Package: thames (via r-universe)

August 23, 2024

Type Package

Title Truncated Harmonic Mean Estimator of the Marginal Likelihood

Version 0.1.1

Description Implements the truncated harmonic mean estimator (THAMES) of the reciprocal marginal likelihood using posterior samples and unnormalized log posterior values via reciprocal importance sampling. Metodiev, Perrot-Dockès, Ouadah, Irons, & Raftery (2023) <arXiv:2305.08952>.

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.2.3

Imports uniformly, stats

Suggests knitr, rmarkdown, mvtnorm

VignetteBuilder knitr

NeedsCompilation no

Author Nicholas J. Irons [aut, cre] (<`https://orcid.org/0000-0002-9720-8259`>), Marie Perrot-Dockès [aut], Martin Metodiev [aut]

Maintainer Nicholas J. Irons <`nicholasjonirons@gmail.com`>

Date/Publication 2023-10-27 23:30:02 UTC

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

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

RemoteRef HEAD

RemoteSha 3a053c89d4e56ceb86f3cbd2c34a55950d43aa63

Contents

thames *THAMES estimator of the (reciprocal) log marginal likelihood*

Description

This function computes the THAMES estimate of the reciprocal log marginal likelihood using posterior samples and unnormalized log posterior values.

Usage

```
thames(
  lps = NULL,
  params,
  n_samples = NULL,
  d = NULL,
  radius = NULL,
  p = 0.025,
  q = 1 - p,
  lp_func = NULL,
  bound = NULL,
  n_simuls = 1e+05
)
```

Arguments

`lps`	vector of unnormalized log posterior values of length n_samples (sum of the log prior and the log likelihood)
`params`	matrix of parameter posterior samples of dimension n_samples * d
`n_samples`	integer, number of posterior samples
`d`	integer, dimension of parameter space
`radius`	positive number, radius to use for defining the ellipsoid A
`p`	percentile, used for lower bound of confidence interval
`q`	percentile, used for upper bound of confidence interval
`lp_func`	function to compute unnormalized log posterior values
`bound`	function calculating membership of a point in the posterior support
`n_simuls`	integer, number of Monte Carlo simulations to use in the bounded parameter correction calculation.

Value

Returns a named list with the following elements:

References

Metodiev M, Perrot-Dockès M, Ouadah S, Irons N. J., Raftery A. E. (2023) Easily Computed Marginal Likelihoods from Posterior Simulation Using the THAMES Estimator. arXiv preprint.

Examples

```
mu_star = 1
n <- 50
Y = rnorm(n, mu_star, 1)
sig2 <- 1
sig2_n <- 1/(n+1/sig2)
mn <- sum(Y)/(n + 1/sig2)
params <- rnorm(20, mean=mn,  (sig2_n))
lps <-  sapply(params, function(i){
sum(dnorm(Y,i,1,log = TRUE)) + dnorm(i,0,sig2, log = TRUE)})
thames(lps, params)
```

Index