

Instructions for IEEE style paper writing

Lasse Einig, Jasper Güldenstein¹

Abstract—The brief abstract describes the content of the paper within about 10-20 lines of text. In this paper the basic commands for \LaTeX will be explained.

I. INSTALL \LaTeX ON WINDOWS

- 1) Download TeXnicCenter
 - a) <http://www.texniccenter.org/download/>
- 2) Download MikTeX
 - a) <http://www.miktex.org/download>
- 3) Download Sumatra
 - a) <http://www.sumatrapdfreader.org/download-free-pdf-viewer-de.html>
- 4) Install MikTeX
 - a) Install Missing Packages on the fly: Yes
- 5) Install SumatraPDF
- 6) Install TeXnicCenter
 - a) Choose typical and recommended options
 - b) Choose MikTeX folder
C:\ProgramFiles(x86)\MiKTeX2.9\miktex\bin
- 7) Run TeXnicCenter
 - a) Choose Latex \Rightarrow PDF
 - b) Create **new folder**
 - c) Copy `ieeeconf.cls` and `root.tex` to **new folder**
 - d) Copy `IEEEtranBST` folder to **new folder**
 - e) Open `root.tex` in TeXnicCenter
 - f) Compile using `Ctrl+Shift+F5`
 - g) Create `paper.tex` in **new folder**
 - h) Start \TeX ing

II. INSTALL \LaTeX ON LINUX (UBUNTU/DEBIAN)

- 1) `sudo apt-get install texlive*`
- 2) Extract .zip file to a working directory
- 3) Navigate to working directory with the console
- 4) `pdflatex paper.tex`

III. USE \LaTeX IN OVERLEAF

- 1) Register/Sign in to overleaf.com
- 2) Create a **New Project** using the arrow up symbol right of the button
- 3) Select **Upload Zip**
- 4) Upload the .zip file from the website
- 5) Set the `paper.tex` as main file

*This work was not supported by any organization

¹Lasse Einig, Jasper Güldenstein is with Group Technical Aspects of Multimodal Systems, Departement Informatics, Universität Hamburg, Germany `einig@informatik.uni-hamburg.de`

IV. PRE-AMBLE

The formatting sections IV-A and IV-B must not be changed (except for the the title text of course).

A. Documentclass

The documentclass must be

```
1 \documentclass[a4paper, 10pt]{ieeeconf}
```

Note: do not set the `conference` option to provide additional space below the text.

The following are required for formatting:

```
1 \IEEEoverridecommandlockouts
2 \overrideIEEE margins
```

B. Title

```
1 \title{\LARGE\textbf{Instructions for IEEE style
      paper writing}}
```

C. Packages

Packages are required for almost every formatting, special characters or other non-text operations in \LaTeX . Some recommended packages are:

```
1 \usepackage[ansinew]{inputenc}% Required for
      Umlauts
2 \usepackage[T1]{fontenc}% Font encoding
3
4 \usepackage{url}% Display urls
5 \usepackage{textcomp}% Additional text elements
6 \usepackage{xcolor}% Color support
7 \usepackage{graphicx}% Add image support
8 \usepackage{amsmath}% Additional math support
9 \usepackage{listings}% Fromat program code
```

Other packages can be found in the source code of this file or on the web.

D. Author

Author name and affiliation, as well as potential supporting organizations should be entered using the `author` command as follows:

```
1 \author{Lasse Einig\textsuperscript{1}}
2 \thanks{*This work was not supported by any
      organization}%
3 \thanks{\textsuperscript{1}Lasse Einig is with Group
      Technical Aspects of Multimodal Systems,
      Departement Informatics, Universität
      Hamburg, Germany {\texttt{\small
      einig@informatik.uni-hamburg.de}}}%
4 }
5
6 Note: Listings do not work with Umlauts
```

Usually, your email is sufficient. The other entries are only required if you have an affiliation for your work.

V. DOCUMENT BODY

The document body is enclosed in

```
1 \begin{document}
2 %Document Body
3 \end{document}
```

Text outside of the document will be ignored by L^AT_EX.

The following commands must be the first lines withing the document.

```
1 \maketitle
2 \thispagestyle{plain}
3 \pagestyle{plain}
```

They set the Title and Author as well as the plain page style. In difference to a conference paper (empty, set the page style to plain to show page numbering.

