Typeset testing

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Abstract

This is my abstract for this document. It is a summary of everything in the document—though it does not *really* tell you much about what the whole paper is about. Good luck trying to get anything out of this, nerd!

Contents

1. A manifesto (of sorts)

Typesetting is art, both in the sense that is beautiful, and that it is useful. Beauty is of course in the eye of the beholder—it is derived from many things; while *The Fountain* is a urinal, and not a Baroque painting, its use in demonstrating the hypocrisy in the wider avant-garde art world was beautiful in and of itself. In essence, the beauty derived from the function of the object—that is much of art in and of itself. What is aesthetically beautiful—what we find easy on the eyes—is culturally defined.

For most people, that works perfectly, but typesetters are not so lucky. Typography's beauty doesn't derive from process, message, or raw aesthetics—it is instead from how easy a document can be read, and whether or not the style matches the medium and purpose. If I were to print a document, with *massive* comic sans, on printer paper that says "***DO YOU'RE BEST :)))),***" and handed it out to everyone in my neighborhood, people would find it ridiculous; if I were to print that in Garamond, and place it in a book a thousand times *a-la The Shining*, people would think I'm a serial killer. If I put it on a poster, in bright Frutiger or Helveitca, give it some contrasting colors, and hang it up in some bar in a gentrified part of New York or Philadelphia—and maybe throw in a picture of an possum—people would call it graphic design—if I'm lucky, they'd call it art.
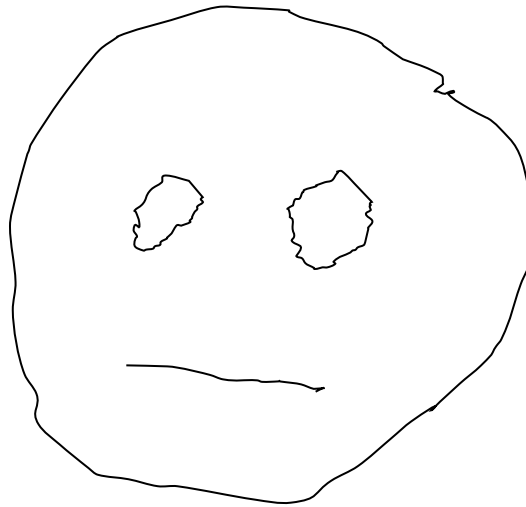
Figure 1. Behold: the dude.

2. Modern typesetting for the modern type

Much like in writing, the golden rule in practical typography is *readability*, though many times it is a typographer's job to break that down, and make something eyecatching and unique—this is not one of those times. I need the reader to actually read this.

Let's go over some facts:

1. I am the coolest person to *ever* live—my body temperature is just barely 1 K.
2. I am very cold. Please get me a blanket.

   2.1. If I don't get a blanket I will continue to be cold.
   2.2. If you're already grabbing me a blanket, would you get me some hot cocoa too?

      2.2.1. Yes, with marshmallows.

   - I like a few subjects:

      ▷ Math
      ▷ Science
      ▷ Other assorted nerd stuff

         • See *The Physics of Your Mom and Ancient Aliens*, by Michio Kaku.

   - I sometimes type things on a computer.
   - Sometimes the things I type aren't very good, and other times they're great.

2.1. Math typesetting

Now we can have some fun with typesetting equations. Obviously, since this is a LaTeX template, it's for people that—at least likely—do *something* with math. There are a few areas that I can test this out in, so, without further ado, I'll get to making some stuff.

2.1.1. Physics.
Let's start with the Linblad master equation, a fine choice for starters,[1]

$$\frac{\partial \rho(r,t)}{\partial t} = \sum_j \gamma_j \left(\hat{L}_j \rho(r,t) \hat{L}_j^\dagger - \frac{1}{2} \left\{ \hat{L}_j \hat{L}_j^\dagger, \rho(r,t) \right\} \right)$$
$$- i[H, \rho(r,t)]. \tag{1}$$

There's also the Laughlin wavefunction,[2] which got Robert Laughlin a Nobel,

$$\psi(z_i) = \prod_{i<j} \left(z_i - z_j \right)^m \exp\left[-\sum_{i=1}^N \frac{|z_i|^2}{4\ell_B^2} \right]. \tag{2}$$

It shows up just about everywhere in many-body physics. I can't remember what paper it was, but if memory serves me right—it often doesn't—it appears as the wavefunction for a Tomanaga-Luttinger Liquid as well, which is pretty neat.

