Package ‘SPIn’
February 19, 2015

Type Package
Title Simulation-efficient Shortest Probability Intervals
Version 1.1
Date 2013-04-02
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Depends R (>= 1.8.0), quadprog
Description An optimal weighting strategy to compute simulation-efficient shortest probability intervals (spins).
License GPL (>= 2)
NeedsCompilation no
Repository CRAN
Date/Publication 2013-04-02 21:57:16

R topics documented:

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Description

Implement an optimal weighting strategy to compute simulation efficient shortest probability intervals (spin’s).

Details
This package contains functions for constructing and plotting simulation efficient shortest probability intervals.

**Author(s)**

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**References**

Simulation efficient shortest probability intervals. (arXiv:1302.2142)

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**Description**

Compute the shortest probability interval (spin) using SPIIn with bootstrap.

**Usage**

```r
bootSPIn(x, n.boot = 50, conf = 0.95, bw = 0, lb = -Inf, ub = Inf, l = NA, u = NA)
```

**Arguments**

- `x` A vector of samples from the distribution.  
- `n.boot` Number of bootstraps.  
- `conf` Scalar, the confidence level desired.  
- `bw` Scalar, the bandwidth of the weighting kernel in terms of sample points. If not specified, $\sqrt{n}$ will be used, where $n$ is the sample size.  
- `lb,ub` Scalars, the lower and upper bounds of the distribution. If specified, a pseudo-sample point equal to the corresponding bound will be added.  
- `l,u` Scalars, weighting centers (if provided).

**Details**

spin.boot computes the shortest probability interval for a distribution using SPIIn with bootstrap.
plot.SPIn

Value

spin.boot returns an object of class 'SPIn'. An object of class 'SPIn' is a list containing the following components:

spin  A vector of length 2 with the lower and upper endpoints of the interval.
conf  The confidence level.
x     A vector of samples from the distribution.
w.l,w.u Vectors of the computed weights.
1.l,1.u,u.l,u.u Endpoints of the weights.

Note

This function assumes that the distribution is unimodal, and computes only 1 interval, not the set of intervals that are appropriate for multimodal distributions.

Author(s)

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References

Simulation efficient shortest probability intervals. (arXiv:1302.2142)

See Also

plot.SPIn,SPIn

Examples

x <- rgamma(100,3)
bootSPIn(x)

plot.SPIn  Plot the Results from SPIn or bootSPIn

Description

Plot the histogram, the kernel density estimate, the shortest probability interval and the central interval.

Usage

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

Arguments

x  SPIn object, result of SPIn or bootSPIn.
...  See plot.

Author(s)

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References

Simulation efficient shortest probability intervals. (arXiv:1302.2142)

See Also

SPIn, bootSPIn

Examples

x <- rgamma(100, 3)
r <- bootSPIn(x)
plot(r)

Description

SPIn computes the shortest probability interval (spin) using an optimal weighting strategy.

Usage

SPIn(x, conf = 0.95, bw = 0, lb = -Inf, ub = Inf, l=NA, u=NA)

Arguments

x  A vector of samples from the distribution.
conf  Scalar, the confidence level desired.
bw  Scalar, the bandwidth of the weighting kernel in terms of sample points. If not specified, sqrt(n) will be used, where n is the sample size.
lb,ub  Scalars, the lower and upper bounds of the distribution. If specified, a pseudo-sample point equal to the corresponding bound will be added.
l,u  Scalars, weighting centers (if provided).

Details

SPIn computes the shortest probability interval for a distribution using an optimal weighting strategy. Quadratic programming is used to determine the optimal weights.
**Value**

SPIn returns an object of class 'SPIn'. An object of class 'SPIn' is a list containing the following components:

- `spinn`: A vector of length 2 with the lower and upper endpoints of the interval.
- `conf`: The confidence level.
- `x`: A vector of samples from the distribution.
- `w1, w_u`: Vectors of the computed weights.
- `1.1, u_1, u_u`: Endpoints of the weights.

**Note**

This function assumes that the distribution is unimodal, and computes only 1 interval, not the set of intervals that are appropriate for multimodal distributions.

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**References**

Simulation efficient shortest probability intervals. (arXiv:1302.2142)

**See Also**

- `bootSPIn`, `plot.SPIn`

**Examples**

```r
x <- rgamma(100,3)
SPIn(x)
```
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