Package: free (via r-universe)

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Type Package

Title Flexible Regularized Estimating Equations

Version 1.0.2

Date 2024-05-22

Description Unified regularized estimating equation solver. Currently the package includes one solver with the l1 penalty only. More solvers and penalties are under development. Reference: Yi Yang, Yuwen Gu, Yue Zhao, Jun Fan (2021) <doi:10.48550/arXiv.2110.11074>.

License GPL-3

Imports Rcpp (>= 1.0.7)

LinkingTo Rcpp, RcppArmadillo

Encoding UTF-8

RoxygenNote 7.3.1

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

NeedsCompilation yes

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Repository https://ly129.r-universe.dev

RemoteUrl https://github.com/cran/free

RemoteRef HEAD

RemoteSha 719afc1660ade1b6c04bd74f12a16232f104e749

Contents

free_lasso *Main solver of* `free`

Description

Main solver of `free`

Usage

```
free_lasso(
  p,
  lambda,
  est_func,
  par_init,
  alpha,
  tau,
  maxit = 1000L,
  tol_ee = 1e-06,
  tol_par = 1e-06,
  verbose = FALSE
)
```

Arguments

`p`	The dimension of the dataset
`lambda`	Lasso regularization coefficient
`est_func`	R function, the estimating function specified by the user
`par_init`	Optional, initial value for parameter update
`alpha`	Tuning parameter
`tau`	Tuning parameter
`maxit`	Maximum iterations
`tol_ee`	Convergence criterion based on the update of the estimating function
`tol_par`	Convergence criterion based on the update of the parameter
`verbose`	logical, print updates

Value

A list containing the regularized estimating equation estimates and the number of iterations it takes to converge.

Examples

```
# Standardize data
dat <- scale(mtcars)
x <- as.matrix(dat[, -1])
y <- as.vector(dat[, 1])
n <- nrow(x)
p <- ncol(x)

# Specify estimating function
ufunc <- function(b) {
  1/n * crossprod(x, (x %*% b - y) )
}

# Set hyperparameters
tau <- 0.6
alpha <- 0.5

# Set regularization coefficient
lambda1 <- 0
free_R1 <- free_lasso(p = p,
                      lambda = lambda1,
                      est_func = ufunc,
                      par_init = rep(0, p),
                      alpha = alpha,
                      tau = tau,
                      maxit = 10000L,
                      tol_ee = 1e-20,
                      tol_par = 1e-10,
                      verbose = FALSE)
free_R1$coefficients

# Compare with lm() - very close
lm(y~x-1)$coefficients

# Set regularization coefficient
lambda2 <- 0.7
free_R2 <- free_lasso(p = p,
                      lambda = lambda2,
                      est_func = ufunc,
                      par_init = rep(0, p),
                      alpha = alpha,
                      tau = tau,
                      maxit = 10000L,
                      tol_ee = 1e-20,
                      tol_par = 1e-10,
                      verbose = FALSE)
free_R2$coefficients
```

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