Package 'GWLelast'

January 20, 2025

Type Package

Title Geographically Weighted Logistic Elastic Net Regression

Version 1.2.2

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Description Fit a geographically weighted logistic elastic net regression. Detailed explanations can be found in Yoneoka et al. (2016): New algorithm for constructing area-based index with geographical heterogeneities and variable selection: An application to gastric cancer screening <doi:10.1038/srep26582>.

Depends R (>= 3.0.1)

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Encoding UTF-8

LazyData true

RoxygenNote 6.0.1

Imports doParallel, geosphere, sp, spgwr, glmnet, foreach, methods, stats

NeedsCompilation no

Repository CRAN

Date/Publication 2019-02-10 13:03:16 UTC

Contents

GWLelast   *GWLelast Geographically weighted logistic elastic net regression*

Description

This pacakge fits the geographically weighted logistic elastic net regression model for a valible seelction and for the mitigatin of the multicolinearity between coefficients due to geographical correlation. Detailed explanations can be found in Yoneoka et al. (2016): New algorithm for constructing area-based index with geographical heterogeneities and variable selection: An application to gastric cancer screening.

GWLelast.cv.bw   *GWLelast.cv.bw*

Description

Cross validation for geographically weighted logistic elastic net regression

Usage

```
GWLelast.cv.bw(x = x, y = y, D = D, coords = coords, alpha = 1,
  lambda = lambda, nlambda = nlambda, gweight = gweight,
  longlat = longlat, bw = bw)
```

Arguments

x	Covariates.
y	Outcome binary variable.
D	Distance matrix.
coords	2 columns matrix including "longitude" and "latitude".
alpha	The elasticnet mixing parameter [0,1] in glmnet package.
lambda	Optional user-supplied lambda sequence in glmnet package.
nlambda	The number of lambda values in glmnet package.
gweight	geographical kernel function in spgwr package.
longlat	Indicate if the coords parameter are sperically calculated.
bw	bandwidth of geographical kernel function.

Value

error Cross validation error.

GWLelast.est *GWLelast.est*

Description

Fitting geographically weighted logistic elastic net regression

Usage

```
GWLelast.est(x, y, coords, D = NULL, alpha = 1, lambda = NULL,
  nlambda = NULL, gweight = c("gwr.Gauss", "gwr.bisquare"),
  longlat = TRUE, bw = bw)
```

Arguments

x	Covariates.
y	Outcome binary variable.
coords	2 columns matrix including "longitude" and "latitude".
D	Distance matrix.
alpha	The elasticnet mixing parameter [0,1] in glmnet package.
lambda	Optional user-supplied lambda sequence in glmnet package.
nlambda	The number of lambda values in glmnet package.
gweight	geographical kernel function in spgwr package.
longlat	Indicate if the coords parameter are sperically calculated.
bw	bandwidth of geographical kernel function.

Value

model: Fitted model at location i.

error: Cross validation error.

GWLelast.inner *GWLelast.inner*

Description

Inner part of fitting GWLelast without parallel cores

Usage

```
GWLelast.inner(x = x, y = y, coords = coords, W = W, lambda = lambda,
  alpha = 1, nlambda = nlambda)
```

Arguments

x	Covariates.
y	Outcome binary variable.
coords	2 columns matrix including "longitude" and "latitude".
W	Weight matrix.
lambda	Optional user-supplied lambda sequence in glmnet package.
alpha	The elasticnet mixing parameter [0,1] in glmnet package.
nlambda	The number of lambda values in glmnet package.

Value

model Fitted model at location i.

error Cross validation error.

GWLelast.sel.bw   *GWLelast.sel.bw*

Description

Bandwidth selection forgeographically weighted logistic elastic net regression

Usage

```
GWLelast.sel.bw(x, y, coords, D = NULL, alpha = 1, lambda = NULL,
  nlambda = NULL, gweight = gweight, longlat = TRUE, lower.bw = NULL,
  upper.bw = NULL)
```

Arguments

x	Covariates.
y	Outcome binary variable.
coords	2 columns matrix including "longitude" and "latitude".
D	Distance matrix.
alpha	The elasticnet mixing parameter [0,1] in glmnet package.
lambda	Optional user-supplied lambda sequence in glmnet package.
nlambda	The number of lambda values in glmnet package.
gweight	geographical kernel function in spgwr package.
longlat	Indicate if the coords parameter are sperically calculated.
lower.bw	Lower limit of bandwidth in geographical kernel.
upper.bw	Upper limit of bandwidth in geographical kernel.

Value

optimal.bw Optimal bandwidth.

Examples

```
######################
# Need to add
```

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