Package 'GWLelast'

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Type Package

Title Geographically Weighted Logistic Elastic Net Regression

Version 1.1

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Description Fit a geographically weighted logistic elastic net regression.

License GPL-2

Suggests testthat

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

NeedsCompilation no

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R topics documented:

GWLelastic-package *GWLelast*

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.

This is an extention of geographically weighted lasso proposed by Wheeler 2009.

Details

Package:	GWLelastic
Type:	Package
Version:	1.0
Date:	2015-02-26
License:	GPL-2

Author(s)

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References

Wheeler, D.C. (2009). Simultaneous coefficient penalization and model selection in geographically weighted regression: the geographically weighted lasso. Environment and Planning A 41, 7220742

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.

GWLelast.cv.bw — *Cross validation for geographically weighted logistic elastic net regression*

Description

Cross validation for geographically weighted logistic elastic net regression

Usage

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

Arguments

x	Covariates.
y	Outcome binary variable.
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.
D	Distance matrix.
Parallel	Calculate the model with multi core or not.

Value

cv.error Cross validation error.

GWLelast.est — *Fitting geographically weighted logistic elastic net regression*

Description

Fitting geographically weighted logistic elastic net regression

Usage

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

Arguments

x	Covariates.
y	Outcome binary variable.
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.
D	Distance matrix.
Parallel	Calculate the model with multi core or not.

Value

model Fitted model at location i.

cv.error Cross validation error.

GWLelast.inner *Inner part of fitting GWLelast without parallel cores*

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.

cv.error Cross validation error.

`GWLelast.inner.parallel` *Inner part of fitting GWLelast with parallel cores*

Description

Inner part of fitting GWLelast with parallel cores

Usage

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

Arguments

`x`	Covariates.
`y`	Outcome binary variable.
`coords`	2 columns matrix including "longitude" and "latitude".
`W`	Weight 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.

Value

model Fitted model at location i.

cv.error Cross validation error.

`GWLelast.sel.bw` *Bandwidth selection forgeographically weighted logistic elastic net regression*

Description

Bandwidth selection forgeographically weighted logistic elastic net regression

Usage

```
GWLelast.sel.bw(x, y, coords, alpha = 1, lambda = NULL, nlambda = NULL,
  gweight = gweight, longlat = TRUE, lower.bw = NULL, upper.bw = NULL,
  D = NULL, tol = .Machine$double.eps^0.25, Parallel = FALSE)
```

Arguments

x	Covariates.
y	Outcome binary variable.
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.
lower.bw	Lower limit of bandwidth in geographical kernel.
upper.bw	Upper limit of bandwidth in geographical kernel.
D	Distance matrix.
tol	The desired accuracy in optimize function.
Parallel	Calculate the model with multi core or not.

Value

optimal.bw Optimal bandwidth.

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