

Introduction to GrapheR

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1 Introduction

GrapheR is a multiplatform (Linux, Mac OS, Windows) user interface for drawing highly customizable graphs in **R**. It aims to be a valuable help to quickly draw publishable graphs without any knowledge of **R** commands.

Six kinds of graph are available:

- histogram
- box - and - whisker plot
- bar plot
- pie chart
- curve
- scatter plot

GrapheR was built on the `tcltk` package, and consequently bugs can happen if **R** is configured in the MDI (Multiple-Document Interface) mode. It is recommended to configure it in SDI (Single-Document Interface) mode before starting the package.

GrapheR needs to function at least the 2.10 version of **R** and one additional package: `tcltk`. Under Mac OS X, Tcl/Tk must have already been installed (for more information see [here](#)).

2 Launching the interface

As any other package, GrapheR is loaded *via* `library(GrapheR)` or the *Packages* menu if working in the **R** console. At this time, the `tcltk` package is automatically loaded.

Launching the interface is the only step that requires to enter a command: `run.GrapheR()`. The interface opens and the console can now be reduced.

3 Description of the interface

3.1 Global view

The interface is divided into three blocks (Fig 1) :

1. the navigation bar: it contains all buttons opening the modules of the interface
2. the messages frame: to make the interface using easier, information messages are displayed in this frame when the mouse is over some elements or when some actions are performed
3. the settings block: it contains all dialog boxes allowing to set the graph to be drawn.

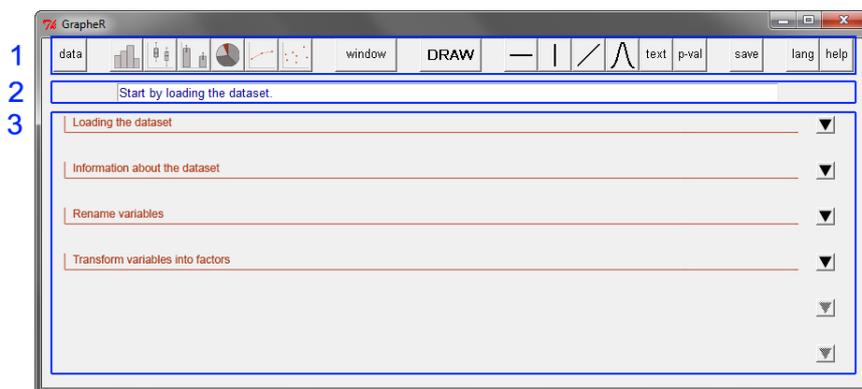


Figure 1: User interface – global view (display under Windows 7)

3.2 Navigation bar

The navigation bar is divided into seven button groups, each corresponding to one (obligatory or facultative) step of the process (Fig 2):

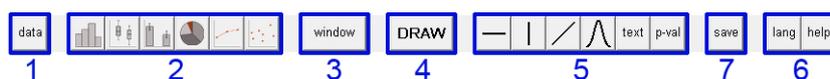


Figure 2: Navigation bar

1. loading and modifying the dataset
2. setting a graph. From left to right: histogram, box - and - whisker plot, bar plot, pie chart, curve and scatter plot
3. opening a new graphics device: when a graph is drawn, it is in the active window or in a new device if none is open. This button allows to open a new graphics device in which several graphs can be drawn
4. draw a graph

5. adding elements to the graph. From left to right: add a horizontal line, add a vertical line, add any other kind of line, add a theoretical distribution curve, add text and add p - values
6. saving graph(s)
7. diverse options: user language and help.

3.3 Messages frame

When the mouse is over some specific elements or when some specific actions are performed, messages are displayed in this frame. Three kinds of message can be displayed:

- **in blue:** informative messages
- **in green:** warnings, a particular attention have to be payed to a specific point (for example: if this option is chosen, this one can not be)
- **in red:** error messages, the action was not performed. The message indicates the origin of the error.

3.4 Settings block

This block is divided into for to six sub - blocks, each containing options relative to a given theme: general parameters of the graph, title of the graph, legend. . . Each sub - block can be opened or closed with the corresponding arrow situated on the right of the interface. Of course, defined settings are not lost when a sub - block is closed.

