

# Package ‘Factoshiny’

April 20, 2024

**Type** Package

**Title** Perform Factorial Analysis from 'FactoMineR' with a Shiny Application

**Version** 2.6

**Author** Pauline Vaissie, Astrid Monge, Francois Husson

**Maintainer** Francois Husson <francois.husson@institut-agro.fr>

**Depends** R (>= 4.0), FactoMineR (>= 2.3),shiny,FactoInvestigate (>= 1.5),ggplot2

**Imports** DT,colourpicker,grDevices,tcltk,ggrepel,shinydashboard,shinyjqui,missMDA

**Description** Perform factorial analysis with a menu and draw graphs interactively thanks to 'FactoMineR' and a Shiny application.

**URL** <http://factominer.free.fr/graphs/factoshiny.html>

**License** GPL (>= 2)

**Encoding** UTF-8

**NeedsCompilation** no

**Repository** CRAN

**Date/Publication** 2024-04-20 08:12:39 UTC

## R topics documented:

Factoshiny-package . . . . .	2
CAshiny . . . . .	2
catdesshiny . . . . .	4
condesshiny . . . . .	5
FAMDshiny . . . . .	6
HCPCshiny . . . . .	7
MCAshiny . . . . .	8
MFAshiny . . . . .	10
PCAshiny . . . . .	11
print.CAshiny . . . . .	12
print.FAMDshiny . . . . .	13

print.HCPCshiny . . . . .	14
print.MCAshiny . . . . .	15
print.MFAshiny . . . . .	15
print.PCAshiny . . . . .	16

<b>Index</b>	<b>18</b>
--------------	-----------

---

Factoshiny-package	<i>Perform classical factorial analysis from FactoMineR within a Shiny app ~ Factoshiny ~</i>
--------------------	---

---

### Description

Factoshiny allows to perform CA, PCA, MFA, HCPC and MFA (classical functions from FactoMineR) within a Shiny app. The user can easily change the function parameters and the graphs parameters and can automatically see the results of the change on the plot. All graphs can be downloaded in png, jpg and pdf.

### Details

Factoshiny has been created to be as easy to use as possible. Thus, only the dataset is needed to be informed in the main function.

### Author(s)

Pauline Vaissie, Astrid Monge, Francois Husson

Maintainer: Who to complain to <Magalie.Houee@agrocampus-ouest.fr>

### References

A website: <http://factominer.free.fr/graphs/factoshiny.html>

Some videos: <https://youtu.be/6y0NDDQcIXo>

---

CAshiny	<i>Correspondance Analysis (CA) with Factoshiny</i>
---------	---

---

### Description

Performs Correspondance Analysis (CA) including supplementary row and/or column points on a Shiny application.

Columns or rows with NA are considered as supplementary in the analysis.

Allows to change CA parameters and graphical parameters.

Graphics can be downloaded in png, jpg and pdf.

### Usage

CAshiny(X)

**Arguments**

`X` a data frame or a table with  $n$  rows and  $p$  columns, i.e. a contingency table or a CAshiny result or a CA result

**Value**

Returns several tabs:

`Graphs` a tab containing the row and column points factor map (with supplementary columns and supplementary rows)

`Values` a tab containing the summary of the CA performed, the eigenvalues, the results for the columns, for the rows, for the supplementary columns and for the supplementary rows.

`Summary of dataset`

a tab containing the summary of the dataset and a boxplot and histogram for quantitative variables.

`Data`

a tab containing the dataset with a nice display.

The left part of the application allows to change all the elements of the CA and the graphs (axes, variables, colors...)

