

L^AT_EX in Collaboration

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ISR/IST

March 9, 2015

Outline

- 1 Introduction
- 2 Some History
- 3 First Steps
- 4 L^AT_EX Basics
- 5 Conclusion

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Motivation

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- Engineers are terrible story tellers ... they prefer content to form
- Readers are lazy ... need self contained and easy to read material
- L^AT_EX can help

Why L^AT_EX ?

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- L^AT_EX automates structure and format so the author can focus on content.

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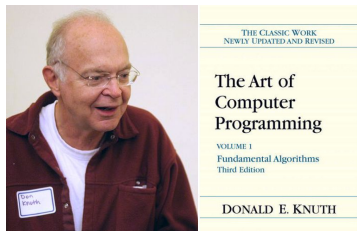
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- L^AT_EX is better to keep uniform the material contributed by different authors.

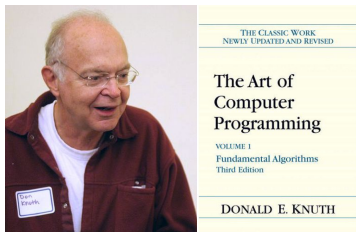
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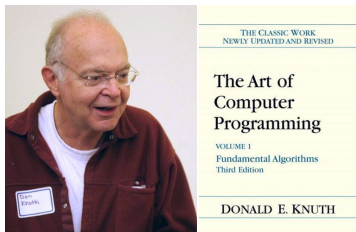
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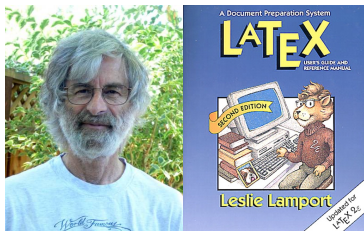
- TEX was created by Donald Knuth in 1978
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 - Readable mathematics
 - Better hyphenation
 - Optimized justification
 - Font management tools
 - Cross-compatibility



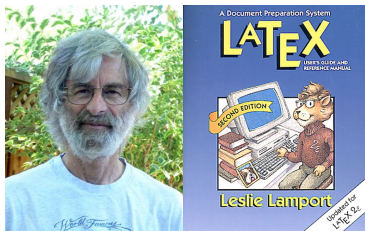
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- Code – Compile – Visualize

- L^AT_EX = Leslie Lamport's T_EX

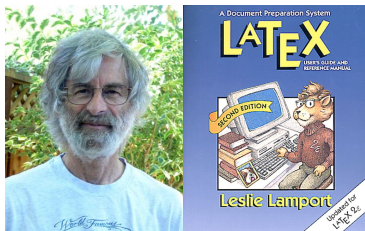


Leslie Lamport
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- L^AT_EX = Leslie Lamport's T_EX
- Initial Release in 1984
- A macro package for T_EX with:
 - Document Types
 - Chapter Headings
 - Footnotes
 - Cross-references
 - Bibliographies
 - Environments (Tables, Figures, Equations)

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Editors and Compilers

- To install in your machine
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Please give me Mb of space on Overleaf

<https://www.overleaf.com/signup?ref=d1806010dac8>

Hello L^AT_EX World!

```
\documentclass{article}  
%This is a comment  
\begin{document}  
Hello \LaTeX{} World!  
\end{document}
```

Hello L^AT_EX World!

More structure

```
\documentclass[10pt, a4paper]{article}
%Notice the options [10pt, a4paper]
\title{My paper}
\author{My self}
\date{\today}
%
\begin{document}
\maketitle
\begin{abstract}
This is a summary of my paper.
\end{abstract}
\tableofcontents
%
\section{Introduction}
Start describing your work.
For a new paragraph put an empty line.

Now you are in a new paragraph.
%
\subsection{Concepts}
This is a subsection.
\subsubsection{Algorithms}
This is a subsubsection.
\paragraph{This is a paragraph}
\subparagraph{This is a subparagraph}
%
\appendix
\section{Appendix}
You may add appendices.
\end{document}
```

My paper

My self

March 8, 2015

Abstract

This is a summary of my paper.

Contents

1 Introduction	1
1.1 Concepts	1
1.1.1 Algorithms	1
A Appendix	1

1 Introduction

Start describing your work. For a new paragraph put an empty line.
Now you are in a new paragraph.

1.1 Concepts

This is a subsection.

1.1.1 Algorithms

This is a subsubsection.

This is a paragraph

This is a subparagraph

A Appendix

You may add appendices.

Team work

```
\documentclass[draft]{book}

\title{Team Work}
\author{Tom and Paul and Mary and Liz}
\date{\today}

\includeonly{Paul_file}

\begin{document}
\maketitle
\tableofcontents

\frontmatter
\chapter{Tom's chapter}
\include{Tom_file}

\mainmatter
\part{Part I}
\chapter{Paul's chapter}
\include{Paul_file}

\part{Part II}
\chapter{Mary's chapter}
\include{Mary_file}

\backmatter
\chapter{Liz's chapter}
\include{Liz_file}

\end{document}
```

- Using the `include` macro, each author can work on an independent file.
- To compile only a set of files, use the macro `includeonly`
- Welcome to team work in L^AT_EX!

