

# Common Technical Writing Issues

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June 2006 first version

Aug 2007 last update

<http://www.csc.ncsu.edu/faculty/xie/>

<http://people.engr.ncsu.edu/txie/publications/writeissues.pdf>

# Important goal

- Don't make readers a hard time in reading your papers
  - Your technical content is already hard enough

# Avoid ambiguous words

- “since” à “because”
  - Bad: components may become coupled since the adaptation introduces dependency.
- “while” à “although”, “whereas”
- “method” à “technique”, “approach”
- “function” à “functionality”
- “if” à “whether”
- “test” a question/hypothesis à “answer” or “validate”
- others?

# Avoid strong words

- “always” → “often”
  - Bad: Coupling is **always** regarded as a **fatal** factor for reducing maintainability

# Avoid informal or offensive words

- Avoid “obviously”, “clearly”, “apparently”
- Avoid “very”?
- “Though” → “Although”
- “above” → “preceding”
- “very well” → “satisfactorily” “sufficiently”
- “enough” → “sufficient”
- “as far as we know” → “within our knowledge”
- “means” → “indicates” “represents”

# Avoid complicated words

- “utilize” à “use”

# Explicitly write out things

- Don't let readers guess
- I just got a pet and gave her a name. This is cute.
  - This pet is cute?
  - This name is cute?
  - This get acquirement process is cute?
  - This naming process is cute?
- Check your writing to see whether there is “This is” “It is” “They are” “This does”... and fill in a noun after “this” or “that”, and replace “they”.. with a noun.
- Bad: The solution in Fig. 2 is in fact a graph production. It follows the definition and presents a software transformation rule.

# Which vs. That

- Restrictive clause: that (with no preceding comma)
- Nonrestrictive clause: which (with preceding comma)
- “ABC which is the best one” → “ABC, which is the best one” or “ABC that is the best one”

# More on Which

- Don't use which to refer the whole sentence
  - Bad: We verify the applications implemented by application developers, **which** helps to discover problems in application systems.
  - Good: We verify the applications implemented by application developers; **the verification** helps to discover problems in application systems.
- Don't separate “which” and the modifying noun with some phrases
  - Bad: Spin provides extension mechanisms such as embedded C code, which greatly facilitate the transformation
  - Good: .... mechanisms (such as embedded C code), which ...

# Figure 1, Table 1, Section 1, ...

- No need to add “the” before them
- The first letters need to be in upper cases
- No need to say Figure one, Table one, ...
- Can refer to multiple numbers like Figures 1-3, Tables 1 and 6; remember to use plural forms
- Alternative (uncommon, less concise) forms: the first figure, the first table
- Other words: Transaction A, Account B

# Also, And, Further

- Don't put "And" in the beginning of the sentence
  - Remove it
- Don't put "Also," in the beginning of the sentence
  - Use "In addition," or "Additionally"
  - Or put "also" in the middle of the sentence
  - Bad: Also we implemented a tool...
  - Good: We also implemented a tool

# Repetition and Consistency is Good

- Use terms/words consistently
- We conducted an experiment to do .... This evaluation does provide insights...
  - You should replace “evaluation” with “experiment”
- Bad: Section 1 introduces.... Section 2 gives ... We also give an example in Section 3. Finally, we explain .. In Section 4.
- Good: ... Section 3 gives an example. Finally Section 4 explains...

# Dangling modifiers

- Bad: After reading the original study, the paper remains unconvincing.
  - à after ....., we find that the paper .....
- Bad: The experiment was a failure, not having studied the lab manual.
  - à They failed in their experiment, not ...
- Bad: To improve his approach, the experiment was done.
  - à To improve his approach, he did the experiment.
- Bad: To capture the new semantics, Promela is extended with new primitives.
  - à To capture the new semantics, we extend Promela...

