

# LECTURE 7:

## Technical Writing Style

FACULTY OF COMPUTING & INFORMATICS  
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CYBERJAYA, MALAYSIA

# Problem with students...

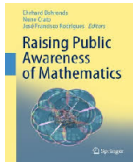
when writing academic essay

No proof-read, immediate headache...



Scientific results can be published as

- a) book
- b) thesis
- c) journal article
- d) conference article
- e) report



Writing should be part of the research process:

- it's really hard to “Do the work” and then “Write it up”
- for one thing: the work is **never** done, and it is **constantly changing**.
- writing helps to pin down the details, and helps to **focus** you on-going research.

# The Writing Process

- All scientists/professional need to be skilled writers and researchers.
- The elements of good writing — clarity, simplicity, accuracy, and organization

- Writing for Computer Science:
  - Gives extensive guidance for writing style and editing;
  - Presents sound practice for graphs, figures, and tables;
  - Guides the presentation of mathematics, algorithms and experiments;
  - Shows how to assemble research materials into a technical paper;
  - Offers guidelines and advice on spoken presentations.

Being a scientist, you involve in

- development of ideas into research programs;
- design and evaluation of experiments;
- search for, read, evaluate, and referee other research;
- research ethics and the qualities that separate good and bad science.

# The Writing Process

How your writing will be graded?





# The Writing Process

## How your writing will be graded?

Each of the following will be assessed on a scale from 1 ("weak") to 5 ("strong"), with 3 being "average". Effort displayed on first draft (0 if not turned in)

- Quality of summary
- Quality of critique
- Organization at the paragraph level
- Sentence structure
- Tone /choice of words
- Economy / lack of padding
- Spelling, grammar, and punctuation
- Bibliographic information

You should publish papers along the way to getting your degree B.CS (definitely true for Ph.D. students; ideally true for M.S. students).

- In CS research, you are expected to have publications when you graduate
- Publications are part of the ongoing department evaluation process
- The extra work more than repays itself in the long term, by focusing your research, and by helping you learn how to think critically and write professionally (and how to do publishable research).

Writing about papers you read:

- makes writing the related-work part of your dissertation that much easier
- creates a record of your understanding of the paper (because you will forget the details)
- helps you to organize and synthesize the threads of the related work
- encourages you to analyze and think about previous work and its limitations

meaning = putting off or delaying or deferring an action to a later time

- Write something every day, even if it's scribbles, an outline, a paper summary, or a trivial bit of commentary
- Write sloppy (sloppily?) and fix it later. (But organize well. Bad organization is much harder to fix later.)

Specific structure varies, but in CS you should always:

- Describe the problem
- Explain why it's important
- State how you solved the problem
- Make explicit claims about your approach
- Support these claims experimentally and/or analytically
- Place your approach in the context of current and past related work
- Give directions for future work Applies in smaller scale and with variations to proposals and technical papers.

# Writing Style

## Important Points

- Keep it brief.
- Break it up. Don't be self-important. Start your paragraphs with topic sentences.
- Don't write a detective novel.
- Don't try to handle too many ideas at once.
- Use key words.
- Signpost with transitional phrases.

# Writing Style

## Important Points

- Repeatedly summarize.
- Avoid passive constructions.
- Avoid adverbs.
- Delete double negatives.
- Chop off your first paragraph.
- Read it out loud.
- Read it again cold.
- Move back and forth between word processor and paper.

# Writing Style

## Important Points

### Make paragraph with unit of composition

- Begin each paragraph with a sentence that suggests the topic of the paragraph.
- Deliberately choose the order of sentences within a paragraph, and the order of paragraphs within a section.

### Write with nouns and verbs

- Not with adjectives and adverbs.
- Select your nouns and verbs carefully.
- No spicy adjective can save a bland noun.
- Use a thesaurus.



# Writing Style Important Points

## Use active voice

- Active voice is more direct, more vigorous, and more concise.
- In scientific writing use “we” to mean “the writer(s) and the reader together.”