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- Documents
- Fonts and Styles
- Text Symbols
- Paragraphs
- Lists
- Cross References
- Tables
- Math Symbols
- Equations
- Figures
- Bibliography

Classes:

- book
- article
- report
- letter
- slides
- beamer
- IEEETran
- minimal
- ...

Options:

- 10pt, 11pt, 12pt
- a4paper, letterpaper, ...
- fleqn, leqno
- titlepage, notitlepage
- twocolumn
- twoside, oneside
- landscape
- openright, openany
- draft

Fonts and Styles

<code>\textrm{Hello}</code>	Hello	<code>{\tiny Hello}</code>	Hello
<code>\textsf{Hello}</code>	Hello	<code>{\scriptsize Hello}</code>	Hello
<code>\texttt{Hello}</code>	Hello	<code>{\footnotesize Hello}</code>	Hello
<code>\textmd{Hello}</code>	Hello	<code>{\small Hello}</code>	Hello
<code>\textbf{Hello}</code>	Hello	<code>{\normalsize Hello}</code>	Hello
<code>\textup{Hello}</code>	Hello	<code>{\large Hello}</code>	Hello
<code>\textit{Hello}</code>	<i>Hello</i>	<code>{\Large Hello}</code>	Hello
<code>\textsl{Hello}</code>	<i>Hello</i>	<code>{\LARGE Hello}</code>	Hello
<code>\underline{Hello}</code>	<u>Hello</u>	<code>{\huge Hello}</code>	Hello
<code>\textsc{Hello}</code>	HELLO	<code>{\Huge Hello}</code>	Hello

Text Symbols

<code>\\$</code>	\$	“	“	<code>\oe</code>	œ
<code>\&</code>	&	’	”	<code>\OE</code>	Œ
<code>\%</code>	%	"	”	<code>\ae</code>	æ
<code>\#</code>	#	<code>\’a</code>	á	<code>\AE</code>	Æ
<code>\S</code>	§	<code>\’a</code>	à	<code>\o</code>	ø
<code>\LaTeX{}</code>	L ^A T _E X	<code>\~a</code>	ã	<code>\O</code>	Ø
<code>A_B</code>	A_B	<code>\^a</code>	â	<code>\l</code>	ł
<code>\textbar</code>		<code>\c a</code>	ç	<code>\L</code>	Ł
<code>\textbullet</code>	•	<code>\"a</code>	ä	<code>\i</code>	ı
<code>\textbackslash</code>	\	<code>\v a</code>	ǎ	<code>\j</code>	Ј
<code>\ldots</code>	...	<code>\H a</code>	ǎ	<code>\aa</code>	å
<code>\~{}</code>	~	<code>\=a</code>	ā	<code>\AA</code>	Å
<code>\^{}</code>	^	<code>\d a</code>	ą	<code>A-B</code>	A-B
<code>\textless</code>	<	<code>\.a</code>	ą	<code>A--B</code>	A-B
<code>\textgreater</code>	>	<code>\b a</code>	ą	<code>A---B</code>	A-B

Paragraphs

```
\begin{center}  
Please give me space on Overleaf  
\end{center}
```

Please give me space on
Overleaf

```
\begin{flushleft}  
Please give me space on Overleaf  
\end{flushleft}
```

Please give me space on
Overleaf

```
\begin{flushright}  
Please give me space on Overleaf  
\end{flushright}
```

Please give me space on
Overleaf

```
\begin{quote}  
Please give me space on Overleaf  
\end{quote}
```

*Please give me
space on Overleaf*

```
\begin{quotation}  
Please give me space on Overleaf  
\end{quotation}
```

*Please give
me space on
Overleaf*

```
\begin{verse}  
Please give me space on Overleaf  
\end{verse}
```

*Please give me
space on
Overleaf*

Paragraphs

```
\begin{itemize}  
\item One item  
\item Another item  
\end{itemize}
```

- One item
- Another item

```
\begin{enumerate}  
\item First item  
\item Second item  
\end{enumerate}
```

- 1 First item
- 2 Second item

```
\begin{description}  
\item[Lion] A mammal  
\item[Shark] A fish  
\end{description}
```

Lion A mammal
Shark A fish

```
\begin{itemize}  
\item A list inside a list  
\begin{enumerate}  
\item Lists  
\item can be  
\item recursive  
\end{enumerate}  
\end{itemize}
```

- A list inside a list
 - 1 Lists
 - 2 can be
 - 3 recursive

Cross References

- Use macro `\label{some-identifier}` to set a mark.
- Use macro `\ref{some-identifier}` to retrieve the number of the item where the mark is defined.
- Use macro `\pageref{some-identifier}` to retrieve the page number where mark is defined.