The next step is your abstract:

```
1 \begin{abstract}
2 %Write your abstract here
3 \end{abstract}
```

A. Structure

L^AT_EX documents are structured hierachical. L^AT_EX will take care of the numbering for you, you only have to provide the order, hierarchy and title as follows:

```
1 \section{This will be the first section}
2 \subsection{This will be the subsection 1 in the
   first section}
3 \subsection{This will be the subsection 2 in the
   first section}
4 \section{This will be the second section}
5 \subsection{This will be the subsection 1 in the
   second section}
6 \subsection{This will be the subsection 2 in the
   second section}
7 ...
```

Every level of hierarchy must have at at least two elements. One single element is not a valid level of hierarchy.

B. Labels and References

L^AT_EX allows you to set labels to almost every structure point. These can be sections, subsections, lists, images, tables, ...

```
1 \label{labeltext}
```

and reference the label at any point within your document

```
1 \ref{labeltext}
```

C. Paragraphs

L^AT_EX will automatically start a new paragraph after a blank line. A single line break will not trigger a new paragraph. In order to force a new line, use the double backslash \\:

```
1 Some text.
2 Some text in a new line.
3
4 A new paragraph after a blank line.\\
5 A co
```

Some text. Some text in a new line.
A new paragraph after a blank line.
A linebreak after a double backslash.

D. Images

Insert an image to one column with label and caption:

```
1 \begin{figure}[htb]
2 \centering
3 \includegraphics[width=.65\linewidth]{asimo.
   jpg}
4 \caption{Image of Asimo \cite{asimocite}}
5 \label{asimo}
6 \end{figure}
```

The label enables you to reference the figure later as Figure 1.

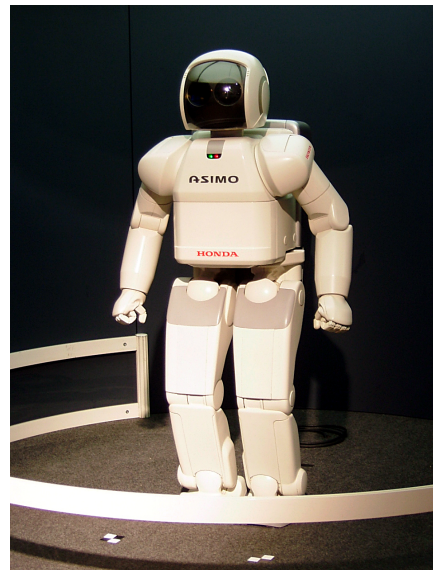


Fig. 1. Image of Asimo [12]

Insert an image to two columns:

```
1 \begin{figure*}[htb]
2 \centering
3 \includegraphics[width=.75\textwidth]{uhh.jpg}
4 \caption{University of Hamburg Logo}
5 \label{uhh}
6 \end{figure*}
```

This figure will be placed on the top or bottom of a page, in order not to interrupt a column.

E. Lists

Lists can either be itemized or enumerated. The following are examples for both types as well as a mixed type:

```
1 \begin{itemize}
2 \item This is item one
3 \item This is item two
4 \begin{itemize}
5 \item This is subitem one of item two
6 \item This is subitem two of item two
7 \begin{itemize}
8 \item This is subsubitem one of subitem
   two of item two
```



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

Fig. 2. University of Hamburg Logo

```

9 \end{itemize}
10 \end{itemize}
11 \end{itemize}

```

- This is item one
- This is item two
 - This is subitem one of item two
 - This is subitem two of item two
 - * This is subsubitem one of subitem two of item two

```

1 \begin{enumerate}
2 \item This is item 1
3 \item This is item 2
4 \begin{enumerate}
5 \item This is subitem 1 of item 1
6 \end{enumerate}
7 \end{enumerate}

```

- 1) This is item 1
- 2) This is item 2
 - a) This is subitem 1 of item 1

```

1 \begin{itemize}
2 \item This is item one
3 \begin{enumerate}
4 \item This is subitem 1 of item one
5 \begin{itemize}
6 \item This is subsubitem one of subitem 1 of item one
7 \begin{enumerate}
8 \item This is subsubsubitem 1 of subsubitem one of subitem 1 of item one
9 \end{enumerate}
10 \end{itemize}
11 \end{enumerate}
12 \end{itemize}

