



L^AT_EX²e

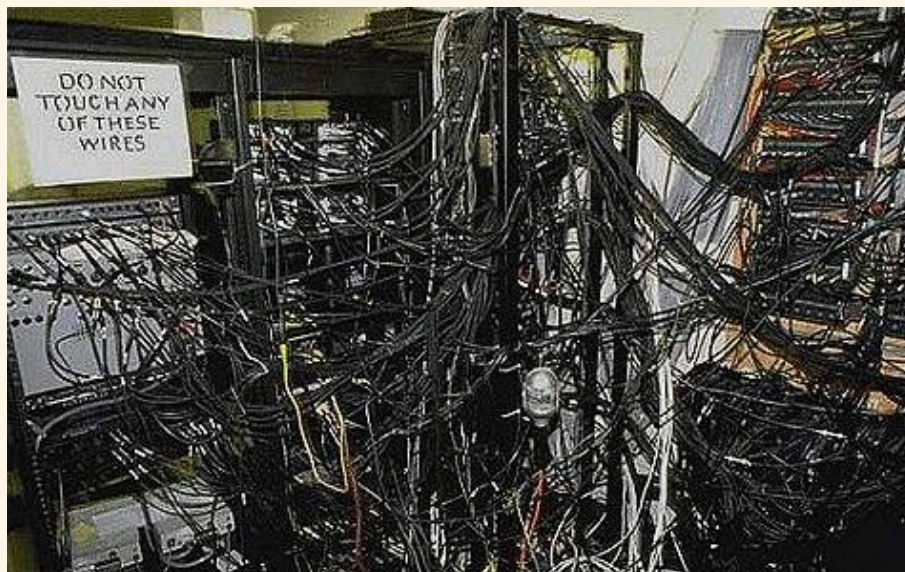
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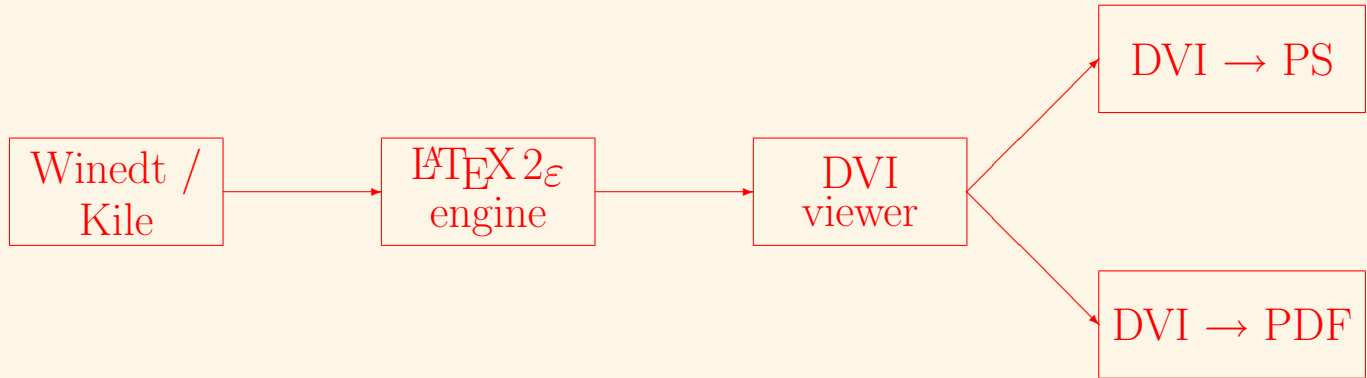
1 July 2004

1. Introduction — What is L^AT_EX2e

“L^AT_EX2e is a macro package that enables authors to typeset and print their work in the highest typographical quality using a predefined, professional layout. It uses the T_EX formatter as its typesetting engine. T_EX is aimed at typesetting text and mathematical formulae.”



2. L^AT_EX 2_ε overview



NB: By default the *DVI2PDF* conversion engine will create letter-sized pages during the *DVI*→*PDF* conversion. To change this to A4, look at:

`texmf/dvipdfm/config/config`

On line 27, change from “*p letter*” to “*p a4*”.

3. Basic L^AT_EX 2_ε document structure

Typical Example:

```
\documentclass[a4paper]{article}

% preamble

\begin{document}

% main body
Hello World

\end{document}
```



3.1. Document class

```
\documentclass[options]{class}
```

Some document classes:

article for articles in scientific journals, presentations,...

report for longer reports containing chapters (PhD theses).

book for real books.

slides for slides (rather use package *pdfslides*).

