

LaTeX

Introduction for Writing Professional Papers

Liam Osman

IEEE Computer Society – Student Branch Chapter
University of South Florida
Tampa, FL, USA

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Agenda

- Background
- Overleaf introduction
- Coding main page
- Bibliography
- Conclusion

Background

History

- Stanford professor Donald Knuth released TeX in 1978 to create an extensible typesetting language for mathematics
 - TeX is actually the Greek letters Tau, Epsilon, and Chi ($\tau\epsilon\chi$)
Therefore, it is pronounced like the word *Tech*
-

- Leslie Lamport (who worked at Stanford Research Institute) created Lamport's TeX (LaTeX) in 1985 as a set of Tex macros for the easy creation of large documents using TeX.
- Now industry standard among researchers and mathematicians

Comparison of Word Processors

MS Word / Google Docs

- “What you see is what you get (WYSIWYG)”
- Content and structure are mixed into one package
- Broken and awkward support for chapters and citations
- Iron grip of corporate SaaS
- Fails when you need it most

TeX / LaTeX Engines

- Document texts are coded alike to markdown or HTML
- Content is split and organized separately into sections
- Built in support for chapters and citations
- Open source software
- Always works right (PDF)

Overleaf

Overleaf

- Although many LaTeX editors exist, we will use Overleaf.
- Overleaf is
 - Online, web based
 - Easy to use with a visual editor
 - No installation required
 - Free to use solo (basic plan)
 - Allows live collaboration with fee
 - Used by major companies and orgs
 - The Google Docs of LaTeX
- Register at overleaf.com



