# VERBOSE: A Verbose Cheat Sheet and Reference for Beginners on using LaTeX

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**Abstract**

This is a LaTeX guide and reference for readers who already *have basic knowledge* about LaTeX and would like to deliver **higher quality** papers with **more efficient collaborations**.

*Remark: Compiled on March 7, 2025.*

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## 1 Introduction

What can you learn from this?

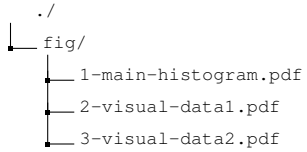
- Make the writing faster.
- Make collaboration more efficient.
- Make the paper a nicer look ⇒ Make readers happier.
- *Overleaf* is fragile before deadlines. Our laptops not.
- *Overleaf* hides details/errors for ease of use. However, it can not handle all errors, and we need to face them by yourself.
- Know what fancy things can be done in LaTeXand how to do it in the time-saving, error-free way.

And we should know:

- Writing in LaTeX **is** programming. Good coding styles and habits shall be followed.
- *Google/LLMs* are always there: Go for it if you get unfamiliar errors. *CTAN* (https://ctan.org/pkg/) has documents for all LaTeX packages.
- (Almost) every conference/journal has own templates. Follow them if there're conflicts with this document.

## 2 Files

1. Put contents into *different files* instead of a single file. Use `\input{xxx.tex}` to include other latex files.
2. **File Path**: To avoid potential path issues, put all `.tex` files in the root directory; Put figures in a separate directory (e.g., `./fig/`). Put tex files containing tables and figures in separate directories (e.g., `./figure/` and `./table/`, respectively).
3. **File Naming**: Keep the file name:
   (a) composed by meaningful prefix and words,
   (b) all in small characters,
   (c) connected by hyphen (-), and
   (d) has no space nor underscore (_).
4. For example, your file structure may be like:



```
├── ...
├── figure/
│   ├── 1-main-histogram.tex
│   ├── 2-visual-data1.tex
│   ├── 3-visual-data2.tex
│   └── ...
├── table/
│   ├── 1-main-table.tex
│   ├── 2-ablation-study.tex
│   └── ...
├── main.tex
├── main.bib
├── intro.tex
├── related.tex
├── method.tex
├── method-overall.tex
├── method-formulation.tex
├── method-coremodule.tex
├── exp.tex
└── ...
```

and in `main.tex` you may have something like: (use blank lines properly)

```
...

\section{Introduction}
\input{intro.tex}

\section{Related Work}
\input{related.tex}

\section{Methodology}
\input{method.tex}

...
```

and in `method.tex` you may have:

```
\input{method-overall.tex}

\subsection{Formulation}
\input{method-formulation.tex}

\section{The XXX Method}
\input{method-coremodule.tex}

...
```

# 3 Figures & Tables

## 3.1 Figures

A few examples: (You may skip these examples.)

- The most common single-column figure.

```
\begin{figure}[h!]
  \centering
  \includegraphics[width=.9\columnwidth]{fig/fig1.pdf}
  \caption{An example of a single-column figure.}
  \label{fig:single}
\end{figure}
```

- A two-column figure.

```
\begin{figure*}[t]
  \centering
  \includegraphics[width=.95\linewidth]{fig/fig1.pdf}
  \caption{An example of a two-column figure at top.}
  \label{fig:double}
\end{figure*}
```

- Multiple figures in a row (in two ways).

```
\begin{figure}[h!]
  \centering
  \begin{subfigure}[b]{0.39\columnwidth}
    \centering
    \includegraphics[width=.3\textwidth]{fig/fig1.pdf}
    \caption{Left.}
    \label{fig:subcaption-two-inner-left}
  \end{subfigure}
  \begin{subfigure}[b]{0.59\columnwidth}
    \centering
    \includegraphics[width=.5\textwidth]{fig/fig1.pdf}
    \caption{Right.}
    \label{fig:subcaption-two-inner-right}
  \end{subfigure}
  \caption{The outer caption of the two figures.}
  \label{fig:subcaption}
\end{figure}

\begin{figure}[h!]
  \centering
  \includegraphics[width=.12\columnwidth]{fig/fig1.pdf}
  \hspace{.1in}
  \includegraphics[width=.3\columnwidth]{fig/fig1.pdf}
  \hspace{.1in}
  \includegraphics[width=.12\columnwidth]{fig/fig1.pdf}
  \caption{Multiple figures without subcaption.}
  \label{fig:multiple}
\end{figure}
```

