

# Design of the Survival Packages

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Half day tutorial proposal

In 1984 I created the first components of the survival package, which endures as one of the suggested components of R. In the interim 5 other packages have been created: date (deprecated), rpart, kinship, bdsmatrix, and coxme. What have I learned along the way? Much of this is captured in the layout of the final 2 packages, one of which uses S4 and one S3 type methods.

In course will present design/implementation issues that arise in the design of a package along with the choices that were made in the survival/coxme packages, why those were chosen, and the consequences in terms of what worked well or not so well. The primary document for the class will be a guide (currently in progress), which will allow us to focus on higher level concepts while leaving the details for home. Attendees should be able to use the course and the guide to write their own packages and not overlook important facets.

Some areas to be covered are

- Top level design: goals of the function, arguments, outputs, one package or multiple interlinked ones.
- Infrastructure: Rforge, CRAN, package skeletons, integrated documentation such as noweb (Sweave) or roxygen.
- Modeling functions: formula processing, data set handling, special variables and transformations, and print/summary/residual/predict methods
- Objects: Different kinds of objects including model fits, survival curves, pedigrees, and special matrices. What components do they have and why, and tradeoffs between rigidity and flexibility.
- Documentation and test suites