4 Using GrapheR

The example used here is based on the dataset given with the package, called **Swallows**. To load it, use the command `data(Swallows)`. This (fictive!) dataset exemplifies the famous dilemma of African and European swallows migrations.

4.1 Loading and modifying the dataset

The first sub - block (Figure 3) allows you to load the dataset. Data can be imported from an external file (only `txt` and `csv` extensions are available so far) or can be an already existing **R** object of class `data.frame` (*i.e.* a table).

The next sub - block allows to you get information on the dataset structure. When a variable is selected in the list on the left, its type (`numeric`, `factor`, `logical`...) and its summary are displayed in the frame on the right.

The two next sub - blocks allow, if needed, to modify the dataset:

- by renaming variables (for example if the dataset does not contain their names)

- by converting variables into factors. The conversion can be applied to variables of class `character` (*i.e.* characters chains vectors) or to numeric variables (in this case values can be grouped into classes). The latter case is obligatory when a factor is numerically coded, *e.g.* binary factors (0/1), otherwise `R` would consider it as a numeric variable.

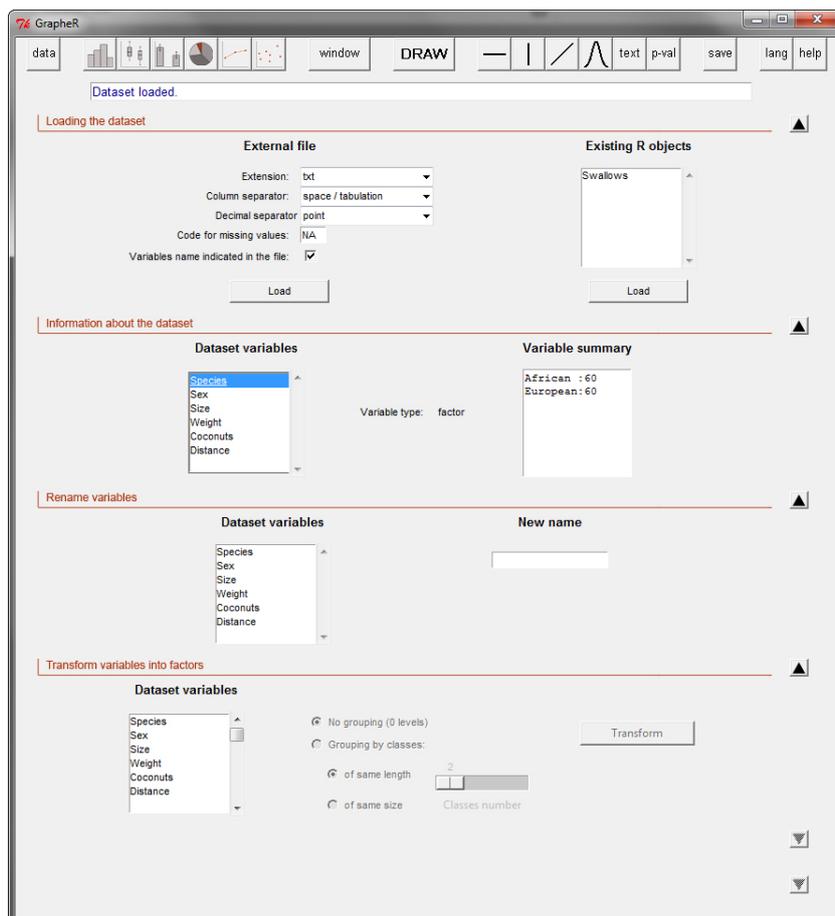


Figure 3: Loading the dataset

4.2 Setting a graph

Whatever the type of graph chosen, all parameters have a default value, except general parameters – which correspond to variable(s) to be represented. Hence, to quickly draw a graph, only general parameters must be defined. If they are not (or not all), an error occurs when trying to draw the graph.

Here the aim is to draw a histogram displaying the distribution of the size of African swallows (Figure 4). We hence choose `Size` as the variable to be represented, and add that we want to retain only the values corresponding to the African level of the `Species` factor. The histogram type is set to `densities`,

because as the warning says only this type allows to draw the distribution curve of the data.

All other settings are let to their default values, except the title of the graph and those corresponding to the distribution curve (we tick **Draw the curve** and define a color and a line type).