- Figures in a $4 \times 2$ grid.

```
\begin{figure}[h!]
  \centering
  \begin{subfigure}[b]{0.24\columnwidth}
    \centering
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}\\
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}
    \caption{LM.}
    \label{fig:grid-left-most}
  \end{subfigure}
  \begin{subfigure}[b]{0.24\columnwidth}
    \centering
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}\\
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}
    \caption{L.}
    \label{fig:grid-middle-left}
  \end{subfigure}
  \begin{subfigure}[b]{0.24\columnwidth}
    \centering
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}\\
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}
    \caption{R.}
    \label{fig:grid-middle-right}
  \end{subfigure}
  \begin{subfigure}[b]{0.24\columnwidth}
```

```
    \centering
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}\\
    \includegraphics[width=1\textwidth]{fig/fig1.pdf}
    \caption{RM.}
    \label{fig:grid-right-most}
  \end{subfigure}
  \caption{Multiple figures in grid.}
  \label{fig:grid}
\end{figure}
```

Figure 1: An example of a single-column figure.

1. **Separated Files**: Put each figure or a group of consecutive figures (that are expected to be placed together) into a separate `.tex` file. [1] It is suggested to name the tex file as `fig-xxx.tex` where `xxx` is the same as the figure file name, or put all these tex files into a folder named `./figure/`.
2. Before you put the figures in tex files:
   - **File Type**: Export your figures as **PDF** files with *font embedded*. No *.png* nor *.jpg*. Some journals require *.eps* for the camera ready, and you can convert PDF files into EPS files by the `pdftops` command.
   - Please **embed the fonts** in the figures. Serif typefaces are preferred. Double check the contents to be properly rescaled, capitalized, and with no typos.
   - Do **NOT** use `crop` in LaTeX. You can use the bash command `pdfcrop` (Installed with TeX) to remove margins or edit figures in Painter/PowerPoint.
3. **One/Two-Column**: For a two-column PDF, use `figure` to create a single-column figure (Figure 1), and use `figure*` to create a double-column figure (Figure 2). For a single-column PDF, use the two environments interchangeably.
4. **Position**: Use `h/t/b` to place the figure here/at page top/at page bottom. '`!`' enforces your option.
   - Notice how LaTeX places figures: It tries to firstly settle down all TeX codes before this figure. Then, it tries to fit this figure with the position command (`h/t/b`). If the figure can not be put on this page, it will be put on the next page **and** after/below all previous figures. Therefore, a figure often shows later than where you want; And you need to manually move ahead this figure's TeX code.
5. **Centering**: Always center your figures. Use `\centering` instead of `\begin{center}`. [2]
6. **Figure Size**: Use `[width=xx]` to set the figure width. Here, `xx` can be a fraction of `\columnwidth` (for single-column figures), `\textwidth`, and `\linewidth` (for double-column figures).
7. **Captions & Labels**:
   - The captions/subcaptions can either be a phrase, a sentences, or multiple sentences. A sentence-ending period is needed.
   - The captions are always under the figures.
   - If any texts or figure parts are not described, you should describe them in the caption.
   - For caption labels, refer to Section 4.2.
8. **Subplots**:
   - Use package `subcaption` if you want to use captions for subplots (Figures 3 and 5); For subplots without captions, simply use multiple `\includegraphics` (Figures 4 and 5).
   - Make sure the summed up width is less than 1 columnwidth/linewidth for single/double-column figures; Otherwise, the figures won't be on a single line.
   - You may adjust the spaces between figures by inserting `\hspace{}`. Please put them evenly.
9. **Warning**:
   - To suppress warnings on multiple page groups: include `\pdfsuppresswarningpagegroup=1`.

[1] Moving one line (`\input{xxx.tex}`) around is much easier and cleaner than moving a long scripts.