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[CA, plot.CA](#)  
[shiny website](#)

**Examples**

```
## Not run:
require(FactoMineR)
data(children)
# Correspondance Analysis with Factoshiny:
res.shiny=CAshiny(children)

# Find your app the way you left it (by clicking on the "Quit the app" button)
res.shiny2=CAshiny(res.shiny)

#CAshiny on a result of a CA
data(children)
res.ca <- CA (children, row.sup = 15:18, col.sup = 6:8)
res.shiny=CAshiny(res.ca)

## End(Not run)
```

---

`catdeshiny`*Categories description*

---

**Description**

Description of the categories of one factor by categorical variables and/or by quantitative variables

**Usage**

```
catdeshiny(X)
```

**Arguments**

`X` a data frame made up of at least one categorical variables and a set of quantitative variables and/or categorical variables

**Value**

Returns a list including:

<code>test.chi</code>	The categorical variables which characterized the factor are listed in ascending order (from the one which characterized the most the factor to the one which significantly characterized with the proba proba)
<code>category</code>	description of each category of the <code>num.var</code> by each category of all the categorical variables
<code>quanti.var</code>	the global description of the <code>num.var</code> variable by the quantitative variables with the square correlation coefficient and the p-value of the F-test in a one-way analysis of variance (assuming the hypothesis of homoscedsticity)
<code>quanti</code>	the description of each category of the <code>num.var</code> variable by the quantitative variables.

**Author(s)**

Etienne Lancelle, Francois Husson <francois.husson@institut-agro.fr>

**References**

Husson, F., Le, S. and Pages, J. (2010). Exploratory Multivariate Analysis by Example Using R, *Chapman and Hall*. Lebart, L., Morineau, A. and Piron, M. (1995) Statistique exploratoire multidimensionnelle, *Dunod*.

**See Also**

[catdes](#)

**Examples**

```
## Not run:  
require(FactoMineR)  
data(wine)  
catdesshiny(wine)  
  
## End(Not run)
```

---

condesshiny	<i>Continuous variable description</i>
-------------	--

---

**Description**

Description continuous by quantitative variables and/or by categorical variables

**Usage**

```
condesshiny(X)
```

**Arguments**

X a data frame made up of at least one quantitative variable and a set of quantitative variables and/or categorical variables

**Value**

Returns a list including:

quanti	the description of the num.var variable by the quantitative variables. The variables are sorted in ascending order (from the one which characterized the most to the one which significantly characterized with the proba proba)
quali	The categorical variables which characterized the continuous variables are listed in ascending order
category	description of the continuous variable num.var by each category of all the categorical variables

**Author(s)**

Etienne Lancelle, Francois Husson <francois.husson@institut-agro.fr>

**See Also**

[condes](#)

**Examples**

```
## Not run:
require(FactoMineR)
data(decathlon)
condesshiny(decathlon)

## End(Not run)
```

---

FAMDshiny

*Factor Analysis for Mixed Data with Factoshiny*


---

**Description**

Performs Factor Analysis for Mixed Data (FAMD) with supplementary individuals, supplementary quantitative variables and supplementary categorical variables on a Shiny application. Allows to change FAMD parameters and graphical parameters. Graphics can be downloaded in png, jpg and pdf.

**Usage**

```
FAMDshiny(X)
```

**Arguments**

**X** a data frame with  $n$  rows (individuals) and  $p$  columns (numeric variables and categorical variables), or a FAMDshiny result or a FAMD result

**Value**

Returns several tabs:

Graphs	a tab containing the individuals factor map, the variables factor (quantitative and categorical) map and the correlation circle.
Values	a tab containing the summary of the FAMD performed, the eigenvalues, the results for the variables, the results for the individuals, the results for the supplementary variables and the results for the supplementary individuals.
Summary of dataset	a tab containing the summary of the dataset and a boxplot and histogram for quantitative variables.
Data	a tab containing the dataset with a nice display.

The left part of the application allows to change all the elements of the FAMDA and the graphs (axes, variables, colors...)

