dendextend: an R package for scientific visualization of dendograms and hierarchical clustering

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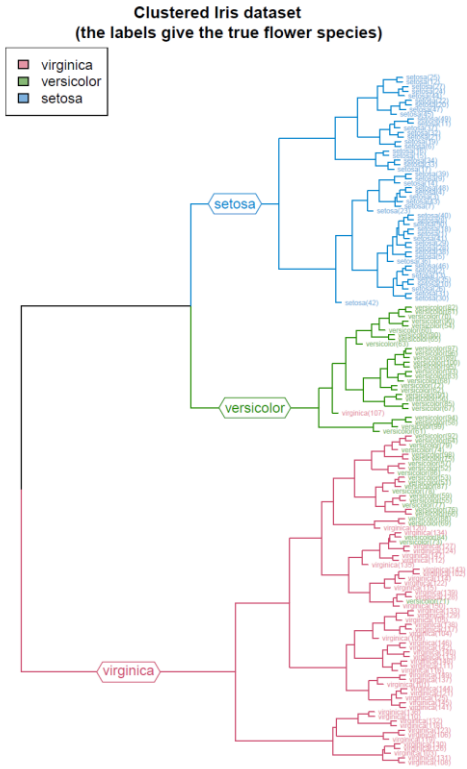
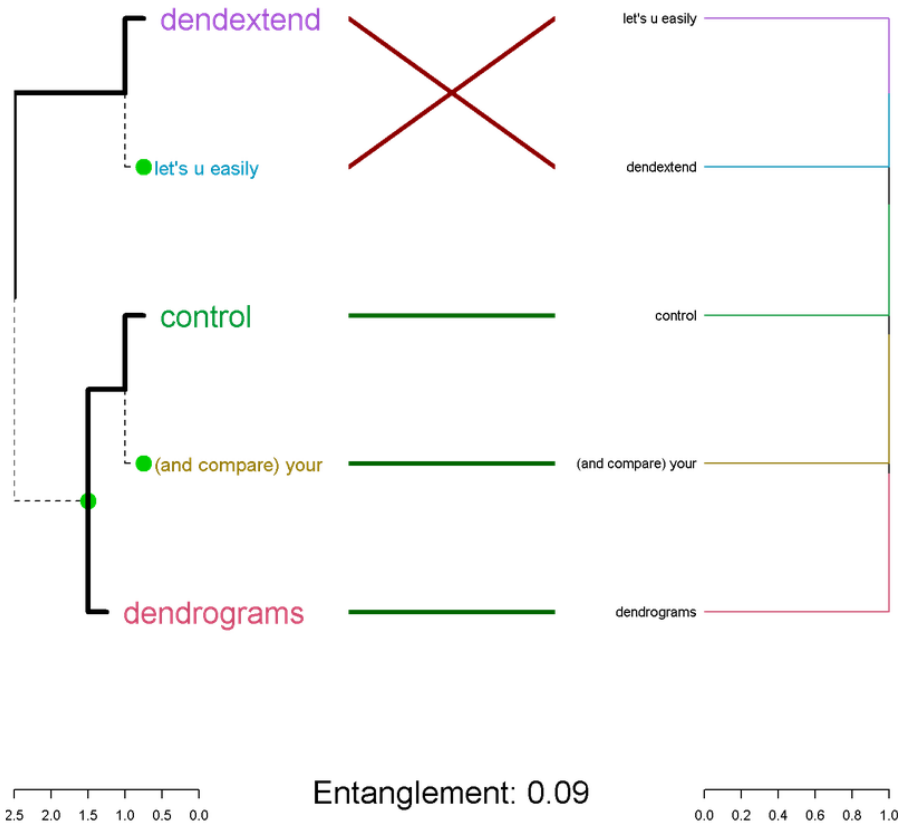
This poster introduces the ***dendextend*** package [1] for extending the palette of functions and methods for the `dendrogram` class in the R statistical environment.

A dendrogram is a tree diagram which is often used to visualize a hierarchical clustering of items. Dendrograms are used in many disciplines, ranging from Phylogenetic Trees in computational biology to Lexomic Trees in text analysis. Hierarchical clustering in *R* is commonly performed using the `hclust` function. When a more sophisticated visualization is desired, the `hclust` object is often coerced into a `dendrogram` object, which in turn is modified and plotted. While **base** *R* comes with several very useful methods for manipulating the `dendrogram` object (namely: `plot`, `print`, `[[`, `labels`, `as.hclust`, `cophenetic`, `reorder`, `cut`, `merge`, `rev`, and `str`), still - the current palette of functions leaves a lot to be desired.



The ***dendextend*** R package offers functions and methods for `dendrogram` class objects in R, allowing for easier manipulation of a dendrogram's shape (via `rotate`, `prune`), color and content (via functions such as `set`, `labels_colors`, `color_branches`, `etc.` function). The package also provides S3 methods for functions such as `labels<-`, `cutree`, and more. ***dendextend*** also provides the tools for comparing the similarity of two dendrograms to one another either graphically using a `tanglegram` plot, or statistically with association measures ranging from `cor_cophenetic` to `Bk_plot`, while enabling bootstrap and permutation tests for comparing the trees.

Since tree structure often requires the use of recursion, which can be slow in *R*, some of the more computationally intensive aspects of the **dendextend** package can be handled with its sister package, **dendextendRcpp** [2], which overrides several basic functions (namely: `cut_lower_fun`, `heights_per_k.dendrogram`, `labels.dendrogram`), with their *C++* implementation.



References

[1] Tal Galili (2014). dendextend: Extending R's dendrogram functionality, http://cran.r-project.org/web/packages/dendextend

[2] R Core Team (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/

[3] Tal Galili (2014). dendextendRcpp: Faster dendrogram manipulation using Rcpp, http://cran.r-project.org/web/packages/dendextendRcpp