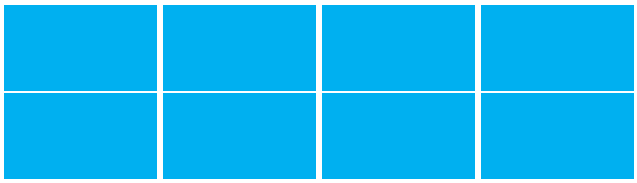
[2] The latter one brings undesired extra vertical spaces.

Figure 2: An example of a two-column figure at top.

(a) Left. (b) Right.

Figure 3: The outer caption of the two figures.

Figure 4: Multiple figures without subcaption.



(a) LM. (b) L. (c) R. (d) RM.

Figure 5: Multiple figures in grid.

### 3.2 Tables

A few examples: (You may skip these examples.)

- A (quite common) double-column table.

```
\begin{table*}[t]
  \centering
  \caption{A double-column table with several useful modules (multiple rows/columns, different lines, etc.)}
  %\resizebox{0.99\linewidth}{!}{
    \begin{tabular}{cl|cc|cc|ccc}
      \toprule
      \multicolumn{2}{c|}{\multirow{2}{*}{Multi-Row \& Multi-Column}} & \multicolumn{2}{c|}{Setting-1}
          & \multicolumn{2}{c|}{Setting-2} &  \multicolumn{3}{c}{Setting-3} \\
      & & Col-1-1 & Col-1-2 & Col-2-1 & Col-2-2 & Col-3-1 & Col-3-2 & Col-3-3 \\
      \midrule
      \multirow{4.5}{*}{Dataset-1} & Method~1 & 1.234 & 1.234 & 1.234 & 1.234 & 1.234 & 1.234 & 1.234 \\
      & Method~2 & 1.234 & 1.234 & -- & -- & 1.234 & 1.234 & 1.234 \\
      & The Strongest Baseline & 7.890 & 7.890 & 7.890 & 7.890 & 7.890 & 7.890 & 7.890 \\
      \cmidrule(lr){2-9}
      & \textbf{Ours} & \textbf{9.876} & \textbf{9.876} & \textbf{9.876} & \textbf{9.876}
          & \textbf{9.876} & \textbf{9.876} & \textbf{9.876} \\
      \cmidrule{1-9}
      \multirow{2.5}{*}{Dataset-2} & A Weak Baseline & 1.234 & 1.234 & 1.234 & 1.234
          & 1.234 & 1.234 & 1.234 \\
      \cmidrule(lr){2-9}
      & \textbf{Ours} & \textbf{9.876} & \textbf{9.876} & \textbf{9.876} & \textbf{9.876}
          & \textbf{9.876} & \textbf{9.876} & \textbf{9.876} \\
      \bottomrule
    \end{tabular}
  %}
  \label{tab:double}
\end{table*}
```

- A single-column table.

```
\begin{table}[h]
  \centering
  \caption{A single-column table with more components.}
  \resizebox{0.97\columnwidth}{!}{
    \begin{tabular}{ccc|c|l|r}
      \toprule
      S1 & S2 & S3 & Value & Comment & Another Column \\
      \midrule
      -- & -- & $\checkmark$ & 1.23E4 & This is a comment. & A comment. \\
      \cmidrule(lr){1-6}
      -- & $\checkmark$ & $\checkmark$ & 1.23E4 & \makecell[cl]{This is a longer \\ text with two lines.}
          & Right-aligned texts. \\
      \bottomrule
    \end{tabular}
  }
  \label{tab:single}
\end{table}
```

Table 1: A double-column table with several useful modules (multiple rows/columns, different lines, etc.)

