Package 'foldedt'

May 8, 2026

Type Package

Title The Folded t Family of Distributions

Version 1.0

Date 2026-03-18

Author Michail Tsagris [aut, cre]

Maintainer Michail Tsagris <mtsagris@uoc.gr>

Depends R (>= 4.0)

Imports Rfast, stats

Suggests Rfast2

Description

Maximum likelihood estimation of the folded t and related distributions. The reference paper is: Psarakis and Panaretos (1990). ``The folded t distribution". Communications in Statistics--Theory and Methods, 19(7): 2717--2734. <doi:10.1080/03610929008830342>.

License GPL (>= 2)

NeedsCompilation no

Repository CRAN

Date/Publication 2026-03-21 10:20:08 UTC

Contents

foldedt-package *The folded t family of distributions.*

Description

Maximum likelihood estimation of the folded t and related distributions. Probability and density functions, and random generation are also included.

Details

Package:	foldedt
Type:	Package
Version:	1.0
Date:	2026-03-18
License:	GPL-2

Maintainers

Michail Tsagris <mtsagris@uoc.gr>.

Author(s)

Michail Tsagris <mtsagris@uoc.gr>.

References

Psarakis and Panaretos (1990). The folded t distribution. Communications in Statistics–Theory and Methods, 19(7): 2717–2734.

dfoldedt *Density function of the (non-standardized) folded t distribution*

Description

Density function of the (non-standardized) folded t distribution.

Usage

```
dfoldedt(y, mu, s2, v, logged = FALSE)
```

Arguments

y	A vector with positive values.
mu	The location parameter, μ.
s2	The σ^2 parameter.
v	The degrees of freedom, v.
logged	If you want the logarithm of the density set this equal to TRUE.

Value

A vector with the (logged) density function values.

Author(s)

Michail Tsagris.

R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr>.

References

Psarakis and Panaretos (1990). The folded t distribution. Communications in Statistics–Theory and Methods, 19(7): 2717–2734.

https://en.wikipedia.org/wiki/Folded-t_and_half-t_distributions

See Also

foldedt.mle

Examples

```
y <- abs( rt(10, 10, 3) )
dfoldedt(y, mu = 3, s2 = 1, v = 10)
```

---

foldedt.mle *MLE of the folded t distribution*

Description

MLE of the folded t distribution.

Usage

```
foldedt.mle(x)
```

Arguments

x	A numerical vector with positive real numbers.

Value

A list including:

`param`	The estimated location and scatter parameters, and the degrees of freedom of the folded t distribution.
`loglik`	The value of the maximised log-likelihood.

Author(s)

Michail Tsagris.

R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr>.

References

Psarakis and Panaretos (1990). The folded t distribution. Communications in Statistics–Theory and Methods, 19(7): 2717–2734.

https://en.wikipedia.org/wiki/Folded-t_and_half-t_distributions

See Also

`halft.mle`, `halft1.mle`, `dfoldedt`

Examples

```
x <- abs( rt(1000, 5, 2) )
foldedt.mle(x)
```

---

halft.mle *MLE of the half t distribution*

Description

MLE of the half t distribution.

Usage

```
halft.mle(x)
```

Arguments

`x`	A numerical vector with positive real numbers.

Details

The half-t distribution with ν degrees of freedom and scatter parameter $\sigma > 0$ has density:

$$f(x) = \frac{2\Gamma\left(\frac{\nu+1}{2}\right)}{\sqrt{\nu\pi}\,\sigma\,\Gamma\left(\frac{\nu}{2}\right)}\left(1+\frac{x^2}{\nu\sigma^2}\right)^{-\frac{\nu+1}{2}}, \quad x \geq 0.$$

Value

A list including:

`param`	The estimated degrees of freedom and the scatter parameter of the half t distribution.
`loglik`	The value of the maximised log-likelihood.

Author(s)

Michail Tsagris.

R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr>.

References

Psarakis and Panaretos (1990). The folded t distribution. Communications in Statistics–Theory and Methods, 19(7): 2717–2734.

https://en.wikipedia.org/wiki/Folded-t_and_half-t_distributions

See Also

`halft1.mle`

Examples

```
x <- abs( rt(1000, 5) )
halft.mle(x)
```

`halft1.mle` *MLE of the half t distribution*

Description

MLE of the half t distribution with unit scatter parameter.

Usage

```
halft1.mle(x, tol = 1e-07)
```

Arguments

`x`	A numerical vector with positive real numbers.
`tol`	The tolerance level up to which the maximisation stops set to 1e-07 by default.

Details

The half-t distribution with $\nu > 0$ degrees of freedom, zero location parameter and unit scatter parameter has density:

$$f(x) = \frac{2\Gamma\left(\frac{\nu+1}{2}\right)}{\sqrt{\nu\pi}\,\Gamma\left(\frac{\nu}{2}\right)}\left(1+\frac{x^2}{\nu}\right)^{-\frac{\nu+1}{2}}, \quad x \geq 0.$$

Value

A list including:

`iters`	The number of iterations required by the Newton-Raphson algorithm.
`nu`	The estimated degrees of freedom of the half t distribution.
`loglik`	The value of the maximised log-likelihood.

Author(s)

Michail Tsagris.

R implementation and documentation: Michail Tsagris <mtsagris@uoc.gr>.

References

Psarakis and Panaretos (1990). The folded t distribution. Communications in Statistics–Theory and Methods, 19(7): 2717–2734.

https://en.wikipedia.org/wiki/Folded-t_and_half-t_distributions

See Also

`halft.mle`, `dfoldedt`

Examples

```
x <- abs( rt(1000, 5) )
halft.mle(x)
```

Index