This is slide 21.
It is in page 35.

```
\label{marcador}  
This is slide \ref{marcador}. \\  
It is in page \pageref{marcador}.
```

Tables

```
\begin{table}
\begin{tabular}{l | c | r | p{6cm}}
Name & Age & Height & Email \\
\hline
Alex & 44 & 1,80m & alex@isr.ist.utl.pt \\
\end{tabular}
\caption{JEEC 2015 Monday Workshop Participants}
\end{table}
```

Name	Age	Height	Email
Alex	44	1,80m	alex@isr.ist.utl.pt

Table 1: JEEC 2015 Monday Workshop Participants

Math Symbols

Equation `$E_c=\frac{mv^2}{2}$` is true

Equation $E_c = \frac{mv^2}{2}$ is true

Equation `\[E_c=\frac{mv^2}{2}\]` is true

Equation

$$E_c = \frac{mv^2}{2}$$

is true

<code>\sqrt[n]{x}</code>	$\sqrt[n]{x}$	<code>\alpha</code>	α
<code>\sum_{k=1}^N</code>	$\sum_{k=1}^N$	<code>\beta</code>	β
<code>\int_{k=1}^N</code>	$\int_{k=1}^N$	<code>\leq</code>	\leq
<code>\prod_{k=1}^N</code>	$\prod_{k=1}^N$	<code>\geq</code>	\geq
<code>\overbrace{ab}</code>	\overbrace{ab}	<code>\infty</code>	∞
<code>\widetilde{ab}</code>	\widetilde{ab}	<code>\times</code>	\times
<code>\rightarrow</code>	\Rightarrow	<code>\forall</code>	\forall
<code>\Updownarrow</code>	\Updownarrow	<code>\exists</code>	\exists
<code>\tilde{a}</code>	\tilde{a}	<code>\in</code>	\in
<code>\hat{a}</code>	\hat{a}	<code>\pm</code>	\pm
<code>\dot{a}</code>	\dot{a}	<code>\neq</code>	\neq
<code>\ddot{a}</code>	\ddot{a}	<code>\mid</code>	$ $
<code>\arctan</code>	\arctan	<code>\subset</code>	\subset
<code>\limsup</code>	\limsup	<code>\cup</code>	\cup
<code>\bigotimes</code>	\bigotimes	<code>\angle</code>	\angle
<code>\bigodot</code>	\bigodot	<code>\cdots</code>	\cdots
<code>\approx</code>	\approx	<code>\flat</code>	\flat
<code>\doteq</code>	\doteq	<code>\Box</code>	\square
<code>\emptyset</code>	\emptyset	<code>\partial</code>	∂

Equations

The `equation` environment automatically numbers equations.
If numbering is not needed use `equation*`.

```
\begin{equation}
\label{eq:matrix_transpose}
\left[\begin{array}{ccc} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{nn} \end{array}\right]^T =
\left[\begin{array}{ccc} a_{11} & \cdots & a_{n1} \\ \vdots & \ddots & \vdots \\ a_{1n} & \cdots & a_{nn} \end{array}\right]
\end{equation}
```

$$\begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{nn} \end{bmatrix}^T = \begin{bmatrix} a_{11} & \cdots & a_{n1} \\ \vdots & \ddots & \vdots \\ a_{1n} & \cdots & a_{nn} \end{bmatrix} \quad (1)$$

Figures

Graphics files (*.jpg, *.png, *.pdf, etc) can be displayed in a `figure` environment, using command `\includegraphics` from the `graphicx` package.

```
\usepackage{graphicx}
\begin{figure}[!htpb]
\label{fig:leslie}
\includegraphics[width=2.5
  cm]{leslie.jpg}
\includegraphics[width=2.5
  cm]{texbook.jpg}
\caption{Leslie Lamport and
  his TeXbook.}
\end{figure}
```

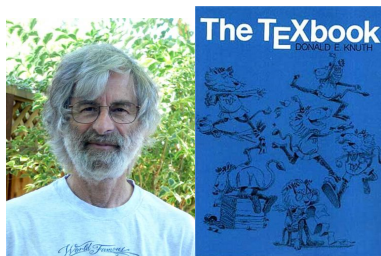


Figure 1: Leslie Lamport and his textbook.

Bibliography

Use BibTeX. Put your bibliography in a separate file (e.g. biblio.bib):

```
@book{lamport86 ,  
  author = "Leslie Lamport" ,  
  title = "\LaTeX: A Document Preparation System" ,  
  publisher = "Addison--Wesley Pub.\ Co." ,  
  year = "1986" ,  
  address = "Reading, MA" }
```

Now use it in your main file.

```
In \cite{lamport86} is  
  given a detailed  
  description of the use  
  of BibTeX.
```

```
...  
\bibliographystyle{plain}  
\bibliography{biblio.bib}
```

In [1] is given a detailed
description of the use of
BibTeX.



Leslie Lamport.

LaTeX: A Document Preparation System.

Addison–Wesley Pub. Co., Reading, MA, 1986.

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Conclusion



*The ideal situation occurs
when the things that we
regard as beautiful are also
regarded by other people as
useful.*

– Donald Knuth