

Package ‘sparvaride’

December 13, 2025

Type Package

Title Variance Identification in Sparse Factor Analysis

Version 1.0.0

Description This is an implementation of the algorithm described in Section 3 of Hosszejni and Frühwirth-Schnatter (2026) <[doi:10.1016/j.jmva.2025.105536](https://doi.org/10.1016/j.jmva.2025.105536)>. 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 7.3.3

Suggests testthat (>= 3.0.0), knitr, rmarkdown

Config/testthat/edition 3

NeedsCompilation yes

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Repository CRAN

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Contents

counting_rule_holds	2
Index	4

counting_rule_holds	<i>Verify that the counting rule $CR(r,1)$ holds</i>
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Description

This is an implementation of the algorithm described in Section 3 of Hosszejni and Fruehwirth-Schnatter (2026). 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 $m \times r$ matrix of 0s and 1s, where $\text{delta}(i,j) == 1$ if and only if the i -th observation loads on the j -th factor
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Value

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

References

Hosszejni and Fruehwirth-Schnatter (2026). "Cover It Up! Bipartite Graphs Uncover Identifiability in Sparse Factor Analysis". *Journal of Multivariate Analysis*, 211, 105536. ISSN 0047-259X. [doi:10.1016/j.jmva.2025.105536](https://doi.org/10.1016/j.jmva.2025.105536)

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

- * **factor analysis variance identification**

- counting_rule_holds, [2](#)

- * **models**

- counting_rule_holds, [2](#)

- * **multivariate**

- counting_rule_holds, [2](#)

counting_rule_holds, [2](#)

stats::factanal(), [2](#)