Some document class options:

10pt, 11pt, 12pt Sets the size of the main font.

a4paper, letterpaper Defines the paper size.

onecolumn, twocolumn Self explanatory.

landscape Changes layout of document to landscape mode.

3.2. Pre-amble

External packages can be loaded to extend the capabilities of \LaTeX :

```
\usepackage{graphicx}
```

Margins can be set:

```
\topmargin -17.8mm \textheight 261.4mm \oddsidemargin -8.9mm  
\evensidemargin -8.9mm \textwidth 177.0mm \headheight 0mm \headsep 10.2mm
```

For more information on page-layout parameters, look at pg 77 (91 of 109) in *The Not So Short Introduction to $\text{\LaTeX} 2_{\epsilon}$ — Or $\text{\LaTeX} 2_{\epsilon}$ in 95 minutes* (texmf/doc/guides/lshort-english/lshort.pdf).

Headers can be set:

```
\pagestyle{myheadings} %must be here for page headings to work!!  
\markright{Microsoft sucks --- Stefan Scriba}
```

3.3. Main body

This is where all the text goes.

3.3.1. Making a title

In the preamble:

```
\title{Microsoft sucks}  
\author{Stefan Scriba}  
% Remove to get current date:  
\date{1 July 2004}
```

In the main body:

```
\maketitle
```

3.3.2. Table of contents

```
\tableofcontents
```

3.3.3. List of figures

```
\listoffigures
```

3.3.4. List of tables

```
\listoftables
```



3.4. Footnotes

```
Stop monkeying around\footnote{This is supposed to be funny!}.
```

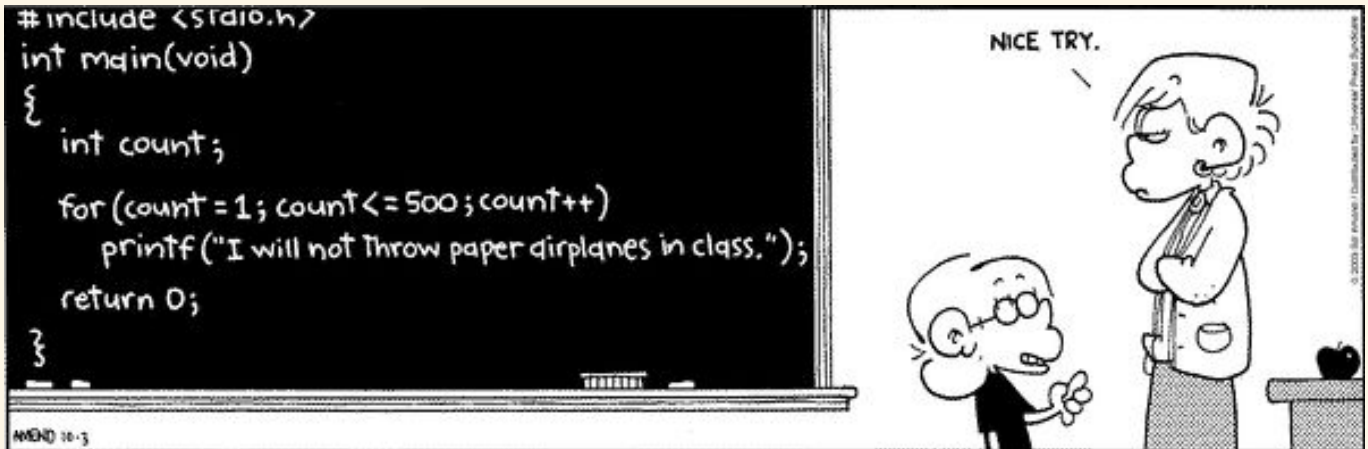
Stop monkeying around^a.



^aThis is supposed to be funny!

4. Sectioning in L^AT_EX 2_ε

Parts:	<code>\part{...}</code>
Chapters:	<code>\chapter{Introduction}</code>
Sections:	<code>\section{Who killed roger rabbit}</code>
Subsections:	<code>\subsection{Where it all started}</code>
Subsubsections:	<code>\subsubsection{Running out of ideas}</code>
Paragraphs:	<code>\paragraph{...}</code>
Subparagraphs:	<code>\subparagraph{...}</code>



5. Equations in L^AT_EX 2_ε

5.1. Inline \$ \$

The equation for a circle with radius r is given by $x^2+y^2=r^2$.

