Package 'l1ball'

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Type Package

Title L1-Ball Prior for Sparse Regression

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Description Provides function for the l1-ball prior on high-dimensional regression. The main function, l1ball(), yields posterior samples for linear regression, as introduced by Xu and Duan (2020) <doi:10.48550/arXiv.2006.01340>.

License GPL (>= 2)

Depends R (>= 3.1.0)

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LazyData true

RoxygenNote 7.1.0

NeedsCompilation no

Repository CRAN

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Contents

`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 $b_w = 1$
`step`	Number of steps to run the Markov Chain Monte Carlo
`burnin`	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

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 = 60
p = 100
X <- matrix(rnorm(n*p),n,p)
d = 5
w0 <- c(rep(0, p-d), rnorm(d)*0.1+1)
y = X%*% w0 + rnorm(n,0,.1)
trace <- l1ball(y,X,steps=2000,burnin = 2000)
plot(colMeans(trace$trace_theta))
```

Index