Package 'mvvg'

May 9, 2026

Type Package

Title Matrix-Variate Variance-Gamma Distribution

Version 0.1.0

Description Rudimentary functions for sampling and calculating density from the matrix-variate variance-gamma distribution.

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Encoding UTF-8

LazyData true

RoxygenNote 7.3.1

Imports MixMatrix, nlme, psych

Suggests knitr, rmarkdown

NeedsCompilation no

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Depends R (>= 3.5.0)

Repository CRAN

Date/Publication 2024-11-19 12:20:27 UTC

Contents

dmvvg *Calculate Matrix-Variate Variance Gamma Density*

Description

Determines density of observations from a Matrix-variate variance gamma (MVVG) distribution, under the identifiability constraint set by [].

Usage

```
dmvvg(X, M, A, Sigma, Psi, gamma, log = FALSE)
```

Arguments

X	$p \times q$ observed matrix value
M	$p \times q$ location matrix
A	$p \times q$ skewness matrix
Sigma	$p \times p$ covariance matrix
Psi	$q \times q$ covariance matrix
gamma	scalar mixing parameter
log	returns log-likelihood if TRUE, default is FALSE.

Details

MVVG samples are formulated through the normal variance-mean mixture $M + WA + \sqrt{W}Z$, where $W \sim Gamma(\gamma, \gamma)$.

Gamma must be > 0. Sigma and Psi must be positive definite covariance matrices.

Value

dmvvg returns the probability density corresponding to the inputted values and parameters.

Author(s)

Samuel Soon

See Also

rmvvg

Examples

```
M <- cbind(rep(1, 5), c(1, 0, 1, 0, 1))
A <- matrix(c(1,2), 5, 2, byrow = TRUE)
Sigma <- diag(5)
Psi <- matrix(c(4,2,2,3), 2, 2)
gamma <- 3

X <- rmvvg(1, M, A, Sigma, Psi, gamma)[[1]]
dmvvg(X, M, A, Sigma, Psi, gamma)
```

`example_matrix` *Example Matrix*

Description

5×2 matrix intended for use as an example in dmvvg.

Usage

```
example_matrix
```

Format

An object of class `matrix` (inherits from `array`) with 5 rows and 2 columns.

Author(s)

Samuel Soon

`rmvvg` *Generate Matrix-Variate Variance Gamma Samples*

Description

Generates random samples from the matrix-variate variance gamma (MVVG) distribution, under the identifiability constraint set by [].

Usage

```
rmvvg(n, M, A, Sigma, Psi, gamma)
```

Arguments

n	number of observations
M	$p \times q$ location matrix
A	$p \times q$ skewness matrix
Sigma	$p \times p$ covariance matrix
Psi	$q \times q$ covariance matrix
gamma	scalar mixing parameter

Details

MVVG samples are formulated through the normal variance-mean mixture $M + WA + \sqrt{W}Z$, where $W \sim Gamma(\gamma, \gamma)$.

Gamma must be > 0. Sigma and Psi must be positive definite covariance matrices.

Value

rmvvg returns a list of random samples.

Author(s)

Samuel Soon

See Also

dmvvg

Examples

```
M <- cbind(rep(1, 5), c(1, 0, 1, 0, 1))
A <- matrix(c(1,2), 5, 2, byrow = TRUE)
Sigma <- diag(5)
Psi <- matrix(c(4,2,2,3), 2, 2)
gamma <- 3

rmvvg(2, M, A, Sigma, Psi, gamma)
```

Index