

Package ‘ggIRT’

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Type Package

Title Visualize Item Response Category Characteristic Curves, Item Characteristic Curves, Item Information Curves, and Test Information Curve

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Author Tatsuya IKEDA

Maintainer Tatsuya IKEDA <ikedata.tatsuya.clpsy@gmail.com>

Description Visualize IRCCC, ICC, IIC, and TIC from a mirt object, using the ggplot2 package. The scale factor $D = 1.701$ is often used, but the `ltm` package uses $D = 1.00$. Therefore, the objects generated by the `ltm` package (`ltm` objects and `grm` objects) are corrected to $D = 1.701$. Therefore, the shapes of the curves differ between the visualization using the `ltm` package and the visualization using this package.

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Encoding UTF-8

LazyData true

URL <https://hedgehog2nd.github.io/ggIRT/>

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Imports ggplot2,
ltm,
mirt

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`demo_data`*demo data*

Description

This dataset contains simulated responses from 100 individuals on 10 items, each rated on a 5-point likert scale (1 to 5). The data were generated using a graded response model with item discrimination parameters ranging from 0.1 to 3, and difficulty thresholds increasing monotonically for each item.

Usage

```
data(demo_data)
```

Format

A data frame with 200 rows and 10 variables:

Item_1 Response to item 1

Item_2 Response to item 2

Item_3 Response to item 3

Item_4 Response to item 4

Item_5 Response to item 5

Item_6 Response to item 6

Item_7 Response to item 7

Item_8 Response to item 8

Item_9 Response to item 9

Item_10 Response to item 10

Details

This is a demonstration data. Any resemblance to actual persons, living or dead, is purely coincidental.

Examples

```
data(demo_data)
head(demo_data)
```

`gg_iic`*visualize Item Information Curves.*

Description

`gg_iic` Calculate the item information volume from the item parameter obtained from GRM or 2PLM.

Usage

```
gg_iic(  
  object,  
  item,  
  theta = c(-3, 3),  
  breaks = 100,  
  grm = TRUE,  
  use_ltm = FALSE,  
  output.data = FALSE  
)
```

Arguments

<code>object</code>	mirt or grm object. If you use the grm object, you must set <code>ltm = TRUE</code> .
<code>item</code>	numeric. The number of the item to be visualized. The length must be 1.
<code>theta</code>	vector. The length must be 2. Specify the range of theta in the IRCCC to be visualized using <code>c()</code> .
<code>breaks</code>	numeric. Specifies the number of divisions of theta. For example, if you specify 1000, the range specified by theta will be divided into 1000 parts. The default is 100.
<code>grm</code>	logical. The default is TRUE. If you are using a binary IRT (2PLM) object, set it to TRUE.
<code>use_ltm</code>	logical. The default is FALSE. If you are using an object (either an ltm object or a grm object) from the ltm package, set this to TRUE. When <code>use_ltm = TRUE</code> , the scale factor D is corrected to 1.701.
<code>output.data</code>	logical. The default is FALSE. If TRUE, instead of visualizing IRCCC, the data that forms the basis of IRCCC is output in long format.

Value

Visualize item information using ggplot2 package.

Examples

```
#library(mirt)  
#mirt_object <- mirt(data, itemtype = "graded")  
  
#gg_iic(mirt_object, item = 1)  
#gg <- gg_iic(mirt_object, item = 1)  
#gg + theme_bw()
```

```
#library(ltm)
#ltm_object <- ltm(data ~ z1, IRT.param = TRUE)

#gg_iic(ltm_object, item = 1, theta = c(-5, 5), breaks = 1000, grm = FALSE, use_ltm = TRUE)
```

gg_irccc

visualize IRCCC from mirt or ltm object.

Description

gg_irccc visualize IRCCC from mirt or ltm object.

Usage

```
gg_irccc(
  object,
  item,
  theta = c(-3, 3),
  breaks = 100,
  grm = TRUE,
  monochrome = FALSE,
  use_ltm = FALSE,
  output.data = FALSE
)
```

Arguments

object	mirt or grm object. If you use the grm object, you must set ltm = TRUE.
item	numeric. The number of the item to be visualized. The length must be 1.
theta	vector. The length must be 2. Specify the range of theta in the IRCCC to be visualized using c().
breaks	numeric. Specifies the number of divisions of theta. For example, if you specify 1000, the range specified by theta will be divided into 1000 parts. The default is 100.
grm	logical. The default is TRUE. If the object is GRM, set it to TRUE, and if it is a binary type, set it to FALSE.
monochrome	logical. The default is FALSE, and IRCCC is output in color. If TRUE, IRCCC is output in black and white.
use_ltm	logical. The default is FALSE. If you are using the mirt object, set this to FALSE. If you are using the grm object from the ltm package, set this option to TRUE. When use_ltm = TRUE, the scale factor D is corrected to 1.701.
output.data	logical. The default is FALSE. If TRUE, instead of visualizing IRCCC, the data that forms the basis of IRCCC is output in long format.

Value

Visualize the IRCCC of the specified item from the mirt or ltm object (output.data = FALSE). Output data that can visualize the IRCCC of the specified item from the mirt or ltm object (output.data = TRUE).

Examples

```

#library(mirt)
#data(Bock1997)
#dat <- Bock1997[1:3]
#res <- mirt(dat, model = 1, itemtype = "graded")

#gg_irccc(object = res, item = 1)
#plot1 <- gg_irccc(object = res, item = 1)
#plot1 + theme_bw()

#library(ltm)
#res <- grm(dat[1:3], IRT.param = TRUE)

#gg_irccc(object = res, item = 1, use_ltm = TRUE)
#d <- gg_irccc(object = res, item = 1, output.data = TRUE)

```

gg_tic

*visualize Item Information Curves.***Description**

gg_tic Calculate the item information volume from the item parameter obtained from GRM.

Usage

```

gg_tic(
  object,
  theta = c(-3, 3),
  breaks = 100,
  se = TRUE,
  grm = TRUE,
  use_ltm = FALSE,
  output.data = FALSE
)

```

Arguments

object	mirt or grm object. If you use the grm object, you must set ltm = TRUE.
theta	vector. The length must be 2. Specify the range of theta in the IRCCC to be visualized using c().
breaks	numeric. Specifies the number of divisions of theta. For example, if you specify 1000, the range specified by theta will be divided into 1000 parts. The default is 100.
se	logical. The default is TRUE. If you are not adding a SE to the test information curve, set it to FALSE.
grm	logical. The default is TRUE. If you are using a binary IRT (2PLM) object, set it to TRUE.
use_ltm	logical. The default is FALSE. If you are using an object (either an ltm object or a grm object) from the ltm package, set this to TRUE. When use_ltm = TRUE, the scale factor D is corrected to 1.701.
output.data	logical. The default is FALSE. If TRUE, instead of visualizing IRCCC, the data that forms the basis of IRCCC is output in long format.

Value

Visualize test information Curves using ggplot2 package.

Examples

```
#library(mirt)
#mirt_object <- mirt(data, model = 1, itemtype = "graded")

#gg_iic(mirt_object, item = 1)
#gg <- gg_iic(mirt_object, item = 1)
#gg + theme_bw()

#library(ltm)
#ltm_object <- ltm(data ~ z1, IRT.param = TRUE)

#gg_iic(ltm_object, item = 1, theta = c(-5, 5), breaks = 1000, grm = FALSE, use_ltm = TRUE)
```

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