Package ‘truncnormbayes’

August 23, 2023

Title Estimates Moments for a Truncated Normal Distribution using 'Stan'

Version 0.0.3

Description Finds the posterior modes for the mean and standard deviation for a truncated normal distribution with one or two known truncation points. The method used extends Bayesian methods for parameter estimation for a singly truncated normal distribution under the Jeffreys prior (see Zhou X, Giacometti R, Fabozzi FJ, Tucker AH (2014). “Bayesian estimation of truncated data with applications to operational risk measurement”. <doi:10.1080/14697688.2012.752103>). This package additionally allows for a doubly truncated normal distribution.


BugReports https://github.com/mathurlabstanford/truncnormbayes/issues

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.2.3

Biarch true

RdMacros Rdpack

Depends R (>= 3.4.0)

Imports methods, Rcpp (>= 0.12.0), RcppParallel (>= 5.0.1), Rdpack, rstan (>= 2.18.1), rstantools (>= 2.2.0), stats

LinkingTo BH (>= 1.66.0), Rcpp (>= 0.12.0), RcppEigen (>= 0.3.3.3.0), RcppParallel (>= 5.0.1), rstan (>= 2.18.1), StanHeaders (>= 2.18.0)

Suggests testthat (>= 3.0.0), truncnorm (>= 1.0), withr (>= 2.5.0)

Config/testthat/edition 3

SystemRequirements GNU make

NeedsCompilation yes
Description

Estimates the posterior modes for the mean (mu) and standard deviation (sigma) of the underlying normal distribution, given truncated data with known truncation point(s).

Usage

trunc_est(x, a, b, mu_start = 0, sigma_start = 1, ci_level = 0.95, ...)

Arguments

x Vector of observations from truncated normal.
a Left truncation limit.
b Right truncation limit.
mu_start Initial value for mu.
sigma_start Initial value for sigma.

ci_level Confidence level of the interval – gives a 100*ci_level% symmetric HPD interval (defaults to 95%).
... Parameters to pass to rstan::sampling().

Value

A list with two elements:

stats A data frame with two rows and the columns param (mu, sd), mode (posterior mode), mean (posterior mean), median (posterior median), se (standard error), ci_lower (lower CI bound), ci_upper (upper CI bound), rhat.

fit A stanfit object (the result of fitting the model).
References


Examples

```r
set.seed(22)
x <- truncnorm::rtruncnorm(100, a = -1, b = 2, mean = 0.5, sd = 0.5)
trunc_est(x, a = -1, b = 2)
```
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