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[FAMD,plot.FAMD  
shiny website](#)

**Examples**

```
## Not run:
require(FactoMineR)
data(geomorphology)
# FAMD with Factoshiny:
res.shiny=FAMDshiny(geomorphology)

# Find your app the way you left it (by clicking on the "Quit the app" button)
res.shiny2=FAMDshiny(res.shiny)

## End(Not run)
```

---

HCPCshiny	<i>Hierarchical Clustering on Principal Components (HCPC) with Factoshiny</i>
-----------	---

---

**Description**

Performs Hierarchical Clustering on Principal Components (HCPC) o results from a factor analysis on a Shiny application.  
Allows to change HCPC parameters and graphical parmeters.  
Graphics can be downloaded in png, jpg and pdf.

**Usage**

```
HCPCshiny(res)
```

**Arguments**

res	Either the result of a factor analysis or a dataframe, the result of a HCPCshiny app or an HCPC result
-----	--

**Value**

Returns several tabs:

Graphs	a tab containing the factor map,individuals colores by cluster, the 3D map (same graph but with tree above) and the tree map
Values	a tab containing the description of classes (by variables and by axes) and the parangons of each cluster

**Summary of dataset**

a tab containing the summary of the dataset and a boxplot and histogram for quantitative variables.

**Data**

a tab containing the dataset with a nice display.

The left part of the application allows to change the number of cluster very easily. Some parameters from the graphs can also be changed. By default, the numeric value of the number of clusters is set to the value advised by the HCPC function.

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[HCPC](#), [plot.HCPC](#)  
[shiny website](#)

**Examples**

```
## Not run:
require(FactoMineR)
data(decathlon)
# HCPC with Factoshiny on a result of a factor analysis:
res.pca <- PCA(decathlon, quanti.sup = 11:12, quali.sup=13)
res.shiny=HCPCshiny(res.pca)

# HCPC with Factoshiny on a dataframe:
data(wine)
res.shiny2=HCPCshiny(wine)

# Find your app the way you left it (by clicking on the "Quit the app" button)
res.shiny3=HCPCshiny(res.shiny2)

## End(Not run)
```

---

MCAshiny

*Multiple Correspondence Analysis (MCA) with Factoshiny*

---

**Description**

Performs Multiple Correspondence Analysis (MCA) with supplementary individuals, supplementary quantitative variables and supplementary categorical variables on a Shiny application.

Allows to change MCA parameters and graphical parameters.

Graphics can be downloaded in png, jpg and pdf.

**Usage**

MCAshiny(X)



**Arguments**

**X** a data frame with  $n$  rows (individuals) and  $p$  columns (numeric variables), or a MCAshiny result or a MCA result

**Value**

Returns several tabs:

**Graphs** a tab containing the individuals factor map and the variables factor map.  
**Values** a tab containing the summary of the MCA performed, the eigenvalues, the results for the variables, the results for the individuals, the results for the supplementary variables and the results for the numerical variables.  
**Automatic description of axes** a tab containing the output of the dimdesc function. This function is designed to point out the variables and the categories that are the most characteristic according to each dimension obtained by a Factor Analysis.  
**Summary of dataset** a tab containing the summary of the dataset and a boxplot and histogram for quantitative variables.  
**Data** a tab containing the dataset with a nice display.

The left part of the application allows to change all the elements of the MCA and the graphs (axes, variables, colors...)

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[MCA,dimdesc,plot.MCA](#)  
[shiny website](#)

**Examples**

```
## Not run:
require(FactoMineR)
data(poison)
# Multiple Correspondance Analysis with Factoshiny:
res.shiny=MCAshiny(poison)

# Find your app the way you left it (by clicking on the "Quit the app" button)
res.shiny2=MCAshiny(res.shiny)

#MCAshiny on a result of a MCA
data(hobbies)
res.mca <- MCA(hobbies,quali.sup=19:22,quanti.sup=23)
res.shiny=MCAshiny(res.mca)

## End(Not run)
```

**Description**

Performs Multiple Factor Analysis (MFA) with supplementary individuals and supplementary groups of variables on a Shiny application.

Groups of variables can be quantitative, categorical or contingency tables.

Allows to change MFA parameters and graphical parameters. A maximum of 10 groups can be created

Graphics can be downloaded in png, jpg, pdf and emf.

