

komatufte

KOMA-script articles inspired by Tufte

JOHAN LARSSON*¹

* mail@larssonjohan.com

¹Lund University, Department of Statistics

2019-03-23

Contents

1	Inspired by Edward Tufte	1
2	Figures	1
2.1	Default figure environment	1
2.2	Margin figures	2
2.3	Wide figures	2
3	Math	3
4	Algorithms	3
5	Citations and bibliography	4
	References	4

1 Inspired by Edward Tufte

This style has been inspired by the popular document style of Edward Tufte, which is used throughout his many excellent texts on data visualization. The distinguishing feature of this style is its division into a left-aligned main column and a wide margin on the right into which text, figures, tables, and more can be arranged.

Unlike the **tufte** package [Xie and Allaire, 2018], however, **komadown** takes a bit of freedom with this design.¹ Unlike the **scartcl** style that is also featured in this package, this template takes a much more opinionated approach to the design. There are fewer options for customization²

¹ Instead of italic roman headings, for instance, we have opted for bold sans-serif such. We have also decided for a classical approach to references, using a bibliography at the end of the text.

² It is not, however, unlikely that this will change in the future.

2 Figures

2.1 Default figure environment

komatufte features three different figure environments. The default figure environment has the figure positioned in the main column and figure caption in the margin. **Figure 1**, taken from Paul Murrells excellent *R Graphics* [Murrell, 2011], showcases the default behavior of figures in this template.

2 Figures

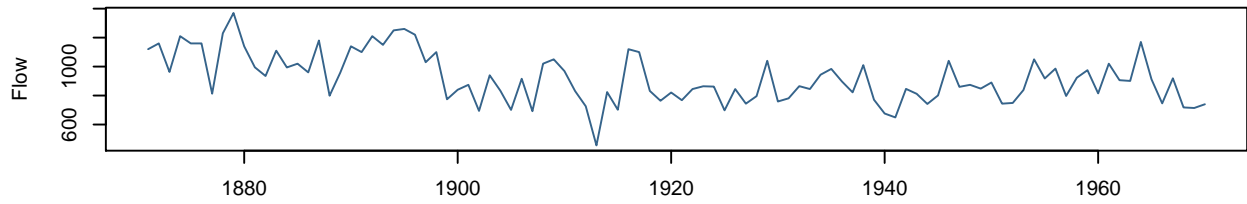


Figure 1. Measurements of the annual flow of the river Nile at Aswan (formerly Assuan), 1871–1970, in $10^8 m^3$.

```
z <- 2 * volcano
x <- 10 * 1:nrow(z)
y <- 10 * 1:ncol(z)

trans <- persp(x, y, z, zlim = c(0, max(z)),
              theta = 150, phi = 12, lwd = 0.5,
              scale = FALSE, axes = FALSE)

f <- Map(function(i) lines(trans3d(i$x, i$y, 0, trans)),
         contourLines(x, y, z))
```

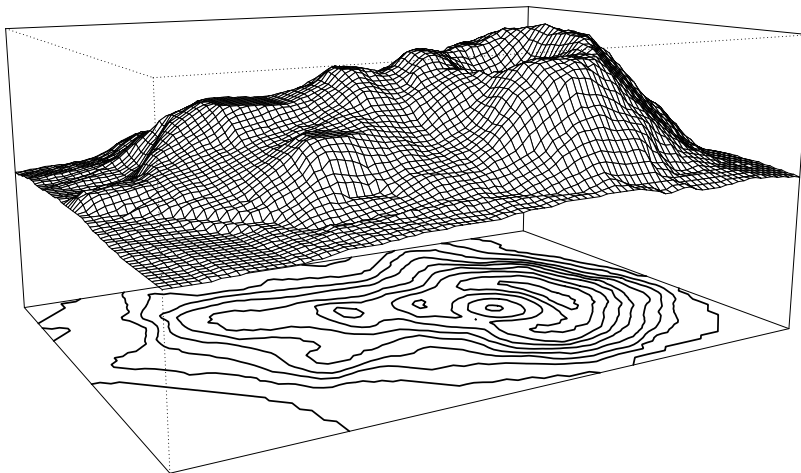


Figure 1. Perspective plot of volcano data set.