```

- This is item one
 - 1) This is subitem 1 of item one
 - This is subsubitem one of subitem 1 of item one
 - a) This is subsubsubitem 1 of subsubitem one of subitem 1 of item one

TABLE I

A SAMPLE TABLE WITH NAME, AGE, HEIGHT AND HAIR COLOR

| Name | Age | Height | Hair color |
|-------|-----|--------|------------|
| John | 20 | 1.84 m | Blond |
| James | 21 | 1.65 m | Brown |
| Jim | 24 | 1.92 m | Black |

VI. MATHEMATICS

A. Units

Numbers and units should be written with a leading 0, as well as a small white space between. See the following example:

```

1 .5metres \newline%Incorrect
2 0.5metres \newline%Incorrect
3 0.5m \newline%Incorrect
4 0.5\,m \newline%Correct
5 29.1\,kg \newline%Correct

```

```

.5metres
0.5metres
0.5m
0.5 m
29.1 kg

```

B. Equations

L^AT_EX features a very powerful math mode for writing any complex formula or even whole sets of formulas. See the following examples:

```

1 %Simple math mode for in-line equations
2 Equations can be incorporated into regular text
  such as $e = mc^2$, the special theory of
  relativity.

```

Equations can be incorporated into regular text such as $e = mc^2$, the special theory of relativity.

Equation 1 is a standard labeled and enumerated equation.

```

1 \begin{equation}\label{eq1}
2 e = mc^2
3 \end{equation}

```

F. Tables

$$e = mc^2 \quad (1)$$

The equation in section VI-B cannot be referenced, as it is no enumerated.

```
1 \begin{equation*}\label{eq2}
2 e = mc^2
3 \end{equation*}
```

$$e = mc^2$$

Equations 2 and 3 are **aligned** equations, which allows to align multiple equations by (for example) the equals sign.

```
1 \begin{align}
2 e &= mc^2 \label{eq3} \\
3 e^{-i\cdot\pi} + 1 &= 0 \label{eq4}
4 \end{align}
```

$$e = mc^2 \quad (2)$$

$$e^{i\cdot\pi} + 1 = 0 \quad (3)$$

VII. REFERENCING AND QUOTING

A. Quotation Marks and Highlighting

There are different quotation marks as well as other highlighting possibilities.

```
1 "These are double quotation marks" \newline
2 'These are single quotation marks' \newline
3 'I recommend these double quotation marks' \
  \newline
4 'And these single quotation marks'
```

"These are double quotation marks"
 'These are single quotation marks'
 "I recommend these double quotation marks"
 'And these single quotation marks'

```
1 Do not use \textbf{bold} font for highlighting
  within the text, as it disrupts reading. \
  textit{Italic} font can be used for
  highlighting technical terms and in some
  cases \texttt{typewriter} font.
```

Do not use **bold** font for highlighting within the text, as it disrupts reading. *Italic* font can be used for highlighting technical terms and in some cases `typewriter` font.

B. Quotations

There are two different quotation environments, which differ in their formatting:

```
1 \begin{quote}
2 "Quotes can be used in order to introduce a
  certain topic, or present a different view
  on an aspect of the paper or to cite another
  person word for word." \hfill \textit{Lasse
  Einig}
3 \end{quote}
```

"Quotes can be used in order to introduce a certain topic, or present a different view on an aspect of the paper or to cite another person word for word." *Lasse Einig*

```
1 \begin{quotation}
2 "Quotes can be used in order to introduce a
  certain topic, or present a different view
  on an aspect of the paper or to cite another
  person word for word." \hfill \textit{Lasse
  Einig}
3 \end{quotation}
```

"Quotes can be used in order to introduce a certain topic, or present a different view on an aspect of the paper or to cite another person word for word." *Lasse Einig*

C. References

All content, which is directly or indirectly taken from another author, a book, a website or other documents, must be referenced. This includes quotations and data sets as well as images. There are different options for quoting.

