Package ‘unsystation’

May 24, 2018

Type Package

Title Stationarity Test Based on Unsystematic Sub-Sampling

Version 0.2.0

Maintainer Haeran Cho <haeran.cho@bristol.ac.uk>

Description Performs a test for second-order stationarity of time series based on unsystematic sub-samples.

License GPL-2

LazyData TRUE

Suggests RcppArmadillo

Imports Rcpp (>= 0.12.10), doParallel, foreach, iterators

LinkingTo Rcpp, RcppArmadillo

RoxygenNote 6.0.1

NeedsCompilation yes

Author Haeran Cho [aut, cre]

Repository CRAN

Date/Publication 2018-05-23 22:06:46 UTC

R topics documented:

unsystation-package .......................................................... 2
unsystation.test ............................................................... 2

Index 4
Description

The package implements a new method for testing the stationarity of time series, where the test statistic is obtained from measuring and maximising the difference in the second-order structure over pairs of randomly drawn intervals.

Details

<table>
<thead>
<tr>
<th>Package:</th>
<th>unsystation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>Package</td>
</tr>
<tr>
<td>Version:</td>
<td>0.2.0</td>
</tr>
<tr>
<td>Date:</td>
<td>2018-05-23</td>
</tr>
<tr>
<td>License:</td>
<td>GPL (&gt;= 2)</td>
</tr>
</tbody>
</table>

The main routine of the package is `unsys.station.test`.

Author(s)

Haeran Cho
Maintainer: Haeran Cho <haeran.cho@bristol.ac.uk>

References


Description

The function implements a stationarity test procedure, where the main statistic is obtained from measuring the difference in the second-order structure over pairs of randomly drawn intervals. Maximising the main statistics after AR Sieve bootstrap-based variance stabilisation, the test statistic is obtained which is reported along with the corresponding pair of intervals and the test outcome.
Usage

```r
unsys.station.test(x, M = 2000, sig.lev = 0.05, max.scale = NULL,
                   m = NULL, B = 200, eps = 5, use.all = FALSE, do.parallel = 0)
```

Arguments

- `x`: input time series
- `M`: number of randomly drawn intervals
- `sig.lev`: significance level between 0 and 1
- `max.scale`: number of wavelet scales used for wavelet periodogram computation; `max.scale = NULL` activates the default choice (`max.scale = round(log(log(length(x)), 2), 2)`) (default = NULL)
- `m`: minimum length of a random interval; `m = NULL` activates the default choice (`m = round(sqrt(length(x)))`) (default = NULL)
- `B`: bootstrap sample size
- `eps`: a parameter used for random interval generation, see the supplementary document of Cho (2016)
- `use.all`: if `use.all=TRUE`, all `M*M` pairs of random intervals are considered in test statistic computation; if `use.all=FALSE`, only `10*M` pairs are used; regardless, the whole `M*M` pairs are considered in test criterion generation
- `do.parallel`: number of copies of R running in parallel, if `do.parallel = 0`, `%do%` operator is used, see also `foreach`

Value

- `intervals`: a pair of intervals corresponding to the test statistic, exhibiting the most distinct second-order behaviour
- `test.stat`: test statistic
- `test.criterion`: test criterion
- `test.res`: if `test.res=TRUE`, the null hypothesis of stationarity is rejected at the given significance level

References


Examples

```r
## not run:
x <- rnorm(200)
unsys.station.test(x, M=1000)
## End(not run)
```
Index

*Topic stationarity test, unsystematic sampling, local stationarity
unsystation-package, 2

foreach, 3

unsys.station.test, 2, 2
unystation (unsystation-package), 2
unsystation-package, 2