

Factoshiny vignette

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1 Introduction

As its name suggests, the **Factoshiny** package uses *shiny* technology to produce a graphical interface of the **FactoMineR** package in the form of an *html* page (see figure 1). Users can fill out different fields to fine tune their analyses. Once the fields are completed, the analyses are conducted instantly and provide the chosen graphs. The following code indicates how **Factoshiny** can be used to carry out a PCA.

```
> library(Factoshiny)
> data(decathlon)
> res.shiny <- PCAshiny(decathlon)
```

Then the interface is used to choose the parameters of the PCA analysis as well as the parameters of the graphical outputs. Cursors enable users to change the extent to which objects are selected using representation quality or contribution and other cursors can be used to change the size of the font used to label the graph. The graphs and outputs are updated immediately, which makes these selections easier.

It is also possible to first perform the PCA analysis and then to use the PCA outputs in order to modify the graphs.

```
> res.pca <- PCA(decathlon, quanti.sup=11:12, quali.sup=13, graph=FALSE)
> res.shiny <- PCAshiny(res.pca)
```

It is also possible to reuse the object resulting from **Factoshiny** in order to further modify the graphs, using the configuration described previously:

```
> res.shiny2 <- PCAshiny(res.shiny)
```

The functions **CAshiny**, **MCashiny** and **MFashiny** operate on exactly the same principle. From a certain point of view, the **Factoshiny** package is a natural evolution of the **RcmdrPlugin.FactoMineR** package: compared to its predecessor, **Factoshiny** includes the latest graphical updates in the **FactoMineR** package, it is more user-friendly, and in particular, it enables the user to handle and explore data directly.

In addition to its **FactoMineR** interfacing capabilities and its ability to effortlessly create complex graphs, the **Factoshiny** package can also generate the code used to construct the graphs.

2 The functions of the Factoshiny package

Several functions are available according to the dataset and the nature of the active variables.

Nature of active variables	Method	Function
continuous	Principal Component Analysis	PCAshiny
contingency table	Correspondence Analysis	CAshiny
qualitative	Multiple Correspondence Analysis	MCashiny
Group of variables	Multiple Factor Analysis	MFashiny
	Clustering	HCPCshiny

You can see this video which is in French: <https://www.youtube.com/watch?v=4T9tDX4aVS4>

PCA on the decathlon dataset

Graphs Values Automatic description of axes Summary of dataset Data

Show PCA parameters

Show graphs options

x axis: 1 y axis: 2

Graph of Individuals Graph of Variables

Title of the graph: Individuals factor map (PCA)

Size of labels: 0.5 1.35 2.5

Draw individuals according to: cos2

cos2: 0 0.65 1

Points colour depend on categorical variable

Save graphs as: PNG JPG PDF

Get the PCA code

Quit the app

Individuals factor map (PCA)

This scatter plot displays the positions of various individuals in a two-dimensional space defined by the first two principal components. The x-axis is labeled 'Dim 1 (32.72%)' and ranges from -4 to 4. The y-axis is labeled 'Dim 2 (17.37%)' and ranges from -4 to 4. Points are colored based on their category: Decastar (black), OlympicG (red), and others. Labeled points include Casarsa, BOURGUIGNON, Udal, Decastar, OlympicG, Karpov, Sebrle, Clay, Lorenzo, NOOL, Warners, and Drews.

Download as png

Variables factor map (PCA)

This vector plot shows the direction and magnitude of various decathlon events relative to the first two principal components. The x-axis is 'Dim 1 (32.72%)' and the y-axis is 'Dim 2 (17.37%)', both ranging from -1.0 to 1.0. A circle is drawn around the origin. Variables are represented by arrows: 400m, 1500m, Discus, Shot put, 100m, 110m hurdle, Javeline, High jump, Rank, Points, Pole vault, and Long jump.

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Figure 1: PCA with Factoshiny.