grnn.distance(physg.test,physg.train,"bray")

grnn.kfold

General Regression Neural Networks (GRNNs)

Description
General Regression Neural Networks (GRNNs)

Usage
grnn.kfold(x, y, k, fun, scale = TRUE)

Arguments
x     The dataframe of training predictor dataset
y     The dataframe of training response variables
k     The numeric number of k folds
fun   The distance function
scale The logic statements (TRUE/FALSE)
Value

rmse, stdae, stdev, mae, r, pvalue, best spread

Examples

data("met")
data("physg")
results_kfold<-grnn.kfold(physg, met, 10, "euclidean", scale=TRUE)

---

**met**  
*meteorological dataset*

Description

Data from a global collection by Robert A. Spicer. It includes 11 climate variables from 378 sites.

Usage

met

Format

A data frame with 378 rows and 11 variables:

- MAT  double COLUMN_DESCRIPTION
- WMMT double COLUMN_DESCRIPTION
- CMMT double COLUMN_DESCRIPTION
- GROWSEAS  double COLUMN_DESCRIPTION
- GSP  double COLUMN_DESCRIPTION
- MMGSP  double COLUMN_DESCRIPTION
- Three_WET double COLUMN_DESCRIPTION
- Three_DRY double COLUMN_DESCRIPTION
- RH  double COLUMN_DESCRIPTION
- SH  double COLUMN_DESCRIPTION
- ENTHAL double COLUMN_DESCRIPTION

Details

DETAILS
Description
Data from a global collection by Robert A. Spicer. It includes 31 leaf physiognomies variables from 378 sites.

Usage
physg

Format
A data frame with 378 rows and 31 variables:

- Lobed double COLUMN_DESCRIPTION
- No.Teeth double COLUMN_DESCRIPTION
- Regular.teeth double COLUMN_DESCRIPTION
- Close.teeth double COLUMN_DESCRIPTION
- Round.teeth double COLUMN_DESCRIPTION
- Acute.teeth double COLUMN_DESCRIPTION
- Compound.teeth double COLUMN_DESCRIPTION
- Nanophyll double COLUMN_DESCRIPTION
- Leptophyll.1 double COLUMN_DESCRIPTION
- Leptophyll.2 double COLUMN_DESCRIPTION
- Microphyll.1 double COLUMN_DESCRIPTION
- Microphyll.2 double COLUMN_DESCRIPTION
- Microphyll.3 double COLUMN_DESCRIPTION
- Mesophyll.1 double COLUMN_DESCRIPTION
- Mesophyll.2 double COLUMN_DESCRIPTION
- Mesophyll.3 double COLUMN_DESCRIPTION
- Emarginate.apex double COLUMN_DESCRIPTION
- Round.apex double COLUMN_DESCRIPTION
- Acute.apex double COLUMN_DESCRIPTION
- Attenuate.apex double COLUMN_DESCRIPTION
- Cordate.base double COLUMN_DESCRIPTION
- Round.base double COLUMN_DESCRIPTION
- Acute.base double COLUMN_DESCRIPTION
- L.W..1.1 double COLUMN_DESCRIPTION
veg.distance

Details

Description
distance using vegdist

Usage
veg.distance(a, b, fun = "bray")

Arguments

a  The dataframe of training predictor dataset
b  The dataframe of validation predictor dataset
fun The distance function

Value
The matrix of distance between a and b

Examples
data("physg")
physg.train<-physg[1:10,]
physg.test<-physg[11:30,]
distance<-veg.distance(physg.test,physg.train,"bray")
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