Package ‘linconGaussR’

Type Package

Title Sampling Multivariate Normal Distribution under Linear Constraints

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License GPL-3

Imports Rcpp (>= 1.0.7), MASS

LinkingTo Rcpp, RcppArmadillo

URL https://github.com/YunyiShen/linconGaussR

BugReports https://github.com/YunyiShen/linconGaussR/issues

RoxygenNote 7.1.1

NeedsCompilation yes

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Repository CRAN

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linconGauss

Sample Gaussian distribution with linear constraints Taking truncated sample of Gaussian distribution over a linear constraint domain.

Description

Sample Gaussian distribution with linear constraints Taking truncated sample of Gaussian distribution over a linear constraint domain.

Usage

linconGauss(
  n,
  A,
  b,
  Sigma,
  mu,
  x_init = NULL,
  intersection = TRUE,
  n_retry_init = 1000,
  nskp = 5
)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>number of samples to take</td>
</tr>
<tr>
<td>A</td>
<td>a matrix with M by D dimensions, the linear constraints, such that Ax+b&gt;=0</td>
</tr>
<tr>
<td>b</td>
<td>the offset of the linear constraints with dimension M such that Ax+b&gt;=0</td>
</tr>
<tr>
<td>Sigma</td>
<td>covariance matrix of the Gaussian</td>
</tr>
<tr>
<td>mu</td>
<td>mean vector of the Gaussian</td>
</tr>
<tr>
<td>x_init</td>
<td>the sample to start with, if NULL, a sample will be drawn using rejection</td>
</tr>
<tr>
<td>intersection</td>
<td>bool whether sample from the intersection or the union of the linear</td>
</tr>
<tr>
<td></td>
<td>constraints, default true, sample from the intersection</td>
</tr>
<tr>
<td>n_retry_init</td>
<td>how many times to try finding a initial value</td>
</tr>
<tr>
<td>nskp</td>
<td>how many sample to skip during the sampling routine</td>
</tr>
</tbody>
</table>

Value

a matrix with truncated sample, row as samples
Examples

```r
my_sample <- linconGauss(100, diag(2), c(0, 0), diag(2), c(0, 0))
MASS_sample <- MASS::mvrnorm(1000, c(0, 0), diag(2))
plot(MASS_sample)
points(my_sample, col = "red")
abline(h=0)
abline(v=0)
```
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