

CS 309: Autonomous Robots

FRI I

LaTeX

Instructor: Justin Hart

http://justinhart.net/teaching/2020_spring_cs309/

LaTeX

TeX

- A typesetting system
 - Differs from a text editor in that it is intended to handle layout and formatting of documents
 - Differs from Word/Libreoffice in that the formatting is handled in a typesetting language
- Initially released by Donald Knuth in 1978

LaTeX

- L^AT_EX
- Leslie Lamport, 1983
- More common now

How do you use LaTeX?

The workflow often looks like

1. Download an “author kit” with formatting instructions for your paper
2. Unzip onto your machine
3. Delete filler text and replace with your own
4. When compiling your LaTeX, you run it several times
latex <paper>; latex <paper>;
bibtex <paper>; bibtex <paper>;
latex <paper>; latex <paper>
 1. This has to deal with how LaTeX resolves cross-referencing

Overleaf

Overleaf has become the popular way to write LaTeX recently

Use Overleaf for your project, the mentors will be better able to help you.

Overleaf

- Uses pdflatex for compilation
 - Most templates and guides are now adapted for this
- Supports multiple concurrent users editing the text
- Generally passes pdf compliance checks for publications like conferences and journals

Why do we use LaTeX?

Conferences, books, journals, and universities have very strict formatting guidelines

When you download a template (in the author kit), the template handles this formatting

Because LaTeX does typesetting, you do not need to manually layout tables, pictures, and other figures

Editors like word have you do this manually

Why do we use LaTeX?

It makes entering mathematical formulas simpler.

You *do* have to learn the syntax

It handles citations and references gracefully

`\label`, `\ref`, and `\cite` are commands used for cross-referencing

With the correct data entered, it will also construct your bibliography for you, correctly formatted

It will also handle footnotes easily.

Let's try this out

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Edited about a month ago by Rishi Shah

Enter your Paper Title Here 13930386...sdg
Edited 2 months ago by JustinHart

Pick “Blank Paper”

The screenshot displays the Overleaf website interface. At the top, there is a navigation bar with the Overleaf logo and links for 'FEATURES & BENEFITS', 'TEMPLATES', 'PRICING', 'COMPANY', and 'HELP'. A 'Create New Project' dialog box is open, showing a list of project templates. The 'Basics' category is selected, and the 'Blank Paper' template is highlighted. Other templates visible include Academic Journal, Bibliography, Book, Calendar, Formal Letter, Homework Assignment, Newsletter, Poster, Presentation, Project / Lab Report, Résumé / CV, and Thesis. The 'Academic Journal' section also shows several journal templates. The background shows a sidebar with 'My Projects' and a search bar.

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My Projects JustinHart

Overleaf

FEATURES & BENEFITS • TEMPLATES PRICING COMPANY • HELP

Create New Project

Basics

Unlisted Protected

Blank Paper

Academic Journal

More Academic Journal templates...