**Usage**

```
MFAshiny(X)
```

**Arguments**

`X` a data frame with  $n$  rows (individuals) and  $p$  columns or a result of the MFA function

**Value**

Returns several tabs:

`Graphs` a tab containing the individuals factor map, the variables factor map, the groups factor map, the axes factor map and the frequencies factor map (if there is at least one frequency group)

`Values` a tab containing the summary of the MFA performed, the eigenvalues, the results for the variables, the results for the individuals and the results of the groups

`Summary of dataset`

a tab containing the summary of the dataset and a boxplot and histogram for quantitative variables.

`Data`

a tab containing the dataset with a nice display.

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <francois.husson@institut-agro.fr>

**See Also**

[PCA](#), [plot.PCA](#)  
[shiny website](#)

**Examples**

```
## Not run:
require(FactoMineR)
data(wine)
# Multiple Factor Analysis with Factoshiny:
res.shiny=MFAshiny(wine)

#If you want to create your groups first and customize your graphs
res.mfa= MFA(wine, group=c(2,5,3,10,9,2), type=c("n",rep("s",5)),
  ncp=5, name.group=c("orig","olf","vis","olfag","gust","ens"),
  num.group.sup=c(1,6))
res.shiny=MFAshiny(res.mfa)

## End(Not run)
```

PCAshiny

*Principal Component Analysis (PCA) with FactoShiny***Description**

Performs Principal Component Analysis (PCA) with supplementary individuals, supplementary quantitative variables and supplementary categorical variables on a Shiny application. Allows to change PCA parameters and graphical parameters. Graphics can be downloaded in png, jpg, pdf and emf.

**Usage**

```
PCAshiny(X)
```

**Arguments**

X a data frame with  $n$  rows (individuals) and  $p$  columns (numeric variables) or a PCAshiny result, or a PCA result

**Value**

Returns several tabs:

Graphs a tab containing the individuals factor map and the variables factor map.

Values a tab containing the summary of the PCA performed, the eigenvalues, the results for the variables, the results for the individuals, the results for the supplementary variables and the results for the categorical variables.

Automatic description of axes a tab containing the output of the dimdesc function. This function is designed to point out the variables and the categories that are the most characteristic according to each dimension obtained by a Factor Analysis.

**Summary of dataset**

a tab containing the summary of the dataset and a boxplot and histogram for quantitative variables.

**Data**

a tab containing the dataset with a nice display.

The left part of the application allows to change all the elements of the PCA and the graphs (axes, variables, colors...). The "Get your code" button print the PCA and the plots code in your RStudio session.

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[PCA](#), [plot.PCA](#)  
[shiny website](#)

**Examples**

```
## Not run:
require(FactoMineR)
data(decathlon)
# Principal Component Analysis with Factoshiny:
res.shiny=PCAshiny(decathlon)

# Find your app the way you left it (by clicking on the "Quit the app" button)
res.shiny2=PCAshiny(res.shiny)

#PCAshiny on a result of a PCA
res.pca <- PCA(decathlon, quanti.sup = 11:12, quali.sup=13)
res.shiny=PCAshiny(res.pca)

## End(Not run)
```

---

```
print.CAshiny
```

```
Print the CAshiny results
```

---

**Description**

Print the CAshiny results i.e the R corresponding script

**Usage**

```
## S3 method for class 'CAshiny'
print(x,...)
```

**Arguments**

x                    an object of class CAshiny  
...                   further arguments passed to or from other methods

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[CAshiny](#)

**Examples**

```
## Not run:  
data(children)  
res.shiny = CAshiny(children)  
#click on the "Quit the app" button  
print(res.shiny)  
  
## End(Not run)
```

---

`print.FAMDshiny`            *Print the FAMDshiny results*

---

**Description**

Print the FAMDshiny results i.e the R corresponding script

**Usage**

```
## S3 method for class 'FAMDshiny'  
print(x,...)
```

**Arguments**

x                    an object of class FAMDshiny  
...                   further arguments passed to or from other methods

