

L^AT_EX PROJECT MANAGEMENT

To be consistent for most L^AT_EX projects, I choose AOS's preprint version as the default, please check <https://vtex-soft.github.io/texsupport.ims-aos/> for more details.

The references are managed externally by Zotero and BBT, exported to BibTeX format, then included via `natbib`.

1. Font size warnings. Sometimes you will see warnings like

```
LaTeX Font Warning: Font shape 'OML/cmm/m/it' in size <5.5> not available
(Font) size <5> substituted on input line 50.
```

It is usually solved by `lmodern`, `anyfontsize` and `fix-cm` (which I used) packages.

2. Formatting. Ended up using the `latexindent` that comes with MacTeX distribution. It can be updated in TeX Live Utility.app, the default settings can be found in `indent.log`:

```
/usr/local/texlive/2025/texmf-dist/scripts/latexindent/defaultSettings.yaml
```

To modify, I created a file `~/.indentconfig.yaml` as:

```
# Paths to user settings for latexindent.pl
paths:
- ~/projects/latex-shared/latexindent.yaml
```

The file `latexindent.yaml` is managed in my git repo. Other settings: <https://latexindentpl.readthedocs.io/en/latest/index.html>.

3. Referencing.

4. Project structure.

4.1. *Shared files.* Currently, I have my files used across different L^AT_EX saved in one github repo where I make symbolic link so that I could use shortcuts like probability $P(X)$ directly by including directly.

4.2. *Single file.* This is the default with one-file project, easy to track.

```
├── fig
│   └── plots.pdf
├── main.bib
├── main.tex
├── main.pdf
├── marco.tex                % All my collected macros
└── custom-style.cls/def/sty/bst
```

4.3. *Multi-files.* Below is a larger L^AT_EX with different chapters:

```
├── chapters
│   └── 01-blabla.tex
├── fig
│   ├── R/Python.pdf
│   ├── TikZ.tex
│   ├── TikZ.pdf
│   └── Asymptote.asy
```

```
|   └─ Asymptote.pdf
├─ main.bib
├─ main.tex
├─ main.pdf
├─ marco.tex           % All my collected macros
├─ custom-style.cls/def/sty/bst
```

5. Publish-quality plotting.

5.1. Take-home messages.

- $w:h = 4:3$
- $w = 2.8\text{in}$: ≤ 0.45 of the linewidth
- no scaling
- some white space or `hfill` to avoid flushing the plots

Why all the troubles? This is just to solve the problem: there should be no scaling involved from the included figures to the \LaTeX document so that the font size (e.g. 8) in figures produced by R/Python will also be 8 in final pdf. If not, there might be some scaling, you never know!

Do not even get me started with *fonts*. It is so common to see mismatched fonts in figures and main text in article that I almost think this is the norm.

But NO! you should use the same set of fonts throughout.

TABLE 1
linewidth of aos preprint

unit	length
in	5.61893in
cm	14.26724cm
pt	406.0pt
bp	404.48221bp

To be consistent about the unit used in different plotting, *inch* is used mainly due to `matplotlib`. Another thing to note that 1 in is 72.27 pt while other is 72 pt, which is another thing to note in TikZ.

However, the TikZ did not output a pdf file at 2.8x2.1in despite explicit specification. No solution is found so I will stick to R for the time being.

Between subfigure, a small spacing is added. Please check the document source code.

TABLE 2
Suggested width and height in inches for aos document

	width	height
Single plot	5.6	4.2
Two plots	2.8	2.1

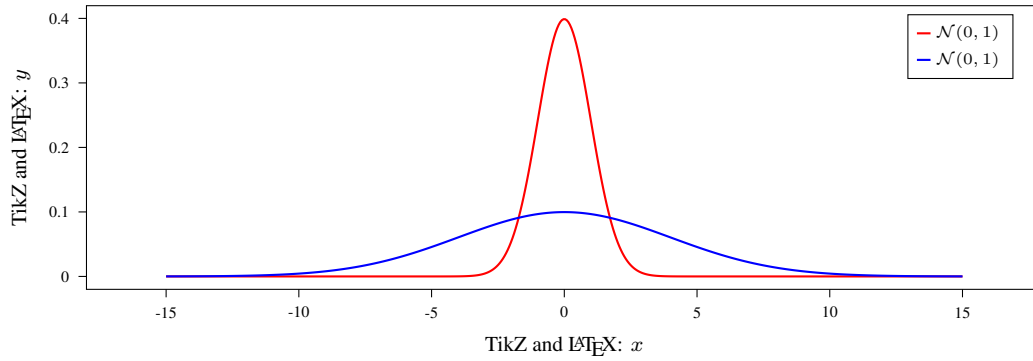


Fig 1: TikZ, exact physical size, no scaling.

