Package 'mvprpb'

February 20, 2015

Type Package

Title Orthant Probability of the Multivariate Normal Distribution

Version 1.0.4

Date 2014-10-06

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Description Computes orthant probabilities multivariate normal distribution.

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R topics documented:

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mvprpb-package   *mvprpb*

Description

Evaluation orthant probabilities of non-degenerate multivariate normal distribution based on orthogonal projections to subspaces.

Details

Package:	mvprpb
Type:	Package
Version:	1.0.4
Date:	2014-10-06
License:	BSD_3_clause License

This program evaluates the probabilites of multivariate distribution based on orthogonal projections to subspaces.

Author(s)

Noboru Nomura

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References

Nomura N. (2014). Evaluation of Gaussian orthant probabilities based on orthogonal projections to subspaces. Statistics and Computing, Online First.

Examples

```
dim.p <- 8
mu    <- c( rep(- 0.5   , dim.p -1) , 3 )
cov   <-  diag( dim.p )  * 0.5 + 0.5
n.itr <- 800
integ.range <- 10
res.val <-  mvorpb( dim.p , mu , cov  ,n.itr , integ.range )
print(res.val)
```

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   mvorpb   *Depends: R(>= 3.0.3)*

Description

Orthant Probability of the Multivariate Normal Distribution

Usage

```
mvorpb( dim.p , m.tgt , v.tgt , n.itr , it.rg )
```

Arguments

`dim.p`	Dimension to evaluate (Integer, Scalar)
`m.tgt`	Mean vector(Real vector, length: dim.p).
`v.tgt`	Covariance Matrix (Real square matrix of size dim.p).
`n.itr`	Number of intervals for numerical integration. Too small n.itr increases the error of the returned value, but too large n.itr requires large memory size as well as computation time.
`it.rg`	Maximum point of the numerical integration range. Too small it.rg increases the error of the returned value due tu integration range. Estimated upper bound of caused by finiteness of it.rg will be given by the attribute with returned value. On the other hand, too large it.rg also increases the error because widths between grid points in numerical integration is inverse proportional to it.rg, and it.rg should be set with the consideration of balance it.rg and n.itr.

Details

This program evaluates the orthant probability of multivariate normal distribution based on orthogonal projections to subspaces. The covariance matrix is assumed to be nonsingular. The implemented procedure is described in Nomura (2014). The value is evaluated through applying numerical integration iteratatively. The number of the intervals for numerical integration is given by n.itr and grid points are placed equidistantly between zero and it.rg in the transformed space.

Value

The evaluated orthant probability is returned with attributes

`error-itg-rg`	Estimated upper bound of error caused by finiteness of the interval of the integration

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Author(s)

Noboru Nomura

References

Nomura N. (2014). Evaluation of Gaussian orthant probabilities based on orthogonal projections to subspaces. Statistics and Computing, Online First.

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