SEARCH

10130150

X

ORCID

ID ID

45...bcc

72...sf6

93...ryx

86...sdg

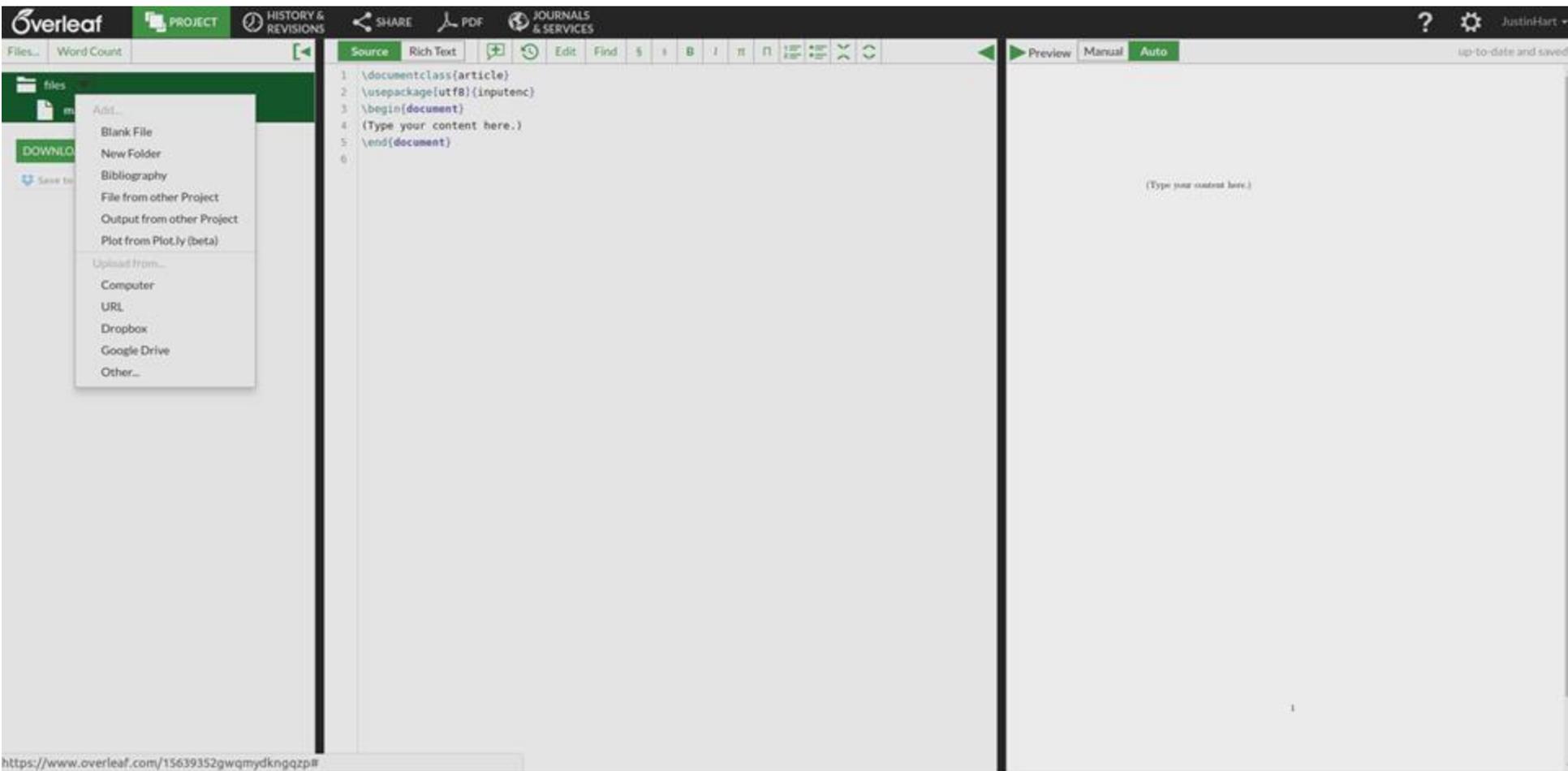
https://www.overleaf.com/docs?template=blank

Picking “Blank Paper”

If you choose a different template, Overleaf will put the LaTeX template into the directory with your files

Picking “blank paper” gives you an empty template, which you then upload the author kit into

“Upload from ..\ Computer”



The screenshot displays the Overleaf web interface. The top navigation bar includes the Overleaf logo, 'PROJECT', 'HISTORY & REVISIONS', 'SHARE', 'PDF', and 'JOURNALS & SERVICES'. Below this, a secondary bar contains 'Files...', 'Word Count', and a toolbar with icons for source, rich text, edit, find, and various text formatting options. The main workspace is split into two panes: 'Source' on the left and 'Preview' on the right. The 'Source' pane shows a LaTeX document structure with line numbers 1 through 6. The 'Preview' pane shows a blank page with the placeholder text '(Type your content here.)'. On the left side, a 'files' sidebar is visible with a 'DOWNLOAD' button and a 'Save to' dropdown. A context menu is open over the 'files' sidebar, listing options such as 'Blank File', 'New Folder', 'Bibliography', 'File from other Project', 'Output from other Project', 'Plot from Plot.ly (beta)', and 'Upload from...'. The 'Upload from...' option is expanded, showing sub-options: 'Computer', 'URL', 'Dropbox', 'Google Drive', and 'Other...'. The 'Computer' option is highlighted. At the bottom left, the URL <https://www.overleaf.com/15639352gwqmydkgqzpi#> is visible. The 'Preview' pane has a status bar at the bottom right that says 'up-to-date and saved' and a page number '1' at the bottom center.

```
1 \documentclass{article}
2 \usepackage[utf8]{inputenc}
3 \begin{document}
4 (Type your content here.)
5 \end{document}
6
```

(Type your content here.)