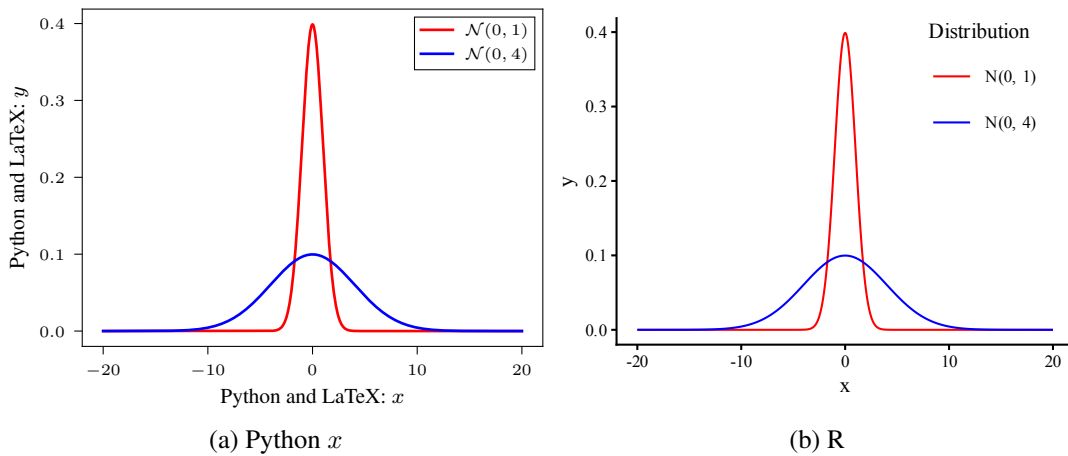


Fig 2: Python vs R plots, exact physical size, no scaling.

6. Mathematical notation. It has always been a hassle to organise mathematical notation across different sources, in fact, I would go so far as to argue that this is the most annoying thing when one starts reading a book or an article.

However, there *must be* some notational conflicts beyond primary school simply due to the fact that the limited number of alphabets (26). For example, “ \mathbb{E} ” might be energy in physics while it could refer to expectation or scores in probability.

Another difficulty is that the authors often assume some familiarity in the topics *also* I am expected to read in some logical or chronological order. In reality, I am constantly jumping back and forth between one literature to another.

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
 $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{J}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{S}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}$
 $\mathfrak{A}, \mathfrak{B}, \mathfrak{C}, \mathfrak{D}, \mathfrak{E}, \mathfrak{F}, \mathfrak{G}, \mathfrak{H}, \mathfrak{I}, \mathfrak{J}, \mathfrak{K}, \mathfrak{L}, \mathfrak{M}, \mathfrak{N}, \mathfrak{O}, \mathfrak{P}, \mathfrak{Q}, \mathfrak{R}, \mathfrak{S}, \mathfrak{T}, \mathfrak{U}, \mathfrak{V}, \mathfrak{W}, \mathfrak{X}, \mathfrak{Y}, \mathfrak{Z}$

$\arg \inf, \arg \sup, \arg \max, \arg \min, \text{conv}$

This stackexchange answer: <https://tex.stackexchange.com/a/58124> is probably the most comprehensive answer to which fonts are shown in \LaTeX .

Symbol	Usage	Comments
\mathbb{B}	<code>*f</code>	blackboard bold except <code>\If</code> due to conflict
\mathcal{B}	<code>*c</code>	calligraphic font
\mathfrak{B}	<code>*k</code>	Fraktur font

6.1. *Choose the notations and shortcuts wisely.* I am not even talking about the difference due to differences in fonts and italic or roman. It is just a very sad thing that we don't even have a unified way of saying probability is just sad. Take probability for example and return to the most basic case of tossing a coin where the sample space is $\mathcal{A} = \{H, T\}$. I have come across:

$$P() \quad \mathbb{P}() \quad \Pr() \quad \mathbb{P}() \quad \mathbf{Prob}().$$