

# Introduction to Overleaf

Alli Gofman and Jaclyn Wilson

LIS 488

## 1 What is LaTeX and Overleaf?

### 1.1 LaTeX

LaTeX is a free document markup system specifically for technical and scientific writing. It is used by students, academics, and researchers in mathematics, engineering, and many science disciplines, as well as some other fields. However, it has a high learning curve to download necessary software and learn the programming language.

**Note 1.** LaTeX documents have a distinctive aesthetic that you may recognize. This tutorial is coded in LaTeX and was created in Overleaf from a handout template. It makes it very easy to include complex equations like

$$\left(\frac{d\mathbf{Q}}{dt}\right)_{S_0} = \left(\frac{d\mathbf{Q}}{dt}\right)_S + \Omega \times \mathbf{Q} \quad (1)$$

### 1.2 Overleaf

The aim of Overleaf is to make the process of writing, collaborating, and publishing scientific documents in LaTeX quicker and easier by offering a Rich Text what-you-see-is-what-you-get (WYSIWYG) overlay, a browser-based editor that allows direct code editing, and templates for major journals (providing authors with the correct formatting for the paper and references). They also offer thesis and dissertation templates, which both CalTech and Stanford are using. Multiple writers can collaborate simultaneously on a document with automatic saving and advanced history and version control.

Overleaf is currently used by 600,000 authors at more than 3600 institutions in 180 countries, including CalTech, Stanford, MIT, Harvard, and Brown<sup>1</sup>. They have detailed training pages and an active live support system for troubleshooting.

### 1.3 When to Use Overleaf?

Libraries are likely to use Overleaf to:

- Support faculty and students in math and science with discipline-specific writing needs.
- Support collaborative research teams who need to write together.

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<sup>1</sup><https://www.overleaf.com/blog/449>

- Support academic publishing with integrated publication submission to top engineering and science journals, including templates.
- Streamline thesis and dissertation formatting and submission, a process that libraries often support. Purdue now uses Overleaf for over 35% of STEM thesis submissions<sup>2</sup>.
- Integrate scientific writing with citation managers like Mendeley, Zotero, and CiteULike.
- Distribute and submit homework assignments.
- Provide a template and integrated submission to repositories.

## 2 How to Use Overleaf

### 2.1 Setting Up An Account

While some features of Overleaf, like saving a PDF and sharing a project, can be used without signing up for an account, an account is necessary to take full advantage of Overleaf's features. An account allows you to save projects that are in progress, see the history and revisions, submit to journals, and more. To sign up for an account, go to Overleaf's homepage, [overleaf.com](https://overleaf.com), and click on the "Sign Up" button in the upper right corner. You need your name and an e-mail to sign up, and will receive an e-mail asking you to verify your e-mail address. After clicking on the link in the e-mail, you will be asked to create a password for your account, and you're ready to get started!

### 2.2 Creating a New Project

There are two main ways to create a new project through Overleaf. The first is by clicking on "New Project" on your Overleaf dashboard, which can be accessed at any time by clicking on the Overleaf logo in the top left of the page, or "My Projects" in the top right of the page when you're logged in. This will lead you to a set of templates available to start with, divided into categories like Academic Journals, Presentation, and Thesis. You can select from one of the visible templates in the category of your choice, as well as from additional templates available.

The second way to create a new project is to go directly to the Templates tab at the top of Overleaf's site. Like the first option, you can see the available categories and select one to explore possible templates, though you can also look through recent and popular templates used by other Overleaf users.

### 2.3 Basic Editing

Once you have decided on a template, it's time to start editing with your content. Once you open a project, the screen will show three sections: "Project," the editing window, and a window for

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<sup>2</sup><https://www.overleaf.com/blog/447>

preview (see Figure 1). The Project section to the left will allow you to upload files that you want to include in your project, for example images and tables. It can be removed or brought back by clicking "Project" in the top menu bar. The editing partition in the middle is where you will make changes to your document. The right section allows you to preview your document with formatting without having to save it as a PDF. By default it is set to automatically update as changes are made, but it can be toggled to a manual option.

