Package 'ICSS'

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Type Package

Title ICSS Algorithm by Inclan/Tiao (1994)

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Description The Iterative Cumulative Sum of Squares (ICSS) algorithm by Inclan/Tiao (1994) <https://www.jstor.org/stable/2290916> detects multiple change points, i.e. structural break points, in the variance of a sequence of independent observations. For series of moderate size (i.e. 200 observations and beyond), the ICSS algorithm offers results comparable to those obtained by a Bayesian approach or by likelihood ration tests, without the heavy computational burden required by these approaches.

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Depends R (>= 3.5.0)

Imports rstack

Suggests testthat

Encoding UTF-8

LazyData true

NeedsCompilation no

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Repository CRAN

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Contents

data *Sample data for Inclan/Tiao (1994)*

Description

Generated random data (n=700) with following the scheme in Inclan/Tiao (1994):

- [1;390]Mean: 0; Variance: 1.000
- [391;517]Mean: 0; Variance: 0.365
- [518;700]Mean: 0; Variance: 1.033

Usage

```
data(data)
```

Examples

```
## load data
data(data)

## calculate the variance until the first breakpoint.
data_var <- var(data[1:390])
```

ICSS *Iterative Cumulative Sum of Squares (ICSS)*

Description

`ICSS` implements the Iterative Cumulative Sum of Squares (ICSS) algorithm by Inclan/Tiao (1994).

The test detects structural breakpoints in the variance of time series data.

Usage

```
ICSS(data, demean = FALSE)
```

Arguments

`data`	A numerical vector
`demean`	An object of class `"logical"`: If `demean` is TRUE, all data will get demeaned prior to the ICSS algorithm.

Value

`ICSS` returns a numerical vector containing the location of structural breakpoints or `NA` if none breakpoints are found.

References

Inclan, C., & Tiao, G. C. (1994): Use of cumulative sums of squares for retrospective detection of changes of variance. *Journal of the American Statistical Association*, 89(427), 913-923. https://www.jstor.org/stable/2290916.

Examples

```
## load demo data
data(data)
breakpoints <- ICSS(data)
```

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