The equation for a circle with radius r is given by $x^2 + y^2 = r^2$.

5.2. Non-numbered equation $\int \int$

$\backslash[y = \sum_{t=0}^{\infty} \int_{-\infty}^{\infty} \frac{x^2}{\sigma - 1} dx \backslash]$

$$y = \sum_{t=0}^{\infty} \int_{-\infty}^{\infty} \frac{x^2}{\sigma - 1} dx$$

5.3. Numbered equation `\begin{equation}` `\end{equation}`

```
\begin{equation}\label{Eq:SomeBigEquation}  
y = \sum_{t=0}^{\infty} \int_{-\infty}^{\infty} \frac{x^2}{\sigma - 1} dx  
\end{equation}
```

If you can work out `\eqref{Eq:SomeBigEquation}`, you are talented!

$$y = \sum_{t=0}^{\infty} \int_{-\infty}^{\infty} \frac{x^2}{\sigma - 1} dx \quad (1)$$

If you can work out (1), you are talented!



5.4. And any arbitrarily complex equation

$$\Pr\{D_i > \tau\} = \exp \left\{ (e^\delta - 1) \sum_{j=1}^J k_j \lambda_j T_j \right\}$$
$$= \exp \left[(e^\delta - 1) \left(\underbrace{\sum_{j=1}^k k_j \lambda_j (d_i - d_j)}_{0 \leq d_i - d_j < \tau_1} + \underbrace{\sum_{j=k+1}^J k_j \lambda_j (d_i - d_j)}_{d_i - d_j < 0} \right) \right],$$

where k_j represents the number of class j sessions and λ_j the average creation rate of class j sessions.

6. Lists

6.1. Itemize

```
\begin{itemize}
  \item Dogs
  \item Cats
  \item Mice
\end{itemize}
```

- Dogs
- Cats
- Mice



6.2. Description

```
\begin{description}
  \item[Dogs] Cats
  \item[Cats] Mice
  \item[Mice] Cheese
\end{description}
```

Dogs Cats

Cats Mice

Mice Cheese

6.3. Enumerate

```
\begin{enumerate}
  \item Dogs
  \item Cats
  \item Mice
\end{enumerate}
```

1. Dogs

2. Cats

3. Mice



7. Tabulars

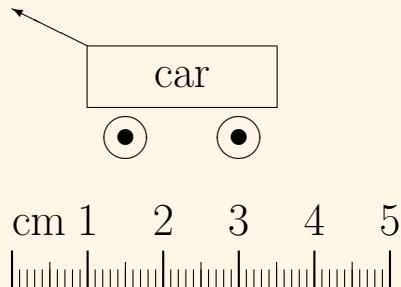
```
\begin{tabular}{|l|r|}  
  \hline  
  Product & Unit Price \\\ \hline\hline  
  Tomatoes & R1.50 \\  
  Apples & R2.00 \\  
  Pumpkins & R10.00 \\\ \hline  
\end{tabular}
```



Product	Unit Price
Tomatoes	R1.50
Apples	R2.00
Pumpkins	R10.00

8. Pictures

```
\newcounter{cms}
\setlength{\unitlength}{1mm}
\begin{picture}(50,39)
  \put(0,7){\makebox(0,0)[bl]{cm}}
  \multiput(10,7)(10,0){5}{\addtocounter{cms}{1}\makebox(0,0)[b]{\arabic{cms}}}
  \put(15,20){\circle{6}}
  \put(30,20){\circle{6}}
  \put(15,20){\circle*{2}}
  \put(30,20){\circle*{2}}
  \put(10,24){\framebox(25,8){car}}
  \put(10,32){\vector(-2,1){10}}
  \multiput(1,0)(1,0){49}{\line(0,1){2.5}}
  \multiput(5,0)(10,0){5}{\line(0,1){3.5}}
  \thicklines
  \put(0,0){\line(1,0){50}}
  \multiput(0,0)(10,0){6}{\line(0,1){5}}
\end{picture}
```



9. Graphics in L^AT_EX 2_ε

- L^AT_EX only recognises EPS graphics.
- PDFL^AT_EX recognises JPG, PNG, and BMP graphics.

Convert between image types, using Adobe Distiller and Adobe PS printers.

```
\centering  
\includegraphics[width=11cm]{LinuxXP.jpg}
```



10. Floating bodies

Tables, pictures, and images can be placed in a floating body. Numbered labels and captions can be added.

