CSE 300
Technical Writing and Presentation

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Outline

Syllabus

- Issues of technical writing and oral presentation in computer science and engineering;

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- Preparation of reports, research papers, theses and books: abstract, preface, content, bibliography and index
- Writing book reviews and referee reports;
- Writing tools: LaTex; Diagram Drawing software; presentation tools.

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Aspects of Technical Writing

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You are a valued customer of XYZ company, and your call is very important to us.

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You are a valued customer of XYZ company, and your call is very important to us.

Because you are a valued customer of XYZ company, your call is important to us.

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Say What You Mean;
Mean What You Say.

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Must make choice to convey most effectively a given message and the sprit of the message.

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Better: A continuous, real valued function on a compact metric space assumes both a maximum and a minimum value.

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Minimize the number of notations.

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Be precise, avoid ambiguity.

Outline

Rules and Practices of Writing

- Be careful about the language: Grammar, sentence formations, spellings, punctuation etc.
- Each paragraph should represent a specific idea.
- Smooth transition from
  - One paragraph to the next
  - One sentence to the next

Rules and Practices of Writing

- Write short and simple sentences.
- The opening paragraph of a section should be the best paragraph of the section.
- The opening sentence of a paragraph should be the best sentence of the paragraph.
- Every statement should be precise and correct.

Example

"The problem stated above is difficult" Difficult for whom? NP-complete? Believed by you? Believed by others? Proved by someone?

Rules and Practices of Writing

- Statement should be logical. Avoid sentence of the form "An *x* is *y*."
  - Bad: An important method for internal sorting is quicksort.
  - Good: Quicksort is an important method for internal sorting, because ...
- Vary the sentence structure and the choice of words to avoid monotony. But use parallelism when parallel concepts are being discussed.
  - Bad: Formerly, science was taught by the textbook method, while now the laboratory method is employed.
  - Good: Formerly, science was taught by the textbook method; now it is taught by the laboratory method.

Rules and Practices of Writing

- Do not omit "that" when it helps the reader to parse sentence.

  Bad: Assume G is a graph.
  Good: Assume that G is a graph.

- There is a definite rhythm in sentences. Read what you have written, and change the wording if it does not flow smoothly.

Rules and Practices of Writing

Active or Passive: In computer science writing active voice is preferred.

- **Bad:** The following result can now be proved.
- **Good:** We can now prove the following theorem.

I or We Always use "we" even you are a single author.

Important Points for Mathematical Writing

- Symbols in different formulas must be separated by words.

  Bad: Consider S_q, $q < p$.
  Good: Consider S_q, where $q < p$.

- Do not start a sentence with a symbol.

  Bad: G has n vertices.
  Good: The graph G has n vertices.

- Do not use symbols $\forall, \exists, \in$; replace them by corresponding words.

Important Points for Mathematical Writing

- Define symbols before use.
  - Bad: Algorithm XYZ finds a drawing of G in $O(n+m)$ time, where n and m are the numbers of vertices and edges, respectively.
  - Good: Let G be a graph of n vertices and m edges. Then Algorithm XYZ finds a drawing of G in $O(n+m)$ time.
- Do not often use qutions in mathematics papers.
  - Bad: As Methuselah used to say, “ When the going gets tough, the tough get going”.
  - Good: As Methuselah used to say, “ When the going gets tough, the tough get going.”
- Commas and periods should be placed inside quatation marks, and colons and semicolons outside quotation marks.

Important Points for Mathematical Writing

- The statement just preceding a theorem, algorithm, etc., should be a complete sentence or should end with a colon.

  Bad: We now have the following
  Theorem. $H(x)$ is continuous.

  Good: We can now prove the following result.
  Theorem. The function $H(x)$ defined in (5) is continuous.

- The statement of a theorem should usually be self-contained, not depending on the assumptions on the previous text.

Important Points for Mathematical Writing

Fact, Lemma, Theorem, Corollary

All these are propositions which have true or false value.

Fact	A proposition which is obviously true. Usually does not need a proof.
Lemma	A proposition which will be used to prove other propositions. A proof is needed.
Theorem	A proposition which gives a main result of the paper. A proof is needed.
Corollary	Immediate from a theorem or a lemma.

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- Capitalized names like Theorem 1, Lemma 2, Algorithm 3, Table 5, Figure 4 etc.

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- Capitalized names like Theorem 1, Lemma 2, Algorithm 3, Table 5, Figure 4 etc.

  Wrong: By lemma 3, we have ...
  Correct: By Lemma 3, we have ...

  Wrong: We now have the following Lemma.
  Correct: We now have the following lemma.

Important points for Mathematical Writing

Wrong: A maximal matching is illustrated in figure 5(a).

Correct: A maximal matching is illustrated in Figure 5(a).

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Correct: A maximal matching is illustrated in Figure 5(a).

Wrong: In section 3 we deal with orthogonal drawings of planar graphs.

Correct: In Section 3 we deal with orthogonal drawings of planar graphs.

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Correct: There are five vertices on the outer face.

Wrong: The count was increased by two.
Correct: The count was increased by 2.

Wrong: The graph has eighty embeddings.
Correct: The graph has 80 embeddings.

Important Points for Mathematical Writing

- Display important formulas on a line by themselves. If you need to refer to some of these formulas from remote parts of the text, give reference numbers to all of the most important ones, even if they are not referenced.

Some more points ....

- Do not overuse commas.

  Bad: I went to the store, to buy some potatoes.
  Bad: In this paper, we give a linear-time algorithm.

- Do not use contraction in formal writing. Bad: don't, I'm ...

How to Write a Theorem and a Proof

Acknowledgement

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  - R. Andonie and I. Dzitac, How to write a good paper in computer science and how will it be measured by ISI web of knowledge, Int. J. of Computers, Communications & Control, 4, pp. 432-446, 2010.
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  - https://cs.uwaterloo.ca/ brecht/thesis-hints.html, accessed on August 29, 2013.

Thank You

Thank you for your attention.