Scientific Writing

Computational Pangenomics – Summer 2020

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Scientific Writing

The skills required for science and writing – are they different?

"The best science is based on straightforward, logical thinking, and it isn't artistic prose that we expect in [scientific texts] – we expect clarity." [Writing for Computer Science, J. Zobel]

Simplicity

Be simple!

- do not divagate
- do not pad
- no run-on sentences
- one idea/fact per sentence, one line of thought per paragraph
- be concise and precise
- be unambiguous (e.g., are back references such as "those" or "it" clear?)
- concrete statements instead of vague descriptions such as "many", "good", "quite" etc.

Avoid

Be sparse with

- abbreviations. If used, use them consistently.
- footnotes, because they interrupt the reading flow.
- parentheses. Either it is important to say/read $\rightarrow$ write it, or it is not important $\rightarrow$ do not write it.

Tenses

Tenses to be be used

- facts: present tense
- observations (in own experiments, previous studies): Past tense

Technical terms

Usage of technical terms

- introduce (\emph{...})
- re-use consistently
- use existing terms instead of inventing new, own terms

Thread

Facilitate reading/understanding!

- vary connecting phrases (many authors overuse "However, ...")
- introductory sentence per section
- refer to each figure/table. Refer at that point where reader should switch from main text to figure/table.

Revision

Be critical on your own text!

"... following elementary steps: create a logical organization, use concise sentences, revise against checklists of possible problems, seek feedback. Like many skills, writing improves through practice and a willingness to accept and learn from criticism." [Writing for Computer Science, J. Zobel]

"There is no excuse for a report that contains spelling errors." [Writing for Computer Science, J. Zobel]

Citations

Why to care about previous work?

- do not invent the wheel a second time
- appreciate previous work
- demonstrate your knowledge of the research area
- provide links to other relevant, interesting, background literature

Citations

What should you cite?

1. books, book chapters
2. review articles
3. journal articles (peer-reviewed)
4. conference articles (peer-reviewed)
5. avoid: PhD theses, posters, personal communication

If you have several choices

- primal publication
- most recent publication
- most important publication
- most elegant publication (?)

Citations

How?

- name-year system:
  "BLAST (Altschul et al. 1990) and FASTA (Pearson 1990) are based on pairwise alignment."
- number system:
  "BLAST [11] and FASTA [17] are based on pairwise alignment."
- Emphasize others work by stating authors and year of publication:
  "In 1990, two methods based on pairwise alignment have been introduced: BLAST by Altschul et al. [1] and FASTA by W. Pearson [17]."

Citations

Where?

- as close to the statement as possible
- directly after naming a method/algorithm/tool
- in case of several statements, after the last

Citations

BibTeX

- blabla~\cite{*KEY1*, *KEY2*}
- blabla~\cite[Chapter 3]{*BOOKKEY*}
- \nocite{*} for test usage
- \bibliographystyle{abbrv, alpha, ...}