Paper Writing Checklist

Prepared by Zheng Zhang (zhengzhang@ece.ucsb.edu), UCSB.

First version, July 22, 2020

Items	Requirement & Suggestions
Paper Organization	☐ Consider discussing with your supervisor and groupmates about paper structure before you start writing, if you don't have much paper writing experience. ☐ Use a short paragraph to summarize the key idea at the beginning of each section; ☐ Use one sentence at the beginning of a paragraph to summarize the key idea; or use a sentence to point to the main issue that you will discuss. ☐ Make the story line of each section/subsection super clear. Consider itemizing different steps or cases.
Paper title, section title and subsection title	☐ Use upper case for the first letter of each word, unless that word is a preposition and in the middle of a sentence, e.g., "Section 2.1: Tensor Methods for Machine Learning".
Sentences	☐ Avoid using long sentences. Consider breaking a long sentence into a few short sentences.
Notations	☐ Use the same notation for the same variable in the whole paper; ☐ Make the notations easily distinguishable. Example, do not use "a" and "\hat{a}" for two very different variables.
Formal writing	Technical writing should be verbal and precise. Therefore: ☐ Do not use "can't", "isn't", "don't", "doesn't". Use "cannot", "is not", "do not", and "does not" instead; ☐ Do not use "but" at the beginning of a sentence. Use "however", "nevertheless". ☐ Do not use "so" in the middle or beginning of a sentence. Use formal words like "therefore" at the middle or beginning. Use "consequently" in the beginning. OK to use "thus" in the middle of a sentence.
Acronyms	Avoid acronyms unless you have limited page space, such as: ☐ You will exceed the page limitation after trying deleting all unnecessary contents; ☐ You need to use acronyms in a table or figure. In this case, please define/explain the acronyms at a place nearby (e.g., in the caption)
Equations	An equation is often part of a sentence. Please note the following: ☐ If an equation is in the middle of a sentence, you may need to add "," at the end of the equation; ☐ If an equation is at the end of a sentence, you need to add "." at the end of the equation; ☐ Please make the equation span two columns if the equation is too long per line.
Figures	Position of figures: ☐ Place figures at the top of a page; ☐ Place figures in the center (use \centering command); ☐ Make the figure span two columns if necessary (e.g. when you have 3 or more sub-figures in a row) Lines/curves in a figure: ☐ Use strongest contrast in figures: lines with and without markers> lines with different line styles > lines with different colors. If you use colors, choose colors with strong contrast (e.g., black+ red + blue) ☐ Use proper line width

	Text/legend of a figure: ☐ Make the text size and style close to that of body texts; ☐ Choose proper text sizes for x/y/z axis. Figure size and spacing: ☐ Tune the figure margin (top/down/left/right), make sure that the space at the margin is fully utilized. Given the same space in the paper, we should make the figure content as visible as possible; ☐ Tune the spacing of sub-figures, such that they are not too crowded, and that they have equal spacing; Captions: ☐ Explain the figure and sub-figures precisely and briefly. ☐ Make sure that the readers understand the key ideas.
Tables	Position of tables: ☐ Place tables at top and center; Contents: ☐ OK to use acronyms in tables, but define them in the body texts; ☐ Please indicate previous methods by citations ☐ Indicate your own method by "proposed" ☐ Consider highlighting your result with bold fonts.
Algorithm flow	☐ Use an algorithm flow to formally & precisely describe your method; ☐ List the input and output of the pseudo codes; ☐ List every step, and refer to the equation associated with every step.
References to tables, figures, equations and algorithm flows	References to Figures and Tables: ☐ All tables and figures should be referenced in the body text; ☐ There should be a space between "Fig.", "Table" and the number. Example: Fig.3 → Fig. 3; Fig. 3(a) → Fig. 3 (a). ☐ Different tables and figures should NOT have the same label in latex; References to Equations: ☐ Different equations should have different labels; ☐ When you refer to an equation, the number should be included in a bracket. Example: Eq. 3 → Eq. (3) (use \eqref in latex). Upper-case letter: ☐ No matter if you are referring to a section/subsection, table, figure, equation or algorithm flow, the first letter should be upper case. Example: section II→ Section II.
Bibliography or references	☐ Use {} to show upper-case letters in the bibtex file. Example: title "Markov-chain Monte Carlo" may appear as "Markov-chain monte carlo" after compiling. You need to use "{Markov}-chain {Monte Carlo}" in the bibtex file; ☐ Delete unnecessary information in the bibtex file, which sometimes happens when you copy the bib item from google scholar; ☐ If you want to save some page space, consider shortening the journal/Conference name. Example: IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems → IEEE Trans. CAD Integr. Circuits Syst., SIAM Journal of Scientific Computing → SIAM J. Sci. Computing.
Spelling and grammar	☐ Do spelling check carefully throughout the whole paper; ☐ Check grammar carefully, and fix any grammatical error ☐ A countable noun should start with "a/an" or "the" or in the complex form. Example: A tensor is a generalization of a matrix. Tensors are a generalization of matrices. Some tensors have a low-rank property. The low-rank decomposition of a tensor.

Recommendations/Requirement about Font Types of Variables

It is very helpful to make notations consistent among different papers. This will help you to combine all of your work as a dissertation or a single job presentation. It will also help the group to prepare grant proposals and project review reports.

Therefore, I suggest to define the following font types at the beginning of the main latex file:

```
\DeclareMathAlphabet\mathbfcal{OMS}{cmsy}{b}{n}
\newcommand{\ten}[1]{\mathbfcal{#1}}
\newcommand{\mat}[1]{\mathbf{#1}}
```

☐ Then, we can use the following font types for variables:

- use x to denote a scalar;
- \mat{x} to denote a vector;
- \mat{X} to denote a matrix;
- \ten{X} to denote a tensor.
- x_{i_1 i_2 \cdots i_d} to denote one element in a tensor.

☐ If we use symbols (e.g., \xi or \lambda) to denote a scalar (e.g., a random variable), then we can use \boldsymbol instead of \mat to enforce a bold font type. Example

- \boldsymbol{\xi} describes a random vector in uncertainty quantification.
- \xi_k just describes the k-th scalar element of vector \boldsymbol{\xi}.