Package ‘dsample’

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Type Package
Title Discretization-Based Direct Random Sample Generation
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Description Two discretization-based Monte Carlo algorithms, namely the Fu-Wang algo-
          rithm and the Wang-Lee algorithm, are provided for random sample generation from a high di-
          mensional distribution of complex structure. The normalizing constant of the target distribu-
          tion needs not to be known.
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R topics documented:

dsample .................................................. 2
plot.dsample ............................................ 3
summary.dsample ........................................ 3

Index 5
dsample

Random Samples Generation Through The Wang-Lee and Fu-Wang Algorithms

Description

dsampling.wl generates a sample of specified size n from the target density function (up to a normalizing constant) based on the Wang-Lee algorithm.

Usage

dsampling(expr, rpmat, n = 1000, nk = 10000, wconst)

Arguments

expr expression
rpmat matrix containing random points for discretization
n a non-negative integer, the desired sample size.
wk a positive integer, the number of contours. See ‘Details’.
wconst a real number between 0 and 1. See ‘Details’.

Details

X has the number of rows equals to the number of discrete base points. In each row, the first element contains the functional value of the target density and the rest elements are the coordinates at which the density is evaluated. wconst is a constant for adjusting the volume of the last contour.

Value

sample.wl gives the drawn sample as a data.frame with number of rows equals the specified size n and number of columns equals ncol(x)-1.

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References

Examples

## The following example is taken from West (1993, page 414).
## Journal of the Royal Statistical Society - B, 55, 409-422.

expr <- expression((x1*(1-x2))^5 * (x2*(1-x1))^3 * (1-x1*(1-x2)-x2*(1-x1))^37)
sets <- list(x1=runif(1e5), x2=runif(1e5))
smp <- dsample(expr=expr, rpmat=sets, nk=1e4, n=1e3)

## More accurate results can be achieved by increasing the number
## of discretization points and the number of contours.

plot.dsample

Plot dsample objects

Description

Plot dsample objects

Usage

## S3 method for class 'dsample'
plot(x, ...)

Arguments

x
dsample object.

...
arguments passing functions inside.

summary.dsample

Generating Basic Summary Statistics of Marginal Distributions

Description

Producing basic summary statistics (the mean, the standard deviation and the first five modes) from
the sample drawn via either the Fu-Wang algorithm or the Wang-Lee algorithm, for all marginal
distributions of the target distribution.

Usage

## S3 method for class 'dsample'
summary(object, n = 5, ...)
Arguments

object  a data.frame, contains the sample drawn via either the Fu-Wang algorithm or the Wang-Lee algorithm

n  the first n samples

...  more arguments

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Index

*Topic discretization
  dsample, 2

*Topic sampling,
  dsample, 2

dsample, 2
plot.dsample, 3
summary.dsample, 3