English Technical Writing Tips

The Electronic Design Automation Lab

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1. **Always use Google to check an uncertain usage!!**

2. **Mathematical expressions are also a part of the context.** Thus, punctuation marks are needed for all expressions! See Knuth's books (e.g., Concrete Mathematics) on how to write expressions in your papers.

3. **Carefully read my universal switch modules paper in TODAES first before starting to write your paper.**

   Check:

   1. How to organize your paper

   2. How to define a terminology

   3. How to explain a term with/in a figure (see the pointers in the figures)

   4. How to use a figure to explain your ideas

   5. How to write a formal definition, a lemma, and a theorem

   6. Always give layout snapshots for a PD paper

   7. Keep a consistent style for your references and check each citation carefully

   8. Check your paper WORD by WORD, presuming that you would commit some mistake in every word (otherwise, you won't find your mistakes). Many (well, almost all) of you told me that you have checked your paper many times, but why it is so easy for me to spot mistakes. Why? I am sure that you didn't check WORD BY WORD, or you just felt comfortable with what you wrote. Then, it is simply not effective to spot those mistakes.

4. **Always give a brief introduction to the content/organization of a section before jumping into the subsections.** Just like opening remarks.

5. **Try to make each figure self-contained with captions and highlighted words in the figure.**

6. **Try NOT to use 'it', "this", "them", etc. to avoid ambiguity.** Instead, include the nouns and use "this macro", "their methods", etc.

7. **Always construct a table for all terminologies used and use the same type of symbols for similar terms.**

   For example, all sets should be in upper-case letters, like A, B, and C, all parameters should be in lower-case Greek letters, all function names should be upper-case Greek letters, etc.

   Keep the terminology table to avoid conflict of symbols and maintain consistency; remove the table only after you are done with writing.

8. **Two usages: "as follows" or "in the following", but definitely NOT "as following".**

9. **"thus", "therefore", "hence", "nevertheless", "however", etc. are adverbs and thus cannot be used as conjunctions ("and", "or", etc.)**

   Wrong: the approach could close the gap between the placement of macros and standard cells, thus is expected to achieve better placement results.

   Correct: the approach could close the gap between the placement of macros and standard cells, and is thus expected to achieve better placement results.

10. **Always use authors' last names plus the publication year to refer to a paper in latex.** By doing so, it is much easier to order the cited papers by just looking at the "referenced names" in your .tex file. You may even use multiple last names if there is a tie.

    *** Good examples:

    \bibitem{**Khatkgate04:fengshui**}

    A.~Khatkhate, C.~Li, A.~R. Agnihotri, M.~C. Yildiz, S.~Ono, C.-K. Koh, and P.~H. Madden.

    \newblock Recursive bisection based mixed block placement.

    \newblock In {\ em Proc.~of ISPD }, pages 84--89, 2004.

    \bibitem{**Li04:WSA**}

    C.~Li, M.~Xie, C.-K. Koh, J.~Cong, and P.~H. Madden.

    \newblock Routability-driven placement and white space allocation.

    \newblock In {\ em Proc.~of ICCAD }, pages 394--401, 2004.

    *** Bad examples:

    \bibitem{EETimes:HardMacro}

    E.~Wein and J.~Benkoski.

    \newblock Hard macros will revolutionize \mbox{SoC} design.

    \newblock {\ em EE Times Online }, August, 2004.

    \bibitem{Jackey08:Defer}

    J.~Z. Yan and C.~ Chu .

    \newblock \mbox{DeFer}: Deferred decision macking enabled fixed-outline floorplanner.

    \newblock In {\ em Proc.~of DAC }, pages 161--166, 2008.

11. **Always try to explain the notations with examples/figures right after using them.**

12. **"That" cannot be omitted for sentence patterns containing adjective clauses.**

    Incorrect: The experiments show our algorithm is effective.

    Correct: The experiments show that our algorithm is effective.

    Incorrect: The inequality makes sure the flows will not exceed the diagonal capacities.

    Correct: The inequality makes sure that the flows will not exceed the diagonal capacities.

13. **Try to use parallel sentences/enumerations.**

Unparallel enumerations:

The global routing consists of the following four steps: (1) tile partitioning, (2) tile merging, (3) flow network construction, and (4) minimum-cost flow problem.

