Package ‘ChangePointTaylor’

June 9, 2020

Type Package

Title Identify Changes in Mean

Version 0.1.0

Date 2020-05-27

Maintainer Michael Marks <michaelmarks@analyticaconsulting.com>

Description A basic implementation of the change in mean detection method outlined in: Tay-
point-analysis-a-powerful-new-tool-for-detecting-changes.pdf>. The package recur-
sively uses the mean-squared error change point calculation to identify candi-
date change points. The candidate change points are then re-estimated and Taylor's back-
wards elimination process is then employed to come up with a fi-
nal set of change points. Many of the underlying functions are written in C++ for improved per-
formance.

License GPL (>= 2)

Imports Rcpp (>= 1.0.4), dplyr, purrr, tidyr, magrittr, bench, rlang, ggplot2

LinkingTo Rcpp

LazyData true

RoxygenNote 7.1.0

Suggests knitr

VignetteBuilder knitr

Encoding UTF-8

NeedsCompilation yes

Author Michael Marks [aut, cre]

Depends R (>= 3.5.0)

Repository CRAN

Date/Publication 2020-06-09 09:40:06 UTC
Description

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

Details

This section should provide a more detailed overview of how to use the package, including the most important functions.

Author(s)

Your Name, email optional.

Maintainer: Your Name <<your@email.com>>

References

This optional section can contain literature or other references for background information.

See Also

Optional links to other man pages

Examples

## Not run:
## Optional simple examples of the most important functions
## These can be in \dontrun{} and \donttest{} blocks.

## End(Not run)
Description

A simple implementation of the change in mean detection methods developed by Wayne Taylor and utilized in his Change Point Analyzer software. The package recursively uses the 'MSE' change point calculation to identify candidate change points. Taylor’s backwards elimination process is then employed to come up with a final set of change points.

Usage

```r
change_point_analyzer(
  x,
  labels = NA,
  n_bootstraps = 1000,
  min_candidate_conf = 0.5,
  min_tbl_conf = 0.9,
  CI = 0.95
)
```

Arguments

- `x`: a numeric vector
- `labels`: a vector the same length as `x`. Will generate labels for the change points in the output dataframe.
- `n_bootstraps`: an integer value. Determines the number of bootstraps when calculating the change confidence level.
- `min_candidate_conf`: a value between 0 and 1. The minimum change confidence level to become a candidate change point before re-estimation and backwards elimination.
- `min_tbl_conf`: a value between 0 and 1. The minimum change confidence level below which a candidate change point will be eliminated after re-estimation and backwards elimination.
- `CI`: a value between 0 and 1. The value of the confidence interval.

Value

A dataframe containing the change points, their confidence levels, and other relevant information

References

Examples

```r
x <- US_Trade_Deficit$deficit_billions
label_vals <- US_Trade_Deficit$date

change_point_analyzer(x)
change_point_analyzer(x, label = label_vals)
change_point_analyzer(x, label = label_vals, n_bootstraps = 10000)
change_point_analyzer(x, label = label_vals, min_candidate_conf = 0.66, min_tbl_conf = 0.95)
```

**US_Trade_Deficit**


**Description**

A replication of the US Trade Deficit data used in Taylor's manuscript.

**Usage**

US_Trade_Deficit

**Format**

A data frame with 24 rows and 2 variables:

- **date** observation month
- **deficit_billions** US trade deficit in billions of dollars ...
Index

+Topic datasets
  US_Trade_Deficit, 4
+Topic package
  ChangePointAnalyzer-package, 2

change_point_analyzer, 3
ChangePointAnalyzer
  (ChangePointAnalyzer-package), 2
ChangePointAnalyzer-package, 2

US_Trade_Deficit, 4