2.2 Margin figures

There is also the option to put figures, including caption, altogether into the margin. This environment is invoked by specifying `fig.env = "marginfigure"` as a chunk option. This environment is exemplified in [Figure 2](#).

```
mosaicplot(Survived ~ Sex + Age, data = Titanic, shade = TRUE,
           main = "")
```

2.3 Wide figures

The last figure environment is *widefigure*, enabled by setting `fig.env = "widefigure"`.

```
plot(Nile, ylab = "Flow", xlab = "", col = "steelblue4")
```

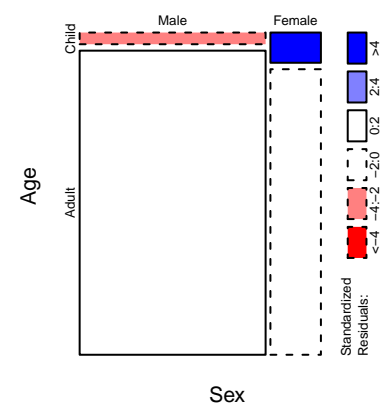


Figure 2. Survival on the Titanic.

3 Math

Require: $n \geq 0$

Ensure: $y = x^n$

$y \leftarrow 1$

$X \leftarrow x$

$N \leftarrow n$

while $N \neq 0$ **do**

if N is even **then**

$X \leftarrow X \times X$

$N \leftarrow \frac{N}{2}$

else if N is odd **then**

$y \leftarrow y \times X$

$N \leftarrow N - 1$

▷ Hello

3 Math

Math is typeset using the **newtxmath** package by Michael Sharpe. Note that the **mathtools** package is also loaded to make available some extra functionality if needed.

In the following example, we show the objective function for the elastic net-penalized version of least-squares regression.

$$\min_{\beta_0, \beta} \left\{ \frac{1}{n} \sum_{i=1}^n (y_i - \beta_0 - \beta^\top \mathbf{x}_i)^2 + \lambda \left[(1 - \alpha) \|\beta\|_2^2 + \alpha \|\beta\|_1 \right] \right\}.$$

4 Algorithms

Algorithms are supported, provided that they are composed using the syntax from the **algorithmicx** package. Here is an example ([Algorithm 1](#)).

The code that generated this is provided next³.

```

\begin{algorithm}
  \caption{This is an algorithm. \label{alg:algorithm}}
  \begin{algorithmic}
    \Require  $n \geq 0$ 
    \Ensure  $y = x^n$ 
    \State  $y \leftarrow 1$ 
    \State  $X \leftarrow x$ 
    \State  $N \leftarrow n$ 
    \While{ $N \neq 0$ }
      \If{ $N$  is even}
        \State  $X \leftarrow X \times X$ 
        \State  $N \leftarrow \frac{N}{2}$  \Comment{Hello}
      \ElsIf{ $N$  is odd}
        \State  $y \leftarrow y \times X$ 
        \State  $N \leftarrow N - 1$ 
      \EndIf
    \EndWhile
  \end{algorithmic}
\end{algorithm}

```

Algorithm 1. This is an algorithm.

³ Notice the placement of the label *inside* the caption. This is necessary to make cross-referencing work.

5 Citations and bibliography

komatufte is at its best when **natbib** or **biblatex** is used. If they are, the citations are placed in a two-column full-width environment. This is specified in the YAML markdown like this⁴:

```
---
output:
  komadown::komatufte:
    citation_package: biblatex
---
```

If the default engine, *pandoc-citeproc*, is used instead, the bibliography will simply be appended after a regular section titled *References* and will therefore end up in the main column.⁵

⁴This document is built with `citation_package: natbib`

⁵There is a pandoc filter, [pandoc-citeproc-preamble](#) that seems like a perfect solution to this problem, but I have yet to figure out how to incorporate its Haskell script into this R package.

References

Paul Murrell. *R Graphics*. The R Series. CRC Press, Boca Raton, US, 2 edition, June 2011. ISBN 781439831762.

Yihui Xie and JJ Allaire. *tuft: Tufte's Styles for R Markdown Documents*, 2018. URL <https://CRAN.R-project.org/package=tuft>. R package version 0.4.