

Package: mvvg (via r-universe)

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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)

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Repository <https://samksoon.r-universe.dev>

RemoteUrl <https://github.com/cran/mvvg>

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`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

| | |
|--------------------|---------------------------------------------------|
| <code>X</code> | $p \times q$ observed matrix value |
| <code>M</code> | $p \times q$ location matrix |
| <code>A</code> | $p \times q$ skewness matrix |
| <code>Sigma</code> | $p \times p$ covariance matrix |
| <code>Psi</code> | $q \times q$ covariance matrix |
| <code>gamma</code> | scalar mixing parameter |
| <code>log</code> | 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 $W \sim \text{Gamma}(\gamma, \gamma)$.

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 | <i>Example Matrix</i> |
|----------------|-----------------------|

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 | <i>Generate Matrix-Variate Variance Gamma Samples</i> |
|-------|-------------------------------------------------------|

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 $W \sim \text{Gamma}(\gamma, \gamma)$.

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)
```

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