| Multi-Row & Multi-Column | | Setting-1 | | Setting-2 | | Setting-3 | | |
|---|---|---|---|---|---|---|---|---|
| | | Col-1-1 | Col-1-2 | Col-2-1 | Col-2-2 | Col-3-1 | Col-3-2 | Col-3-3 |
| Dataset-1 | Method 1 | 1.234 | 1.234 | 1.234 | 1.234 | 1.234 | 1.234 | 1.234 |
| | Method 2 | 1.234 | 1.234 | – | – | 1.234 | 1.234 | 1.234 |
| | The Strongest Baseline | 7.890 | 7.890 | 7.890 | 7.890 | 7.890 | 7.890 | 7.890 |
| | **Ours** | **9.876** | **9.876** | **9.876** | **9.876** | **9.876** | **9.876** | **9.876** |
| Dataset-2 | A Weak Baseline | 1.234 | 1.234 | 1.234 | 1.234 | 1.234 | 1.234 | 1.234 |
| | **Ours** | **9.876** | **9.876** | **9.876** | **9.876** | **9.876** | **9.876** | **9.876** |

Table 2: A single-column table with more components.

| S1 | S2 | S3 | Value | Comment | Another Column |
|---|---|---|---|---|---|
| – | – | ✓ | 1.23E4 | This is a comment. | A comment. |
| – | ✓ | ✓ | 1.23E4 | This is a longer text with two lines. | Right-aligned texts. |

1. **Separated Files**: Put each table or a group of consecutive tables (that are expected to be placed together) into a separate `.tex` file. Name the tex file as `tab-xxx.tex`, or put all these tex files into a folder named `./table/`.
2. **One/Two-Column**: For a two-column PDF, use `table` to create a single-column figure (Table 2), and use `table*` to create a double-column table (Table 1). For a single-column PDF, use the two environments interchangeably.
3. **Position**: Same as figures.
4. **Centering**: Same as figures.
5. **Table Size**:
   - Use `\resizebox{xx}{!}{...}`, to set the table width. Here, `xx` can be a fraction of `\columnwidth` (for single-column tables), `\textwidth`, and `\linewidth` (for double-column figures).
   - Following common practice, adjust the table size to make the table font size *slightly smaller* than the main text. Not too small nor too large.
   - Always keep the `\resizebox` lines in your TeX file; If you do not want to adjust the table size, simply comment it out rather than deleting it.
   - To make tables in multiple pages, use the package `longtable`.
     - Use `\\*` to enforce (mid/cmid/top/bottom-) rules not being pushed to the next page.
6. **Captions & Labels**:
   - The captions/subcaptions can either be a phrase, a sentences, or multiple sentences. A sentence-ending period is needed.
   - The captions are usually above the tables. Some venues require captions being below the tables. Please stick to the venues' provided templates.
   - If any texts or figure parts are not described, you should describe them in the caption.
   - For caption labels, refer to Section 4.2.
7. **Alignment**: For each column, use `l/c/r` to left/center/right-align the contents.
8. **Multiple Columns/Rows**:
   - `\multicolumn{x}{y}{...}`: For cells with $> 1$ columns. The parameters are:
     - `x`: # of columns;
     - `y`: alignment (`l/c/r`) and vertical lines.
   - `\multirow{x}{y}{...}`: For cells with $> 1$ rows. The parameters are:
     - `x`: # of rows (can be non-integer);
     - `y`: width (by default '`*`').
   - For cells with both $> 1$ columns and $> 1$ rows: Use nested `\multicolumn` and `\multirow`.
   - `\makecell[xy]{...}`: For multilined cells. The parameters are:
     - `x`: vertical alignment (`t/c/b`);
     - `y`: horizontal alignment (`l/c/r`).
9. **Horizontal Lines (Rules)**: For examples, see Table 1.
   - Use rules from the `booktabs` package rather than lines: `\toprule`, `\midrule`, `\bottomrule`, and `\cmidrule`.
   - Put one and only one `\toprule`/`\bottomrule` at the very top/bottom of the table. They are thicker solid lines and properly aligned.
   - Use one `\midrule` to separate the header and the body. It is thinner than the top/bottom rules.
   - Use `\cmidrule{x-y}` to separate different settings (blocks of lines). This line starts from `x`-th column and ends at `y`-th column.
   - Use `\cmidrule(lr){x-y}` to separate our method and the others. Only used if necessary. `lr` means the line trims in the left/right.
10. **Vertical Lines**: '`|`'. Use it seldomly. `\multicolumn` overrides the table-level vertical lines for the spanned columns, so you need to add the vertical line argument in it. See Table 1 as an example.
11. **Texts and Numbers**:
    - Make sure numbers (for the same metric) have the same number of decimal places.