# Fixing long sentences

- Bad: In ABC, the Project Plan module responsible for making plan can access the Process Pattern Manager, which can choose proper process patterns from Process Pattern Base, utilize the value of estimated parameter vector in quantitative context models to assist the estimation in project plan, and build project plan skeleton based on the solution part of selected process patterns.
- Good: “, which can” → “. This manager can”

# Punctuation issues

- When listing more than three items, put “,” before “and”, “A, B and C” → “A, B, and C”
  - Similarly for “or”
- Put “,” after “e.g.” “i.e.”
- Put “,” before “respectively”

# Citations

- Don't use [1] as a part of the sentence
  - Removing [1] won't produce an incomplete sentence
  - “Tools proposed in [2]” → “Tools proposed by AAA et al. [2]”
- When mentioning others' work
  - Two authors: A and B [1] proposed ..., e.g., Xie and Notkin [1] proposed
  - More than two authors A et al. [2] proposed ..., e.g., Xie et al. [2] proposed
  - Don't use full name but only last name
    - Bad: Tao Xie et al. [1]
  - Put a space before [1]

# Citations - II

- Don't use emotional word
  - Bad: Xie et al. [1] developed an excellent tool
  - Bad: JPF [2] is a famous model checker
  - Maybe ok: JPF [2] is a well-known model checker

# Uncountable Words

- “Work” is not countable when being used to refer to research
- “Research” is also not countable
- “Software” is not countable
- Bad: several works, several researches, several softwares
- Good: several research projects, several pieces of work, several lines of research, several software programs, several software applications

# Abbreviation

- Spell out the full name and then “(ABBREVIATION)”.
- Remember to put a space before “(“
- Better to make upper cases of relevant words
  - Bad: CBSE(Component-based software engineering)
  - Good: Component-Based Software Engineering (CBSE)

# “A” or “An”?

- “A FSM” → “An FSM”
- “a XML file” → “an XML file”
- “a L and a R” → “an L and an R”

# Only

- Places of “only”
  - Bad: JPF **only** interprets Java bytecode and cannot support native code
  - Why: only “interprets” not “compile”?
  - Good: JPF interprets **only** Java bytecode and cannot support native code

# Will

- I often intend to avoid “will” but use “plan to”, “shall” or “does”
  - but proposals can be ok to have “will”
- Maybe bad: Our future work will focus on ...
- Ok: In future work, we plan to focus on...
- Maybe bad: Section 5 will describe the experiment
- Ok: Section 5 describes the experiment

# Avoid firstly, secondly, ...

- Never use “ly” after first, second, third, ... except for “finally”
- Use First, Second, Third, Finally

# Avoid passive voice

- Using passive voice makes “subject” unclear
- Bad: Given the collected operational violations, a Perl script was developed to select the first encountered test for each violated operational abstraction. Then the selected violating tests are sorted based on the number of their violated operational abstractions.

# Avoid passive voice - II

- Good: Given the collected operational violations, Jov selects the first encountered test for each violated operational abstraction. Then Jov sorts the selected violating tests based on the number of their violated operational abstractions.

# Article usage

- If a noun is countable (and singular), there must be a preceding “a”, “the”, or sth like “my”
- You can fix it by turning the singular form to the plural form
- When to use “a” or plural forms vs. “the”
- Bad: following definition defines ...
- Good: the following definition defines
- Bad: In model checker Spin
- Good: In the Spin model checker

# Otherwise

- “Otherwise” cannot connect two clauses
- “A, otherwise, B” → “A; otherwise, B”
- Similar rules for “however”, “therefore”
- It is ok to replace “;” with “.” and make first letters upper cases.