1

<https://www.overleaf.com/15639352gwqmydkgqzpi#>

“Upload from .. \ Computer”

Hover your mouse over “files”

- This will give you the option to upload files from your computer

You can simply unzip IEEEtran.zip and upload, but you will want to delete the directory contents first

- files
- IEEEabrv.bib
- IEEEexample.bib
- IEEEfull.bib
- IEEEtran.bst
- IEEEtran.cls
- IEEEtranN.bst
- IEEEtranS.bst
- IEEEtranSA.bst
- IEEEtranSN.bst
- IEEEtran_HOWTO.pdf
- IEEEtran_bst_HOWTO.pdf
- IEEEtrantools.sty
- IEEEtrantools_doc.txt
- bare_conf.tex**
- testflow_cti_A4.pdf
- testflow_cti_A4.ps
- testflow_cti_LTR.pdf
- testflow_cti_LTR.ps
- testflow_doc.pdf
- tux.eps
- tux.pdf

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Save to Dropbox

```
1 %\bare_conf.tex
2 %\v1.4b
3 %\2015/08/26
4 %\by Michael Shell
5 %\See:
6 %\http://www.michaelshell.org/
7 %\for current contact information.
8 %\
9 %\This is a skeleton file demonstrating the use of IEEEtran.cls
10 %\ (requires IEEEtran.cls version 1.8b or later) with an IEEE
11 %\ conference paper.
12 %\
13 %\Support sites:
14 %\http://www.michaelshell.org/tx/ieeetran/
15 %\http://www.ctan.org/pkg/ieeetran
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36 %\in the base LaTeX documentation of all distributions of LaTeX released
37 %\2003/12/01 or later.
38 %\Retain all contribution notices and credits.
39 %\ ** Modified files should be clearly indicated as such, including **
40 %\ ** renaming them and changing author support contact information. **
41 %*****
42
```

Bare Demo of IEEEtran.cls for IEEE Conferences

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Abstract—The abstract goes here.

I. INTRODUCTION

This demo file is intended to serve as a "starter file" for IEEE conference papers produced under L^AT_EX using IEEEtran.cls version 1.8b and later. I wish you the best of success.

August 26, 2015

A. Subsection Heading Here

Subsection text here.

1) Subsubsection Heading Here: Subsubsection text here.

II. CONCLUSION

The conclusion goes here.

ACKNOWLEDGMENT

The authors would like to thank...

REFERENCES

[1] H. Kugel and F. W. Daley, *A Guide to RJE*, 3rd ed. Hoboken, England: Addison-Wesley, 1998.

Next steps

Go into the project settings and make the template document your main file

Erase comments that are not useful to you

Text in blue after % are comments

Similarly, anything from `\ifCLASSINFOpdf` to `\fi` can be removed

Files... Word Count

- files
- IEEEabrv.bib
- IEEEexample.bib
- IEEEfull.bib
- IEEEtran.bst
- IEEEtran.cls
- IEEEtranN.bst
- IEEEtranS.bst
- IEEEtranSA.bst
- IEEEtranSN.bst
- IEEEtran_HOWTO.pdf
- IEEEtran_bst_HOWTO.pdf
- IEEEtrantools.sty
- IEEEtrantools_doc.txt
- bare_conf.tex**
- testflow_ctl_A4.pdf
- testflow_ctl_A4.ps
- testflow_ctl_LTR.pdf
- testflow_ctl_LTR.ps
- testflow_doc.pdf
- tux.eps
- tux.pdf