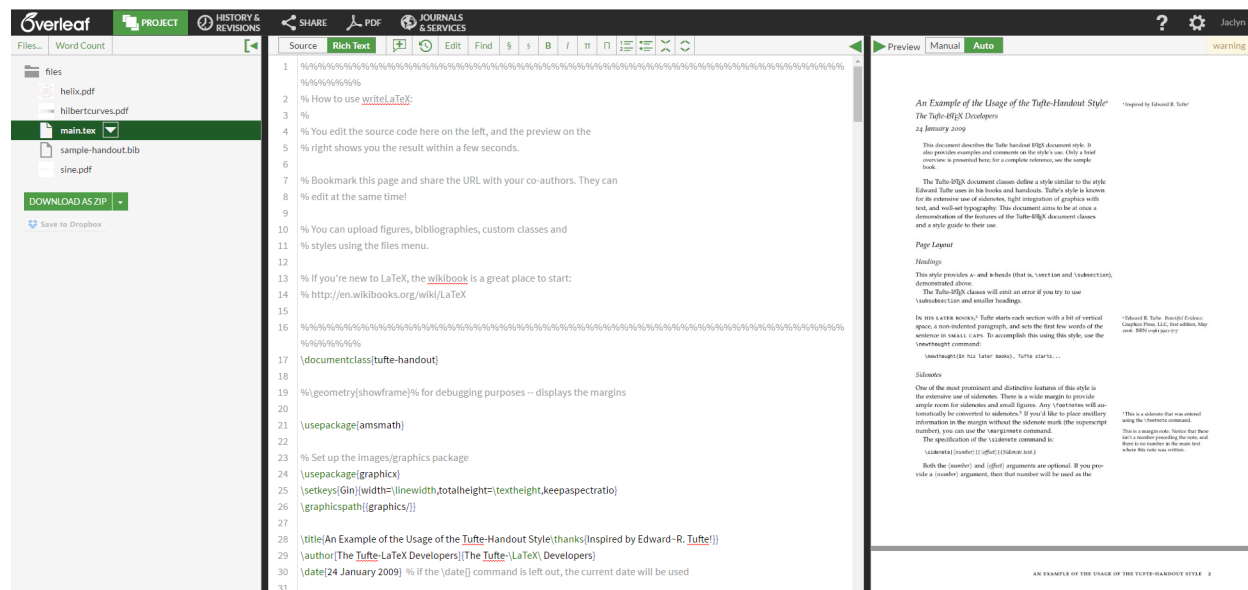


Figure 1: A screenshot of an Overleaf project

When editing a project there are two options to select from: Source and Rich Text. Both can use the toolbar that inserts code for you for particular actions, but will look different in their set-up. If you are already familiar with LaTeX, you can use the Source editing to code in your sections, figures, and more, and the editing window will show the code completely written out. Rich Text creates the WYSIWYG interface where formatting is mostly done by clicking buttons rather than coding by hand. This can be used by someone with no knowledge of LaTeX at all. This tutorial will primarily focus on Rich Text editing, with occasional forays into Source code.

### 2.3.1 Editing Toolbar

Along with basic formatting options like making lists and making text bold or italic, Overleaf offers advanced formatting tools. Let's first look at the toolbar (Figure 2) found at the top of the middle editing window.



Figure 2: A toolbar of editing options

After the option to choose between Source coding and Rich Text, we have a bubble with a plus in the center. This button is used to add a comment. Since Overleaf is a collaborative online tool,

this option allows collaborators to leave feedback for each other and to reply to other's comments, without the risk of the comments appearing in the final text. The next button, a clock with a counterclockwise arrow as its outline, is the file history. With the free online version of Overleaf, users can look at the past 24 hours of revisions to the project. A project's history can also be accessed in the top-level toolbar under History & Revisions.

