# Package ‘hgam’

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**Title**  High-dimensional Additive Modelling

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**Description**  High-dimensional additive models as introduced by Meier, van der Geer and Buehlmann (2009).

**Depends**  grplasso, splines, lattice, rgl

**Suggests**  parallel

**License**  GPL-2

**NeedsCompilation**  no

**Repository**  CRAN

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hgam-package

Fitting high-dimensional generalized additive models

Description

hgam is used to fit high-dimensional generalized additive models.

Details

Package: hgam  
Type: Package  
Version: 0.1-0  
Date: 2010-02-09  
License: GPL-2

The package implements high-dimensional additive models as introduced by Meier et al. (2009).

Author(s)

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References


dgp

Sample data generating process

Description

Sample data generating process

Usage

dgp(n, sd = 1)

Arguments

n  sample size  
 sd  standard deviation
hgam

Value
data.frame

See Also
hgam, rnorm, sin

hgam  Fitting high-dimensional generalized additive models

Description
hgam is used to fit high-dimensional generalized additive models.

Usage
hgam(formula, data = NULL, weights, model = LinReg(),
nknots = 20, lambda1 = 2, lambda2 = 3, ...)

Arguments

formula  an object of class formula (or one that can be coerced to that class): a symbolic
description of the model to be fitted.
data  a data frame.
weights  vector of weights.
model  an object of class grpl.model implementing the negative log-likelihood, gradient, hessian etc. See the documentation of grpl.model for more details.
nknots  number of knots.
lambda1  grouplasso penalty term.
lambda2  smoothing penalty term.
...  ignored.

Value
hgam returns an object of class hgam:
y  response
x  covariables
Btilde  model matrix
coef  coefficients
Btildenew  function to set up the model matrix for (new) data

See Also
grpllasso
Examples

```r
test.d <- dgp(1000)
test.m <- hgam(y ~ ., data = test.d)
```

hrisk  

Cross-Validation

Description

Cross-validated estimation of the empirical risk for hyper-parameter selection.

Usage

```r
hrisk(object, folds = 10, type = c("cv", "bootstrap", "subsampling"),
nlambda1 = 10, lambda2 = 1:10, trace = TRUE,
papply = if (require("multicore")) mclapply else lapply)
```

Arguments

- **object**: an object of class hrisk
- **folds**: a weight matrix with number of rows equal to the number of observations. The number of columns corresponds to the number of cross-validation runs.
- **type**: type of the cross-validation
- **nlambda1**: ignored
- **lambda2**: ignored
- **trace**: ignored
- **papply**: adfa

Details

If package multicore is available, hrisk runs in parallel on cores/processors available.

Value

`object` returns an object of class hrisk.
Methods for displaying information about high-dimensional generalized additive models

Description

print.hgam is used to display some information about the fitted GAMs. plot.hgam plot the marginal effects of the two selected covariates. fitted.hgam is used to predict the original data with the fitted GAM model. coef.hgam is used to display the fitted coefficients. predict.hgam is used to predict (new) data with the fitted GAM model. logLik.hgam is used to display the value of the log likelihood function. print.hrisk is used to display the results of the hrisk function.

Usage

```r
## S3 method for class 'hgam'
print(x, ...)
## S3 method for class 'hgam'
plot(x, which = NULL, newdata = NULL, 
rug = TRUE, multidim = FALSE, ...)
## S3 method for class 'hgam'
fitted(object, ...)
## S3 method for class 'hgam'
coef(object, ...)
## S3 method for class 'hgam'
predict(object, newdata = NULL, which = NULL, intercept = NULL, ...)
## S3 method for class 'hgam'
logLik(object, ...)
## S3 method for class 'hrisk'
print(h, ...)
```

Arguments

- `x`: an object of class hgam
- `object`: an object of class hgam
- `newdata`: a data frame. If newdata = NULL then original data will be used.
- `which`: which covariate to be predicted. Character or integer can both be used. If which = NULL all predictors will be used.
- `multidim`: when multidim = TRUE the marginal effects of the two selected covariates is plotted in a three-dimensional grid.
- `intercept`: boolean or NULL. If intercept = NULL then the function uses the same intercept options as specified in hgam.
- `h`: an object of the class hrisk.
- `rug`: logical, add rugs to plots.
- `...`: ignored.
Examples

```r
  test.d <- dgp(1000)
  test.m <- hgam(y ~ ., data = test.d)

  print(test.m)
  coef(test.m)
  fitted(test.m)
  predict(test.m)
  loglik(test.m)
  plot(test.m, which = c("x1", "x2"), multidim = TRUE)
```
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