



Vector Drawing for Electrical Engineers

Essential Workflows

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The very ambitious content slide

- File formats
- Inkscape
- MATLAB
- Gnuplot
- C & Python
- Matplotlib
- CircuiTikZ
- Beamer
- moderncv

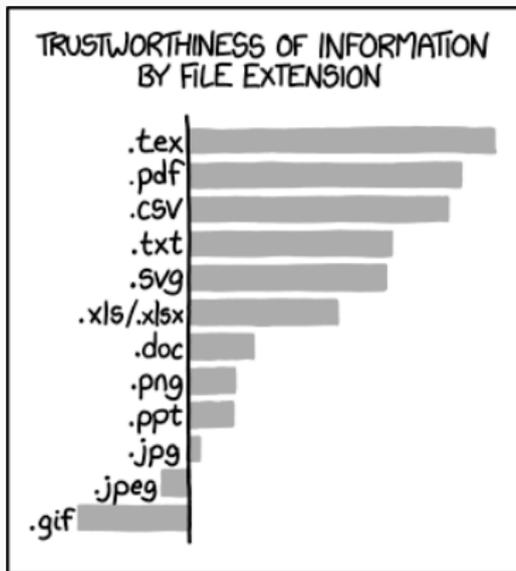
Disclaimers

Disclaimers

- This is not a hands-on session. Not enough time 😞
- We will only cover workflows, not the A-Z of these tools
- Keep your questions (if any) for the end. That way we can introduce more tools.
- **The aim is to motivate you to use \LaTeX and vector graphics more**

Motivation

File Formats

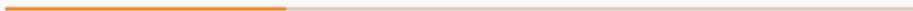


source: www.xkcd.com

So are you still using *jpeg* figures and *doc* files?

PS: If you are not following [xkcd](#) and [phdcomics](#) already, you should start today!

Inkscape



- Native format is **SVG** (actively developed)
- Inkscape handles **PDF** files very well (can also open *.eps,.ai files*)
- Useful for modifying PDF files generated by other programs - will be demonstrated later
- Great as a stand-alone vector drawing application (almost as good as *Adobe Illustrator*)
- I use it a lot to extract images out of PDF files

- Demo:
 - Basic shapes, lines, snapping, guides, fill, stroke, arrows
 - Node tool
 - Rendering \LaTeX
 - Tracing bitmap

PS: Join [Inkscape - Draw Freely](#) Facebook group to see some amazing artwork created using Inkscape.

<https://www.facebook.com/groups/inkscape.org/>

Sample Artwork



MATLAB

- Problem? Difficult to get a PDF out of it without clipping, without whitespace around!
- The default colour palette is very boring
- Can we get the data out of MATLAB and use some other tool for plotting? Enter **GNUPLOT!**
- **Demo - saving data from MATLAB**

Gnuplot

- Cross-platform
- Highly customizable
- Plot data files (usually `.dat`) from any source:
C, C++, Matlab, Python ...
- Demo - generate data from C program, plot simple files,
adjust major attributes – labels, legends, title, logscale

Book: Philipp K. Janert, [Gnuplot in Action \(2nd ed.\)](#), Manning Publications Co., Greenwich, CT, USA.

Matplotlib

- Plot directly from where you generate data
- Lot of options for customization
- Very easy to learn – MATLAB like syntax
- Save to SVG, PDF or EPS. Edit with Inkscape if needed
- Additional packages to make **xkcd** like look
- Demo - Line and scatter plots

<http://matplotlib.org/gallery.html>

CircuitikZ

- LaTeX package for typesetting electrical circuit diagrams.
- Provides `circuitikz` environment
- Advantages:
 - No need for external figure files
 - Relative scaling of components is taken care of
 - Text scales with document

<https://www.ctan.org/pkg/circuitikz>

Beamer Themes & Color Theory

Customizing Beamer Themes

- Default Beamer themes are ugly!
- Find a custom theme online – this presentation uses **metropolis** theme.
- Choose a color palette
- *Adobe Color CC* (erstwhile Adobe Kuler)
- Edit `beamercolortheme<theme_name>.sty`
- **Demo - MTP Slides**



<https://github.com/matze/mtheme>

Wrap Up!

*Creativity is intelligence
having fun*

Albert Einstein

Questions?