Hierarchical qualitative color palettes

Martijn Tennekes and Edwin de Jonge
Statistics Netherlands (CBS)
m.tennekes@cbs.nl

Motivation

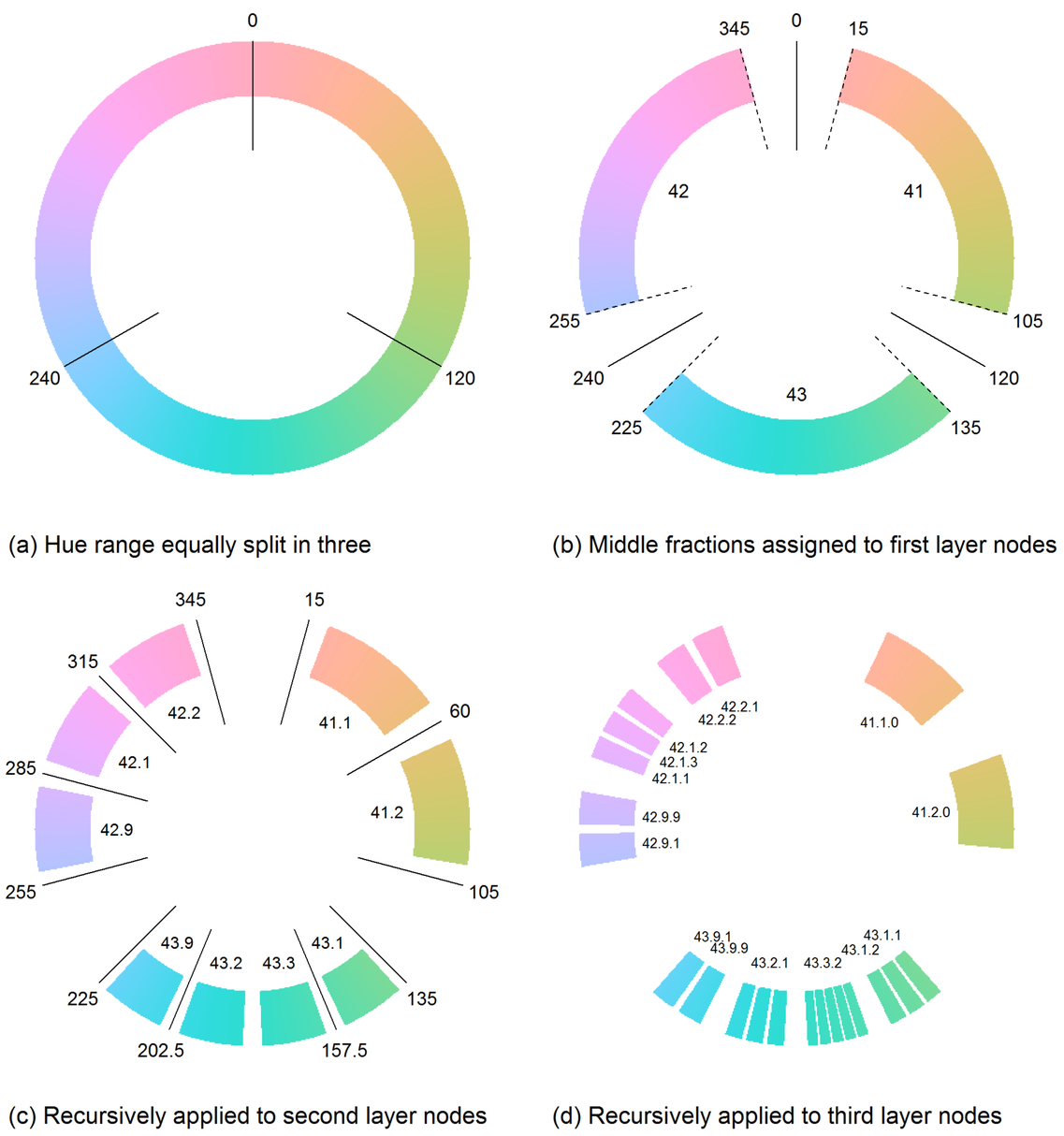
Aim: Visualize tree-structured statistical data
Question: What color palettes to use?

