

# 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

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**Repository** CRAN

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methods

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*Methods for class "palasso"*


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## 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  | <a href="#">palasso</a> 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 <a href="#">predict.cv.glmnet</a> , <a href="#">coef.cv.glmnet</a> , or <a href="#">deviance.glmnet</a> |

## 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.

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

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## 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 <a href="#">cv.glmnet</a> or <a href="#">glmnet</a>                   |

## 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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