

Practical Robust Statistical Methods via R

M. Mächler^{1*}

¹ *Seminar für Statistik, ETH Zurich; maechler@stat.math.ethz.ch*

^{*} *Presenting author*

Keywords. *Robust statistics; R; Applications; robustbase; regression.*

The R language and environment for statistical computing and graphics has become the de facto standard for most of professional statisticians. Some robust methodology has been part of S, the precursor of R, since the 1980s. Further, in 2006, a considerable group of research experts in robust statistics had decided to join forces creating a dedicated R package providing the most basic and important robust methodology, notably covering Maronna et al. (2006), and the R package `robustbase` ((?)) was created. Not much later, when CRAN task views (CTV) were initiated as a human expert guides to the exponentially growing CRAN R packages, the “Robust” CTV ((?)) was created and listed dozens of R packages already in 2007 and has been listing 50 packages since the end of 2014.

Our presentation will emphasize on use-cases of regression methods — in our experience used for roughly 90% of all data analysis — and also use the `fit.models` package to compare classical (least squares) and robust model fits. We will look at some generalizations of linear models—nonlinear, mixed effects, generalize additive models (GAM— and explore how easily (or not) using robust R functions can be used instead of or in addition to classical methods.

References

- Kjell Konis. (2016). `fit.models`: Compare Fitted Models. R package version 0.5-11, <http://CRAN.R-project.org/package=fit.models>.
- Martin Maechler (2014). CRAN Task View: Robust Statistical Methods. Version 2014-12-07, <http://CRAN.R-project.org/view=Robust>
- Maronna, R., Martin, D. & Yohai, V. (2006). *Robust Statistics: Theory and Methods*. John Wiley & Sons, Chichester.
- R Core Team (2016). *R Foundation for Statistical Computing. R: A Language and Environment for Statistical Computing*. Vienna, Austria. <https://www.R-project.org/>.

Rousseeuw, P., Croux, C., Todorov, V., Ruckstuhl, A., Salibián-Barrera, M., Verbeke, T., Koller, M. & Maechler, M. (2015). robustbase: Basic Robust Statistics. R package version 0.92-5, <http://CRAN.R-project.org/package=robustbase>.