Method

Color space: **Hue - Chroma- Luminance** (HCL)
Designed to control human perception. [1, 2]

(Horizontal) position in tree: controlled by Hue values

Hue range recursively assigned among nodes in tree:



(a) Hue range equally split in three
(b) Middle fractions assigned to first layer nodes
(c) Recursively applied to second layer nodes
(d) Recursively applied to third layer nodes

Figure 1. Assignment of Hue values

- Assigned hue ranges of siblings are permuted to prevent percentual order. Permutation order is based on [1, 3, 5, 2, 4] permutation.
- Middle fractions *f* are kept to discriminate difference branches. Trade-off between discrimination of:
  1) main branches (low *f*) or
  2) leaf nodes (high *f*).

Tree depth: controlled by Chroma and Luminance values

- Luminance decreases with tree depth
- Chroma increases with tree depth (More intense colors helps in discriminating leaf nodes)

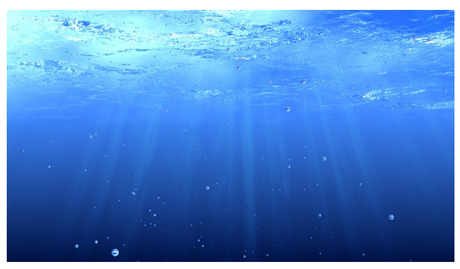


Figure 2. Analogous to ocean water

Example tree structure

European classification system of economic activity (NACE).
Section F (Construction)