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[FAMDshiny](#)

**Examples**

```
## Not run:
data(geomorphology)
res.shiny = FAMDshiny(geomorphology)
#click on the "Quit the app" button
print(res.shiny)

## End(Not run)
```

---

`print.HCPCshiny`      *Print the HCPCshiny results*

---

**Description**

Print the HCPCshiny results i.e the R corresponding script

**Usage**

```
## S3 method for class 'HCPCshiny'
print(x,...)
```

**Arguments**

`x`                    an object of class HCPCshiny  
`...`                further arguments passed to or from other methods

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[HCPCshiny](#)

**Examples**

```
## Not run:
data(decathlon)
res.shiny = HCPCshiny(decathlon)
#click on the "Quit the app" button
print(res.shiny)

## End(Not run)
```

---

print.MCAshiny      *Print the MCAshiny results*

---

**Description**

Print the MCAshiny results i.e the R corresponding script

**Usage**

```
## S3 method for class 'MCAshiny'  
print(x,...)
```

**Arguments**

x                    an object of class MCAshiny  
...                  further arguments passed to or from other methods

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[MCAshiny](#)

**Examples**

```
## Not run:  
data(poison)  
res.shiny = MCAshiny(poison)  
#click on the "Quit the app" button  
print(res.shiny)  
  
## End(Not run)
```

---

print.MFAshiny      *Print the MFAshiny results*

---

**Description**

Print the MFAshiny results i.e the R corresponding script

**Usage**

```
## S3 method for class 'MFAshiny'  
print(x,...)
```

**Arguments**

x                    an object of class MFAshiny  
...                   further arguments passed to or from other methods

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>

**See Also**

[MFAshiny](#)

**Examples**

```
## Not run:
data(wine)
res<- MFA(wine, group=c(2,5,3,10,9,2), type=c("n",rep("s",5)),
         ncp=5, name.group=c("orig","olf","vis","olfag","gust","ens"),
         num.group.sup=c(1,6),graph=FALSE)
res.shiny=MFAshiny(res)

#click on the "Quit the app" button
print(res.shiny)

## End(Not run)
```

---

`print.PCAshiny`            *Print the PCAshiny results*

---

**Description**

Print the PCAshiny results i.e the R corresponding script

**Usage**

```
## S3 method for class 'PCAshiny'
print(x,...)
```

**Arguments**

x                    an object of class PCAshiny  
...                   further arguments passed to or from other methods

**Author(s)**

Pauline Vaissie, Astrid Monge, Francois Husson <paulinevaissie@gmail.com>



**See Also**

[PCAshiny](#)

**Examples**

```
## Not run:  
data(decathlon)  
res.shiny = PCAshiny(decathlon)  
#click on the "Quit the app" button  
print(res.shiny)  
  
## End(Not run)
```

# Index

- \* **multivariate**
  - catdesshiny, 4
  - condesshiny, 5
- \* **package**
  - Factoshiny-package, 2
- \* **print**
  - print.CAshiny, 12
  - print.FAMDshiny, 13
  - print.HCPCshiny, 14
  - print.MCAshiny, 15
  - print.MFashiny, 15
  - print.PCAshiny, 16

CA, 3

CAshiny, 2, 13

catdes, 4

catdesshiny, 4

condes, 5

condesshiny, 5

dimdesc, 9

Factoshiny (Factoshiny-package), 2

Factoshiny-package, 2

FAMD, 7

FAMDshiny, 6, 13

HCPC, 8

HCPCshiny, 7, 14

MCA, 9

MCAshiny, 8, 15

MFashiny, 10, 16

PCA, 10, 12

PCAshiny, 11, 17

plot.CA, 3

plot.FAMD, 7

plot.HCPC, 8

plot.MCA, 9

plot.PCA, 10, 12

print.CAshiny, 12

print.FAMDshiny, 13

print.HCPCshiny, 14

print.MCAshiny, 15

print.MFashiny, 15

print.PCAshiny, 16