Register for Overleaf



Register using Google



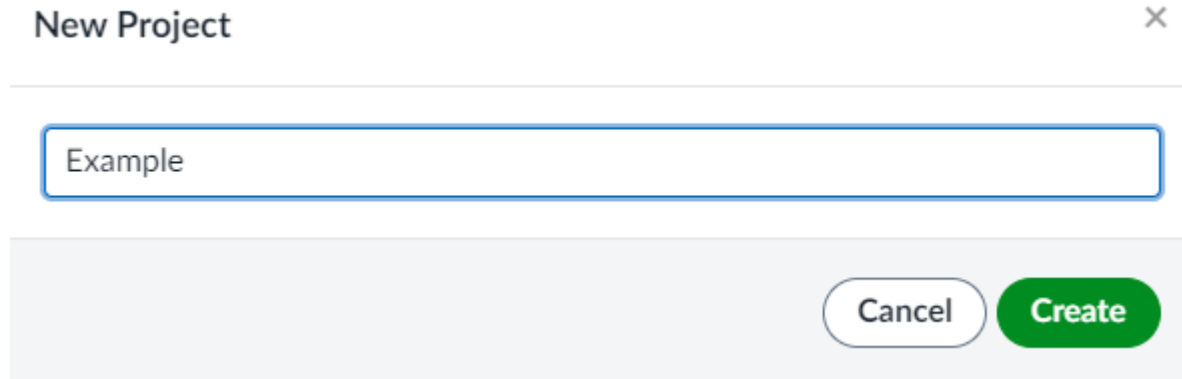
Register using ORCID

or

Register using your email

Starting a Project

1. Create a new project
2. Choose blank project for now
3. Name it and create
4. Look around the menu

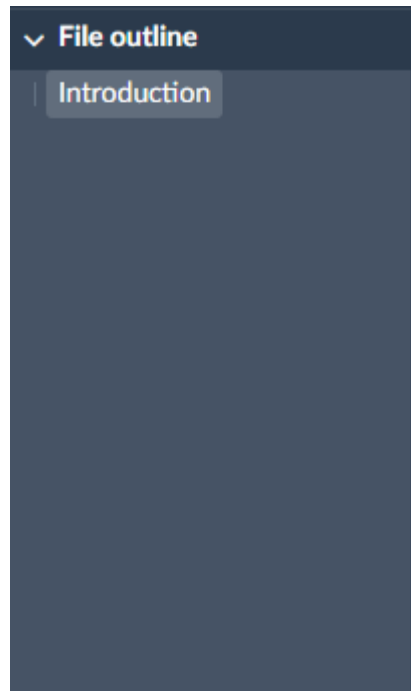
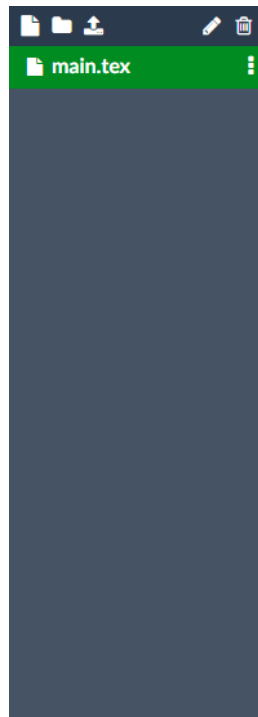


A screenshot of a 'New Project' dialog box. The title bar at the top says 'New Project' with a close button (X) on the right. Below the title bar is a text input field containing the word 'Example'. At the bottom right of the dialog are two buttons: 'Cancel' and 'Create'. The 'Create' button is green with white text, while the 'Cancel' button is white with a grey border and grey text.

File Outline and Source Folder

These will contain your files

- Sources contain:
 - TeX files (has your text)
 - Images you upload to use
 - Other miscellaneous files
- File outline (of TeX) contains:
 - Sections (intro, references, etc.)
 - Subsections
 - Paragraphs
 - etc....



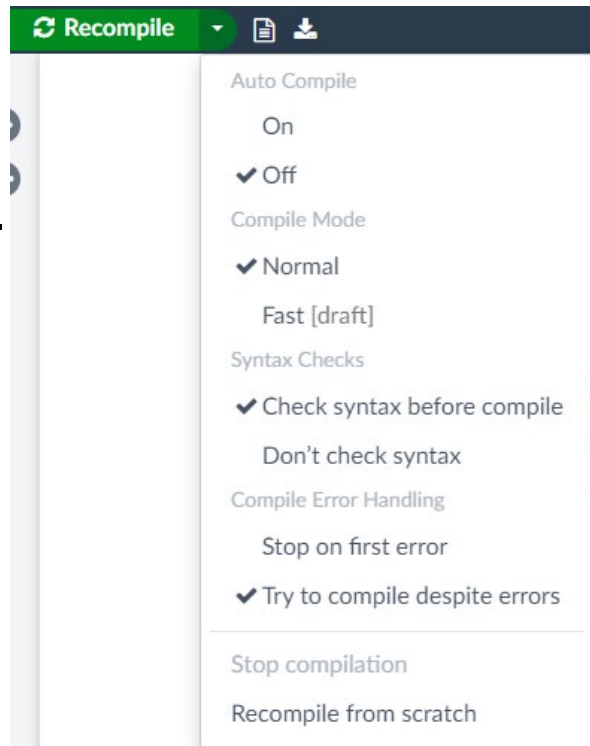
Compiling

Your name might be your email address.

Change your name at `\author{name here}`.

Make sure it compiles!

- LaTeX code must be compiled
- Press recompile to update your PDF
- Can also put on auto compile mode
- Advanced settings configurable also



Main Coding

Starter Code, Notated

```
1 \documentclass{article} % Defines format, ignore for now
2 \usepackage{graphicx} % Imported package for inserting images
3
4 % This is the preamble, declared before the body begins
5 \title{Example}
6 \author{Liam Osman}
7 \date{February 2024}
8
9 % Main body of text
10 \begin{document} % Beginning declaration of document
11
12 \maketitle % This generates our title with the preamble
13
14 \section{Introduction} % Paper is divided into sections
15
16 \end{document} % End of document
```

Sections

```
14 ▾ \section{Introduction} % Paper is divided into sections
15 This will be our introduction.
16     If we leave a whitespace to indent our code, it'll
17     be ignored by the compiler.
17 ▾ \section*{An Unnumbered Section} % The * marks this as an
    unnumbered section
18 You can name this section whatever you want.
19 Notice how this paragraph is not indented.
20
21 This one is indented because of the space in the code marking
22 it as a new paragraph.
22 % Nesting sections
23 ▾ \part{part}
24 %\chapter{chapter} only works on book class
25 ▾ \section{section}
26 ▾ \subsection{subsection}
27 ▾ \subsubsection{sub subsection}
28 ▾ \paragraph{paragraph}
29 ▾ \subparagraph{subparagraph}
```

Classes

Change your class and see how it works!

