

Package ‘sparseLTSEigen’

February 20, 2015

Type Package

Title RcppEigen back end for sparse least trimmed squares regression

Version 0.2.0

Date 2013-11-13

Depends robustHD ($\geq 0.4.0$)

Imports Rcpp ($\geq 0.9.10$), RcppEigen ($\geq 0.2.0$)

Suggests mvtnorm

LinkingTo Rcpp, RcppEigen

Description Use RcppEigen to fit least trimmed squares regression models with an L1 penalty in order to obtain sparse models.

License GPL (≥ 2)

LazyLoad yes

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 sparseLTSEigen-package

RcppEigen back end for sparse least trimmed squares regression

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Details

```

Package:    sparseLTSEigen
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Depends:   robustHD (>= 0.4.0)
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Suggests:  mvtnorm
LinkingTo: Rcpp, RcppEigen
License:   GPL (>= 2)
LazyLoad:  yes
  
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      RcppEigen back end for sparse least trimmed
      squares regression
  
```

Note

Package **sparseLTSEigen** provides an alternative back end for sparse least trimmed squares regression from package **robustHD**. The back end built into **robustHD** uses the C++ library Armadillo, whereas this back end uses the C++ library Eigen. The latter is faster, but currently does not work on 32-bit R for Windows.

When **sparseLTSEigen** is loaded, its back end is used automatically for sparse least trimmed squares regression, except on 32-bit R for Windows.

Author(s)

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Examples

```
# example is not high-dimensional to keep computation time low
```

```
library("mvtnorm")
set.seed(1234) # for reproducibility
n <- 100 # number of observations
p <- 25 # number of variables
beta <- rep.int(c(1, 0), c(5, p-5)) # coefficients
sigma <- 0.5 # controls signal-to-noise ratio
epsilon <- 0.1 # contamination level
Sigma <- 0.5^t(sapply(1:p, function(i, j) abs(i-j), 1:p))
x <- rmvnorm(n, sigma=Sigma) # predictor matrix
e <- rnorm(n) # error terms
i <- 1:ceiling(epsilon*n) # observations to be contaminated
e[i] <- e[i] + 5 # vertical outliers
y <- c(x %*% beta + sigma * e) # response
x[i,] <- x[i,] + 5 # bad leverage points

## fit sparse LTS model
# since package sparseLTSEigen is loaded, its back end based on
# the C++ library Eigen is used rather than the back end built
# into package robustHD, except on 32-bit R for Windows
fit <- sparseLTS(x, y, lambda = 0.05, mode = "fraction")
coef(fit, zeros = FALSE)
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