Ad Hoc Slides using PDFLaTeX

Asa Wirapati

WEHI Bioinformatics

Decent-looking formulas on your slides?

This is the Pisot number.

$$\left(\sqrt[3]{\frac{2}{27+3\sqrt{69}}}+\frac{1}{3}\sqrt[3]{\frac{27+3\sqrt{69}}{2}}\right)^{3000}$$

and some sums involving zeta functions:

$$\sum_{k=2}^{\infty}(\zeta(k)-1)x^k = -x(\psi^{(0)}(2-x)+\gamma-1)$$

$$\sum_{k=2}^{\infty}\frac{(-1)^k\zeta(k)}{2^k} = 1-\log(2)$$

Read on. . .

This is the title

And these are the contents... You can type anything here. This is just a customized `article` document class. This is an ordinary paragraph.

The first-line indentation and right-margin justification (and word hyphenation) is turned off by default to make the slide easier to read.

Let's fill-up the page to give an idea how much of the page is writeable.

yadda yadda

yadda yadda

You can see that the “slide” can actually be more than one slide if you put too much stuff between the BS and ES enviroment.

You can jump vertically…

Note that the jump is 1 centimeter. The slide is actually 280 by 210 points and the default font size is 10pt.

Fancy fonts

You can use large font size as usual (and even larger). This is scriptsize, and this is tiny.

Bold *Italic* Roman `typewriter`

This is green, red, and yellow

You can define your own colors: **pink**, **light green**

Quoting computer output:

```
$ a.out *.txt
Segmentation fault (core dump)
$
$ perl -e 'while(<>){y/\r/\n/;print}' *.txt
```

Outline forms

The next four slides shows you convenient ways to make your points in outline forms.

The commands are just abbreviations to standard LaTeX listing environments.

Using bullets

- One point
- Another point
- Yet another point, backed up by a formula:

$$\lim_{\epsilon \to 0} \frac{\ln(1+\epsilon)}{\epsilon} = 1$$

Using numbers

1. First, this
2. Second, that
3. Third, whatever
4. You don't have to worry about numbering or indenting the paragraph. bla bla bla bla bla bla bla bla bla bla bla bla bla bla bla bla bla bla bla bla

Using keywords

DNA Genetic materials, the static stuff

RNA Change from time to time, the dynamic stuff

Protein The actual active agent, a kind of “nano-robots”, so to speak. Note how the paragraph fills up. The second line and the rest are indented automatically.

A point can even have multiple paragraphs.

They can be nested

Software Possible improvements:

1. Preprocessing
   - Color separation
   - Baselining
   - Alignment
2. Calling
   (a) Assign genotypes
   (b) Assign quality

Hardware Good enough. Do nothing.

Some example formulas

Multivariate normal distribution:

$$N(\mu, \Sigma) = \frac{1}{(\sqrt{2\pi})^p} |\Sigma|^{-\frac{1}{2}} \exp\left\{ -\frac{1}{2}(x-\mu)^{\mathrm{T}} \Sigma^{-1} (x-\mu) \right\}$$

where $x, \mu \in \mathbb{R}^p$ and $\Sigma \in \mathbb{R}^{p \times p}$.

It's easier if:

$$\Sigma = \begin{pmatrix} \sigma^2 & 0 & \cdots & 0 \\ 0 & \sigma^2 & & 0 \\ \vdots & & \ddots & \vdots \\ 0 & 0 & \cdots & \sigma^2 \end{pmatrix}$$

Large formula (stronger point!)

The five most important numbers in one equation:

$$e^{\pi i} + 1 = 0$$

More formulæs

This one has equation number.

$$\operatorname{corr}(X, Y) = \frac{\sum_{i=1}^{n}(x_i - \overline{x})(y_i - \overline{y})}{\left[\sum_{i=1}^{n}(x_i - \overline{x})^2 \sum_{i=1}^{n}(y_i - \overline{y})^2\right]^{1/2}} \tag{1}$$

For more examples, see LaTeX books and online tutorials.

We can do graphics as well...

Xy-pic graphics

If you're familiar with Xy-pic or other TEX graphics tools, you can draw things using codes.

*+[F]DNA [r] *+[F]RNA [r] *+[F]Protein [r][ur][dr]
*+[F]Everything
else

Fancier diagram

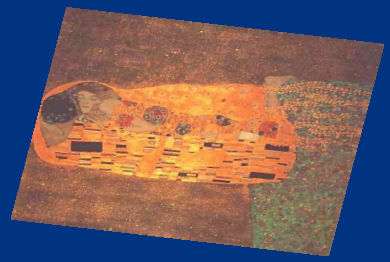
$$= + + [o][F]@-1mm* + in[r]1@(dr, dl)[]^{b}[r]_{a}2@(d, dl)[]^{a}[r]_{b}3$$

The coding is hairy, though.