- Put numbers in text mode, and use `\textbf` and `\textit` to emphasize. Otherwise, if you would like to put number is math mode (within `$...$`), use `\mathbf` and `\mathit` to emphasize. Make sure your choice is consistent. The former one is preferred.

# 4 Citations & References

## 4.1 Citations (`\cite`)

1. If the `natbib` package is used (which is common for most conferences), please take care of `\citet{}` and `\citep{}`: Use `\citet{}` if the citation itself is a component of the sentence (e.g., subject or object); otherwise use `\citep{}`, with '`~`' to connect it and the word before it. For example:

```
Unlike \citet{radford:2018}, which uses
unidirectional language models for pre-training,
BERT uses masked language models to enable
pre-trained deep bidirectional representations.

ELMo advances the state of the art for several
major NLP benchmarks~\citep{peters:2018}
including question answering~\citep{raj-etal:2016},
sentiment analysis~\citep{socher-etal:2013:_recur},
and named entity recognition~\citep{tjong-de:2003}.
```

Unlike Radford et al. [3], which uses unidirectional language models for pre-training, BERT uses masked language models to enable pre-trained deep bidirectional representations.

ELMo advances the state of the art for several major NLP benchmarks [2] including question answering [4], sentiment analysis [6], and named entity recognition [5].

2. If you have multiple citations at the same place, order them chronologically; and do *not* put space between them. For example:

```
Language model pre-training has been shown to be
effective for many natural language processing
tasks~\cite{dai:2015,peters:2018,radford:2018}.
```

Language model pre-training has been shown to be effective for many natural language processing tasks [1, 2, 3].

3. Avoid citing arXiv versions, and try using proceeding (conference/workshop/journal/or even tech report) version. If https://scholar.google.com does not have non-arXiv `bibtex`, try https://dblp.org.

## 4.2 References (`\ref`)

1. For **label**: Use `\label{type:name-in-smallcase}`. `type` can be `fig/tab/alg/eq/sec/thm` for figures/tables/algorithms/equations/(sub)sections/theorems.
2. For **ref**: For equations, use `\eqref{·}`. For others, use `\ref{·}`.
3. You can use either full names or abbreviations, but be consistent in the same label type. For example:

```
Figure~\ref{fig:double} shows a double-column figure,
and Figure~\ref{fig:single} shows a single-column figure.

Figures~\ref{fig:grid-left-most},
\ref{fig:grid-middle-left}, \ref{fig:grid-middle-right},
and~\ref{fig:grid-right-most} are the four subfigures.

In Section~\ref{sec:citeref}, there are two subsections:
Sections~\ref{sec:citations} and~\ref{sec:references}.
```

Figure 2 shows a double-column figure, and Figure 1 shows a single-column figure.

Figures 5a, 5b, 5c, and 5d are the four subfigures.

In Section 4, there are two subsections: Sections 4.1 and 4.2.

Or:

```
Fig.\ref{fig:double} shows a double-column figure,
and Fig.\ref{fig:single} shows a single-column figure.

Figs.\ref{fig:grid-left-most},
\ref{fig:grid-middle-left}, \ref{fig:grid-middle-right},
and~\ref{fig:grid-right-most} are the four subfigures.

In Sec.\ref{sec:citeref}, there are two subsections:
Secs.\ref{sec:citations} and~\ref{sec:references}.
```

Fig.2 shows a double-column figure, and Fig.1 shows a single-column figure.

Figs.5a, 5b, 5c, and 5d are the four subfigures.

In Sec.4, there are two subsections: Secs.4.1 and 4.2.

