Package 'fastpos'

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Type Package

Title Finds the Critical Sequential Point of Stability for a Pearson
Correlation

Version 0.3.0

Date 2020-02-12

Description Finds the critical sample size (``critical point of stability") for a
correlation to stabilize in Schoenbrodt and Perugini's definition of
sequential stability (see <doi:10.1016/j.jrp.2013.05.009>).

License GPL-3

Imports Rcpp (>= 1.0.1), plyr, MASS

LinkingTo Rcpp, RcppArmadillo, RcppProgress

URL https://github.com/johannes-titz/fastpos

BugReports https://github.com/johannes-titz/fastpos/issues

Encoding UTF-8

RoxygenNote 7.0.2

Suggests knitr, rmarkdown, testthat (>= 2.1.0), covr

VignetteBuilder knitr

NeedsCompilation yes

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Repository CRAN

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R topics documented:

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create_pop   *Creates a population with a specified correlation.*

Description

The correlation will be exactly the one specified. The used method is described here: https://stats.stackexchange.com/question
a-random-variable-with-a-defined-correlation-to-an-existing-variables/15040#15040

Usage

```
create_pop(rho, size)
```

Arguments

rho   Population correlation.

size   Population size.

Value

Two-dimensional population matrix with a specific correlation.

Examples

```
pop <- create_pop(0.5, 100000)
cor(pop)
```

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find_critical_pos   *Find the critical point of stability*

Description

Run simulations for one or several population correlations and return the critical points of stability
(POS). The critical point of stability is the sample size at which a certain percentage of studies will
fall into an a priori specified interval and stay in this interval if the sample size is increased further.

Usage

```
find_critical_pos(
  rhos,
  precision = 0.1,
  precision_rel = FALSE,
  sample_size_min = 20,
  sample_size_max = 1000,
  n_studies = 10000,
  confidence_levels = c(0.8, 0.9, 0.95),
  pop_size = 1e+06
)
```

Arguments

`rhos`	Vector of population correlations (can also be a single correlation).
`precision`	Precision around the correlation which is acceptable (defaults to 0.1). The precision will determine the corridor of stability which is just rho+-precision.
`precision_rel`	Whether the precision is absolute (rho+-precision or relative rho+-rho*precision), boolean (defaults to FALSE).
`sample_size_min`	Minimum sample size for each study (defaults to 20).
`sample_size_max`	Maximum sample size for each study (defaults to 1e3).
`n_studies`	Number of studies to run for each rho (defaults to 10e3).
`confidence_levels`	Confidence levels for point of stability. This corresponds to the quantile of the distribution of all found critical sample sizes (defaults to c(.8, .9, .95)).
`pop_size`	Population size (defaults to 1e6).

Value

A data frame containing all the above information, as well as the points of stability.

Examples

```
find_critical_pos(rhos = 0.5)
find_critical_pos(rhos = c(0.4, 0.5), n_studies = 1e3)
```

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simulate_pos	*Simulate several points of stability*

Description

Runs several simulations and returns the points of stability, which can then be further processed to calculate the critical point of stability.

Usage

```
simulate_pos(
  x_pop,
  y_pop,
  n_studies,
  sample_size_min,
  sample_size_max,
  replace,
  lower_limit,
  upper_limit
)
```

Arguments

`x_pop`	First vector of population.
`y_pop`	Second vector of population.
`n_studies`	How many studies to conduct.
`sample_size_min`	
	Minimum sample size to start in corridor of stability.
`sample_size_max`	
	How many participants to draw at maximum.
`replace`	Whether drawing samples is with replacement or not.
`lower_limit`	Lower limit of corridor of stability.
`upper_limit`	Upper limit of corridor of stability.

Value

Vector of sample sizes at which corridor of stability was reached.

Examples

```
pop <- fastpos::create_pop(0.5, 1000000)
simulate_pos(pop[,1], pop[,2], 100, 20, 1000, TRUE, 0.4, 0.6)
```

Index