Package ‘sparseLTSEigen’

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Type Package

Title RcppEigen back end for sparse least trimmed squares regression

Version 0.2.0

Date 2013-11-13

Depends robustHD (>= 0.4.0)

Imports Rcpp (>= 0.9.10), RcppEigen (>= 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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NeedsCompilation yes

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**Description**

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

**Details**

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**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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