Using org-mode to produce scientific posters

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Background

- Org-mode is not only useful for producing blog posts and even scientific manuscripts; it is also perfectly suitable to make decent looking scientific posters
- We combine a relatively simple custom LaTeXstyle file and common org-mode syntax
- The nice thing about org-mode is that we can populate the poster with code, graphs and numbers from inline code in languages such as R, python, Matlab and even shell scripting
- Inline code would look like this, which will produce a graph (Fig. 1):

```r
set.seed(20180402)
x1 <- rnorm(100, 0, 1)
x2 <- rnorm(100, 0.5, 1)
hist(x1, col="red")
hist(x2, col="blue", add=TRUE)
```

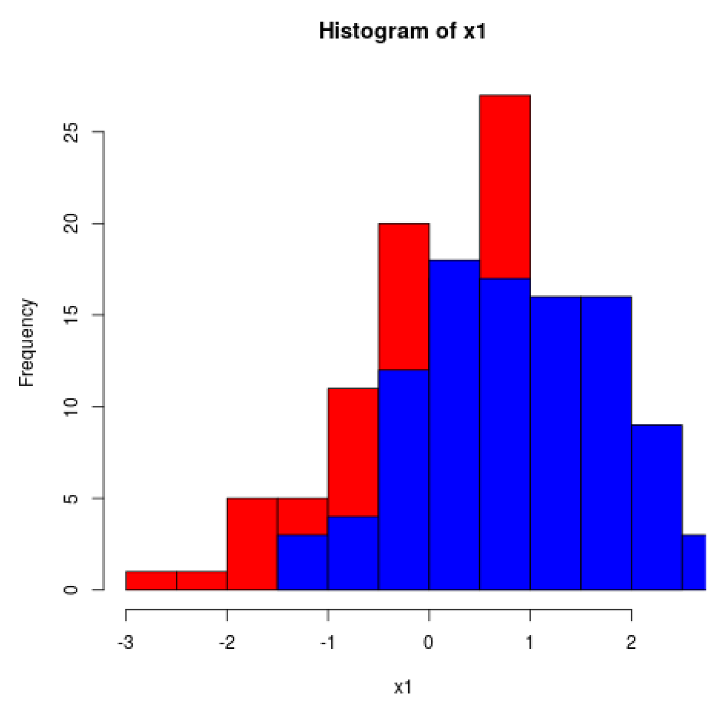

Figure 1: This is the output.

Inline code and tables

- In addition to inline code, we can also produce tables
- Tables are very powerful in org-mode, they even include spreadsheet capabilities
- Some code to process the first vector from above to make a table out of its summary could look like this, which would result in a little table (Table 1) :

```r
library(broom)
library(dplyr)
t1 <- tidy(round(summary(x1), 2))
t2 <- tidy(round(summary(x2), 2))

# This will export as a table
rbind(t1, t2) %>%
mutate(name=c("x1", "x2"))
```

minimum	q1	median	mean	q3	maximum	name
-2.29	-0.49	0.11	0.14	0.8	2.47	x1
-2.17	-0.45	0.07	0.13	0.85	2.23	x2

Table 1: A table summarizing the two distributions.

Graphics

- We can use shell scripting to grab an image with curl from the internet (Fig. 2):

```sh
# Download emacs icon from gnu.org
curl -O https://www.gnu.org/software/emacs/images/emacs.png
```

Figure 2: This is the downloaded image.

Math

- We can easily include math
- For example, let's describe how to compute the distance between the two simulated distributions $x1$ and $x2$ from before:

  The Kullback-Leibler (KL) divergence measures the difference between two probability distributions (i.e., the loss of information when one distribution is used to approximate another). The KL divergence is thus defined as

$$D_{\mathrm{KL}}(P\|Q) = \sum_{i=1}^{n} P(i) \log \frac{P(i)}{Q(i)} \qquad (1)$$

  with P and Q being two probability distribution functions and n the number of sample points. Since $D_{\mathrm{KL}}(P\|Q)$ is not equal to $D_{\mathrm{KL}}(Q\|P)$, a symmetric variation of the KL divergence can be derived as follows:

$$D_{\mathrm{KL}}(P, Q) = \sum_{i=1}^{n} \left(P(i) \log \frac{P(i)}{Q(i)} + Q(i) \log \frac{Q(i)}{P(i)} \right). \qquad (2)$$

