

Latex and Overleaf

Write the code, Render the report

Pascal Sun

UWA NLP-TLP Group

The University of Western Australia

March 20, 2025

Table of Contents

- 1 What is LaTeX
- 2 Overleaf
- 3 Practical Guide
- 4 Reference management
- 5 How to compile and submit a paper
- 6 Q&A



What is LaTeX

What is LaTeX?

- LaTeX (pronounced "lay-tech" or "lah-tech") is a document preparation system
- Created by Leslie Lamport in the 1980s, based on TeX (Donald Knuth, 1978)
- A markup language, not a word processor
- Separates content from formatting
- Excels at typesetting complex mathematical expressions
- Industry standard for academic and scientific publications

Reference: www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes

Why Use LaTeX?

Advantages:

- Professional typesetting quality
- Consistent formatting
- Excellent for mathematics
- Superior reference management
- Free and open-source
- Cross-platform

Common Uses:

- Research papers
- Thesis and dissertations
- Books and technical documentation
- Presentations (using Beamer)
- Letters and CVs
- Mathematical content

LaTeX vs. Word

LaTeX	Word
Markup language	WYSIWYG interface ¹
Separation of content and style	Blended content and formatting
Superior math typesetting	Limited equation support
Better for large documents	Easier for short documents
Version control friendly	Track changes functionality
Consistent output across systems	May vary by platform/version

¹what you see is what you get

Learning it

Want to learn in 30 minutes? Visit:
https://www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes

LaTeX Compilation Engines

Major LaTeX Engines:

■ pdfLaTeX

- Most common engine
- Produces PDF directly
- Limited Unicode support
- No OpenType fonts

■ XeLaTeX

- Native Unicode support
- System fonts (OpenType, TrueType)
- Better multilingual support
- Slower than pdfLaTeX

More Engines:

■ LuaLaTeX

- Embedded Lua scripting
- Full Unicode support
- Modern font technologies
- Most flexible but slowest

■ LaTeX + dvips

- Classic two-step workflow
- Creates DVI then PostScript
- Useful for special PS effects
- Primarily for legacy projects

Feature	pdfLaTeX	XeLaTeX	LuaLaTeX	LaTeX+dvips
Unicode support	Limited	Full	Full	Limited
System fonts	No	Yes	Yes	No
Compilation speed	Fast	Medium	Slow	Medium
Scripting	No	No	Lua	No

When to Use Each Engine

■ Use pdfLaTeX when:

- Working with standard LaTeX documents
- Speed is a priority
- Only need basic Latin characters
- Maximum compatibility with packages

■ Use XeLaTeX when:

- Working with non-Latin scripts (Chinese, Arabic, etc.)
- Need to use system fonts
- Want simpler font selection syntax (`\fontspec`)
- Compatibility with modern typographic features

■ Use LuaLaTeX when:

- Need programmable control via Lua
- Working with complex typography
- Need Unicode + advanced typesetting
- Developing new LaTeX features



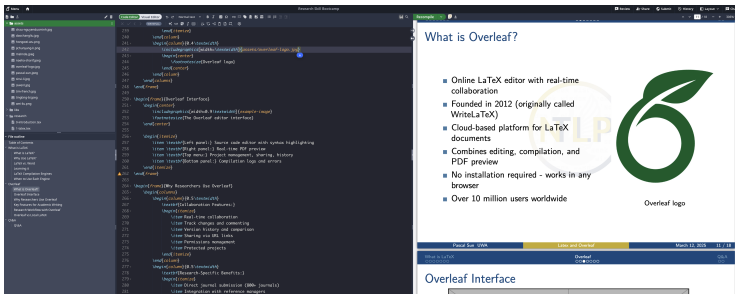
What is Overleaf?

- Online LaTeX editor with real-time collaboration
- Founded in 2012 (originally called WriteLaTeX)
- Cloud-based platform for LaTeX documents
- Combines editing, compilation, and PDF preview
- No installation required - works in any browser
- Over 10 million users worldwide



Overleaf logo

Overleaf Interface

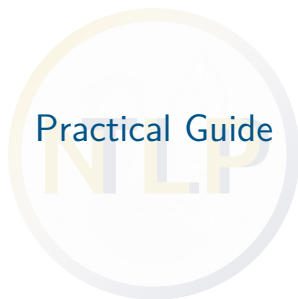


The Overleaf editor interface

- **Left panel:** Source code editor with syntax highlighting
- **Right panel:** Real-time PDF preview
- **Top menu:** Project management, sharing, history