No “can not”, avoid abbrev “n’t”

- “can not” à “cannot”
- “don’t” à “do not”

# The authors

- Better to use “We”
- Bad: The authors also extract many requirements...
- Good: We also extract many requirements
- But it may be ok to say in acknowledgment
  - Ok: the authors would like to thank ...
- Side note: in US, no “e” in acknowledgment, in UK, yes, “acknowledgement”

# Long subjects

- Bad: An example taken from middleware enabled systems demonstrates the feasibility and effectiveness of our approach
- Good: We demonstrate the feasibility and effectiveness of our approach with an example taken from middleware enabled systems

# Current vs. Existing

- Bad: the approach is implemented in current mainstream programming languages.
  - “current” → “existing”
- It may be ok to say “the current implementation of our approach” but “the existing implementation” is also ok

# Noun Stacking/Verbal

- Bad: We have proposed an approach for interoperable protocol performance **comparison**.
- Good: We have proposed an approach for comparing interoperable protocol performance.
- Bad: ... takes responsibility for **business transaction completion** and **component failure recovery**
- Good: ... for completing business transactions and recovering component failures

# Redundancy

- “such as/like/some examples include” + ... + “etc./and so on/...”
  - The former already implies the list is incomplete
- Bad: problems like deadlocks, livelocks or others
- Good: problems like deadlocks and livelocks
- Bad: such as CMM, CMMI, ISO 9000 etc.
- Good: such as CMM, CMMI, and ISO 9000

# As below/as follows

- Bad: The paper makes:
  - first contribution as...
  - second contribution as
- Good: The paper makes the following contributions: ...
- Good: We list the main contributions as follows/as below:
- Bad: They are described below:
- Good: They are described as below:

# Using hyphen -

- “third party libraries” à “third-party libraries”
- “interface contract mutator” à “interface-contract mutator”
- “model checking algorithms” à model-checking algorithms”
- “test generation tools” à “test-generation tools”

# Confusing words

- “stimulate” à “simulate”
- “constrains” (verb) à “constraints”
- “latter” à “later”
- “later” à “latter”
- “due to space limitation” à “due to space limit”
- “automatical” à “automatic”
- “software industry is more and more relied on third party libraries” à “software industry increasingly relies on third party libraries”

# Don't over omit “,” or “that”

- Bad: In the paper text is well written
- Good: In the paper, text is well written
- Bad: Note a void path is always executable
- Good: Note that ...

# References

- If using Bibtex, in paper titles, remember to add {} around some words that should be shown in upper cases.
  - java, jpf...
- Conference or journal references usually need to include page numbers

# Exercise

- Our solution is presented and a toolkit(named BCD) based on it is developed.
- Nowadays, the interoperable protocols play an important role in the performance of the whole application systems in the dynamic network environments.
- For example, the new version has to keep the old interface, otherwise, it may fail other softwares communicating with it.
- Obviously the above definitions are not enough because we have not defined the operational model yet.

# Use LaTeX

- <http://www.csc.ncsu.edu/faculty/xie/publications/writingtools.html>
- Sometimes when you have to use Word, you may consider to use Endnote

# Excellent Online Dictionary

- <http://www.oup.com/elt/catalogue/teachersites/oald7/>
- Has good sample sentences
- Indicates whether a noun is countable or uncountable

# Use hardcopies

- Use hardcopies to edit papers
  - Not directly edit on screen when possible

# More Resources

- <http://spoke.compose.cs.cmu.edu/ser04/course-info.htm>
- <http://www.cs.cmu.edu/~Compose/shaw-icse03.pdf>
- <http://www1.cs.columbia.edu/~kaiser/relatedwork.htm>
- <http://pag.csail.mit.edu/~mernst/advice/write-technical-paper.html>
- [http://www-bsac.eecs.berkeley.edu/~muller/jmems.web/sds\\_editorial\\_june\\_2003.pdf](http://www-bsac.eecs.berkeley.edu/~muller/jmems.web/sds_editorial_june_2003.pdf)
- <http://www.cs.berkeley.edu/%7Epattrsn/talks/writingtips.html>
- <http://www.csc.ncsu.edu/faculty/xie/advice.htm#writing>
- <http://www.csc.ncsu.edu/faculty/xie/adviceonresearch.html>
- <http://www.csc.ncsu.edu/faculty/xie/seconferences.htm>
- <http://www.csc.ncsu.edu/faculty/xie/publications/writingtools.html>