Package 'uni.shrinkage'

July 22, 2025

Type Package

Title Shrinkage Estimation for Univariate Normal Mean

Version 1.0.0

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Description Implement a shrinkage estimation for the univariate normal mean based on a preliminary test (pretest) estimator. This package also provides the confidence interval based on pivoting the cumulative density function. The methodologies are published in Taketomi et al.(2024) <doi:10.1007/s42081-023-00221-2> and Taketomi et al.(2024-)(under review).

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Encoding UTF-8

RoxygenNote 7.3.2

NeedsCompilation no

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Repository CRAN

Date/Publication 2024-09-10 09:00:02 UTC

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`uni.pt` *Shrinkage Estimation for the Univariate Normal Mean based on a Preliminary Test Estimator*

Description

This function computes a preliminary test (pretest) estimate for the univariate normal mean. This function also computes the confidence interval based on a pretest estimator.

Usage

```
uni.pt(y,s,alpha=0.05,gamma=0.05,gamma1=NA,gamma2=NA,conf.int=TRUE)
```

Arguments

y	A vector of normal distributed data
s	Standard deviation of y
alpha	Significance level for the preliminary hypothesis test. This parameter satisfies 0< alpha <1. The default is alpha=0.05.
gamma	A constant that 1-gamma is the confidence level. This constant satisfies 0< gamma <1. The default is gamma=0.05.
gamma1	A constant for the 1-gamma confidence level that satisfies gamma1+gamma2=gamma. This argument is optional.
gamma2	A constant for the 1-gamma confidence level that satisfies gamma1+gamma2=gamma. This argument is optional.
conf.int	An indicator whether confidence interval is in the output or not. The default is conf.int=TRUE

Value

Sample_mean	Sample mean of y
PT	Pretest estimator for the normal mean based on y
Lower.pivotCI	Lower limit of the confidence interval
Upper.pivotCI	Upper limit of the confidence interval

Author(s)

Nanami Taketomi, Takeshi Emura

References

Taketomi N, Shih JH, Emura T.(2024-). Confidence interval for the univariate normal mean based on a pretest estimator.(under review)

Examples

```
mu=0
s=10
y=rnorm(20,mu,s)
uni.pt(y,s)

mu=1.5
s=10
y=rnorm(20,mu,s)
uni.pt(y,s,alpha=0.10)
```

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