Why Use Overleaf

- **No local installation required**
 - LaTeX runs entirely in your browser
 - Access from any device with internet connection
 - No managing packages or updates
 - Available on Windows, Mac, Linux, mobile devices
- **Real-time rendering**
 - Instant preview of changes
 - WYSIWYG-like experience similar to Word
 - Immediate feedback on errors
 - Split screen: code editor and PDF preview
- **Collaborative features**
 - Multiple authors can edit simultaneously
 - Share via URL links
 - Permission control (view-only or edit access)
 - Track changes and commenting functionality
- **Ready-to-use templates**
 - Hundreds of pre-defined journal templates
 - Conference papers, theses, presentations
 - Start writing immediately without setup
 - Templates from major publishers (IEEE, ACM, Springer)



Honor Project Guide

1 Project Proposal

- Identify goal and knowledge gap
- Develop initial research direction

2 Literature Review

- Understand existing knowledge gap
- Formalize research objectives

3 Updated Project Proposal

- Define specific goals
- Design experiments and methodology
- Transform initial ideas into executable project

4 Thesis

- Report experiments and results
- Document findings and conclusions

Overleaf Template

Honour Project Template

<https://www.overleaf.com/read/scpvbnvkvhj#8db448>

This is a demo overleaf project
Includes templates for your research proposal,
literature review, thesis and seminar.

Honour Project Template

- Proposal
- Literature Review
- Thesis



Demo: Formula, Table and Figure

- Use LLMs to help you with that if you encounter troubles.
- Formula, Table and Figures should be the focus in a paper to convey the most important information.

Reference management

Why Reference Management?

- Crucial part of academic writing
- Automatically formats citations and bibliography
- Maintains consistent citation style
- Saves time when writing large documents
- Simplifies handling dozens or hundreds of references
- Reduces errors in citations

Reference Management in LaTeX

BibTeX:

- Classic approach (since 1980s)
- Uses .bib files to store references
- Widely supported by journals
- Various citation styles (.bst files)
- Limited Unicode support

BibLaTeX:

- Modern approach
- More flexible and customizable
- Better Unicode support
- Enhanced functionality
- Uses Biber as backend
- More complex but powerful

The .bib File

- Bibliography database file (plain text)
- Contains structured information about references
- Format:

```
1 @article{key,  
2   author  = {Author Name},  
3   title   = {Title of the Article},  
4   journal = {Journal Name},  
5   year    = 2023,  
6   volume  = 42,  
7   number  = 1,  
8   pages   = {1--15}  
9 }  
10
```

- Key types: @article, @book, @inproceedings, etc.
- Each entry has a unique citation key (e.g., "smith2023")

Basic BibTeX Usage

```
1 % In the preamble (optional):  
2 % \usepackage{natbib} % Enhanced citation commands  
3  
4 % In your document:  
5 According to Smith \cite{smith2023}, the results show...  
6  
7 % At the end of your document:  
8 \bibliographystyle{plain} % Citation style  
9 \bibliography{references} % Your .bib filename without extension  
10
```

Citation Commands

Basic commands:

- `\cite{key}` → Standard citation (Smith, 2023)

With natbib package:

- `\citet{key}` → Textual: Smith (2023)
- `\citep{key}` → Parenthetical: (Smith, 2023)
- `\citeauthor{key}` → Author only: Smith
- `\citeyear{key}` → Year only: 2023

With BibLaTeX:

- `\cite{key}` → Standard citation
- `\textcite{key}` → Textual citation
- `\parencite{key}` → Parenthetical citation
- `\footcite{key}` → Citation as footnote

Citation Styles

BibTeX styles:

- `plain` — Standard numbered format
- `unsrt` — In order of citation
- `alpha` — Alphanumeric labels (Smi23)
- `abbrv` — Abbreviated names
- `ieeetr` — IEEE Transactions style
- `acm` — ACM Transactions style
- `apalike` — APA-like format
- Custom styles from journals

BibLaTeX styles:

- `numeric` — [1], [2], etc.
- `alphabetic` — [Smi23], etc.
- `authoryear` — (Smith, 2023)
- `authortitle` — (Smith, Title)
- `verbose` — Full citation in first use
- `ieee` — IEEE format
- `apa` — APA format
- `chicago` — Chicago format

Reference Management Tools

Desktop tools:

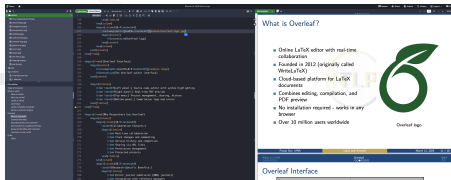
- **JabRef** — Open-source .bib manager
 - Native BibTeX support
 - Sorts and organizes references
 - Groups and filtering
- **Zotero** + Better BibTeX plugin
 - Captures web references
 - Browser integration
 - PDF management
- **Mendeley**
 - BibTeX export
 - PDF organization

Online resources:

- **Google Scholar**
 - "Cite" button with BibTeX export
 - Quick reference lookup
- **Overleaf**
 - Built-in .bib editor
 - Automatic BibTeX compilation
 - Integrated into workflow
- **CiteSeerX, DBLP**
 - BibTeX export for CS publications
 - Comprehensive database