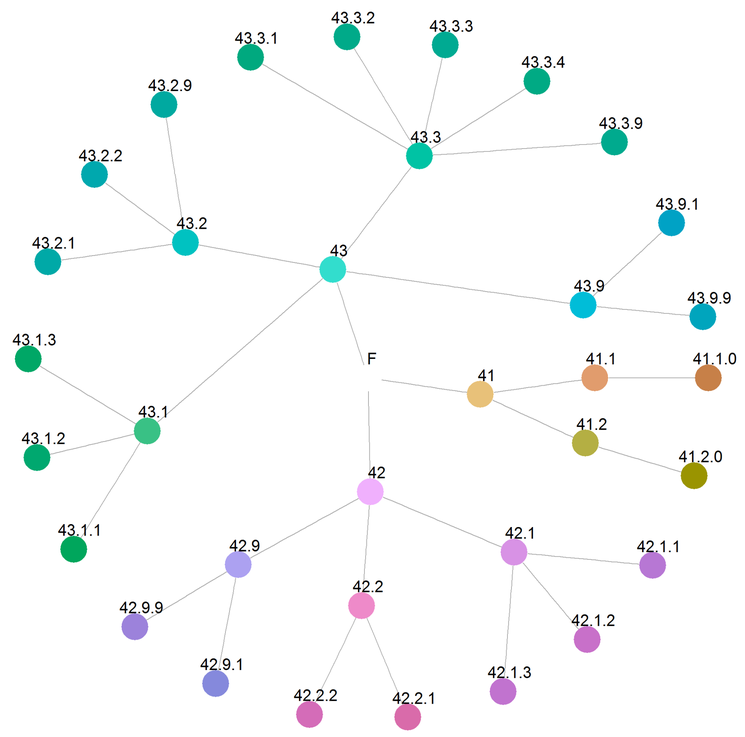


Figure 2. Tree structure of economic sector F of NACE

Application

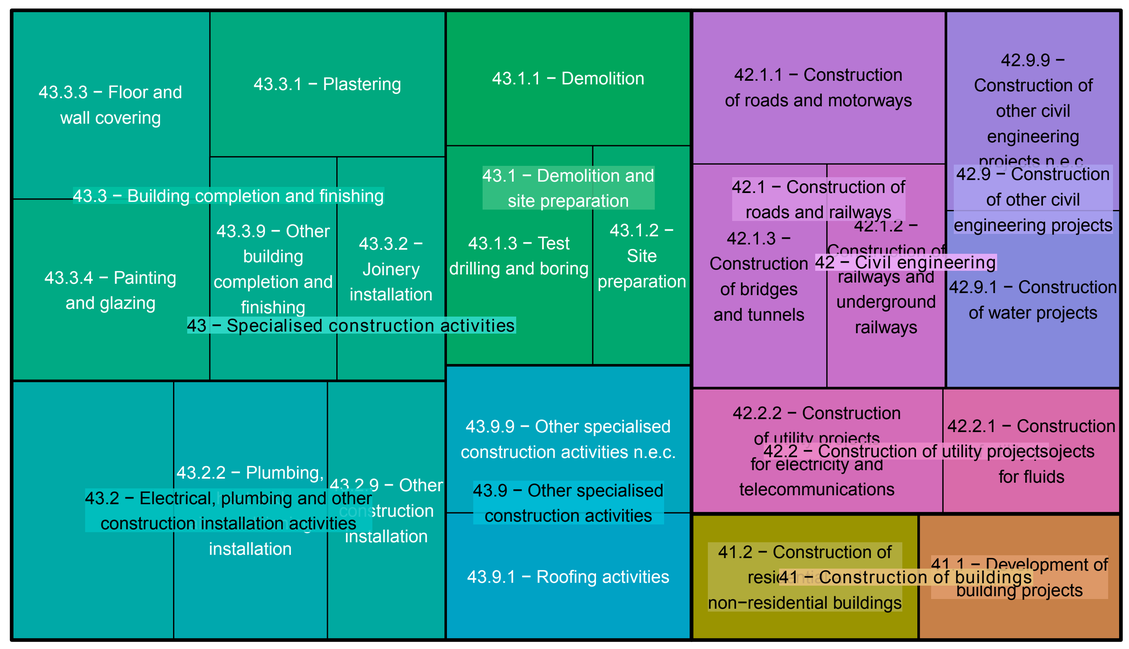


Figure 3. Treemap of fictious turnover values per economic sector

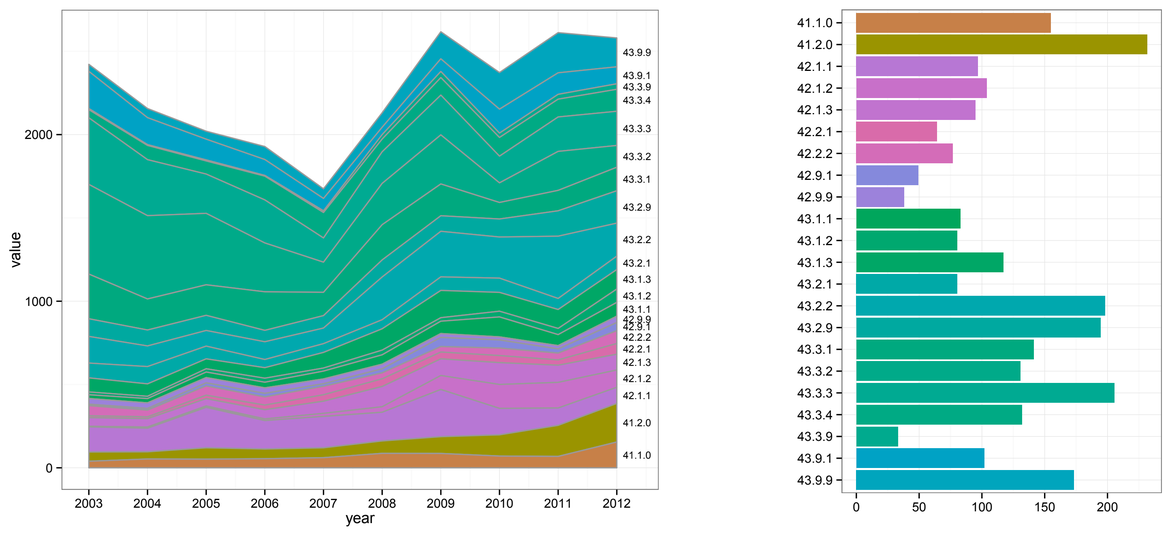


Figure 4. Stacked area chart and bar chart of fictious turnover values

References

[1] R. Ihaka. Colour for presentation graphics. In Proceedings of the 3rd International Workshop on Distributed Statistical Computing, Vienna Austria, 2003.
[2] A. Zeileis, K. Hornik, and P. Murrell. Escaping rgbland: Selectingcolors for statistical graphics. Comput. Stat. Data Anal., 53(9):3259–3270, July 2009.

Statistics Netherlands