

Package ‘greta.censored’

November 29, 2024

Title Censored Distributions for 'greta'

Version 0.1.0

Description Provides additional censored distributions for use with 'greta', a probabilistic programming framework for Bayesian modeling. Includes censored versions of Normal, Log-Normal, Student's T, Gamma, Exponential, Weibull, Pareto, and Beta distributions with support for right, left, and interval censoring. For details on 'greta', see Golding (2019) <[doi:10.21105/joss.01601](https://doi.org/10.21105/joss.01601)>. The methods are implemented using 'TensorFlow' and 'TensorFlow Probability' for efficient computation.

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URL <https://github.com/mtwesley/greta.censored>

BugReports <https://github.com/mtwesley/greta.censored/issues>

Depends greta (>= 0.4.2), R (>= 3.1.0)

Imports glue, reticulate, tensorflow (>= 2.7.0)

Suggests devtools, VGAM, knitr, rmarkdown, testthat (>= 3.1.0), roxygen2, styler, pkgdown

Config/testthat/edition 3

Encoding UTF-8

Language en-GB

RoxygenNote 7.3.2

SystemRequirements Python (>= 3.7.0) with header files and shared library; TensorFlow (>= v2.0.0; <https://www.tensorflow.org/>); TensorFlow Probability (v0.8.0; <https://www.tensorflow.org/probability/>)

NeedsCompilation no

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Repository CRAN

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Contents

beta_censored	2
exponential_censored	3
gamma_censored	3
greta.censored	4
lognormal_censored	5
normal_censored	6
pareto_censored	6
student_censored	7
weibull_censored	8

Index	9
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beta_censored	<i>Beta Censored Distribution</i>
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Description

Creates a censored beta distribution for use with greta.

Usage

```
beta_censored(
  alpha,
  beta,
  is_censored,
  censor = "right",
  lower = NULL,
  upper = NULL,
  dim = length(is_censored)
)
```

Arguments

alpha	Shape parameter for successes.
beta	Shape parameter for failures.
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of alpha).

Value

A greta censored beta distribution node.

exponential_censored *Exponential Censored Distribution*

Description

Creates a censored exponential distribution for use with greta.

Usage

```
exponential_censored(  
  rate,  
  is_censored,  
  censor = "right",  
  lower = NULL,  
  upper = NULL,  
  dim = length(is_censored)  
)
```

Arguments

rate	Rate parameter of the exponential distribution.
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of rate).

Value

A greta censored exponential distribution node.

gamma_censored *Gamma Censored Distribution*

Description

Creates a censored gamma distribution for use with greta.

Usage

```
gamma_censored(
  shape,
  rate,
  is_censored,
  censor = "right",
  lower = NULL,
  upper = NULL,
  dim = length(is_censored)
)
```

Arguments

shape	Shape parameter of the gamma distribution.
rate	Rate parameter of the gamma distribution (reciprocal of scale).
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of shape).

Value

A greta censored gamma distribution node.

greta.censored	<i>Censored Distributions for 'greta'</i>
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Description

Provides additional censored distributions for use with Greta, a probabilistic programming framework for Bayesian modeling. Includes censored versions of Normal, Log-Normal, Student's t, Gamma, Exponential, Weibull, Pareto, and Beta distributions with support for right, left, and interval censoring.

Author(s)

Maintainer: Mlen-Too Wesley <mlen.too.wesley@gmail.com>

See Also

Useful links:

- <https://github.com/mtwesley/greta.censored>
- Report bugs at <https://github.com/mtwesley/greta.censored/issues>

Examples

```
# add a simple example here to introduce the package!
```

lognormal_censored *Log-Normal Censored Distribution*

Description

Creates a censored log-normal distribution for use with greta.

Usage

```
lognormal_censored(  
  meanlog,  
  sdlog,  
  is_censored,  
  censor = "right",  
  lower = NULL,  
  upper = NULL,  
  dim = length(is_censored)  
)
```

Arguments

meanlog	Mean of the log-transformed normal distribution.
sdlog	Standard deviation of the log-transformed normal distribution.
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of meanlog).

Value

A greta censored log-normal distribution node.

normal_censored	<i>Normal Censored Distribution</i>
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Description

Creates a censored normal distribution for use with greta.

Usage

```
normal_censored(
  mean,
  sd,
  is_censored,
  censor = "right",
  lower = NULL,
  upper = NULL,
  dim = length(is_censored)
)
```

Arguments

mean	Mean of the normal distribution.
sd	Standard deviation of the normal distribution.
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of mean).

Value

A greta censored normal distribution node.

pareto_censored	<i>Pareto Censored Distribution</i>
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Description

Creates a censored Pareto distribution for use with greta.

Usage

```
pareto_censored(
  scale,
  alpha,
  is_censored,
  censor = "right",
  lower = NULL,
  upper = NULL,
  dim = length(is_censored)
)
```

Arguments

scale	Minimum value of the Pareto distribution.
alpha	Shape parameter of the Pareto distribution.
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of scale).

Value

A greta censored Pareto distribution node.

student_censored	<i>Student's t Censored Distribution</i>
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Description

Creates a censored Student's t distribution for use with greta.

Usage

```
student_censored(
  df,
  loc,
  scale,
  is_censored,
  censor = "right",
  lower = NULL,
  upper = NULL,
  dim = length(is_censored)
)
```

Arguments

df	Degrees of freedom for the Student's t distribution.
loc	Location parameter (mean).
scale	Scale parameter.
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of df).

Value

A greta censored Student's t distribution node.

weibull_censored	<i>Weibull Censored Distribution</i>
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Description

Creates a censored Weibull distribution for use with greta.

Usage

```
weibull_censored(
  shape,
  scale,
  is_censored,
  censor = "right",
  lower = NULL,
  upper = NULL,
  dim = length(is_censored)
)
```

Arguments

shape	Shape parameter of the Weibull distribution.
scale	Scale parameter of the Weibull distribution.
is_censored	Logical vector indicating whether each observation is censored.
censor	Type of censoring: one of 'right', 'left', 'interval'.
lower	Lower bound for interval censoring (optional).
upper	Upper bound for interval censoring (optional).
dim	Dimension of the data (optional, defaults to length of shape).

Value

A greta censored Weibull distribution node.

Index

[beta_censored](#), [2](#)

[exponential_censored](#), [3](#)

[gamma_censored](#), [3](#)

[greta.censored](#), [4](#)

[greta.censored-package](#)
([greta.censored](#)), [4](#)

[lognormal_censored](#), [5](#)

[normal_censored](#), [6](#)

[pareto_censored](#), [6](#)

[student_censored](#), [7](#)

[weibull_censored](#), [8](#)