The next option is Edit, which covers typical undo/redo and copy/cut/paste options. It also has a useful "toggle comment" feature (Figure 3). Generally, placing the percent symbol (%) in front of a line of text will "comment" the line out; the text will remain in your editing window, but will not appear in your final PDF. To comment out more than one line of code or text, or to bring commented lines back, highlight it and use the "toggle comment" option under Edit.

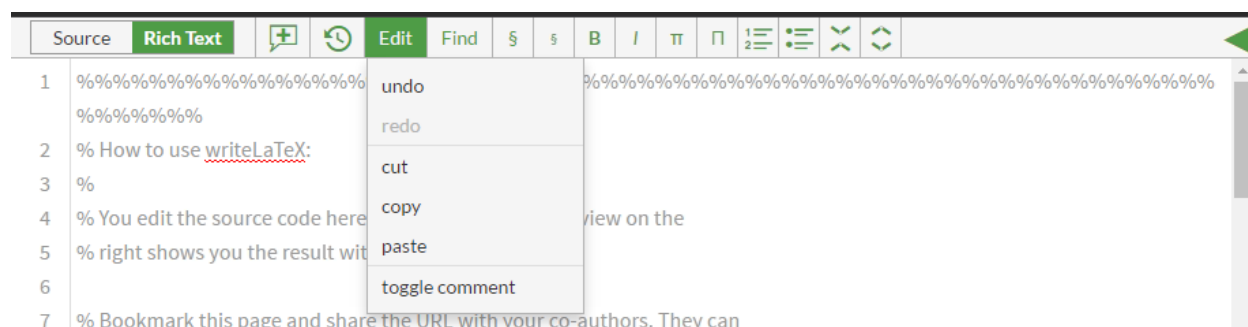


Figure 3: A menu of editing options

The Find feature allows you to search for the existence and locations of a word or words in the document (Figure 4). The replace function let you choose a word or words and replace any or all iterations of the words with something new. The "position in preview" function allows you to highlight a piece of text or code and have the preview automatically jump to that point. The reverse is also possible: from any place in the preview, use the cross-hair cursor to click on a point in the preview. After a moment, the editing screen will jump to that source code/text. These functions are particularly useful in very long documents.

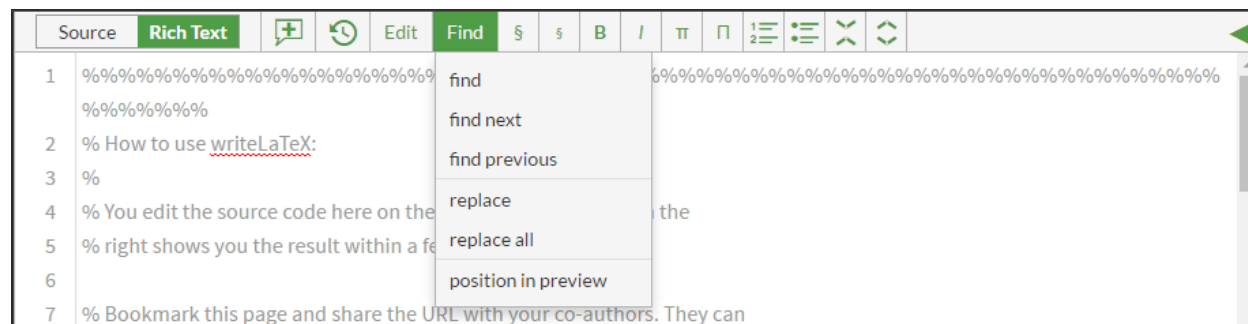


Figure 4: A menu of finding options

Our next two options are very similar, both a section symbol: §. These provide headings and sections, with the larger § acting as "Heading 1" and the smaller § as "Heading 2" to create an easy way to divide up your writing. Many templates number sections and subsections sequentially, like this document. This can be changed in different templates or by calling different format packages

- more support can be found in the Help section.

