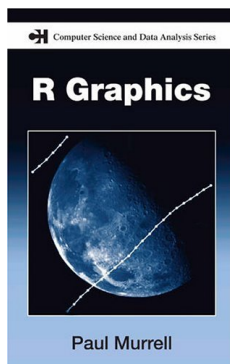# The good, the bad, and the ugly—Review of Paul Murrell's new book: "R Graphics"

by David Meyer

At the DSC 2001 workshop in Vienna, Ross Ihaka presented an overview on the "old" R graphics system using the title: "The good, the bad, and the ugly", basically meaning that the traditional graphics system, albeit flexible, was getting old and the interface was cumbersome in several aspects. Think, e.g., of the mysteries of the dozens of `par()` parameters whose lengthy help page most useRs keep browsing on a regular basis to filter out the appropriate settings. Thanks to Paul Murrell's new book, the secrets of both traditional graphics and the new, modern `grid` system get unveiled, preventing useRs from writing "ugly" code. Starting from scratch, both architectures are presented and compared in detail, complemented with illustrative examples and summary tables. The text not only covers basic elements such as points, lines, segments, and text, but also discusses the most important high-level plot functions available in base R, as well as some popular extension packages such as `scatterplot3d`. In addition, a clear effort has been made to enable the readers to develop their own graphical methods, in the R spirit of "users becoming developers".

The first part of the book covers the traditional graphics system. It starts with some simple plots using `plot()` and friends, and proceeds with a detailed chapter on customizing, covering all low-level and high-level `par()` settings, multiple plots, annotation, and more complex, superposed plots. Even experienced users will discover "new" features. For example, most people will be familiar with line types—but what about the various line join and line ending styles, or the correct handling of fonts?

The second part is devoted to `grid`, the new graphics system developed by the book author himself. Murrell chooses a practical approach and first introduces the lattice package, R's version of Trellis graphics. After giving an overview on all high-level lattice functions, the author provides customization examples. Only after this "teaser" is the reader confronted with the basic elements of the `grid` package. The text explains the idea behind concepts like units, graphical context, viewports, and how existing plot elements can easily be integrated in more complex displays. Particular emphasis is given to the possibilities of interactive plot modifications and off-screen computations. Finally, a whole chapter is devoted to the development of new `grid`-based functions and objects that can be reused by others.

Paul Murrell's book is the first publication entirely devoted to R graphics, written by *the* authoritative expert in the field. It is definitely a must-have for novices and professionals alike, the ultimate guide to the power (and beauty) of R graphics.

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Changes in R

by the R Core Team

User-visible changes

- In the grid package there are new 'arrow' arguments to `grid.line.to()`, `grid.lines()`, and `grid.segments()` (`grid.arrows()` has been deprecated).

  The new 'arrow' arguments have been added BEFORE the 'name', 'gp' and 'vp' arguments so existing code that specifies any of these arguments *by position* (not by name) will fail.

- `all.equal()` is more stringent, see the PR#8191 bug fix below.

- The data frame argument to `transform()` is no longer called 'x', but '_data'. Since this is an invalid name, it is less likely to clash with names given to transformed variables. (People were getting into trouble with `transform(data, x=y+z)`.)