

Package ‘palasso’

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Version 1.0.0

Title Sparse Regression with Paired Covariates

Description Implements sparse regression with paired covariates (<[doi:10.1007/s11634-019-00375-6](https://doi.org/10.1007/s11634-019-00375-6)>). The paired lasso is designed for settings where each covariate in one set forms a pair with a covariate in the other set (one-to-one correspondence). For the optional correlation shrinkage, install `ashr` (<<https://github.com/stephens999/ashr>>) and `CorShrink` (<<https://github.com/kkdey/CorShrink>>) from GitHub (see README).

Depends R (>= 3.0.0)

Imports glmnet, Matrix, survival

Suggests knitr, testthat, rmarkdown, remotes, pROC, edgeR, ashR, CorShrink

License GPL-3

Encoding UTF-8

VignetteBuilder knitr

RoxygenNote 7.3.2

URL <https://github.com/rauschenberger/palasso>,
<https://rauschenberger.github.io/palasso/>

BugReports <https://github.com/rauschenberger/palasso/issues>

NeedsCompilation no

Author Armin Rauschenberger [aut, cre] (ORCID:
<<https://orcid.org/0000-0001-6498-4801>>)

Maintainer Armin Rauschenberger <armin.rauschenberger@uni.lu>

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 methods

Methods for class "palasso"

Description

This page lists the main methods for class "palasso".

Usage

```
## S3 method for class 'palasso'
predict(object, newdata, model = "paired", s = "lambda.min", max = NULL, ...)
```

```
## S3 method for class 'palasso'
coef(object, model = "paired", s = "lambda.min", max = NULL, ...)
```

```
## S3 method for class 'palasso'
weights(object, model = "paired", max = NULL, ...)
```

```
## S3 method for class 'palasso'
fitted(object, model = "paired", s = "lambda.min", max = NULL, ...)
```

```
## S3 method for class 'palasso'
residuals(object, model = "paired", s = "lambda.min", max = NULL, ...)
```

```
## S3 method for class 'palasso'
deviance(object, model = "paired", max = NULL, ...)
```

```
## S3 method for class 'palasso'
logLik(object, model = "paired", max = NULL, ...)
```

```
## S3 method for class 'palasso'
summary(object, model = "paired", ...)
```

Arguments

object	palasso object
newdata	covariates: list of matrices, each with n rows (samples) and p columns (variables)
model	character "paired", or an entry of <code>names(object)</code>
s	penalty parameter: character "lambda.min" or "lambda.1se", positive numeric, or NULL (entire sequence)
max	maximum number of non-zero coefficients, positive integer, or NULL
...	further arguments for predict.cv.glmnet , coef.cv.glmnet , or deviance.glmnet

Details

By default, the function `predict` returns the linear predictor (`type="link"`). Consider predicting the response (`type="response"`).

See Also

Use [palasso](#) to fit the paired lasso.

palasso	<i>Paired lasso</i>
---------	---------------------

Description

The function `palasso` fits the paired lasso. Use this function if you have *paired covariates* and want a *sparse model*.

Usage

```
palasso(y = y, X = X, max = 10, ...)
```

Arguments

<code>y</code>	response: vector of length n
<code>X</code>	covariates: list of matrices, each with n rows (samples) and p columns (variables)
<code>max</code>	maximum number of non-zero coefficients: positive numeric, or NULL (no sparsity constraint)
<code>...</code>	further arguments for cv.glmnet or glmnet

Details

Let x denote one entry of the list X . See [glmnet](#) for alternative specifications of y and x . Among the further arguments, `family` must equal "gaussian", "binomial", "poisson", or "cox", and `penalty.factor` must not be used.

Hidden arguments: Deactivate adaptive lasso by setting `adaptive` to FALSE, activate standard lasso by setting `standard` to TRUE, and activate shrinkage by setting `shrink` to TRUE.

Value

This function returns an object of class `palasso`. Available methods include [predict](#), [coef](#), [weights](#), [fitted](#), [residuals](#), [deviance](#), [logLik](#), and [summary](#).

References

Armin Rauschenberger, Iuliana Ciocanea-Teodorescu, Marianne A. Jonker, Renee X. Menezes, and Mark A. van de Wiel (2020). "Sparse classification with paired covariates." *Advances in Data Analysis and Classification* 14:571-588. doi:10.1007/s11634019003756. (Click [here](#) to access PDF. Contact: <armin.rauschenberger@uni.lu>.)

Examples

```
set.seed(1)
n <- 50; p <- 20
y <- rbinom(n=n,size=1,prob=0.5)
X <- lapply(1:2,function(x) matrix(rnorm(n*p),nrow=n,ncol=p))
object <- palasso(y=y,X=X,family="binomial") # adaptive=TRUE,standard=FALSE
names(object)
```

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