CMSE 492 Final Project LaTeX Template - Usage Guide

Overview

This template uses the RevTeX 4.2 document class, which is a professional scientific document format commonly used in physics and computational science publications. It provides a clean, professional layout for your machine learning project report.

Getting Started with Overleaf

Method 1: Upload to Overleaf (Recommended)

1. Go to Overleaf
2. Create a free account using your MSU email (@msu.edu)
3. Click "New Project" → "Upload Project"
4. Upload the `CMSE_492_Project_Template.tex` file
5. Start editing!

Method 2: Start from Scratch on Overleaf

1. Create a new project on Overleaf
2. Copy and paste the contents of `CMSE_492_Project_Template.tex`
3. Make sure the compiler is set to "pdfLaTeX" (in the Menu)

How to Use This Template

DO NOT CHANGE:

- The document class: `\documentclass[aps,prl,preprint,groupedaddress]{revtex4-2}`
- The overall structure and section organization
- The required sections outlined in the project requirements

YOU SHOULD FILL IN:

1. **Document Header (Lines 35-42)**

   - Your project title
   - Your name
   - Your email
   - Date (or keep `\today` for automatic dating)

2. **Abstract (Lines 44-47)**

   - Write a 150-250 word summary of your project

3. **All Section Content**

   - Replace placeholder text with your actual content

- Follow the guidelines provided in each section

Adding Figures

```
\begin{figure}[H]
    \centering
    \includegraphics[width=0.8\linewidth]{figures/your_image.png}
    \caption{Your caption here.}
    \label{fig:your_label}
\end{figure}
```

Important:

- Upload your figures to a `figures/` folder in your Overleaf project
- Supported formats: PNG, PDF, JPG
- Reference figures in text using `Figure \ref{fig:your_label}`

Adding Tables

Tables are already formatted in the template. Example:

```
\begin{table}[H]
\centering
\caption{Your table caption.}
\label{tab:your_label}
\begin{tabular}{@{}lcc@{}}
\toprule
\textbf{Column 1} & \textbf{Column 2} & \textbf{Column 3} \\
\midrule
Row 1 & Data & Data \\
Row 2 & Data & Data \\
\bottomrule
\end{tabular}
\end{table}
```

Writing Mathematical Equations

Inline math: Use `$...$` for inline equations, e.g., `$y = mx + b$`

Display math: Use `\begin{equation}...\end{equation}` for numbered equations:

```
\begin{equation}
\mathcal{L}(\mathbf{w}) = \frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2
\label{eq:loss}
\end{equation}
```

Reference equations using `Equation \ref{eq:loss}`

Adding References

Option 1: Manual Bibliography (Simple) Add references in the `thebibliography` environment:

```
\begin{thebibliography}{99}
\bibitem{sklearn}
Scikit-learn developers,
``Scikit-learn: Machine Learning in Python,''
\url{https://scikit-learn.org}
\end{thebibliography}
```

Cite in text: `\cite{sklearn}`

Option 2: BibTeX (Advanced)

1. Create a `references.bib` file
2. Add entries in BibTeX format
3. Uncomment line 282: `\bibliography{references}`
4. Remove the manual bibliography section

Common LaTeX Commands

Text Formatting

- **Bold:** `\textbf{bold text}`
- *Italic:* `\textit{italic text}`
- Typewriter: `\texttt{code}`

Lists

Itemized:

```
\begin{itemize}
    \item First item
    \item Second item
\end{itemize}
```

Numbered:

```
\begin{enumerate}
    \item First item
    \item Second item
\end{enumerate}
```

Hyperlinks

- `\url{https://example.com}` - Creates a clickable URL
- `\href{https://example.com}{link text}` - Creates a hyperlink with custom text

Special Characters

- Percentage: `\%`
- Underscore: `\_`
- Dollar sign: `\$`
- Ampersand: `\&`

Compiling Your Document

On Overleaf

- Click the "Recompile" button (or it auto-compiles)
- View the PDF on the right side
- Download the PDF using the download icon

Troubleshooting

Common Errors

Error: "Undefined control sequence"

- Check for typos in LaTeX commands
- Make sure all packages are loaded

Error: "Missing $ inserted"

- You forgot to close math mode with `$`
- Check all your equations

Figures not showing up:

- Make sure the image file is uploaded to Overleaf
- Check the file path in `\includegraphics{...}`
- Make sure the file extension is correct

Table formatting issues:

- Each row must end with `\\`
- Columns are separated by `&`
- Number of `&` must match number of columns minus 1

Tips for Success

1. **Compile Early, Compile Often:** Don't wait until the end to compile your document
2. **Use Labels:** Label all figures, tables, and equations for easy referencing
3. **Comment Your Code:** Use `%` to add comments that won't appear in the PDF
4. **Keep It Organized:** Create folders for figures, data, etc.
5. **Save Versions:** Overleaf has version control - use it!

6. **Read the Error Log:** If compilation fails, read the error messages carefully

Resources

- Overleaf Documentation
- LaTeX Wikibook
- RevTeX Documentation
- Detexify - Draw symbols to find LaTeX commands
- Tables Generator - Visual table editor for LaTeX

Getting Help

If you encounter issues:

1. Check the Overleaf error log (bottom of the editor)
2. Search for your error message online
3. Ask during office hours
4. Post on the course discussion board

Submission

When you're ready to submit:

1. Download the final PDF from Overleaf
2. Submit to D2L as specified in the course requirements
3. Include your GitHub repository link in the report

Remember: The goal is to communicate your machine learning work clearly and professionally. Focus on the content and analysis - the template handles the formatting!