Package ‘bridgedist’

March 2, 2022


Version 0.1.1

Description An implementation of the bridge distribution with logit-link in R. In Wang and Louis (2003) <DOI:10.1093/biomet/90.4.765>, such a univariate bridge distribution was derived as the distribution of the random intercept that ‘bridged’ a marginal logistic regression and a conditional logistic regression. The conditional and marginal regression coefficients are a scalar multiple of each other. Such is not the case if the random intercept distribution was Gaussian.

Depends R (>= 3.0.0)

License GPL (>= 2)

RoxygenNote 7.1.2

Suggests knitr, rmarkdown, reshape2, ggplot2, testthat

Imports stats

VignetteBuilder knitr

URL https://github.com/swihart/bridgedist

BugReports https://github.com/swihart/bridgedist/issues

NeedsCompilation no

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Repository CRAN

Date/Publication 2022-03-02 09:50:02 UTC

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Description

Density, distribution function, quantile function and random generation for the bridge distribution with parameter phi. See Wang and Louis (2003).

Usage

dbridge(x, phi = 1/2, log = FALSE)
pbridge(q, phi = 1/2, lower.tail = TRUE, log.p = FALSE)
qbridge(p, phi = 1/2, lower.tail = TRUE, log.p = FALSE)
rbridge(n, phi = 1/2)

Arguments

x, q vector of quantiles.
phi phi parameter. The phi must be between 0 and 1. A phi of 1/sqrt(1+3/pi^2) gives unit variance.
log, log.p logical; if TRUE, probabilities p are given as log(p).
lower.tail logical; if TRUE (default), probabilities are P[X ≤ x], otherwise, P[X > x].
p vector of probabilities.
n number of observations. If length(n) > 1, the length is taken to be the number required.

Details

If phi is omitted, the default value 1/2 is assumed.

The Bridge distribution parameterized by phi has distribution function

and density

The mean is μ and the variance is π^2(φ^2 - 1)/3.
**Value**

`dbridge` gives the density, `pbridge` gives the distribution function, `qbridge` gives the quantile function, and `rbridge` generates random deviates.

The length of the result is determined by `n` for `rbridge`, and is the maximum of the lengths of the numerical arguments for the other functions.

The numerical arguments other than `n` are recycled to the length of the result. Only the first elements of the logical arguments are used.

**Note**

Consult the vignette for some figures comparing the normal, logistic, and bridge distributions.

**Source**

`[dpq]bridge` are calculated directly from the definitions.

`rbridge` uses inversion.

**References**


See also:


**See Also**

*Distributions* for other standard distributions.

**Examples**

```r
## Confirm unit variance for phi = 1/sqrt(1+3/pi^2)
var(rbridge(1e5, phi = 1/sqrt(1+3/pi^2)))  # approximately 1
```
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