Package 'sparvaride'

Type Package

Title Variance Identification in Sparse Factor Analysis

Version 0.1.0

Description This is an implementation of the algorithm described in Section 3 of Hosszejni and Früh-wirth-Schnatter (2022) <doi:10.48550/arXiv.2211.00671>. The algorithm is used to verify that the counting rule CR(r,1) holds for the sparsity pattern of the transpose of a factor loading matrix. As detailed in Section 2 of the same paper, if CR(r,1) holds, then the idiosyncratic variances are generically identified. If CR(r,1) does not hold, then we do not know whether the idiosyncratic variances are identified or not.

License GPL (>= 3)

Encoding UTF-8

BuildResaveData best

VignetteBuilder knitr

BugReports https://github.com/hdarjus/sparvaride/issues

URL https://hdarjus.github.io/sparvaride/

Depends R (>= 4.1)

Imports Rcpp

LinkingTo RcppArmadillo, Rcpp

RoxygenNote 7.2.3

Suggests testthat (>= 3.0.0), knitr, rmarkdown

Config/testthat/edition 3

NeedsCompilation yes

Author Darjus Hosszejni [aut, cre] (<https://orcid.org/0000-0002-3803-691X>),
Sylvia Frühwirth-Schnatter [ths]
(<https://orcid.org/0000-0003-0516-5552>)

Maintainer Darjus Hosszejni <darjus.hosszejni@wu.ac.at>

Repository CRAN

Date/Publication 2023-03-13 13:30:05 UTC

R topics documented:

---

counting_rule_holds   *Verify that the counting rule CR(r,1) holds*

Description

This is an implementation of the algorithm described in Section 3 of Hosszejni and Fruehwirth-Schnatter (2022). The algorithm is used to verify that the counting rule CR(r,1) holds for the sparsity pattern of the transpose of a factor loading matrix. As detailed in Section 2 of the same paper, if CR(r,1) holds, then the idiosyncratic variances are generically identified. If CR(r,1) does not hold, then we do not know whether the idiosyncratic variances are identified or not.

Usage

```
counting_rule_holds(delta)
```

Arguments

delta   an m x r matrix of 0s and 1s, where delta(i,j) == 1 if and only if the i-th
                   observation loads on the j-th factor

Value

TRUE if CR(r,1) holds, FALSE otherwise

References

Hosszejni and Fruehwirth-Schnatter (2022). "Cover It Up! Bipartite Graphs Uncover Identifiability in Sparse Factor Analysis". arXiv:2211.00671

See Also

stats::factanal()

Examples

```
# Two example matrices
cr_holds <-
  matrix(c(1, 0, 0,
           1, 0, 1,
           0, 1, 0,
           0, 1, 1,
           0, 1, 1,
           1, 1, 1,
           1, 1, 1),
```

```
                 7, 3, byrow = TRUE)

cr_does_not_hold <-
  matrix(c(1, 0, 0,
           0, 0, 1,
           0, 1, 0,
           0, 1, 0,
           0, 1, 0,
           1, 1, 1,
           1, 1, 1),
         7, 3, byrow = TRUE)

# Check if the counting rule holds
counting_rule_holds(cr_holds)
#> [1] TRUE
counting_rule_holds(cr_does_not_hold)
#> [1] FALSE
```

Index