The next two toolbar options provide different formats for inserting basic mathematical symbols and equations. Lowercase pi ( $\pi$ ) creates math in the same line as the line being written, like this line. Uppercase pi ( $\Pi$ ) will give the equation its own line. Instead of an inline equation like  $(4 * 5)^2$ , it creates:

$$(4 * 5)^2$$

Following standard numbered and bulleted list options, there are tools represented by arrows pointing up and down either towards or away from each other. These allow you to collapse and uncollapse the sections and subsections you've created. By collapsing the sections, you can often more easily find one that you are looking to edit, or get a look at the bigger picture of your document.

## 2.4 Inserting Figures and Tables

Inserting figures and table does require a bit of coding, whether using Source or Rich Text.

### 2.4.1 Inserting Figures

To insert a figure (which includes images or graphs and tables that you may have created in excel), you must first upload your image using the Project button in the top toolbar. Pressing "files" will provide options to upload a file from your computer, Dropbox, Google Drive, and more (Figure 5). The next step is to type in the code for the figure.

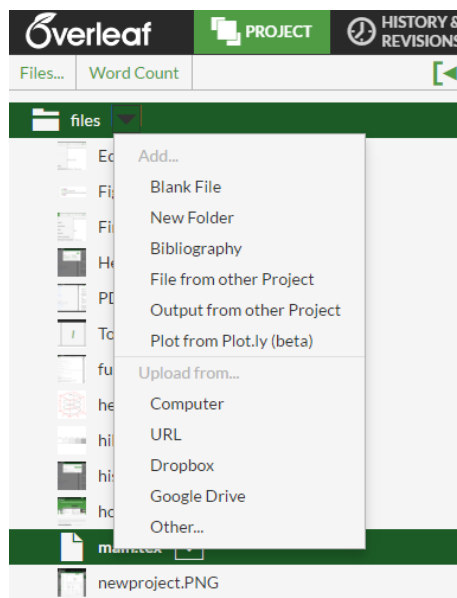


Figure 5: You can select from a variety of file sources.

Figure 6 demonstrates the code for a figure. All code in LaTeX begins with a backslash, and as line 160 in Figure 6 shows, you want to "begin" by setting up your code as a figure in the curly

brackets, which will automatically label it with a number based on its position within the paper relative to other figures. Including "h" in the square brackets directly after holds the figure as close as possible to the previous text, keeping the size of the image and the space left on the page in mind. The size of the image can be modified in square brackets after `\includegraphics`. In this image, it is resized to be 60% of the width of the text. `\centering` in line 161 is optional, as it will center your figure on the page. Line 162, `\includegraphics`, is where you call the figure by file name in curly brackets. The file name is case sensitive, including the filetype. To include a caption (which is recommended), the next line `\caption` includes the text of the caption in your curly brackets. Finally you "end" your figure to indicate any text afterwards should not be included in creating the figure.

```

159
160 \begin{figure}[h]
161 \centering
162 \includegraphics[width=0.6\textwidth]{Figure.PNG}
163 \caption{Example of the basic code to insert a figure}
164 \end{figure}
165

```

Figure 6: Example of the basic code to insert a figure.

### 2.4.2 Inserting Tables

There are two ways to insert a table. The first is to create a table in a different program, like Excel, and import it using the same method as a figure. This may provide more formatting options, and is also the recommended method for graphs.

However, it is also possible to build a table directly in Overleaf; sample code is in Figure 7. Like when coding a figure, you should "begin" by establishing your element as a table in the curly brackets, and code the h in square brackets to keep your table close to the previous text (see line 167 in Figure 7). This will associate any code before the "end" of the table with this table element. Next you want to "begin" the data in the rows and columns with "tabular" in the first set of curly brackets, and the equivalent number of "l"s for the number of columns you would like; in this example, we also placed a vertical line before and after each "l" to indicate we want lines on the edges of the table and between each of the columns - the sample code has 3 columns. To place a line between rows, we use the code `\hline` demonstrated in line 170. Each subsequent line after beginning the tabular data represents a row, with column values separated by ampersands. The end of a line is established with two backslashes. Once all the rows are entered, you should "end" the "tabular" as in line 177. Before "end"ing your table, you can add a caption as in line 178, as well as choose from other table features like centering, here in the earlier line 168.

