# Step in LaTeX

## SFD 2014

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# Contents

1 What is LaTeX?

2 Why do we use LaTeX?

3 How does LaTeX work?

4 Some Interesting Applications

5 LaTeX and Research

# What is LaTeX?

- TeX is a computer program created by *Donald E. Knuth*, and it is also a typesetting language.
- LaTeX is a large set of macros built on top of TeX and was originally written by Leslie Lamport.
- LaTeX is a typesetting system that is very suitable for the documents of *high typographical quality*.
  - LaTeX2.09⇒LaTeX $2_\varepsilon$ ⇒ LaTeX3

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# Why do we use LaTeX?

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

- Word is WYSIWYG (What You See Is What You Get)

# Why do we use LaTeX?

- Word is WYSIWYG (What You See Is What You Get)
- LaTeX is WYTIWYG (What You Think Is What You Get)

# Why do we use LaTeX?

- Word is WYSIWYG (What You See Is What You Get)
- LaTeX is WYTIWYG (What You Think Is What You Get)
- Microsoft Word is OK, but LaTeX is perfect.

# High typographical quality

- High typographical quality of the documents.
  - article, report, book, slides, beamers
- Professionally crafted layouts are available, which make a document really look as if "printed".

# High typographical quality

## Contents

**Thank you!** iii

**Preface** v

**1 Things You Need to Know** 1
- 1.1 The Name of the Game . . . 1
  - 1.1.1 TeX . . . 1
  - 1.1.2 LaTeX . . . 2
- 1.2 Basics . . . 2
  - 1.2.1 Author, Book Designer, and Typesetter . . . 2
  - 1.2.2 Layout Design . . . 2
  - 1.2.3 Advantages and Disadvantages . . . 3
- 1.3 LaTeX Input Files . . . 4
  - 1.3.1 Spaces . . . 4
  - 1.3.2 Special Characters . . . 4
  - 1.3.3 LaTeX Commands . . . 5
  - 1.3.4 Comments . . . 6
- 1.4 Input File Structure . . . 6
- 1.5 A Typical Command Line Session . . . 8
- 1.6 The Layout of the Document . . . 9
  - 1.6.1 Document Classes . . . 9
  - 1.6.2 Packages . . . 9
  - 1.6.3 Page Styles . . . 11
- 1.7 Files You Might Encounter . . . 11
- 1.8 Big Projects . . . 13

**2 Typesetting Text** 15
- 2.1 The Structure of Text and Language . . . 15
- 2.2 Line Breaking and Page Breaking . . . 17
  - 2.2.1 Justified Paragraphs . . . 17
  - 2.2.2 Hyphenation . . . 18
- 2.3 Ready-Made Strings . . . 19
- 2.4 Special Characters and Symbols . . . 19
  - 2.4.1 Quotation Marks . . . 19

## Chapter 1

## Things You Need to Know

The first part of this chapter presents a short overview of the philosophy and history of LaTeX 2ε. The second part focuses on the basic structures of a LaTeX document. After reading this chapter, you should have a rough knowledge of how LaTeX works, which you will need to understand the rest of this book.

### 1.1 The Name of the Game

#### 1.1.1 TeX

TeX is a computer program created by Donald E. Knuth [2]. It is aimed at typesetting text and mathematical formulae. Knuth started writing the TeX typesetting engine in 1977 to explore the potential of the digital printing equipment that was beginning to infiltrate the publishing industry at that time, especially in the hope that he could reverse the trend of deteriorating typographical quality that he saw affecting his own books and articles. TeX as we use it today was released in 1982, with some slight enhancements added in 1989 to better support 8-bit characters and multiple languages. TeX is renowned for being extremely stable, for running on many different kinds of computers, and for being virtually bug free. The version number of TeX is converging to $\pi$ and is now at 3.141592653.

TeX is pronounced "Tech," with a "ch" as in the German word "Ach"[1] or in the Scottish "Loch." The "ch" originates from the Greek alphabet where X is the letter "ch" or "chi". TeX is also the first syllable of the Greek word τεχνική (technique). In an ASCII environment, TeX becomes `TeX`.