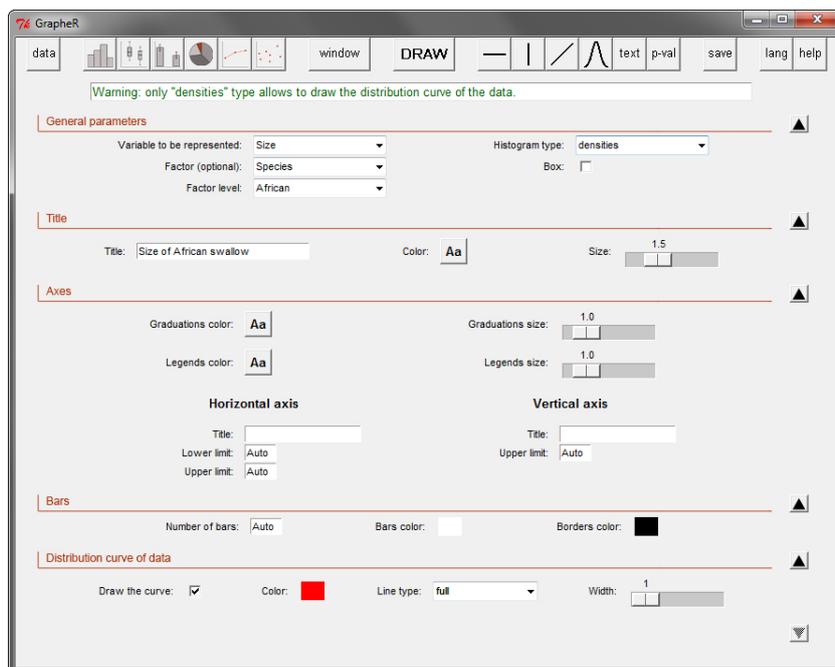


Figure 4: Paramtrer un histogramme

Once all necessary parameters are set, the graph is drawn by clicking on the **DRAW** button of the navigation bar. If a new graphics device have to be beforehand opened, click first on the **window** button (see next section).

4.3 Opening a new graphics device

It is possible to draw graphs in different windows and/or to draw several graphs in the same one. To do this click on the **window** button of the navigation bar. The dialog box that opens on the right of the interface allows to define how many graphs have to be drawn in the device to be created, and the background color of this device (Figure 5).

It is possible to draw up to 16 graphs in the same device, shared between four rows and four columns. However, the larger is the number of graphs to be drawn, the smaller is the space allocated to each.

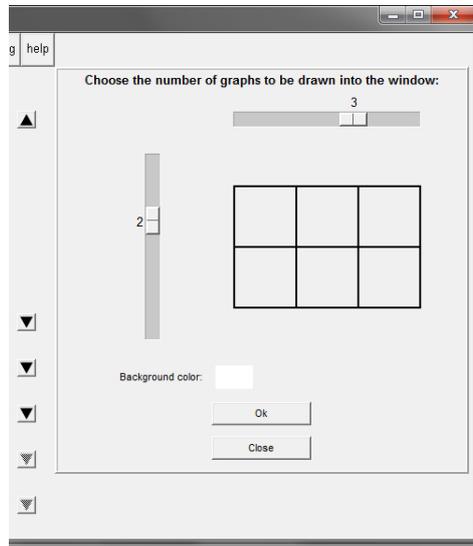


Figure 5: Opening a new graphics device

4.4 Adding elements to the graph

Once the graph is drawn, elements can be added to complete it:

- one or several horizontal line(s)
- one or several vertical line(s)
- any other kind of line(s)
- one or several theoretical distribution curve(s): only on densities histograms
- text
- p - values: only on bar plots.

These elements are always added to the last graph drawn.

For each element, clicking on the corresponding button in the navigation bar opens a dialog box on the right of the interface.

Here we want to add a distribution curve to the histogram, corresponding to the values of a normal law of parameters $\mu = 15.8$ and $\sigma = 2.2$ (parameters calculated from the data). Setting the curve is simple (Figure 6). Once all settings are defined, click on **Draw**.

The graph is now finished (Figure 7).

