Package ‘fastpos’

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Type Package
Title Finds the Critical Sequential Point of Stability for a Pearson Correlation
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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
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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/questions/15011/generate-a-random-variable-with-a-defined-correlation-to-an-existing-variables/15040#15040](https://stats.stackexchange.com/questions/15011/generate-a-random-variable-with-a-defined-correlation-to-an-existing-variables/15040#15040)

**Usage**

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

**Arguments**

- `rho`  
  Population correlation.
- `size`  
  Population size.

**Value**

Two-dimensional population matrix with a specific correlation.

**Examples**

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

**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**

```r
find_critical_pos(
  rhos,
  precision = 0.1,
  precision_rel = FALSE,
  sample_size_min = 20,
  sample_size_max = 1000,
  replace = TRUE,
  n_studies = 10000,
  confidence_levels = c(0.8, 0.9, 0.95),
)```
simulate_pos

pop_size = 1e+06,
n_cores = 1

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).
replace Whether drawing samples is with replacement or not.
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).
n_cores Number of cores to use for simulation.

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)

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.
simulate_pos

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)
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