1	2	3
There were a great number of dead leaves lying on the ground	The ground was covered by dead leaves	Dead leaves covered the ground

## Put statements in positive form

He was not very often on time → He usually came late.

## Be Clear

- When you become hopelessly mired in a sentence, start fresh. Usually what is wrong is that the construction has become too involved and the sentence needs to be broken apart.
- Never take shortcuts at the cost of clarity. Never use undefined abbreviations.
- Avoid ambiguous pronouns (this, it).

## Abstract

- Sentence 1: the problem
- Sentence 2: the solution
- Sentence 3: the consequences

Write the abstract last and choose each word carefully.

The fewer words you have to describe something, the more difficult it is.

# Avoid Uncertainty

## Example

[The Environmental Protection Agency] has developed an industry-specific cross-media pollution-abatement model that also estimates the reduction in human health risks attributable to adopting various sets of abatement measures. The model has been applied to the iron and steel industry.

## Rewrite

In order to understand how to reduce pollution in some specific industries, the [EPA] has developed a computer model which examines how pollutants in air, water, and other environmental media interact. In addition, the model can estimate how selected measures to reduce pollution would also reduce human health risks. As a trial run, the EPA has used this model to examine pollution reduction in the iron and steel industry.

# Cut It Out (1)

The volume of information has been rapidly increasing in the past few decades. While computer technology has played a significant role in encouraging the information growth, the latter has also had a great impact on the evolution of computer technology in processing data throughout the years. Historically, many different kinds of databases have been developed to handle information, including the early hierarchical and network models, the relational model, as well as the latest object-oriented and deductive databases. However, no matter how much these databases have improved, they still have their deficiencies. Much information is in textual format. This unstructured style of data, in contrast to the old structured record format data, cannot be managed properly by the traditional database models. Furthermore, since so much information is available, storage and indexing are not the only problems. We need to ensure that relevant information can be obtained upon querying the database. (Zobel p. 12)

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Much information is **textual**. This unstructured data cannot be managed properly by traditional database models. Furthermore, storage and indexing are not the only problems. We need to ensure that relevant information can be obtained upon querying.  
(Zobel p. 12)

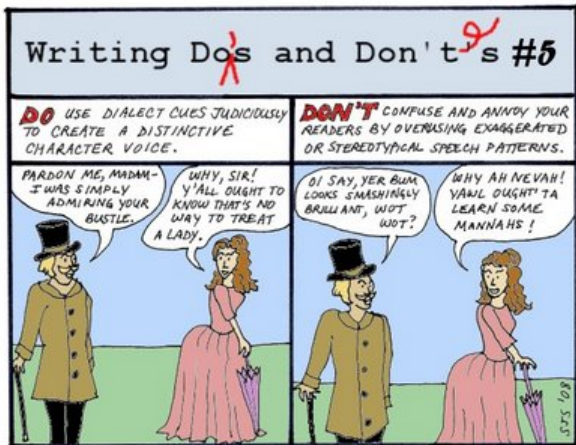
Can you do better?

Much information is **Unstructured textual**. This unstructured **data** cannot be managed properly by traditional database models. Furthermore, **Storage and indexing** are not the only problems: we also **need to ensure that relevant information can be obtained upon querying**.



# Cut It Out 1 Redux

- Don't write overly long papers, sections, paragraphs, sentences, or words
- Know what each section, paragraph, and sentence is about, and stick to the subject
- Define your terms, and use **boldface** or another convention to make them stand out
- Expand your acronyms (and use as few as possible)
- Explain your math in English



# Cut It Out 1 Redux

- The reader is always (well, at least sometimes) right.
- Don't get defensive and start making excuses:
  - ① It's in there! [Then why didn't they notice it?]
  - ② I didn't have room! [Then maybe you should rethink your priorities.]
  - ③ It's not important!" [But this reader thinks it is. So the paper has to explain it, or convince her that it's not important.]

But ignore "There's no future work" comments...\*

Be careful about paraphrasing

According to Fier and Byke such an approach is “simple and...fast, [but] fairly crude and... could be improved” Fier and Byke describe the approach as simple and fast, but fairly crude and open to improvement.