## 4.3 Cross-Referencing among Different Files

1. Use package `xr` and `hyperref`.
2. Include `\externaldocument[xxx]{yyy}`.
   - `xxx`: Prefix.
   - `yyy`: File name.

# 5 Spacing

1. **Vertical Spacing**: Adjusting vertical spacing is quite important, as you will often have page limit issues. Try not explicitly adjusting vertical spacing by, e.g., `vspace` and `vskip`, because it makes the PDF ugly and is difficult to track/control. Instead, you may try:
   - Reduce figure sizes and table sizes.
   - Change the position and layout of figures and tables.
   - Rephrase your texts, especially for paragraphs with a short last line. Then, you can save one line by removing/replacing several words/phrases.
   - Break multi-line math environments into smaller pieces, or manually set the new line/new page for them.
   - Iteratively try the above operations.
2. **Horizontal Spacing**: Here are some use cases.
   - For *Subfigures*: Use `\hspace{xx}` to evenly place several figures.
   - In *Equations*: Use '`\`', '`\quad`', and '`\qquad`' for small, medium, and large horizontal spaces, respectively.
3. **Space between Words**: Often ignored but important.
   - For citation and reference, use '`~`' to connect it and the word before it. See Section 4 for more details.

- For abbrivations/explanations within parentheses, use '~' to connect it and the phrase before it. For example:

```
Convolutional Neural Networks~(CNNs) are networks
composed by a stack of convolution~(CONV) layers.
```

Convolutional Neural Networks (CNNs) are networks composed by a stack of convolution (CONV) layers.

- Why using '~' instead of a simple space? It ('~') leaves space between the two words and ensures the link break is not between the two words.

4. **New Line/Page**:
   - Avoid to use '\\' for a new line in main text. (In tables/equations, it is fine.)
   - Use `\newpage` for a new column (in double-column papers), and `\clearpage` for a new page.
     - When drafting, put `\clearpage` before the reference section, and put `\newpage` between an incomplete section and its following section. It helps you better estimate the paper length and place the (tables/figures) contents.

## 6 Commands

Use a single file (e.g., `macro.tex`) for all user-defined common commands. Keep and expand this file towards your Swiss Army Knife. Here I summarize a few useful tips.

**For full details please refer to** `macro.tex`.

- Put `\input{macro.tex}` in the main tex file, after all packages and commands provided by conference/journal template and before `\begin{document}`.
- What we should put in the `macro.tex` file (in the following orders):
  1. *Packages* to be used.
  2. *General commands* for all papers. E.g., math, format, editing, and rebuttal. They're rarely modified.
  3. *Special commands* for this paper only: definitions of terms/abbrivations, shortcuts for frequently-used math variables, hacks of length/margin settings, etc.
- **Packages**:
  - To use new packages:

```
\usepackage[OPTIONS]{PACKAGENAME}
```

  - Make sure the used packages are allowed by the conference/journal template.
- **Commands**:
  - To define new commands:

```
\newcommand{\COMMANDNAME}[NUMBER]{DEFINITION}
\renewcommand{\COMMANDNAME}[NUMBER]{DEFINITION}
\def\COMMANDNAME{DEFINITION}    % Less used.
```

    * Use `\newcommand` for new commands, and `\newcommand` for overriding existing commands.
    * `NUMBER` is the number of parameters for the command (default value: 0).
    * Use '#$x$' for $x$-th parameter in the definition.
    * Use new commands for model names, module names, etc. Thus, you only need to change it once in the command definition, without seeking it at all places (slow and error-prone). See the example below.

```
We propose a novel model, named {\ourslong}~(\ours),
which, however, sounds boring and performs poorly.
```

We propose a novel model, named You Only Look Once and One Thousand Times (YOLOv1001), which, however, sounds boring and performs poorly.

    * When using the command in texts, a pair of bracket is needed, so that a proper space is inserted. Otherwise, `\xspace` can be used. See the examples below.

```
The use of \ours is wrong. That of {\ours} is right.
The use of \oursx is easy but risky.
```

The use of YOLOv1001is wrong. That of YOLOv1001 is right. The use of YOLOv1001 is easy but risky.