Revised example:

The global routing consists of the following four steps: (1) tile partitioning, (2) tile merging, (3) flow-network construction, and (4) minimum-cost-flow solving.

Unclear original writing:

The global routing… In the tile partitioning, we... Then, in the tile merging, we… In the flow network construction, we … After that, we solve the minimum-cost flow problem…

14. **Always define an unconventional term before using it.**

Exp. 1: the number of openings on each boundary is less than or equal to one

Question: What is "opening"?

Exp. 2: k1 overwhelms k2…

Question: What does it mean?

15. **Always give an example for a "non-trivial" definition to improve the readability.**

Exp. 1:

\begin{Definition}

The centrality of a vertex v, denoted by $\Theta(v)$, is defined as

\[\Theta(v) = \sum_{j=1}^{\alpha} \frac{1}{j} \times m_j, \]

\end{Definition}

where α is a user-specified parameter, and m_j is the number of vertices, each passing through at least j edges to reach v.

Comment: Give an example of the $\Theta(v)$ value by using an existing figure!!!

Exp 2:

\begin{Definition}

The cost of an edge e, denoted by $\Phi(e)$, is defined as

\[\Phi(e) = (\Theta(v_1) + \Theta(v_2))^{-1}, \]

\end{Definition}

where v_1 and v_2 are the two endpoints of e.

Comment: Give an example of the$\Phi(e)$ value by using an existing figure!!!

16. **Always keep yourself updated for related new publications.** For the ICCAD'10 submission, for example, check for any new related papers published at ISPD'10, DATE'10, TCAD,

TODAES, TVLSI, TC, Integration, etc?? If so, cite it (them) and even compare with it (them)!!

17. **Pay attention to verb tenses.** The results are summary as follows. => The results are summarized as follows.

18. **Check the references carefully!** In .bib files, put upper-case letters/terms like CBL, TCG-S, MP-tree, etc. in {} to make them display correctly (they will become lower-case Letters/terms, otherwise).

19. **Always check the .log file to see if there are any error/warning messages and run spell check.**

    An example of warning messages in the .log file. Note that errors of this kind are just not forgivable, as they can be simply checked with the .log file after the latex compilation.

    LaTeX Warning: Label `const:drx' multiply defined.

    LaTeX Warning: Label `const:drx' multiply defined.

    LaTeX Warning: There were multiply-defined labels.

20. **Basic grammar with multiple items:**

    Line 11- -15 in Algorithm … should be "Lines" 11— 15 in Algorithm…

    Method 1 and 2… should be *Methods* 1 and 2…

21. **Always name the references based on all authors' last names.**

    "the free-assignment (FA for short) routing problem [7], [6], [1], [2], [10], [11]"

    the citations should be ordered with increasing numbers, i.e.,"[1], [2], [6], [7], [10], [11]." If the first last names are the same, then we should order the references based on their 2nd last names, etc.

    Tip: in your latex file, always name your references based on all authors' last names. For example, if the authors are "Chen and Chang" (published in 2005), you might want to name the reference something like "ChenChang 2005" .   In this way, you will definitely know the right order while working on your latex file.

    I often see some people name the references based on the paper contents, like "Clock 05". I personally don't think it is a right way, as you don't have any ordering info for citing multiple references.

22. **Collective nouns like most - singular or plural?**

    See the explanations from Jamie Nelson of ManhattanGMAT Instructor:

    There are two rules:

    1) Collective nouns are almost always singular.

    2) "Most" falls into the category of the 5 indefinite pronouns that can be either singular or plural depending on the context. These 5 pronouns, referred to by the acronym SANAM, are:

    S- Some

    A - Any

N - None

A - All

M - More/Most

To determine whether its singular or plural, we have to check the noun object of the Of-prepositional phrase, which in this case is audience.

So, according to that rule, a singular verb must follow audience. e.g., "Most of the audience has left." "Most of the audience claps her/his hands."

23. Always justify the soundness of your assumptions (and justify them right after you make the assumptions).

24. Always give the *significance* of your step/method, instead of just describing your step/method.

Everybody can write a long statement on his/her own method, but reviewers only care about the *significance* of his/her method.