[1] In german there are actually two pronounciations for "ch" and one might assume that the soft "ch" sound from "Pech" would be a more appropriate. Asked about this, Knuth wrote in the German Wikipedia: *I do not get angry when people pronounce TeX in their favorite way . . . and in Germany many use a soft ch because the X follows the vowel e, not the harder ch that follows the vowel a. In Russia, 'tex' is a very common word, pronounced 'tyekh'. But I believe the most proper pronunciation is heard in Greece, where you have the harsher ch of ach and Loch.*

# Graceful Mathematical formulae

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

Add $a$ squared and $b$ squared to get $c$ squared. Or, using a more mathematical approach:

$$c^2 = a^2 + b^2$$

or you can type less with:

$$a + b = c$$

# Graceful Mathematical formulae

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

$$\underbrace{a+\overbrace{b+\cdots+y}^{24}+z}_{26}$$

$$y=\begin{cases} a & \text{if } d>c \\ b+x & \text{in the morning} \\ l & \text{all day long} \end{cases}$$

$$E(u)=\int_\Omega \phi(|\nabla u|)+\lambda\int_\Omega (f-Ru)^2\mathrm{d}x$$

$$p'(z)=c\sum_{k=1}^{n}\prod_{\substack{i=1\\ i\neq k}}^{n}(z-r_i)=\sum_{k=1}^{n}p(z)/(z-r_k)$$

# Graceful Mathematical formulae

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

$$\begin{bmatrix} d_1 & c_1 & & & & & \\ a_1 & d_2 & c_2 & & & & \\ & a_2 & d_3 & c_3 & & & \\ & & a_3 & d_4 & c_4 & & \\ & & & \ddots & \ddots & \ddots & \\ & & & & a_{n-2} & d_{n-1} & c_{n-1} \\ & & & & & a_{n-1} & d_n \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ \vdots \\ x_{n-1} \\ x_n \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \\ b_4 \\ \vdots \\ b_{n-1} \\ b_n \end{bmatrix}$$

# Graceful Mathematical formulae

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

$$
\begin{aligned}
(LU)_{ij} &= \sum_{k=1}^{n} l_{ik} u_{kj} = \sum_{k=1}^{j} l_{ik} a_{kj}^{(k)} \\
&= \sum_{k=1}^{j} (a_{ij}^{(k)} - a_{ij}^{(k+1)}) \\
&= a_{ij}^{(1)} - a_{ij}^{j+1} \\
&= a_{ij}^{(1)} = a_{ij}
\end{aligned}
$$

# Make a presentation

- Learn a few easy-to-understand commands that specify the logical structure of a document.

# Make a presentation

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

```
\documentclass{beamer}
\usepackage[utf8]{inputenc}

%Information to be included in the title page:
\title{Sample title}
\author{Anonymous}
\date{2014}

\begin{document}

\begin{frame}
\frametitle{Sample frame title}
This is a text in first frame.
\end{frame}  %

\end{document}
```

# Make a presentation



## Sample frame title

This is a text in first frame.

# Free various packages

- Free add-on packages exist for many typographical tasks not directly supported by basic LaTeX.
  - Coloured text
  - Include graphics.
  - Bring source code from a file into your document.
  - . . .

# Multi-platform applications

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

- TeX, the formatting engine of LaTeX $2_\varepsilon$, is highly portable and free. Therefore the system runs on almost any hardware platform available.

# ··· and more

- Stable, Free and Open Source.
- LaTeX is very flexible, and will do the things you want.
- ···

# How does LaTeX work?

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

- LaTeX is a typesetting system
  1. Taking a text file, containing LaTeX commands, as input
  2. Produces a PDF, DVI or PS file

# How does LaTeX work?

- Create text file using editor and save as some.tex.
- Compile the file using command
  - use latex some.tex ⇒ some.dvi
  - use dvips some.dvi ⇒ some.ps
  - use pdflatex(xelatex) some.tex ⇒ some.pdf

# Theorem

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

**THEOREM 1 (Theorem on Matrix Inverse)**

*If $A$ and $B$ are square matrices such that $AB = I$, then $BA = I$.*

**Proof.**

Let $C = BA - I + B$. Then

$$AC = ABA - AI + AB = A - A + I = I$$

Thus, $C$ (as well as $B$) is a right inverse of $A$. By Theorem 2, $B = C$; hence, $BA = I$. $\square$

# Table



| | |
|---|---|
| 7C0 | hexadecimal |
| 3700 | octal |
| 11111000000 | binary |
| 1984 | decimal |

| Class | A | B | C | D |
|---|---|---|---|---|
| X | 1 | 2 | 3 | 4 |
| Y | 3 | 4 | 5 | 6 |
| Z | 5 | 6 | 7 | 8 |

| 资源限量 | 甲 | 乙 | 资源总数 |
|---|---|---|---|
| 煤 | 9 | 4 | 360 |
| 电 | 4 | 5 | 200 |
| 油 | 3 | 10 | 300 |
| 单位价格 | 7 | 12 | * |

