Easing access to R using 'shiny' to create graphical user interfaces: An example for the R package 'Luminescence'

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Since the release of the **R** package 'Luminescence' (Kreutzer et al., 2012) the functionality of the package has been greatly enhanced by implementing further functions for measurement data processing, statistical analysis and graphical output. Despite its capabilities for complex and non-standard analysis of luminescence data, working with the command-line interface (CLI) of **R** can be tedious at best and overwhelming at worst, especially for users without experience in programming languages. Even though much work is put into simplifying the usage of the package to continuously lower the entry threshold, at least basic knowledge of **R** will always be required. Thus, the potential user base of the package cannot be exhausted, at least as long as the CLI is the only means of utilising the 'Luminescence' package.

But even experienced users may find it tedious to iteratively run a function until a satisfying results is produced. For example, plotting data is also at least partly subject to personal aesthetic tastes in accordance with the information it is supposed to convey and iterating through all the possible options in the **R** CLI can be a time-consuming task. An alternative approach to the CLI is the graphical user interface (GUI), which allows direct, interactive manipulation and interaction with the underlying software. For users with little or no experience with command-lines a GUI offers intuitive access that counteracts the perceived steep learning curve of a CLI. Even though **R** lacks native support for GUI functions, its capabilities of linking it to other programming languages allows to utilise external frameworks to build graphical user interfaces. A recent attempt to provide a GUI toolkit for **R** was the introduction of the 'shiny' package (Chang et al., 2016), which allows automatic construction of HTML, CSS and JavaScript based user interfaces straight from **R**.

Here, we give (1) a brief introduction to the 'shiny' framework for **R**, before we (2) present a GUI for the **R** package 'Luminescence' in the form of interactive web applications. These applications can be accessed online so that a user is not even required to have a local installation of **R** and which provide access to most of the plotting functions of the **R** package 'Luminescence'. These functionalities will be demonstrated live during the PICO session.

References

Chang, W., Cheng, J., Allaire, JJ., Xie, Y., McPherson, J., 2016. shiny: Web Application Framework for R. R package version 0.13.2. https://CRAN.R-project.org/package=shiny

Kreutzer, S., Schmidt, C., Fuchs, M.C., Dietze, M., Fischer, M., Fuchs, M., 2012. Introducing an R package for luminescence dating analysis. Ancient TL, 30: 1–8, 2012.