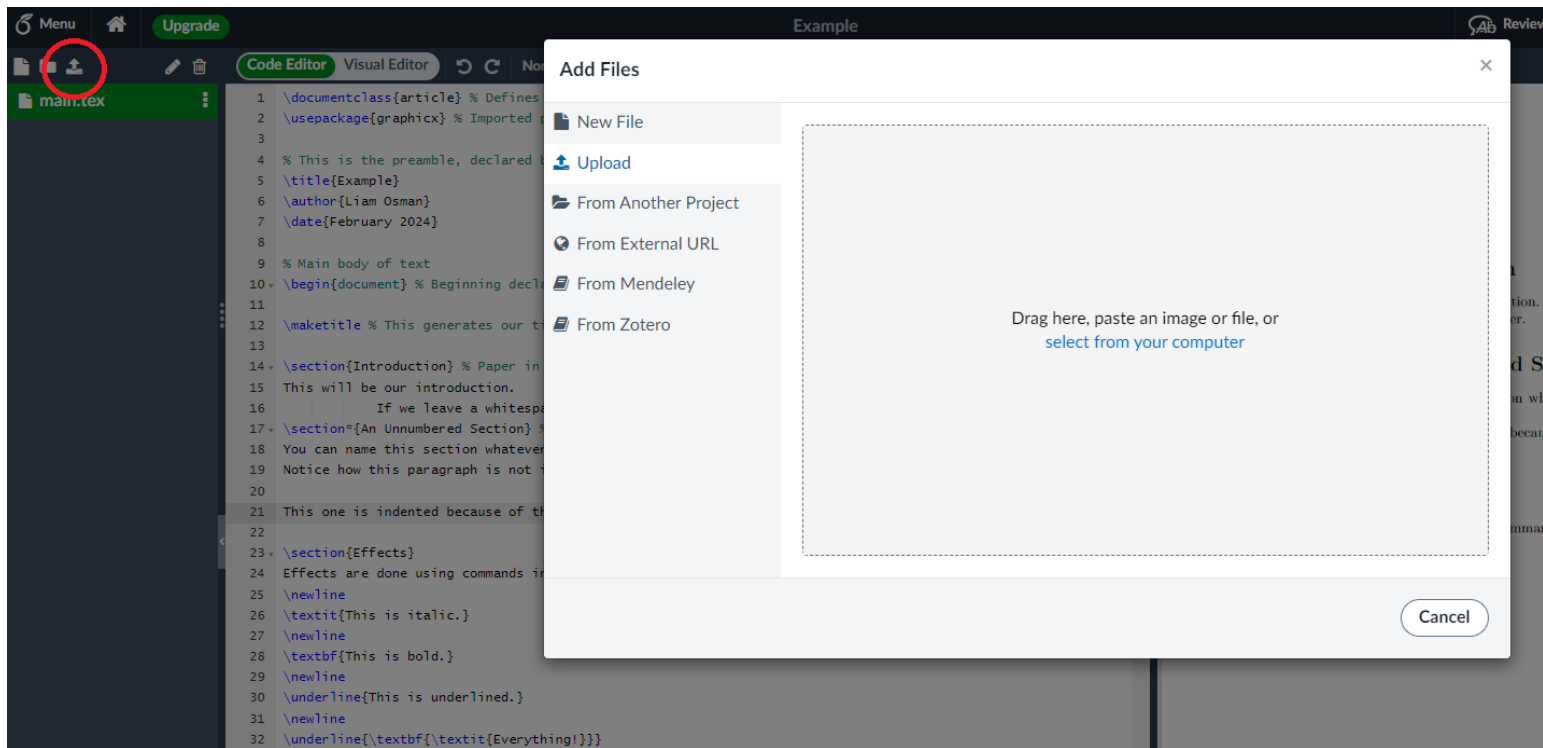
```
1 \documentclass[12pt, 2side, a4paper]{report}
```