# Geometry

$$F = \sqrt{s(s-a)(s-b)(s-c)}$$

$$s := \frac{a+b+c}{2}$$

# Insert Python scripts

```
#!/usr/local/bin/python
print "Hello World"
os.system("""
VAR=even;
sed -i "s/$VAR/odd/" testfile;
for i in `cat testfile` ;
do echo $i; done;
echo "now the tr command is removing the vowels";
cat testfile |tr 'aeiou' ' '
""")
```

# Columns and Blocks

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

## The OUC logo

This is the logo of OUC.
海纳百川，取则行远。

# Figures



生物形态学分类特征 形状、突起、角毛

洛氏角毛藻

尖刺伪菱形藻

丹麦细柱藻

热带骨条藻

# Some Interesting Applications

Step in LaTeX
Qiu
What is LaTeX?
Why do we use LaTeX?
How does LaTeX work?
Some Interesting Applications
LaTeX and Research

| | | | | |
|---|---|---|---|---|
| 硅藻门 3/12 | 22 | 旋链角毛藻 | *Chaetoceros curvisetus* | |
| | 23 | 洛氏角毛藻 | *Chaetoceros lorenzianus* | √ |
| | 24 | 聚生角毛藻 | *Chaetoceros socialis* | |
| | **25** | **尖刺伪菱形藻** | ***Pseudo-nitzschia pungens*** | √ |
| | **26** | **多纹伪菱形藻** | ***Pseudo-nitzschia multistriata*** | |
| | 27 | 丹麦细柱藻 | *Leptocylindrus danicus* | √ |
| | 28 | 新月筒柱藻 | *Cylindrotheca closterium* | |
| | 29 | 派格棍形藻 | *Bacilaria paxillifera* | |
| | **30** | **热带骨条藻** | ***Skeletonema tropicum*** | √ |
| | 31 | 旋转海链藻 | *Thalassiosira curviseriata* | |
| | 32 | 圆海链藻 | *Thalassiosira rotula* | |
| | 33 | 双环海链藻 | *Thalassiosira diporocyclus* | |
| 针胞藻纲 2/2 | **34** | **海洋卡盾藻** | ***Chattonella marina*** | √ |
| | **35** | **赤潮异湾藻** | ***Heterosigma akashiwo*** | √ |
| 硅鞭藻纲 0/2 | 36 | 小等刺硅鞭藻 | *Dictyochafibula* | √ |
| | 37 | 六异刺硅鞭藻 | *Distephanus speculum* | |
| 隐藻门 0/1 | 38 | 抢鞋隐藻 | *Cryptomonas calceiformis* | |
| 定鞭藻纲 1/1 | **39** | **球形棕囊藻** | ***Phaeocystis globosa*** | √ |
| 蓝藻门 0/1 | 40 | 红海束毛藻 | *Trichodesminu erythraeum* | √ |

# Circuit diagram

# CV or resume



**ROGER DARLING**

**Local Address**
19 Tibbits Avenue
Troy, NY 12180
(518) 274-3087

**Permanent Address**
29 Amorous Avenue
Madison, NJ 07940
(201) 777-3821

**OBJECTIVE** A summer position in the field of Electrical Engineering with emphasis on communications or control systems.

**EDUCATION** B.S., Electrical Engineering
Rensselaer Polytechnic Institute, Troy, NY
GPA: 3.3/4.0
Expected Date of Graduation: May, 1988

**EXPERIENCE** **Yeides, Inc., Union, NJ**
Assistant Manager 7/82-8/86

Managed operation of store including opening, closing, supervising employees, inventory control, and customer service.

**A & P Supermarket, Madison, NJ**
Meat Department Assistant 5/83-8/84

Assisted department manager with ordering, pricing, and maintaining department inventory.

**HONORS** Dean's List, Rensselaer Polytechnic Institute
Clayton and Mary Shelley Scholarship
United Food and Commercial Workers Union Scholarship
National Honor Society

**ACTIVITIES** Delta Tau Sigma Fraternity Rush Chairman
Coordinated and ran house events and meetings during the first eight weeks of the semester. Facilitated a successful rush that increased house membership by 20.

Student Orientation Advisor

Student Advisory Board to Electrical Engineering Department

Ice Hockey and various intramural sports

# Specialities

- LaTeX is proper to create, edit and publish your research.
  - Thesis
  - Conference papers
  - Journal papers
  - Book
  - ...

# LaTeX and zhenglab

Step in LaTeX

Qiu

What is LaTeX?

Why do we use LaTeX?

How does LaTeX work?