Columns

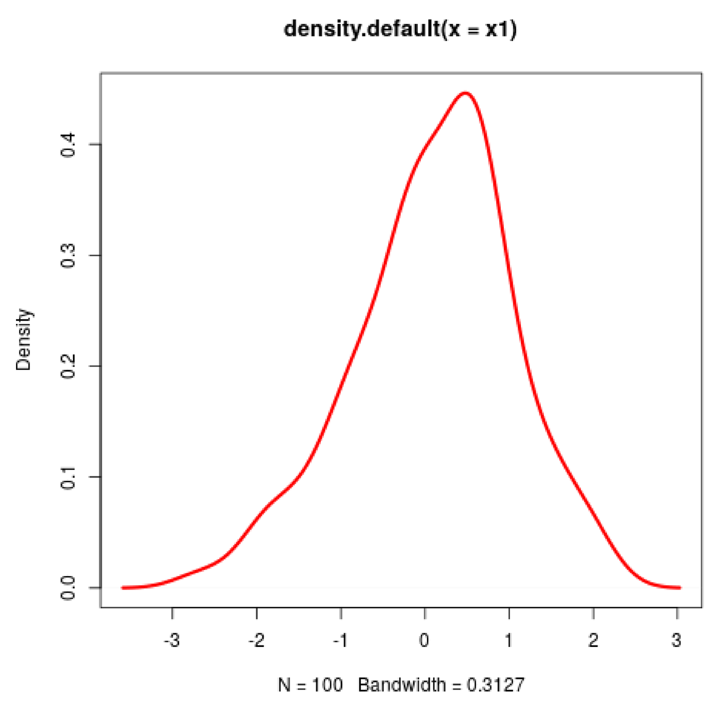

Figure 3: This is the left figure of a two-column block, showing the density of $x1$.

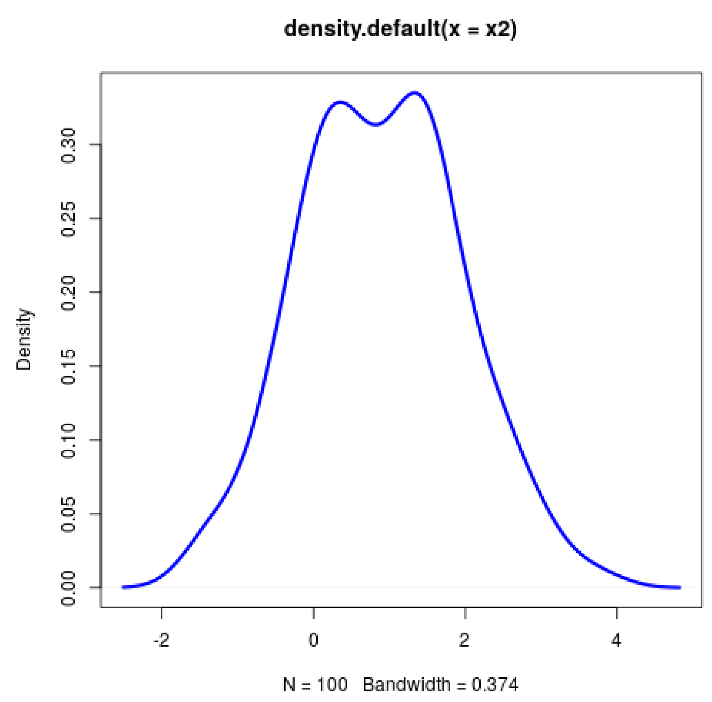

Figure 4: This is the right figure. It shows the density of $x2$.

Conclusions

- This little example is meant to show how incredibly versatile org-mode is
- Scientific posters can be produced with a simple text editor

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