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```
1 \documentclass[conference]{IEEEtran}
2
3 \ifCLASSINFOpdf
4   \usepackage[pdf]{graphicx}
5   % declare the path(s) where your graphic files are
6   \graphicspath{../pdf/ ../img/}
7   % and their extensions so you won't have to specify these with
8   % every instance of \includegraphics
9   \DeclareGraphicsExtensions{.pdf,.jpeg,.png}
10 \else
11   % or other class option (dvipsone, dvipdf, if not using dvips). graphicx
12   % will default to the driver specified in the system graphics.cfg if no
13   % driver is specified.
14   \usepackage[dvips]{graphicx}
15   % declare the path(s) where your graphic files are
16   \graphicspath{../eps/}
17   % and their extensions so you won't have to specify these with
18   % every instance of \includegraphics
19   \DeclareGraphicsExtensions{.eps}
20 \fi
21
22 % correct bad hyphenation here
23 \hyphenation{op-tical net-works semi-conduc-tor}
24
25
26 \begin{document}
27 %
28 % paper title
29 % Titles are generally capitalized except for words such as a, an, and, as,
30 % at, but, by, for, in, nor, of, on, or, the, to and up, which are usually
31 % not capitalized unless they are the first or last word of the title.
32 % \linebreak {} can be used within to get better formatting as desired.
33 % Do not put math or special symbols in the title.
34 \title{Bare Demo of IEEEtran.cls\ for IEEE Conferences}
35
36
37 % author names and affiliations
38 % use a multiple column layout for up to three different
39 % affiliations
40 \author{\IEEEauthorblockN{Michael Shell}
41 \IEEEauthorblockA{School of Electrical and\Computer Engineering\
42 Georgia Institute of Technology\}}
```

Preview Manual Auto up-to-date and saved

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Abstract—The abstract goes here.

I. INTRODUCTION

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August 26, 2013

A. Subsection Heading Here

Subsection text here.

1) Subsubsection Heading Here: Subsubsection text here.

II. CONCLUSIONS

The conclusion goes here.

ACKNOWLEDGMENT

The authors would like to thank...

REFERENCES

[1] H. Kiefer and P. M. Durr, *A Guide to L^AT_EX*, 3rd ed. Boston, England: Addison-Wesley, 1999.

Now, fill in the blanks

You can basically step through the document writing
your content in the boxes in the template

Figures

For figures, you can basically copy this text, filling in your own caption, label, and image

```
\begin{figure}[ht]
  \centering
  \includegraphics[width=0.45\textwidth]{hallway_with_robot_and_participant}
  \caption {Constructed hallway environment with robot and participant in the early
stage of hallway traversal.}
  \label{fig:hallway}
\end{figure}
```

If your figure needs to span both columns, that's

```
\begin{figure*}[ht]
...
\end{figure*}
```

Label & Ref

```
\label{some_label}
```

This marks a position in the text

```
\ref{some_label}
```

This references that position

You use this functionality to create cross-references in your paper.

For example:

“See Figure `\ref{figure_name}`.” will get you

See Figure 4.6.

Bibtex & Cite

Remove this stuff

```
\begin{thebibliography}{1}
\bibitem{IEEEhowto:kopka}
H.~Kopka and P.~W. Daly, \emph{A Guide to \LaTeX}, 3rd~ed.\hskip 1em
plus
0.5em minus 0.4em\relax Harlow, England: Addison-Wesley, 1999.
\end{thebibliography}
```

Add this

```
\bibliographystyle{IEEEtran}

\bibliography{project}
```

Bibtex & Cite

You can now add items to project.bib for your bibliographic citations

A quick way to do this is to simply Google the paper and copy-paste in the bibtex data found in your search

```
@inproceedings{reference_name,  
  author = "B. Mikkelsen and G. Raybon and R.-J. Essiambre",  
  title = "160 {Gbit/s} Single-channel Transmission Over 300 km",  
  booktitle = "Proc. {ECOC}'99",  
  year = "1999",  
  pages = "28-29"  
}
```

Bibtex & Cite

Now in your paper, you can type this, and it will put in the citation and bibliography entry correctly

```
\cite{reference_name}
```

You should experiment a bit to get the hang of this, as it will be essential to properly formatting your paper