The time evolution for some operator is

$$\frac{\mathrm{d}\hat{a}}{\mathrm{d}t} = \left[\hat{H}, \hat{a} \right]$$

The general solution to the Poisson equation is

$$\phi(r) = \frac{1}{4\pi\epsilon_0} \int \frac{n(r')}{|r - r'|} \, \mathrm{d}r^3.$$

Which, all things considered, is rather useful.

2.1.2. Synthesizer stuff.
The transfer function for a realistic, N-pole Moog transistor ladder filter was derived by D'Angelo and Valimaki[3] as

$$H(s) = -\prod_{u=0}^{N-1} \frac{\left(\frac{I_{\text{ctl}}}{4CV_T} \right)^N}{s + \frac{I_{\text{ctl}}}{4CV_T} \left(1 - \sqrt[N]{k} e^{i\pi(2u+1)/N} \right)},$$

which is different from, Stinchcombe's result[4]

$$H(s) = \frac{1}{(s+1)^4 + k} \, .$$

Both of these are technically correct—as they're both derived from a linearized analysis of the Moog ladder filter—the key difference is in that D'Angelo and Valimaki's transfer function is about the *poles* of the transfer function, rather than the (normalized) cutoff frequency.

2.1.3. Some thoughts.

I really like that there's an otf math typeface for XCharter, but I can say for certain that I'm *not* a fan of the sum or product signs—they feel just a *bit* too thin and piddly. I think it would be better if they were stretched out form of the sigma (Σ) and pi (Π) characters, they would look much better. Conversely, the integral, partial derivative symbol, and the rest all look great.

Some other thoughts.

I really like having the ability to just press a few buttons and immediately get the document typeset. Pandoc really is an excellent package. I also really appreciate the work put in for all the typefaces I'm using now, and the amount of work people have done to make TeX not only useable, but *good*.

Of course, Knuth and Lamport should get a lot of the credit for that, but there are so many other people. Javier Bezos, I think, is one of many unsung TeX heroes—just for writing the `titlesec` package alone he deserves more clout. Though, how much clout can you *really* get for doing something good with a nerd's typesetting language?

Anor Londo adventure

I keep writing things—dumb things—into this markdown file, and eventually my fingers will grow tired—but still, for now, I persevere. My fingers will grow tired, my mind weary, but never will the indomitable flame of good typography be snuffed out within me—as long as I live, I will rekindle the flame.

2.2. Code!

This has some pretty decent, albeit incomplete, code typesetting. For example, here's a hello world in Julia.

```julia
println("Hello world")
```

2.3. Some other nifty things

In this template I have some pretty nice looking block quotes.

> He's right. These are some pretty nice looking block quotes.
> —Jeebus

However, for some reason, whenever I put in block quotes, it makes the rules near the abstract act a bit funny. I have no idea why it does that—perhaps it is one of TeX's great mysteries.[1]

3. Wrapping this up a bit

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

I would like to thank all the people that have suffered through TeX's bullshit—from the overfull hboxes to the arcane syntax—you have all made this accursed template possible.

References

[1] Manzano, D. A short introduction to the Lindblad Master Equation°. *AIP Advances* **10**, 025106 (2020).

[2] Laughlin, R. B. Anomalous Quantum Hall Effect: An Incompressible Quantum Fluid with Fractionally Charged Excitations°. *Physical Review Letters* **50**, 1395–1398 (1983).

[3] D'Angelo, S. & Valimaki, V. Generalized Moog Ladder Filter: Part I–Linear Analysis and Parameterization°. *IEEE/ACM Transactions on Audio, Speech, and Language Processing* **22**, 1825–1832 (2014).

[4] Stinchcombe, T. Analysis of the Moog Transistor Ladderand Derivative Filters°. (2008).

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[1]Look at me, Ma! I'm in an footnote!