Why skirt the edge of plagiarism when you can use your own words?

According to Fier and Byke, this approach is efficient, but the quality of the results could be improved.

Under **certain** circumstances...

- Most researchers reuse parts of earlier papers, especially related work and terminology
- New publications should be substantially different and/or have significant new results

Workshop  $\Rightarrow$  conference  $\Rightarrow$  journal

- It's common for a paper to evolve and mature as it is accepted in different kinds of venues
- There can be a lot of overlap, but there should be new material and/or results at each step

- There is no single authority on style. How could there be? E.g., How should we write dates? When should we use words for numbers?
- Most commercial publishers choose an established style manual perhaps with a small collection of “house rules”
- The goal is consistency and to have a way of resolving questions
- Journals that edit papers may **enforce their own style rules**

# Avoid Slang and Idioms

- “Very,” “rather,” “simply,” “possibly,” “of course,” “naturally,” “obviously,” “just,” “pretty,” “pretty much,” “more of,” “extremely,” “seriously,” “indeed,” “really”
- Particularly avoid qualifying non-qualifiable words such as “unique,” “intractable,” “optimal” and “infinite”
- Avoid personalizing your remarks: Minimize the use of “I think” “I feel,” “I believe”, “It seems”

# Avoid Fluff

adding together	→	adding
cancel out	→	cancel
during the course of	→	during
for the purpose of	→	for
in view of the fact	→	given
the vast majority	→	most
a number of	→	several
whether or not	→	whether
it can be seen that	→	it is
it is a fact that	→	it is
is something that can	→	can



The three most important things to remember are:

- Write a little every day.
- You should proofread everything before showing it to your advisor.
- Careful of bad grammar!"

Rather than writing...

The key findings are:

- Ⓐ The algorithm to learn the preference function, based on the Freund and Schapire “Hedge” algorithm.
- Ⓑ An algorithm to find the ordering... is NP-complete; however, ....
- Ⓒ A system (composed of these two algorithms) to compile the result sets of various searches often performs better than a domain expert entity.

It is better to write...

The key contributions are:

- Ⓐ An algorithm to learn the preference function, based on Freund and Schapire's Hedge algorithm.
- Ⓑ A proof that finding the optimal ordering is NP-complete, and a greedy algorithm that is guaranteed...
- Ⓒ A system (composed...) that compiles the result sets of multiple searches, and often performs better than any individual search.

To avoid the use of “he”, you can:

- Use “one”
- Use the plural
- Rewrite to avoid pronouns
- Name people in examples (with alternating male/female names)
- OK these days to use “they” for singular nouns

# Some of Zobel Personal Nits

- Its vs. it's Which vs. that “which” qualifies; “that” defines.  
Heuristic: Use “that” by default
- Between vs. among
- Dangling “this” references
- Affect vs. effect
- Continual vs. continuous
- Optimize vs. improve
- Plurals and apostrophes
- Colons, semicolons, and dashes
- i.e. / e.g. / etc. / et al.
- Hyphenate compound adjectives, not adverbs or nouns!
- Commas!

- Use consistent tense Generally the present tense
- Punctuation goes inside quotation marks
- “Scare quotes” vs *italics* to introduce new terms Only do this the *first time* you use the new term
- Avoid passive voice (usually) Authors and algorithms do things; they don’t just happen

- The summary itself should be written in a formal, “scientific paper” style The wrapup (discussion of presentation etc.) can be more informal
- “Via” → “using” or “by”
- Semicolon vs. colon vs. comma
- “As” → “because” or “since”

- Avoid “use”. Try “apply”, “employ”, “perform”, “choose”, “evaluate”, etc.
- “utilize” should refer only to resources (“... fully utilize memory bandwidth ...”)
- Use English equivalents of Latin outside of parentheses  
Replace “etc” with “and so on”, “i.e.” with “for example”, “vs” with “versus”.



# Don't do this for your ASSIGNMENT!

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"MOM... I NEED YOU TO GHOST WRITE  
MY ENGLISH ESSAY."

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