Position of floats can be controlled with a combination of optional parameters:

h here

t top of page

b bottom of page

p on current page

Put the following line into preamble to allow 3 instead of the default 2 floating bodies per page:

```
\setcounter{totalnumber}{3}
```

Put the following line into preamble to reduce the minimum paragraph length between a floating body and the bottom of the page to 10%, instead of default 20% of the page length

```
\renewcommand{\textfraction}{0.1}
```

10.1. Tables

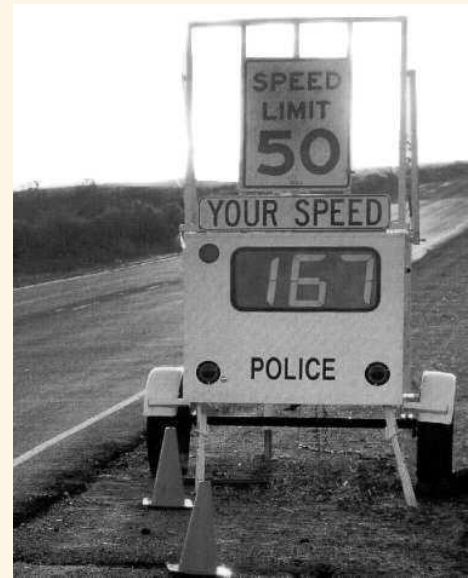
```
\begin{table}[htbp]\label{Table: Fruit}  
  \centering  
  \caption{International fruit prices}  
  \begin{tabular}{ll}  
    ...  
  \end{tabular}  
\end{table}
```

10.2. Pictures

```
\begin{figure}[htbp]\label{Picture: Flow Diagram}  
  \begin{picture}(50,39)  
    \put ...  
  \end{picture}  
  \caption{Flow diagram of some process}  
\end{figure}
```

10.3. Images

```
\begin{figure}[htbp]\label{Image: Puppy}  
  \centering  
  \includegraphics[width=8cm]{c:/puppy.eps}  
  \caption{Picture of our new puppy}  
\end{figure}
```



11. Referencing information

One can reference a section, floating body or equation, if it has been labelled. Check out `\eqref` and `\pageref`.

```
\begin{table}
\centering
\caption{The price of various products.}
\label{T: Product}
\begin{tabular}{|l|r|}
\hline
Product & Unit Price \\ \hline
Tomatoes & R1.50 \\
Apples & R2.00 \\
Pumpkins & R10.00 \\ \hline
\end{tabular}
\end{table}
```

The prices listed in Table~\ref{T:Product} on page~\pageref{T:Product} will change.

Table 1. The price of various products.

Product	Unit Price
Tomatoes	R1.50
Apples	R2.00
Pumpkins	R10.00

The prices listed in Table 1 on page 21 will change.

12. Creating a bibliography

The easiest way to create a bibliography is to use BibTeX.

Create entries in a separate *.bib* file:

```
@article{cruz91calculusI,  
  author = "R.L. Cruz",  
  title = "A Calculus for Network Delay, Part I: Network Elements in Isolation",  
  journal = "IEEE Transaction on Information Theory",  
  volume = "37",  
  number = "1",  
  pages = "114-131",  
  year = "1991"}
```



Now one can do a citation:

```
In reference~\cite{cruz91calculusI} numerous delay analysis techniques...
```

