

Package ‘GWLeleast’

July 21, 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

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 GWLeLast

GWLeLast Geographically weighted logistic elastic net regression

Description

This package fits the geographically weighted logistic elastic net regression model for a variable selection and for the mitigation of the multicollinearity 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, nlambdas = nlambdas, 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.
nlambdas	The number of lambda values in glmnet package.
gweight	geographical kernel function in spgwr package.
longlat	Indicate if the coords parameter are spherically 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 spherically 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	<i>GWLelast.sel.bw</i>
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Description

Bandwidth selection for geographically 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 spherically 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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