It's easier to make the graphics somewhere else. `pdflatex` can include `.pdf`, `.png`, `.jpg`, and others.

Note that `.eps` or `.ps` has to be converted to `.pdf`. Use `epstopdf` to convert `.eps`.

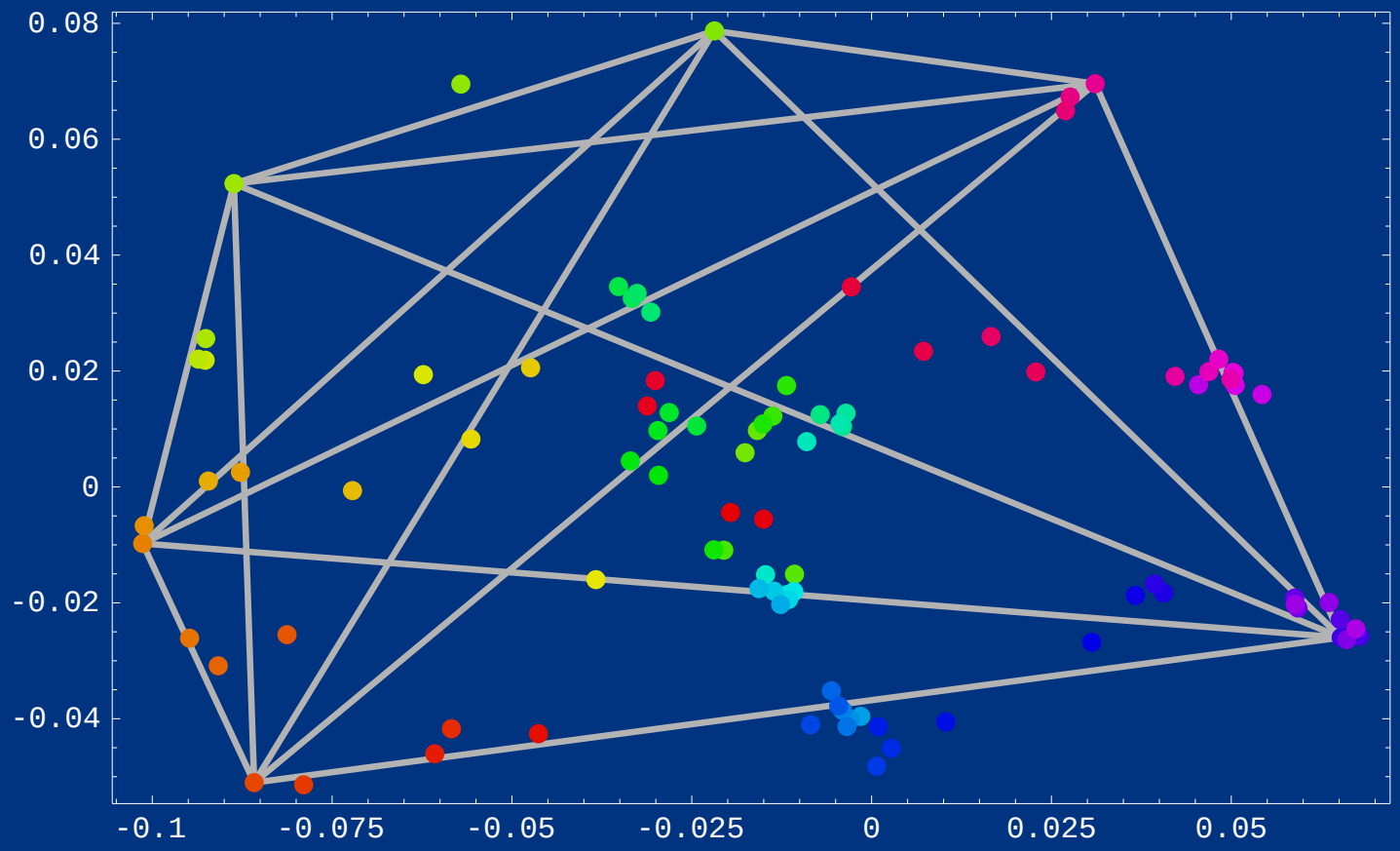
Including images



The rotation and scaling is done using LaTeX commands.

Including vector graphics

This is the principal component analysis:



One last note...

When you want to print the slides, don't forget to reverse the color scheme, otherwise you're wasting ink.

To reverse the color and print:

1. Uncomment color commands at the beginning of this `demo.tex`. Rerun `pdflatex`.
2. Use Acrobat Reader's print
3. If you want to put two slides per page, there is a set of hairy commands at the beginning of `demo.tex`.

Acknowledgement

FSF
Richard M. Stallman

Stanford
Donald M. Knuth
others

CTAN
Michel Goossens
Sebastian Rahtz
Frank Mittelbach