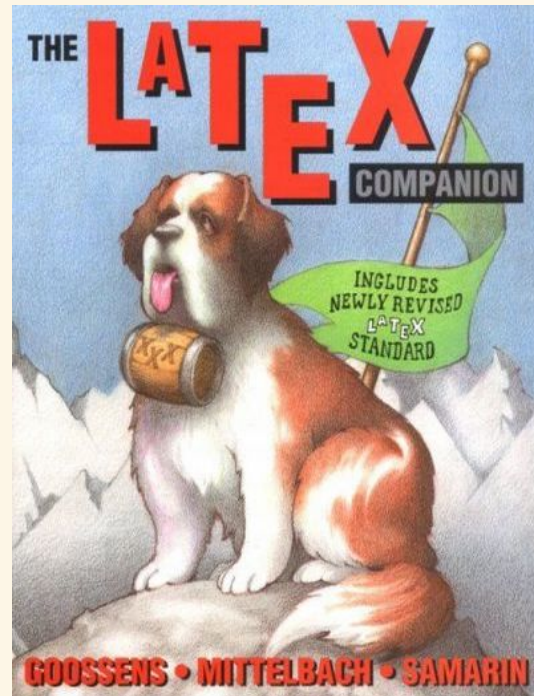
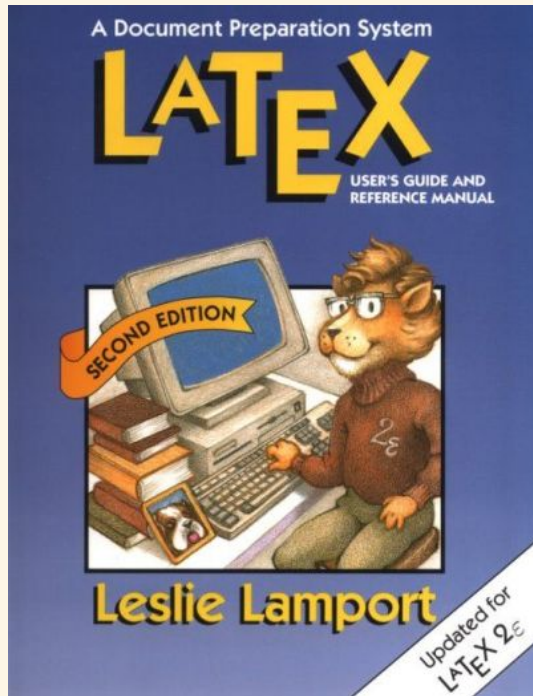
In reference [?] numerous delay analysis techniques...

At the end of the document create the bibliography:

```
\bibliographystyle{ieeetr}  
\bibliography{../PhDThesis/PhDThesis}
```

Now run BibTeX (Ctrl-Shift-B in WinEdt).

13. Recommended Reading



The not so short guide to $\text{\LaTeX} 2_{\epsilon}$ —or latex in 95min:

`texmf/doc/guides/lshort-english/lshort.pdf`

14. Useful stuff in MiKTeX

14.1. General T_EX and L^AT_EX 2_ε documentation

- [texmf/doc/](#)

14.2. Guides

- [texmf/doc/guides/lshort-english](#) *Not so short Introduction*
- [texmf/doc/guides/symbols](#) *Comprehensive L^AT_EX symbol list*
- [texmf/doc/guides/companion](#) *L^AT_EX Companion: AMS L^AT_EX*
- [texmf/doc/guides/wp-conv](#) *L^AT_EX and other WP*

14.3. Packages

- [texmf/doc/latex/](#)

14.4. Downloading MiKTeX and WinEdt

MiKTeX: <http://www.miktex.org/setup.html> — Download setup wizard!

WinEdt: <http://www.winedt.com/> — Download & install!

15. Recommended packages



For more info on packages, see the *Latex Companion*.

Some packages worth looking at:

- texmf/doc/latex/amsmath *American Mathematics Society*
- texmf/doc/latex/graphics *has been replaced by “graphicx”*
- texmf/doc/latex/hyperref *enabling hyper-references*
- texmf/doc/latex/pdftscreen *this presentation*
- texmf/doc/latex/epic *graphics extension package*
- texmf/doc/latex/xr *external references*

and many more...

The *Comprehensive T_EX Archive Network* (CTAN) is kept at:

<http://www.ctan.org>

The CTAN L^AT_EX section is kept at:

<http://www.ctan.org/tex-archive/macros/latex/>

Click on *contrib/* to look for packages to download.

16. Adding packages:

.sty , .cls , .fd	localtexmf/tex/latex/<packagename>/
.dvi , .ps , .pdf	localtexmf/doc/latex/<packagename>/
.tfm	localtexmf/fonts/tfm/<supplier>//
.vf	localtexmf/fonts/vf/<supplier>//
.afm	localtexmf/fonts/afm/<supplier>//
.pfb	localtexmf/fonts/type1/<supplier>//
.ttf	localtexmf/fonts/truetype/<supplier>//
.mf	localtexmf/fonts/source/<supplier>//

<packagename>, <supplier> and depend on what's appropriate for the particular file.

Once the files are there, you have to update the L^AT_EX 2_ε database. With MikTeX, you go to Start→Programs→MikTeX→MikTeX Options and click on “Refresh Now”.

Alternatively, look up the correct command:

teTeX (Linux) , fpTeX	— mktexlsr
web2c	— maktexlsr
MiKTeX (Windows)	— initexmf -update-fndb