- Commands for editing and commenting: E.g., `\todo` for mild reminders and `\TODO` for **![Critical Issues]**. Also, define personal comment command for each collaborator (with different colors), e.g., `\zc` for me.
- Command for the 3rd level headline: While `\section` and `\subsection` are used for the top-2 level headlines, three variations of `\para` are provided for the 3rd level headline. You can switch among them to get different (wide/compact) spacing. To see the differences:

---

**Caption by Subsubsection** This is formal and takes a lot of space.

**Caption by Paragraph** This is commonly used.

**Caption by Textbf.** This is the most compact one.

---

- Commands for rebuttal: Some conferences require a single-page PDF for rebuttal; Use `\question` to refer to the reviewer's question.

```
\question{R1Q2}{important baseline xxx} We
compared it, and new results are ...
```

**R1Q2:** *important baseline xxx.* We compared it, and new results are ...

- Commands for revision: use `\dif` to mark the updates differences/updates of the revision compared to the original manuscript. Useful for journal resubmissions.

## 7 Math

- Use max, min, arg max, tanh, exp; Not $max$, $min$, $argmax$, $tanh$, $exp$. (I.e., `\op` rather than `op`)
- For loss: $\mathcal{L} = \lambda_1 \ell_1 + \lambda_2 \ell_2$.
- Use `\left` and `\right` for parentheses properly:

```
T = F\left( H(x) + y^2 \right)
```

$$T = F\left(H(x) + y^2\right) \tag{1}$$

and here is a wrong example:

```
T = F(H(x) + y^2)
```

$$T = F(H(x) + y^2) \tag{2}$$

- Distinguish variables/functions (use math fonts) and texts (use text fonts) in equations[2]. For example:

```
v_{\text{enc}} = \sum_{i, j} F( W_{i, j}, i \cdot j)
```

$$v_{\text{enc}} = \sum_{i,j} F(W_{i,j}, i \cdot j) \tag{3}$$

- Make sure equations are aligned ('&') before/after the equal signs; Use `\nonumber` for no-numbered equations. See the example below:

```
\vct{a}_{i}^{m} & = \mat{W}_{3} \tanh \left(\mat{W}_{1}
\vct{h} + {\mat{W}_{2}}\T \mat{M}_{i}^{k} \right) \\
\hat{\vct{a}}^{m} & = \text{softmax} \left( \vct{a}^{m}
\right) \nonumber
```

$$\begin{aligned} \boldsymbol{a}_i^m &= \boldsymbol{W}_3 \tanh\left(\boldsymbol{W}_1 \boldsymbol{h} + \boldsymbol{W}_2{}^\top \boldsymbol{M}_i^k\right) \\ \hat{\boldsymbol{a}}^m &= \text{softmax}\left(\boldsymbol{a}^m\right) \end{aligned} \tag{4}$$

*Remark: This section is expected to expand, if necessary.*

# 8 Grammar

1. **Tense**: In general and to make it simple:
   - Use the simple past tense in experiments (what you did and what the model did) and related work (what others did); Use the simple present tense for discussions, model descriptions, known facts, etc.
   - If you're not sure, keep it simple (the simple present tense).
2. **Abbreviation**:
   - For an abbreviation, introduce it at its first occurrence in the paper. Be careful about plurals. See the example in Sec 5.
3. **Oxford Comma**[3]: When listing $\geq 2$ items, use the Oxford comma (a comma before *and* and *or*) for clarity.

# 9 Writing Together

1. Do **NOT** sync cache and produced files. You can refer to `.gitignore` for more details. To list a few:
   (a) Do not sync your produced PDF file, e.g., `main.pdf` or `supp.pdf`. You can, however, back up files by renaming it or using git.
   (b) Do not sync the temporary files, e.g., `.*(buzy)` or `~$*.docx/.xlsx/.pptx` (office temporary files).
   (c) Regularly clean and not sync the intermediate produced files, e.g., `.aux/.bbl/.blg`. Refer to `clean.bat`. This may help if you have failed in compiling the tex files.
2. Put each sentence in one line in `.tex` file, so that others can modify the content easily.
3. Comment out unused contents and do not delete them, as they may be reused later. However, for your arXiv submission or other submissions with tex files, do remove all comments.

# 10 Misc

1. For an arXiv submission: include `\pdfoutput=1` at the beginning of the main tex file.

[2] See https://www.linkedin.com/pulse/when-italicize-math-expression-hamed-keramati/ for more details.

[3] See https://en.wikipedia.org/wiki/Serial_comma.

## References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