Some Interesting Applications

LaTeX and Research

# LaTeX and zhenglab



```
\documentclass[10pt,twocolumn,letterpaper]{article}

\usepackage{cvpr}
\usepackage{times}
\usepackage{epsfig}
\usepackage{graphicx}
\usepackage{amsmath}
\usepackage{amssymb}

% Include other packages here, before hyperref.

% If you comment hyperref and then uncomment it, you should delete
% egpaper.aux before re-running latex.  (Or just hit 'q' on the first latex
% run, let it finish, and you should be clear).
\usepackage[breaklinks=true,bookmarks=false]{hyperref}

\cvprfinalcopy % *** Uncomment this line for the final submission

\def\cvprPaperID{****} % *** Enter the CVPR Paper ID here
\def\httilde{\mbox{\tt\raisebox{-.5ex}{\symbol{126}}}}

% Pages are numbered in submission mode, and unnumbered in camera-
ready
%\ifcvprfinal\pagestyle{empty}\fi
\setcounter{page}{4321}
\begin{document}

%%%%%%%%% TITLE
\title{\LaTeX\ Author Guidelines for CVPR Proceedings}

\author{First Author\\
Institution1\\
Institution1 address\\
```

**LaTeX Author Guidelines for CVPR Proceedings**

First Author
Institution1
Institution1 address
firstauthor@i1.org

Second Author
Institution2
First line of institution2 address
secondauthor@i2.org

**Abstract**

*The ABSTRACT is to be in fully-justified italicized text, at the top of the left-hand column, below the author and affiliation information. Use the word "Abstract" as the title, in 12-point Times, boldface type, centered relative to the column, initially capitalized. The abstract is to be in 10-point, single-spaced type. Leave two blank lines after the Abstract, then begin the main text. Look at previous CVPR abstracts to get a feel for style and length.*

**1. Introduction**

Please follow the steps outlined below when submitting your manuscript to the IEEE Computer Society Press. This style guide now has several important modifications (for example, you are no longer warned against the use of sticky tape to attach your artwork to the paper), so all authors should read this new version.

**1.1. Language**

All manuscripts must be in English.

**1.2. Dual submission**

By submitting a manuscript to CVPR, the authors guarantee that it has not been previously published or accepted for publication in substantially similar form in an archival peer-reviewed forum. Furthermore, no paper which contains significant overlap with the contributions of this paper is neither under review at the moment of submission nor will be submitted during the CVPR 2014 review period to **any of the following**: another conference, a workshop, or a journal. The authors also attest that they did not submit substantially similar submissions to CVPR 2014. **Violation of any of these conditions will lead to rejection.** If you are not sure about the extent of overlap, you may upload a copy of the paper in question as supplementary material. Note that a Technical Report (departmental, arXiv.org, etc.) that is put up without any form of direct peer-review is **NOT** considered a publication. Likewise, mention of the work under review in a presentation is **NOT** considered a violation.

If there are papers that may appear to the reviewers to violate this condition, then it is your responsibility to: (1) cite these papers (preserving anonymity as described in Section 1.6 below), (2) argue in the body of your paper why your CVPR paper is non-trivially different from these concurrent submissions, and (3) include anonymized versions of those papers in the supplemental material.

**1.3. Paper length**

CVPR papers may be between 6 pages and 8 pages, with a $100 per page added fee. Overlength papers will simply not be reviewed. This includes papers where the margins and formatting are deemed to have been significantly altered from those laid down by this style guide. Note that this LaTeX guide already sets figure captions and references in a smaller font. The reason such papers will not be reviewed is that there is no provision for supervised revisions of manuscripts. The reviewing process cannot determine the suitability of the paper for presentation in eight pages if it is reviewed in eleven. If you submit 8 for review expect to pay the added page charges for them.

**1.4. The ruler**

The LaTeX style defines a printed ruler which should be present in the version submitted for review. The ruler is provided in order that reviewers may comment on particular lines in the paper without circumlocution. If you are preparing a document using a non-LaTeX document preparation system, please arrange for an equivalent ruler to appear on the final output pages. The presence or absence of the ruler should not change the appearance of any other content on the page. The camera ready copy should not contain a ruler. (LaTeX users may uncomment the `\cvprfinalcopy` command in the document preamble.) Reviewers: note that the ruler measurements do not align well with lines in the paper — this turns out to be very difficult to do well when the paper contains many figures

4321

# Some Resources

- TeX Users Group web site: `http://www.tug.org/`
- More usepackages can be found: `http://www.ctan.org/`
- LaTeX help document: `http://www.ctan.org/tex-archive/info/lshort`
- BibTeX web site: `http://www.bibtex.org/`
- BibDesk web site: `http://bibdesk.sourceforge.net/`

Thank you