Column 1	Column 2	Column 3
Row 1a	Row1b	Row1c
Row 2a	Row 2b	Row2c
Row 3a	Row3b	Row3c

Table 1: The table created from the code in Figure 7

Figures and tables are counted separately and automatically renumbered as new items are added.

```

166
167 \begin{table}[h]
168 \centering
169 \begin{tabular}{|l|l|l|}
170 \hline
171 Column 1 & Column 2 & Column 3\\
172 \hline
173 Row 1a & Row1b & Row1c\\
174 Row 2a & Row 2b & Row2c\\
175 Row 3a & Row3b & Row3c\\
176 \hline
177 \end{tabular}
178 \caption{Example of the basic code to create a table}
179 \end{table}
180

```

Figure 7: Example of the basic code to create a table

It is easy to then generate a list of figures and tables by entering the source code and using the commands `\listoffigures` or `\listoftables`.

## 2.5 Citation

Overleaf has templates for dedicated bibliographies as well as a structure for standard in-line citations in a variety of formats. There are two main ways of creating an integrated bibliography: by uploading a static .bib file (downloaded from another citation manager) or by linking Overleaf with a citation manager like Mendeley, Zotero, or CiteULike for dynamic integration of the citation manager and Overleaf. This tutorial will focus on linking a citation manager because it is simpler and has more robust features with a better user interface.

Integrate a citation manager by going to Project, then Files. Choose "Bibliography" as in Figure 8.

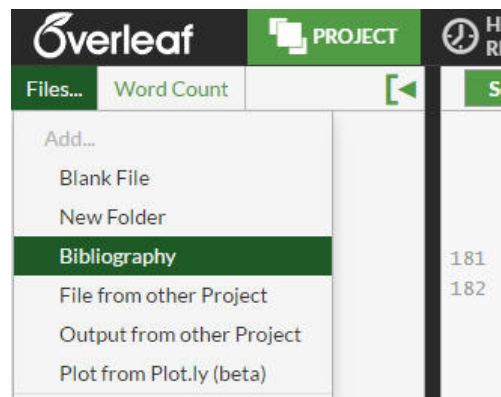


Figure 8: Insert a bibliography from the Files tab under Projects.

After choosing your citation manager, you will be prompted to log in and choose the specific

bibliography file.

Once the bibliography is loaded, you can cite by entering the source code editor and using the `\cite` command. Press the up or down arrows to bring up autocomplete options from your existing citations.

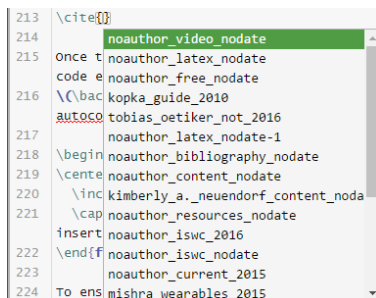


Figure 9: With the `\cite` command, use up or down arrows to choose a citation to insert.

To ensure the citation integration runs properly and to generate a list of references at the end of the document, insert these two lines of code at the end of the document (but before `\enddocument`!)

```
\bibliographystyleplain \bibliographyNAMEOFBIBLIOGRAPHY.bib
```

If you do not change "NAMEOFBIBLIOGRAPHY" to the correct name, you will get an error. To check the name, go to Files to see what was uploaded when you linked your account.

If you have recently added items to your citation manager and don't see autocomplete options, you may want to manually refresh. To do so, go to Files (in Project in the top menu bar) and find the correct .bib file. Hover over it and choose refresh, as in Figure 10.

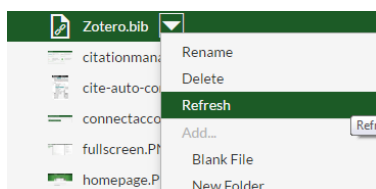


Figure 10: Manually refresh a linked bibliography.

