Package 'mixtureSPRT'

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Type Package

Title Mixture Sequential Probability Ratio Test

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Description Perfoms mixture Sequential Probability Ratio Test for normally distributed data.

License GPL (>= 2)

Imports Rcpp (>= 1.0.0), ggplot2

LinkingTo Rcpp

RoxygenNote 6.1.1

Suggests knitr,
rmarkdown

VignetteBuilder knitr

R topics documented:

`mixtureSPRT-package` *Performs mixture Sequential Probability Ratio test*

Description

A more detailed description of what the package does. A length of about one to five lines is recommended.

Details

mixtureSPRT includes two functions, mSPRT for the actual test and calcTau which calculated a mixture variance based on significance level, population variance andand desired truncation time

Author(s)

Erik Stenberg

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References

Johari, R., Koomen, P., Pekelis, L. & Walsh, D. 2017, "Peeking at A/B Tests: Why it matters, and what to do about it", ACM, , pp. 1517

Examples

```
## Not run:
  library(mixtureSPRT)
  set.seed(12345)
   n <- 10000
   m <- mSPRT(x = rnorm(n),
         y = rnorm(n, mean = 0.06),
         sigma = 1,
         tau =  calcTau(alpha = 0.05, sigma = 1, truncation = n),
         theta = 0,
         distribution = "normal",
         alpha = 0.05)

     plot(m)

## End(Not run)
```

---

calcTau *Calculate Mixture Variance*

Description

Calculate Mixture Variance

Usage

```
calcTau(alpha, sigma, truncation)
```

Arguments

alpha	Significance level
sigma	Population standard deviation
truncation	Desired truncation time for mSPRT

Value

tau Optimal mixture variance τ for mSPRT.

Details

Mixture variance

$$\tau^2 = \sigma^2 \frac{\Phi(-b)}{\frac{1}{b}\phi(b) - \Phi(-b)}.$$

References

Johari, R., Koomen, P., Pekelis, L. & Walsh, D. 2017, "Peeking at A/B Tests: Why it matters, and what to do about it", ACM, , pp. 1517

`mSPRT` *Calculate mixture Sequential Probability Ratio Test*

Description

Calculate mixture Sequential Probability Ratio Test

Usage

```
mSPRT(x, y, sigma, tau, theta = 0, distribution = "normal",
  alpha = 0.05)
```

Arguments

`x, y`	Numeric vectors
`sigma`	Population standard deviation
`tau`	Mixture variance
`theta`	Hypothesised difference between `x` and `y`
`distribution`	The desired distribution. Currently, only `normal` is implemented.
`alpha`	Significance level

Value

The likelihood ratio

Details

With normal data and normal prior, the closed form solution of the probability ratio after n observations have been collected is:

$$\tilde{\Lambda}_n = \sqrt{\frac{V_n}{V_n + n\tau^2}} \exp\left(\frac{n^2\tau^2(\bar{Y}_n - \bar{X}_n - \theta_0)^2}{2V_n(V_n + n\tau^2)}\right).$$

References

Johari, R., Koomen, P., Pekelis, L. & Walsh, D. 2017, "Peeking at A/B Tests: Why it matters, and what to do about it", ACM, , pp. 1517

mSPRT.default *Perform mixture Sequential Probability Ratio Test*

Description

Perform mixture Sequential Probability Ratio Test

Usage

```
## Default S3 method:
mSPRT(x, y, sigma, tau, theta = 0,
  distribution = "normal", alpha = 0.05)
```

Arguments

x, y	Numeric vectors
sigma	Population standard deviation
tau	Mixture variance
theta	Hypothesised difference between x and y
distribution	The desired distribution. Currently, only normal is implemented.
alpha	Significance level

Value

The likelihood ratio

References

Johari, R., Koomen, P., Pekelis, L. & Walsh, D. 2017, "Peeking at A/B Tests: Why it matters, and what to do about it", ACM, , pp. 1517

plot.mSPRT *plot.mSPRT*

Description

plot.mSPRT

Usage

```
## S3 method for class 'mSPRT'
plot(x, ...)
```

Arguments

x	An object of class mSPRT
...	Further arguments

print.mSPRT *print.mSPRT*

Description

print.mSPRT

Usage

```
## S3 method for class 'mSPRT'
print(x, ...)
```

Arguments

x	An object of class mSPRT
...	Further arguments

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