1) *Website*: Websites must be referenced with their URL as well as the date of last check/visit. Websites are no scientific source, thus you should try to avoid citing websites. You may not cite wikipedia and other websites, which are editable by public. You may reference websites of vendors or producers in order to cite technical data of a sensor for example. Websites may be referenced as a footnote:

```
1 The SICK S3000 family is certified by the \
  textit{TÄV}, Rheinland \footnote{\url{https
  ://www.sick.com/media/pdf/5/85/185/IM
  0023185.PDF}, last checked 2015-10-18}.
```

The SICK S3000 family is certified by the *TÜV Rheinland*^a.

^a<https://www.sick.com/media/pdf/5/85/185/IM0023185.PDF>, last checked 2015-10-18

2) *Scientific Publications*: Scientific publications must be referenced in full IEEE style. In \LaTeX this is done by entering the publication information to the bibliography and then recalling these with the *cite* command. The bibliography has the basic format:

```
1 \begin{thebibliography}{99}
2 \bibitem{identifier} Author, Title,
  Publication, Place, Year, Page
3 \end{thebibliography}
```

The 99 marks the indentation of the entries. 99 will indent for two number spaces, thus should be sufficient for your papers. Entries will be sorted in the order in which you place them in the bibliography.

There are different types of scientific publications. The most important types are exemplified here. You can find the result of each citation in the REFERENCES section.

The corresponding numbers are printed at the end of this enumeration and the beginning of the REFERENCES section. Do not cite below a published M.Sc. thesis.

1) Book style with paper title and editor [1]

```
1 \bibitem{book1} G. O. Young, ‘‘Synthetic
  structure of industrial plastics’’, in
  Plastics, 2nd ed. vol. 3, J. Peters, Ed
  . New York: McGraw-Hill, 1964, pp.
  15--64.
```

2) Book style with pages [2]

```
1 \bibitem{book2} W.-K. Chen, Linear Networks
  and Systems. Belmont, CA: Wadsworth,
  1993, pp. 123--135.
```

3) Book style with chapter [3]

```
1 \bibitem{book3} H. Poor, An Introduction to
  Signal Detection and Estimation. New
  York: Springer-Verlag, 1985, ch. 4.
```

4) Translated journal style [4]

```
1 \bibitem{journal} Y. Yorozu, M. Hirano, K.
  Oka, and Y. Tagawa, ‘‘Electron
  spectroscopy studies on magneto-optical
  media and plastic substrate interfaces
  ’’, IEEE Transl. J. Magn.Jpn., vol. 2,
  Aug. 1987, pp. 740--741 [Dig. 9th Annu.
  Conf. Magnetism Japan, 1982, p. 301].
```

5) Conference proceedings style [5]

```
1 \bibitem{conf1} S. P. Bingulac, ‘‘On the
  compatibility of adaptive controllers
  ’’, in Proc. 4th Annu. Allerton Conf.
  Circuits and Systems Theory, New York,
  1994, pp. 8--16.
```

6) Conference proceedings style [6]

```
1 \bibitem{conf2} G. R. Faulhaber, ‘‘Design
  of service systems with priority
  reservation’’, in Conf. Rec. 1995 IEEE
  Int. Conf. Communications, pp. 3--8.
```

7) Presented conference paper style [7]

```
1 \bibitem{pres1} G. W. Juetten and L. E.
  Zeffanella, ‘‘Radio noise currents n
  short sections on bundle conductors’’,
  presented at the IEEE Summer power
  Meeting, Dallas, TX, June 22--27, 1990,
  Paper 90 SM 690-0 PWRs.
```

8) Presented conference paper style [8]

```
1 \bibitem{pres2} J. G. Kreifeldt, ‘‘An
  analysis of surface-detected EMG as an
  amplitude-modulated noise’’, presented
  at the 1989 Int. Conf. Medicine and
  Biological Engineering, Chicago, IL.
```

9) PhD thesis style [9]

```
1 \bibitem{thesis1} J. Williams, ‘‘Narrow-
  band analyzer’’, Ph.D. dissertation,
  Dept. Elect. Eng., Harvard Univ.,
  Cambridge, MA, 1993.
```

10) M.Sc. thesis style [10]

```
1 \bibitem{thesis2} N. Kawasaki, ‘‘Parametric
  study of thermal and chemical
  nonequilibrium nozzle flow’’, M.S.
  thesis, Dept. Electron. Eng., Osaka
  Univ., Osaka, Japan, 1993.
```

11) Patent style [11]

```
1 \bibitem{patent} J. P. Wilkinson, ‘‘
  Nonlinear resonant circuit devices’’, U
  .S. Patent 3 624 12, July 16, 1990.
```

D. Citation

The basic command for citing is:

```
1 \cite{book1}
```

which will result in [1]. There are different citation styles, such as citing the names of the authors, or an abbreviation of the first author and the year of publication. For the IEEE conference paper style, use the enumerated style due to page limits.