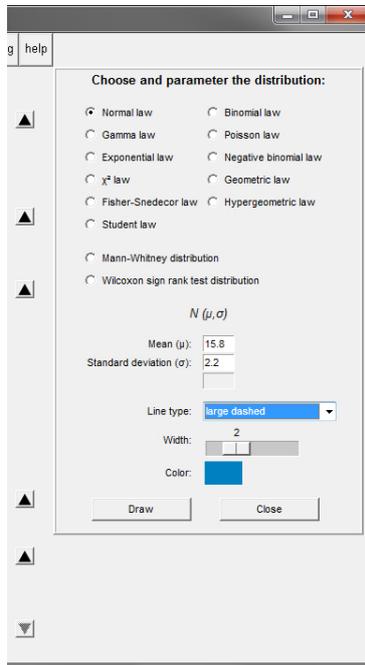


Figure 6: Add a theoretical distribution curve to the graph

4.5 Saving graph(s)

To save one or several graph(s), click on the **save** button of the navigation bar. A dialog box opens on the right of the interface. Choose the graphics device to be saved with the drop - down menu (the window number corresponds to the number automatically allocated by **R**, under the guise “R Graphics: Device *number*”). Choose the extension of the file to be created and its width (in pixels; height is automatically calculated according to the width) (Figure 8). Once all parameters are defined, click on **Save**.

4.6 Changing the user language

To change the user language, click on the **lang** button of the navigation bar. A dialog box opens on the right of the interface (Figure 9). Choose the desired language in the drop - down menu. To fix this preference in the future, tick the checkbox **Save the preference**. Click on the **Ok** button to validate. The interface is closed and re - opened in the chosen language (but note that any dataset loaded in the previous language session is lost and has to be re - loaded).

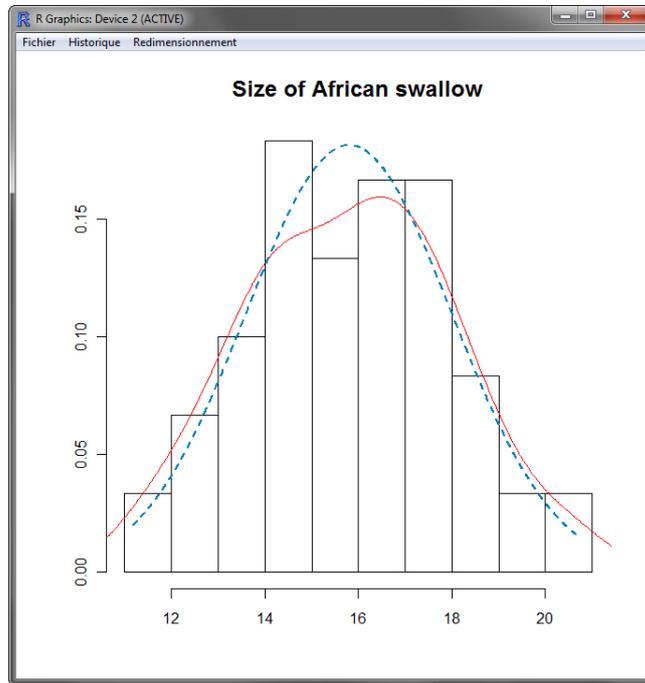


Figure 7: Final histogram

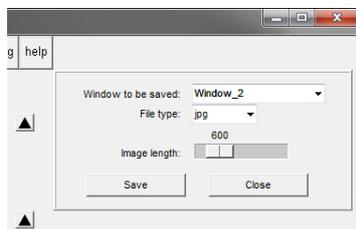


Figure 8: Saving a graph

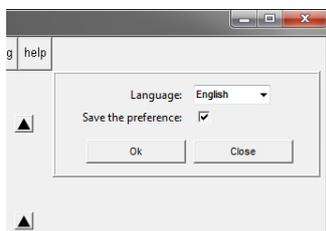


Figure 9: Changing the user language

5 Extending GrapheR in a new language

If you want to extend GrapheR in a new language, it is very easy. You only have two things to do:

- get the file named `Language_en.csv` in the `lang` directory of the package. All words written in the interface come from this file. Just translate scrupulously each line (be careful of the spaces before or after words, they are not randomly placed) and save the file in `csv` extension
- translate this user manual. You can just write a classic Microsoft Word or Open Office Writer file, or if you are \LaTeX familiar ask me for the original `tex` file.

After doing your translation, send me the two files and I will finish the job ;)