Package ‘l1ball’

June 17, 2020

Type Package

Title l1-ball Prior For Sparse Regression

Version 0.1.0

Author Maoran Xu and Leo L. Duan

Maintainer Maoran Xu <maoranxu@ufl.edu>

Description This package provides function for the l1-ball prior on high-dimensional regression. The main function, l1ball, yields posterior samples for linear regression.

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Depends R (>= 3.1.0),EnvStats, extraDistr

Encoding UTF-8

LazyData true

RoxygenNote 7.1.0

Import extraDistr, EnvStats

R topics documented:

`l1ball` *Fit the L1 prior*

Description

This package provides an implementation of the Gibbs sampler, for using l1-ball prior with the regression likelihood $y_i = X_i\theta + \epsilon_i, \epsilon_i \sim N(0, \sigma^2)$.

Arguments

`y`	A data vector, n by 1
`X`	A design matrix, n by p
`b_w`	The parameter in $Beta(1, p^{b_w})$ for w, default $b_w = 1$
`steps`	Number of steps to run the Markov Chain Monte Carlo
`burn-ins`	Number of burn-ins
`b_lam`	The parameter in $\lambda_i \sim Inverse - Gamma(1, b_\lambda)$, default $b_\lambda = 10^{-3}$. To increase the level of shrinkage, use smaller b_λ.

Value

Outputs, the posterior sample collected from the Markov Chain:

trace_theta: θ

trace_NonZero: The non-zero indicator $1(\theta_i \neq 0)$

trace_Lam: λ_i

trace_Sigma: σ^2

Examples

```
n = 200
p = 500
X <- matrix(rnorm(n*p),n,p)
d = 5
w0 <- c(rep(0, p-d), rnorm(d)*0.1+1)

y = X
trace <- l1ball(y,X,steps=2000,burnin = 2000)

plot(colMeans(trace$trace_theta))
```

Index