VIII. EQUALIZING THE LAST PAGE

```
1 \balance
```

This command equalized the two columns on the last page. The command must be placed inside the text of the second-last page but in the left column. The **balance** package is required for this command.

REFERENCES

- [1] G. O. Young, ‘‘Synthetic structure of industrial plastics’’, in Plastics, 2nd ed. vol. 3, J. Peters, Ed. New York: McGraw-Hill, 1964, pp. 15–64.
- [2] W.-K. Chen, Linear Networks and Systems. Belmont, CA: Wadsworth, 1993, pp. 123–135.
- [3] H. Poor, An Introduction to Signal Detection and Estimation. New York: Springer-Verlag, 1985, ch. 4.
- [4] Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, ‘‘Electron spectroscopy studies on magneto-optical media and plastic substrate interfaces’’, IEEE Transl. J. Magn.Jpn., vol. 2, Aug. 1987, pp. 740–741 [Dig. 9th Annu. Conf. Magnetism Japan, 1982, p. 301].
- [5] S. P. Bingulac, ‘‘On the compatibility of adaptive controllers’’, in Proc. 4th Annu. Allerton Conf. Circuits and Systems Theory, New York, 1994, pp. 8–16.
- [6] G. R. Faulhaber, ‘‘Design of service systems with priority reservation’’, in Conf. Rec. 1995 IEEE Int. Conf. Communications, pp. 3–8.
- [7] G. W. Juetten and L. E. Zeffanella, ‘‘Radio noise currents n short sections on bundle conductors’’, presented at the IEEE Summer power Meeting, Dallas, TX, June 22–27, 1990, Paper 90 SM 690-0 PWRs.
- [8] J. G. Kreifeldt, ‘‘An analysis of surface-detected EMG as an amplitude-modulated noise’’, presented at the 1989 Int. Conf. Medicine and Biological Engineering, Chicago, IL.
- [9] J. Williams, ‘‘Narrow-band analyzer’’, Ph.D. dissertation, Dept. Elect. Eng., Harvard Univ., Cambridge, MA, 1993.
- [10] N. Kawasaki, ‘‘Parametric study of thermal and chemical nonequilibrium nozzle flow’’, M.S. thesis, Dept. Electron. Eng., Osaka Univ., Osaka, Japan, 1993.
- [11] J. P. Wilkinson, ‘‘Nonlinear resonant circuit devices’’, U.S. Patent 3 624 12, July 16, 1990.
- [12] Wikipedia contributors. Honda Asimo, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=140450>, accessed 28th Sept. 2023.

Eidesstattliche Erklärung

Hiermit versichere ich, Lasse Einig, Jasper Güldenstein, an Eides statt, dass ich die vorliegende Seminararbeit mit dem Titel *Instructions for IEEE style paper writing*, sowie die Präsentationsfolien zu dem dazugehörigen mündlichen Vortrag ohne fremde Hilfe angefertigt und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe.

Alle Teile, die wörtlich oder sinngemäß einer Veröffentlichung entstammen sind als solche kenntlich gemacht.

Die Arbeit wurde in dieser oder ähnlicher Form noch nicht veröffentlicht, einer anderen Prüfungsbehörde vorgelegt oder als Studien- oder Prüfungsleistung eingereicht.

Declaration of an Oath

Hereby I, Lasse Einig, Jasper Güldenstein, declare that I have authored this thesis, titled *Instructions for IEEE style paper writing*, and the presentation slides for the associated oral presentation independently and unaided. Furthermore, I confirm that I have not used other than the declared sources / resources.

I have explicitly marked all material which has been quoted either literally or by content from the used sources.

This thesis, in same or similar form, has not been published, presented to an examination board or submitted as an exam or course achievement.

Hamburg, September 28, 2023

Lasse Einig, Jasper Güldenstein