Package 'mirtsvd'

April 21, 2025

Title SVD-Based Estimation for Exploratory Item Factor Analysis

Version 1.0.1

Author Haoran Zhang [aut, cre],
Yunxiao Chen [aut],
Xiaoou Li [aut]

Maintainer Haoran Zhang <hrzhang16@gmail.com>

Description Provides singular value decomposition based estimation algorithms for exploratory item factor analysis (IFA)
based on multidimensional item response theory models. For more information, please refer to:
Zhang, H., Chen, Y., & Li, X. (2020). A note on exploratory item factor analysis by
singular value decomposition. Psychometrika, 1-15, <DOI:10.1007/s11336-020-09704-7>.

License GPL-3

Encoding UTF-8

RoxygenNote 7.3.2

Depends R (>= 3.1)

Imports GPArotation, mirtjml, graphics, stats

NeedsCompilation no

Repository CRAN

Date/Publication 2025-04-21 03:00:02 UTC

Contents

mirtsvd 2
screeplot_svd 3

Index **4**

mirtsvd *Item Factor Analysis by Singular Value Decomposition*

Description

Item Factor Analysis by Singular Value Decomposition

Usage

```
mirtsvd(data, K, link = "logit", epsilon = 1e-04, rotation_fn = NULL, ...)
```

Arguments

data	the data matrix. Entries are either binary or categorical. Missing entries should be NA.
K	the number of factors.
link	the link function. Possible choices are "logit" and "probit".
epsilon	the truncation parameter. Default value is 1e-4.
rotation_fn	rotation applied to the estimated loading matrix. See rotations. If NULL, no rotation would be applied.
...	optional arguments passed to rotation_fn.

Value

The function returns a list with the following components:

loadings The estimated loading matrix.

rotation The rotation method.

type The data type.

number The number of categories in data.

References

Zhang, H., Chen, Y., & Li, X. (2020). A note on exploratory item factor analysis by singular value decomposition. Psychometrika, 1-15, doi:10.1007/s11336020097047.

Examples

```
require(mirtjml)
require(GPArotation)

# load a simulated dataset
attach(data_sim)

data <- data_sim$response
K <- data_sim$K
res <- mirtsvd(data, K, rotation_fn = Varimax)
```

screeplot_svd *Scree plot for singular values.*

Description

Scree plot for singular values.

Usage

```
screeplot_svd(data, link = "logit", epsilon = 1e-04, K_max = 10)
```

Arguments

data	the data matrix. Entries are either binary or categorical. Missing entries should be NA.
link	the link function. Possible choices are "logit" and "probit".
epsilon	the truncation parameter. Default value is 1e-4.
K_max	The maximum number of factors contained in data. Default value is 10.

References

Zhang, H., Chen, Y., & Li, X. (2020). A note on exploratory item factor analysis by singular value decomposition. Psychometrika, 1-15, doi:10.1007/s11336020097047.

Examples

```
require(mirtjml)

# load a simulated dataset
attach(data_sim)

data <- data_sim$response
screeplot_svd(data, K_max = 10)
```

Index

mirtsvd, 2

rotations, *2*

screeplot_svd, 3