- You can specify font size, paper size, double-sided or not, etc.
- Tons of standard or custom classes to choose to format your paper:
 - Your own custom built or imported
 - book
 - report
 - letter
 - slides
 - beamer
 - IEEEtran

Effects

```
23 ▾ \section{Effects}
24 Effects are done using commands in code.
25 \newline
26 \textit{This is italic.}
27 \newline
28 \textbf{This is bold.}
29 \newline
30 \underline{This is underlined.}
31 \newline
32 \underline{\textbf{\textit{Everything!}}}
```

Uploading Images



Using Images

```
34 \newpage
35
36 \section{Images}
37 Image functionality comes from importing the
   graphicx package!
38 Infinite possibilities for your documents await
   by copying other people's libraries.
39 \begin{figure}[h]
40     \centering
41     \includegraphics[width=0.75\textwidth]{latex}
42     \caption{All natural latex}
43     \label{fig:latex} % this is for citation
44 \end{figure}
45
```

3 Images

Image functionality comes from importing the `graphicx` package! Infinite possibilities for your documents await by copying other people's libraries.



Figure 1: All natural latex

Lists

```
48 ▾ \section{Lists}
49
50 ▾ \begin{itemize}
51     \item Let's count what we've learned
        so far!
52     \item Bullet points won't do, though.
53 \end{itemize}
54
55 ▾ \begin{enumerate}
56     \item sectioning your paper
57     \item Editing your class
58     \item Making text effects
59     \item Inserting figures
60 \end{enumerate}
```

4 Lists

- Let's count what we've learned so far!
- Bullet points won't do, though.

1. Sectioning your paper
2. Editing your class
3. Making text effects
4. Inserting figures

References

```
64 ▾ \section{References}  
65  
66 References are one of the best features of LaTeX!  
67  
68 I can easily reference what I've labelled  
69 as we did previously for the picture\ref{fig:latex}
```

Math

```
71 \newpage
72
73 \section{Math}
74 The original purpose of TeX! Many ways to write equations.
75 As a wise man once said in an inline equation, $ E=mc^2 $.
76 \newline\newline
77 Some of you may need to emphasize your fancy equation:
78
79 \[ \int_0^1 \frac{dx}{e^x} = \frac{e-1}{e} \]
80
```

Table of Contents

Making a table of contents is hard right? How do we do it here?

Table of Contents

14

`\tableofcontents`

Bibliography

Make a Bibliography File

Add Files

New File

Upload

From Another Project

From External URL

From Mendeley

From Zotero

File Name

mybibliography.bib

Cancel

Create

Bibliography Entries

- Add book information in *bib* file (if done manually)

```
1 @book{theHobbit,  
2     author = {J. R. R. Tolkien},  
3     title = {The Hobbit},  
4     publisher = {George Allen and Unwin},  
5     year = 1937  
6 }
```

- Import package to main file
 - Many packages and settings!
- Add bibliography resource

```
4 \usepackage[  
5     backend=biber,  
6     style=alphabetic,  
7     sorting=ynt  
8 ]{biblatex}  
9  
10 \addbibresource{mybibliography.bib}
```

Citing with Bibliography

```
93 ▾ \section{An Unexpected Party}
94   In a hole in the ground there lived a
    hobbit\cite{theHobbit}.
95
96 \newpage
97 \printbibliography
```

References Page

7 An Unexpected Party

In a hole in the ground there lived a hobbit[Tol37].

References

[Tol37] J. R. R. Tolkien. *The Hobbit*. George Allen and Unwin, 1937.

Conclusion

Questions?



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*Student Branch Chapter at
the University of South Florida*



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