

# Package: screening (via r-universe)

November 10, 2024

**Title** What the Package Does (one line, title case)  
**Version** 0.0.0.9000  
**Description** What the package does (one paragraph).  
**Depends** R (>= 3.2.2)  
**License** What license is it under?  
**LazyData** true  
**RoxygenNote** 5.0.0.9000  
**Repository** <https://mrcieu.r-universe.dev>  
**RemoteUrl** <https://github.com/wwrechard/screening>  
**RemoteRef** HEAD  
**RemoteSha** 5011c98016c26aa6bae539dac22258697d523812

## Contents

linearModelTest . . . . .	1
logisticTest . . . . .	2
screening . . . . .	2

<b>Index</b>	<b>4</b>
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linearModelTest	<i>A test function for linear models</i>
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## Description

This function tests screening performance on linear models with user specified dimension. The function generates synthetic data using linear model and prints the screened variable for all method to the screen.

## Usage

```
linearModelTest(n, p, beta.not.null = c(1, 2, 3), num.select = 5 *  
length(beta.not.null), ebic = FALSE)
```

**Arguments**

n	the sampel size
p	the model dimension
beta.not.null	the non-zero coefficient indexes
num.select	the same as in "screening"
ebic	the same as in "screening"

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logisticTest	<i>A test function for logistic models</i>
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**Description**

This function tests screening performance on logistic models with user specified dimension. The function generates synthetic data using logistic model and prints the screened variable for all method to the screen.

**Usage**

```
logisticTest(n, p, beta.not.null = c(1, 2, 3), num.select = 5 *
  length(beta.not.null), ebic = FALSE)
```

**Arguments**

n	the sampel size
p	the model dimension
beta.not.null	the non-zero coefficient indexes
num.select	the same as in "screening"
ebic	the same as in "screening"

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screening	<i>An efficient variable screening method</i>
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**Description**

This function implements 4 different screening methods (SIS, HOLP, RRCS and Forward regression) for linear models and 3 (excluding RRCS) for generalized linear models.

**Usage**

```
screening(x, y, method = "holp", num.select = floor(dim(x)[1]/2),
  family = "gaussian", ebic = FALSE, ebic.gamma = 1)
```

**Arguments**

x	the predictor variables, each row corresponds to an observation. Should be a numeric matrix instead of a data.frame
y	the observation.
method	the screening method to use. Choices are "sis", "holp", "rrcs", "forward". Default to "holp".
num.select	the number of variables to keep after screening. Default to half of the sample size. It will not be used if ebic is set to be TRUE.
family	the model type choices are the same as glmnet. Default to be 'gaussian'.
ebic	Indicate whether the extended BIC should be used to determine the number of variables to keep. If ebic is TRUE, then the algorithm will use ebic to terminate the screening procedure and num.select will be ignored.
ebic.gamma	tunning parameter for ebic (between 0 and 1). Gamma = 0 corresponds to the usual BIC. default to be 1.

**Value**

a list of two variables "screen" and "method". "screen" contains the index of the selected variables and "method" indicates the method of the screening.

**References**

Fan, Jianqing, and Jinchi Lv. "Sure independence screening for ultrahigh dimensional feature space." *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 70.5 (2008): 849-911. Wang, Xiangyu, and Chenlei Leng. "High-dimensional ordinary least-squares projection for screening variables." *arXiv preprint arXiv:1506.01782* (2015). Li, Gaorong, et al. "Robust rank correlation based screening." *The Annals of Statistics* 40.3 (2012): 1846-1877. Wang, Hansheng. "Forward regression for ultra-high dimensional variable screening." *Journal of the American Statistical Association* 104.488 (2009): 1512-1524.

**Examples**

There are one unit test function and two integrated test functions. Two integrated function test on linear model and

```
linearModelTest(n = 50, p = 100, beta.not.null = c(1, 2, 3), num.select = 20)
logisticTest(n = 50, p = 100, beta.not.null = c(1, 2, 3), nums.select = 20)
```

# Index

linearModelTest, 1

logisticTest, 2

screening, 2