## 2.6 Collaboration

Projects can be shared with an unlimited number of collaborators. To share your project, go to "Share" in the top toolbar. To share with co-authors who can edit simultaneously, you can share a link by copy/pasting, or with embedded links to email and social media platforms. There is also a Read Only Link for non-collaborators. The Share screen provides several repository and publication options as well: you can clone a project to github (a popular software development platform) or publish to the Overleaf Gallery.

By default, projects are semi-private: they are not publicly shared, but can be viewed by anyone with a link. Pro Accounts have additional security options.



## 2.7 History and Revisions

Each document shows live previews of compiled code on the right section of the screen. To see previous edits and versions, choose "History and Revisions" in the top toolbar. Before major edits, a version can be frozen and titled (ex. Draft 1, Advisor's Revisions, etc.). Versions can be compared and sections can be compared and restored if desired. A Pro Account (individually or through an institutional subscription) can be used for more options.

## 2.8 Publishing

Done with your project? Hooray! Overleaf provides multiple publishing options. The most basic is to download as a PDF, which is available in the top toolbar and can be used at any time.

More advanced publishing options are available under "Journals & Services" in the top toolbar. Overleaf partners with many academic journals, repositories and other author services, all of which can be submitted to through an intuitive interface. Institutions can set up systems for thesis/dissertation submission as well. The publication process will likely ask you to download a ZIP file with all the source files as well as a PDF file of your document. All partner publishers also have templates available on Overleaf with formats for style and citation.

## 2.9 Troubleshooting

Having trouble, or just want to learn more about what you can do with Overleaf? In the top right corner of your project window, you'll find a question mark, which will bring up a window dedicated to help and Frequently Asked Questions (Figure 11). You can use the search bar to search through a number of help pages by keyword, or one of the links if your question is about LaTeX or Overleaf in general. Clicking on the text "Help and FAQs" will lead you to a page with the top 10 FAQs, a list of help categories, and other resources that may aid you. Finally, the pop-up window also includes a link at the bottom to contact Overleaf's support team for more assistance.

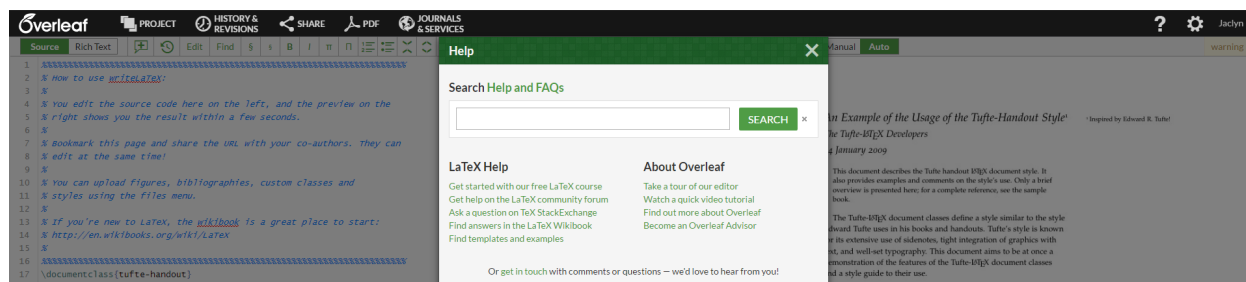


Figure 11: Options for additional help

### 3 Further Resources

Interested in learning more about LaTeX and Overleaf? Check out these resources:

- *LaTeX* on Wikibooks: <https://en.wikibooks.org/wiki/LaTeX>
- *The Not So Short Introduction to LATEX 2E* by Tobias Oetiker, Hubert Partl, Irene Hyna, and Elisabeth Schlegl: <https://archive.org/details/lshort>
- *Guide to LaTeX* (4th edition) by Helmut Kopka and Patrick W. Daly: <http://www.worldcat.org/oclc/844889428>
- Overleaf LaTeX Tips: [https://www.overleaf.com/help/category/latex\\_tips](https://www.overleaf.com/help/category/latex_tips)
- Overleaf Video Tutorials: [https://www.overleaf.com/help/category/video\\_tutorials](https://www.overleaf.com/help/category/video_tutorials)