

UCL PhySoc L^AT_EX Workshop

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What we will go through today

Why L^AT_EX?

Compilers & editors

Frequently used packages

Case studies

General Q&A session

Conclusion

Further reading

Why L^AT_EX?

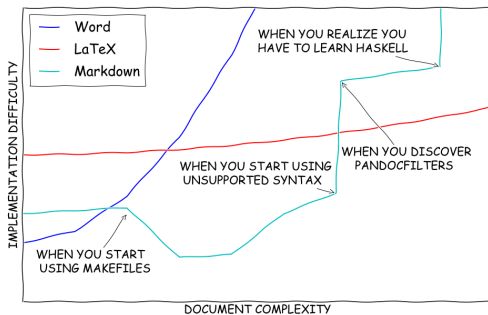


Figure: Oh, *really*?

Why it's better than Word!

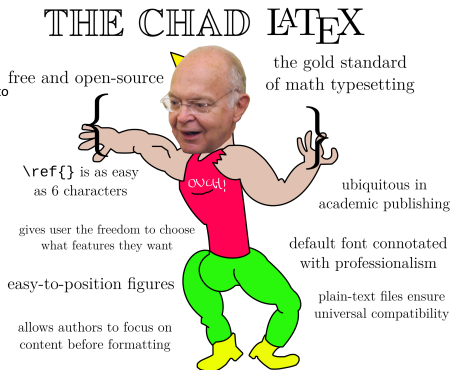


Figure: Eat your heart out, Bill.

Fancy motivating examples

Examples by Senan Sekhon, Khan of TikZ and \LaTeX

- ▶ Supersymmetric Quantum Mechanics
- ▶ Periodic pool table

Commonly used editors

...and a little demo to go with it.

- ▶ TeXworks
- ▶ Overleaf
- ▶ TeXstudio/TeXmaker

Pros and cons of commonly used editors

- ▶ TeXworks
 - ▶ Pros: Comes with MikTeX, simple, very lightweight
 - ▶ Cons: Very basic, sometimes needs extra work with bib
- ▶ Overleaf
 - ▶ Pros: Online (no install), allows collaborators
 - ▶ Cons: No extra packages (?), costs, online, closed-source
- ▶ TeXstudio/TeXmaker
 - ▶ Pros: Way more functionality, spellchecker, autocomplete, symbols libraries¹
 - ▶ Cons: Slightly larger size, sometimes slow to run, overwhelming at start

¹If you call a package-specific symbol, it auto-adds the package on the top of the document.

A list of such packages

- ▶ **Encoding packages, largely uninteresting:** fontenc, inputenc, lmodern
- ▶ **Trivial packages:** amsmath, amssymb/gensymb, physics, graphicx
- ▶ **Hidden gems:** siunitx, hyperref (custom link colours), float (force image placement), longtable, tabularx, listings (for programmers)
- ▶ **Ultra-sophisticated stuff:** amsthm/ntheorem, TikZ (and family), mdframed/tcolorbox