Reference Management in Overleaf

- Upload .bib files
- Built-in bibliography editor
- Citation helper
- Auto-completes `\cite{...}`
- Automatically runs BibTeX/Biber
- Checks for errors
- Shows warnings



Reference management in Overleaf

Best Practices

- **Use consistent citation keys**
 - AuthorYearKeyword: smith2023neural
 - FirstAuthorYear: smith2023
- **Keep a master .bib file**
 - Maintain one central bibliography database
 - Reuse across projects
- **Include complete information**
 - All required fields for each entry type
 - DOI or URL when available
- **Use reference management software**
 - Avoid manual editing of .bib files
 - Ensure correct formatting
- **Backup your .bib files**
 - Version control (Git)
 - Cloud storage

Common Issues and Solutions

■ Citation [?] showing instead of proper citation

- Run complete compilation sequence
- Check for typos in citation key
- Ensure .bib file is in correct location

■ Bibliography not appearing

- Check proper commands (`\bibliography`, `\bibliographystyle`)
- Run proper compilation sequence
- Check compile log for errors

■ Special characters in names

- Use proper accent commands or Unicode
- Consider switching to BibLaTeX/Biber

■ Wrong citation format for journal

- Check journal guidelines
- Use specific .bst or BibLaTeX style

How to compile and submit a paper

Identify Your Target Venue

- **Decide between journal or conference**
 - Journals: Comprehensive studies, longer review times, year-round submissions
 - Conferences: Shorter papers, fixed deadlines, networking opportunities
- **Match venue to your research field and impact**
 - Consider impact factor, ranking, or conference tier
 - Ensure topical alignment with your research
- **Check acceptance rates and timelines**
 - Higher-ranked venues typically have lower acceptance rates
 - Plan submission around conference deadlines or journal review times

Study the Submission Guidelines

- **Carefully read the “Author Guidelines” or “Call for Papers”**
 - These are typically found on the venue’s website
 - Pay special attention to page limits and formatting requirements
- **Note important dates**
 - Abstract submission deadline (for conferences)
 - Paper submission deadline
 - Camera-ready version deadline
- **Understand the review process**
 - Single-blind vs. double-blind review
 - Review timeline

Obtain and Use the Template

- **Download the official template**
 - Most venues provide LaTeX templates and/or Word templates
 - ACM, IEEE, Springer, Elsevier all have specific formats
- **Don't modify the template settings**
 - Keep margins, font sizes, styles, and spacing as provided
 - Use template-provided sectioning commands
- **Learn the template features**
 - Special environments for algorithms, theorems
 - Citation formats and bibliography style

Prepare Your Manuscript

- **Follow the structure expected in your field**

- Typically: Abstract, Introduction, Related Work, Methods, Results, Discussion, Conclusion

- **Pay attention to formatting details**

- Figures: resolution, size, placement
- Tables: formatting, captions
- Equations: numbering, alignment

- **Adhere to length limits strictly**

- Page count, word count, or character limits
- Abstract length (often 150-250 words)

References and Citations

- **Follow the required citation style**
 - APA, IEEE, ACM, Chicago, etc.
- **Use reference management software**
 - Zotero, Mendeley, EndNote, BibTeX
- **Ensure all references are:**
 - Complete and accurate
 - Consistently formatted
 - Actually cited in the text
- **Check for missing or incorrect DOIs**

Final Checks Before Submission

- **Conduct thorough proofreading**
 - Spelling and grammar
 - Consistency in terminology
 - Figure and table numbering
- **Verify compliance with requirements**
 - Page limit (including references)
 - Anonymization (for double-blind review)
 - File size limitations
- **Ask colleagues for feedback**
 - Technical content review
 - Clarity and readability assessment

Submission Process

- **Create an account on the submission system**
 - Common systems: EasyChair, CMT, ScholarOne, Editorial Manager
 - Complete your profile information
- **Gather required metadata**
 - Title, abstract, keywords
 - Author information and affiliations
 - Research areas or topics (for reviewer matching)
- **Upload your files**
 - Main manuscript (PDF)
 - Supplementary materials (if allowed)
 - Cover letter (for journals)

Post-Submission

- **Confirmation of receipt**
 - Save confirmation email and submission ID
- **Track review progress**
 - Most systems allow you to check status
- **Prepare for revision**
 - Start thinking about potential improvements
 - Continue refining your work
- **Respond promptly to editor/chair communications**
 - Revisions, proof corrections, or clarification requests

Handling the Decision

■ Acceptance

- Prepare camera-ready version addressing reviewer comments
- Complete copyright transfer forms
- Register for conference (if applicable)

■ Revise and Resubmit

- Address ALL reviewer comments systematically
- Prepare a detailed response letter

■ Rejection

- Analyze reviews constructively
- Improve paper and consider alternative venues
- Don't give up!



Q&A

Questions?

Feel free to ask anything