Title:

Getting to Know Grid Graphics

Tutor:

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Description:

The **grid** graphics package provides a low-level graphics system for R. Many R users do not have direct contact with **grid**, but they regularly make indirect use of **grid** whenever they draw a **lattice** or **ggplot2** plot.

This tutorial will expose the **grid** graphics system that is lurking behind higher-level packages, like **lattice** and **ggplot2**, and explore the tools that **grid** provides to modify, customise, reuse, and augment those higher-level plots. We will learn about the fundamental concepts in **grid** graphics— grobs, units, and viewports—and we will learn functions to explore, access, and manipulate grobs and viewports.

Outline:

Entrée (approx. 15 min):

A peek under the hood of **lattice** and **ggplot2** to see that **grid** is hiding underneath.

- A view of the grobs and viewports that are created when **lattice** and/or **ggplot2** do their drawing
- Simple demonstration of adding new drawing or editing existing drawing in **lattice** and/or **ggplot2** plots

Main (approx. 2 hrs, with 15 min break in middle):

Manipulating plots with **grid**

- Exploring grobs and viewports
- Navigating viewports
- Creating new grobs and viewports
- Manipulating grobs

This section will be illustrated and motivated by the task of customising **lattice** and/or **ggplot2** plots. This section will also include several exercises to engage the attendees and reinforce their learning.

Dessert (approx. 15 min):

Some other ways to get into and out of **grid**

- The **gridGraphics** package
- The **gridSVG** package

Requirements:

This course will not be appropriate for complete R newbies. It will be assumed that the audience is familiar with R and comfortable writing R expressions. On the other hand, no statistical or graphical expertise will be required.

It is also assumed that the tutorial will take place in a computer lab or that attendees will bring laptops with R installed so that they can attempt exercises or examples on their own machines.

Justification:

This course is *needed* because: Graphics is something that R people do a lot of and are prepared to learn more about. Based on emails that I receive and courses that I have run, there are a number of R users who are interested in learning more about **grid**, but need a little help to get their feet wet.

This course is *important* because: People are producing plots with **grid** every day, but are unaware of the tools that are available for working with those plots.

I hear of many instances of users producing a plot in R then exporting it to make further modifications in something like Adobe Illustrator (AI). This has two problems: there is no code to record the changes made in AI, so the final result is not reproducible, and this sort of manual modification does not scale well to the case of producing large numbers of plots.

Although plots are usually produced for people to *look at*, there are many benefits to be gained from being able to *manipulate* plots—to query, modify, and reuse plots. This course will demonstrate to users that **grid** produces plots that can be manipulated, and that **grid** provides powerful tools to manipulate plots.

I ran a successful "Introduction to Grid Graphics" course at useR! 2011 (participant survey attached) so I am confident that a similar tutorial at useR! 2015 would also have a good chance of success. I am also confident in my ability to prepare and deliver material effectively based on many years of experience as a university lecturer.