Now that wasn't so hard, was it?

```

                                You keeping us on course,
                                Little buddy? \

Yes, Skipper \
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```

Figure: Famous last words in L^AT_EX

Equation basics

$$\frac{d}{d\lambda} \left(\frac{\partial L}{\partial \dot{q}} \right) = \frac{\partial L}{\partial q}$$

$$\delta_b^a = \begin{cases} 1 & a = b \\ 0 & a \neq b \end{cases}$$

$$ds^2 = -dt^2 + dx^2 + dy^2 + dz^2 \leftrightarrow g_{ij} = \begin{pmatrix} -1 & & & \\ & 1 & & \\ & & 1 & \\ & & & 1 \end{pmatrix}$$

Environments

$$R_{tt} = e^{\nu-\lambda} \left[\frac{1}{2} \nu'' + \frac{1}{4} (\nu')^2 + \frac{1}{r} \nu' - \frac{1}{4} \nu' \lambda' \right]$$

$$R_{rr} = -\frac{1}{2} \nu'' - \frac{1}{4} (\nu')^2 + \frac{1}{4} \nu' \lambda' + \frac{1}{r} \lambda'$$

$$R_{\theta\theta} = 1 - e^{-\lambda} + \frac{1}{2} r \lambda' e^{-\lambda} - \frac{1}{2} r \nu' e^{-\lambda}$$

$$R_{\phi\phi} = \sin^2 \theta R_{\theta\theta}$$

Property	Natural unit	Conversion to SI
Energy	GeV	Multiply by constants
Momentum	GeV/c	Reinsert c and multiply by constants

Here is some text². Here is a [hyperlink](#) and an [e-mail address](#).

²And here is a footnote.

Image placement



Figure: The image, when you place it without the *float* package.

Blocks in beamer

Standard block

This is a standard block.

Alert block

This block presents an alert message.

Example block

Warning: examples not included.

Theorems

Theorem 1 (*The Big Lebowski*)

When you start working with L^AT_EX, you're entering a world of pain.

Remark 1

This is a shitty theorem. More sophisticated theorems can be implemented with TikZ, often outside Beamer:

```
\usepackage{tikz}
\usepackage{mdframed}
\usepackage{ntheorem}
\theorembodyfont{\upshape}
\mdfdefinestyle{default}{hidealllines=true, topline=true,
linewidth=5pt, leftmargin=2, rightmargin=2}
\newmdtheoremenv[style=default, backgroundcolor=blue!10,
linecolor=blue]{definition}{Definition}[section]
```

Lipsum (oh wait... wrong one)

What the fuck did you just fucking say about me, you little bitch? I'll have you know I graduated top of my class in the Navy Seals, and I've been involved in numerous secret raids on Al-Quaeda, and I have over 300 confirmed kills. I am trained in gorilla warfare and I'm the top sniper in the entire US armed forces. You are nothing to me but just another target. I will wipe you the fuck out with precision the likes of which has never been seen before on this Earth, mark my fucking words. You think you can get away with saying that shit to me over the Internet? Think again, fucker. As we speak I am contacting my secret network of spies across the USA and your IP is being traced right now so you better prepare for the storm, maggot. The storm that wipes out the pathetic little thing you call your life. You're fucking dead, kid. I can be anywhere, anytime, and I can kill you in over seven hundred ways, and that's just with my bare hands. Not only am I extensively trained in unarmed combat, but I have access to the entire arsenal

Lipsum (take 2)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur 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.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi.

Morbi auctor lorem non justo. Nam lacus libero pretium at

Beginnings of TikZ

I am an evil TikZduck and
I am plotting your demise
in the end-of-year exams



Figure: An evil TikZduck plots your demise in the end-of-year exams

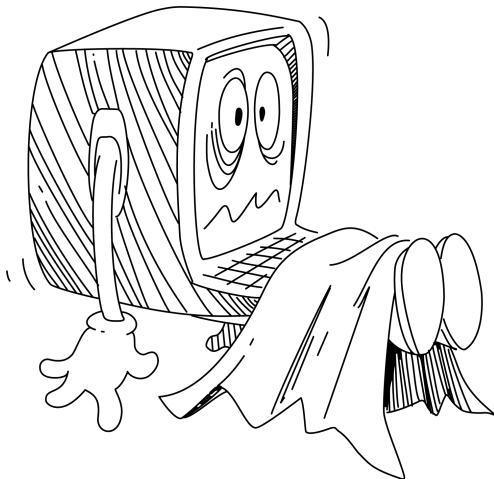
Examples Q&A session

Ask yer questions before it's too late!

General Q&A session

No, really.

Conclusion



Further reading

- ▶ The Great, Big List of L^AT_EX Symbols
- ▶ A very minimal introduction to TikZ
- ▶ TikZ & PGF Manual (advanced)