(X) Poor/meaningless claim in "Our Contribution": "We address the problem of length-ratio-matching routing in capacitor arrays." (This is not a contribution!! Every paper certainly works on a specific topic!!)

(O) Better claim: "This paper presents the first work to address the problem of length-ratio-matching routing in capacitor arrays."

(X) Another poor example for "Our Contribution": "We propose a coupling-aware length-ratio-matching routing algorithm for the addressed problem." Are your ideas smart???

25. Please pay attention to the differences between "in contrast" and "on the contrary" and between "as a result (consequently)" and "therefore (thus)".

26: desired vs. desirable

A good example from internet:

If you want to go up in the elevator, it is **desirable** to push the button. To reach the **desired** floor, you push the button.

"desired" in this context means that it is the floor that you *wish to* go to. "Desirable" in this context

means something that is recommendable or advisable.

When the elevator arrives, step inside and press the button for the desired ~~or desirable~~ floor.

That ice cream is so desirable. (we yearn for it.)
The lawyer said that the desired (preferred) side in the courtroom was the left one, the one farthest from the jury.

27: article (冠詞)

From 華樂絲論文編修／翻譯的資深編修師 Vincent Katona。

冠詞「a」、「an」、和「the」看來是些微不足道的字，然而，對學術論文的品質而言，正確使用冠詞卻是相當重要的一環。冠詞能使其修飾的名詞更加明確。由於明確性為學術寫作的核心概念，了解在什麼情況下使用不定冠詞、定冠詞或省去冠詞就顯得更加重要了。

與英語的其他層面相似，文法規則決定了不定冠詞的正確使用方式。所有可屬單數名詞皆須接一個冠詞：「a」先行於首字母為子音的單字，「an」先行於首字母為母音的單字。但也有些例外，因為此項規則事實上取決於名詞在口語發音上的首音節。正確的不定冠詞使用方式如：「A uniform distribution」、「an hour」。因為「uniform，發音為 yoo-ni-form」的開頭是子音，「hour」中的「h」不需發音，因此「hour」開頭是母音。

不同於不定冠詞，定冠詞的使用方式缺乏明確定義。定冠詞用於修飾對作者及讀者而言特定或已知的名詞。此規則之所以模糊不清乃由於名詞是「特定」或「非特定」幾乎完全取決於作者的判斷。學術寫作系統性且公式化的風格將能解決這樣的不確定性。

以論文中的研究方法章節為例，假如是第一次出現的名詞，若是單數則需要不定冠詞修飾：「A class of psychology students was selected as the experimental group」。第二次出現之後，無論是單數或複數，該名詞必須由定冠詞修飾：「The class was observed for two weeks. The students were 18-22 years of age」。

冠詞的選用其實有跡可循，也是英語其中一個寶貴層面。一篇論文中，定冠詞說明了與被修飾名詞相連結的資訊，舉例來說，「The psychology students 18-22 years of age in the class that was observed for two weeks as part of an experimental group」，可藉由定冠詞濃縮為「the students」。定冠詞讓學術作者傳達高度具體、詳細的資訊，且不必使用冗長、讓人困惑的句型。

在某些情況，用冠詞修飾名詞是不正確的選擇。學科及語言是不可用冠詞修飾的，但是當語言或學科用以修飾其他名詞，這時就必須用冠詞修飾。「The students scored highly in mathematics and Japanese, but did not perform well on the biology test」，此範例展示了適當的冠詞

使用方式。

　　另外，當兩個名詞皆需要定冠詞加以修飾時，當名詞合併時，可省略後面的冠詞。舉例來說，「both the taste and the smell」可以更精簡地表示為「both the taste and smell」。不過句子中如果牽涉「from」、「between」等介係詞，這樣的省略卻不恰當，例如：「We observed a difference between the taste and the smell of the sample」。

　　在學術寫作中，資訊的呈現必須清晰、詳細，以利讀者引用其結果，並且能在將來的相關研究中繼續採用相同研究方法。像冠詞這樣微小的詞彙，在寫作中經常會被忽略，但是對於學術社群而言，正確使用這些詞彙有助提高研究貢獻的明確性，絕對是不可或缺的。