Writing for

Computer Science & Engineering

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Good Style

Introduction

- Style
  - Not about correct use of grammar, but about how well you communicate with likely readers
  - Conventions and styles are valuable because some forms of presentation are difficult to understand or are simply boring
  - Conformity to commonly used styles reduces the effort required from readers
- Science writing
  - Plain and straightforward – the need for it to be accurate and clear makes poetry inappropriate
  - Poor usage is distracting, suggests disorganized thinking, and prejudices readers against whatever is being said – readers tend to mistrust statements if they contain numerous spelling errors; a lazy or amateurish presentation suggests to the reader that little care has been taken with the work
- Good style for science
  - Nothing more than writing that is easy to understand
  - Fundamental aims of science writing : to be clear, unambiguous, correct, interesting, and direct

Economy

- Text should be taut
  - It is admirable to use only as many words are are required
  - Papers are not made more important by padding with long-winded sentences

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 has been developed to handle information, including The early hierarchical and network models, the relational model, as well as the latests 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 databased models. Furthermore, since so much information is available, storage and indexing are not The only problem. We need to ensure that relevant information can be obtained Upon querying the database.

- Taut writing is a consequence of careful, frequent revision – to delete superfluous words, simplify sentence structure, and establish a logical flow
- If someone dislikes something you have written, remember that is is readers you need to please, not yourself
- When you are making changes to a paper in response to comments from a reader, you may find that the reader has made a claim that is wrong or meaningless. Ask yourself, “What did I write that led the reader astray?”

Economy

- Text can be condensed too far
  - Bit-stream interpretation requires external description of stored structures. Stored description are encoded, not external.
  - Interpretation of bit-streams requires external information such as descriptions of stored structures. Such descriptions are themselves data, and if stored with the bit-stream becomes part of it, so that further external information is not required

Tone

- Science writing
  - Objective and accurate
  - Nuance, ambiguity, metaphor, sensuality are inappropriate for technical works
  - Use of awkward, convoluted language is the most common fault in scientific writing
- A few simple rules
  - Have one idea per sentence or paragraph and one topic per section
  - Have a straightforward, logical organization
  - Use short words
  - Use short sentences with simple structure
  - Keep paragraphs short
  - Avoid buzzwords, clichés, and slang
  - Avoid excess, in length or style
  - Omit unnecessary material
  - Be specific, not vague or abstract
  - Break these rules if there is a good reason to do so
- Sometimes a long word or a complex sentence is the best option. Use these when necessary, but not otherwise

Tone

- Use direct statements and expressions involving “we” or “I”, the active voice – to make reading more pleasant and to help distinguish new results from old
- There is nothing wrong with using a casual or conversational tone in technical writing, so long as it does not degenerate into slang
- Novice writers can be tempted to imitate the style of, not science writing, but popular science writing
  - As each value is passed to the server, the “heart” of the system, it is checked to see whether it is in the appropriate range
  - **->Each value passed to the central server is checked to see whether it is in the appropriate range**
- Don’t dress up your ideas as if they were on sale
  - Sometimes the local network stalls completely for a few seconds. This is what we call the “Grimwade effect”, discovered serendipitously during an experiment to measure the impact of server configuration on network traffic
  - **Sometimes the local network stalls completely for a few seconds. We first noticed this effect during an experimental measurement of the impact of server configuration on network traffic.**

Example

- Use an example whenever it adds clarification
- A small example often means that difference between communication and confusion, particularly if the concept being illustrated is fundamental to understanding the paper
  - In a semi-static model, each symbol has an associated probability representing its likelihood of occurrence. For example, if the symbols are characters in text, then a common character such as "e" might have an associated probability of 12%
  - Large document collections, such as a repository of newspaper articles, can be managed with the same techniques
  - Special cases, such as the empty set, need to be handled separately
  - Algorithm that involve bit manipulation cannot be efficiently implemented in these language. For example, Huffman coding is impractical because it involves processing a stream one bit at a time

Motivation

Structure of paper

- Brief summaries at the start and end of each section are helpful, as are sentences connecting one section to the next
- Together these results show that the hypothesis holds for linear coefficients. The difficulties presented by non-linear coefficients are considered in the next section
- Link text together as a narrative – each section should have a clear story to tell – Tell the reader what you are going to say, then say it, and then tell the reader that you have said it

Common errors

- Include material such as definitions or theorems without indicating why the material is useful
- The problem is lack of explanation; it is symptomatic of an ordering problem, such as including material before the need for it is obvious
- Take many difficult issues for granted. You should explain everything that is not common knowledge to the paper’ s readership

Balance

- Each topic should be discussed to a similar depth
- A paragraph on a previous algorithm followed by seven pages on your refinements to it is unbalanced
  - Four-page rambling introduction is unlikely to be readable
- The length of a paper is a consequence of how much material is included and of how much detail is given, that is, the depth to which each topic is discussed
  - When a paper must be kept within a length limit, some compromise is required
  - Some of the discussion must be omitted, or the graphs selected more carefully, or the text condensed
  - It will even be necessary to omit a proof or a series of result

Voice

- Avoid excessive use of indirect statement (passive voice)
  - The following theorem can now be proved.
  - We can now prove the following theorem.
- Artificial use of verbs like “perform” or “utilize”
  - Tree structure can be utilized for dynamic storage of terms
  - Terms can be stored in dynamic tree structure.
  - Local packet transmission was performed to test error rates
  - Error rates were tested by local packet transmission
- Change of voice changes meaning and changes emphasis. If passive voice is necessary, use it
- Use of “we” is valuable when trying to distinguish between the contribution made in your paper and existing results in a field, particular in an abstract or introduction

Voice

- “it is shown that stable graphs are closed”
  - Reader may have difficulty deciding who is doing the showing
- “it is hypothesized that”
  - The reader will be unsure whether the hypothesis was posed in your paper or elsewhere
- ” We show” vs “in this paper it is shown that”
- We is preferable to pretentious expression such as “the authors”
- “This paper shows” or “this section argues”
  - The paper not the author is doing the arguing, should generally be avoided
- Some cases the use of “we” are wrong
  - When we conducted the experiment it showed that our conjecture was correct
  - The experiment showed that our conjecture was correct

The Upper Hand

- Some authors seem to have a superiority complex – swagger
- Form of swagger
  - Imply familiarity with material that most scientists will never read –> the argument proceeds on Voltarian principles
  - Unnecessary inclusion of difficult mathematics, offhand remarks such as "analysis of this method is of course a straightforward application of tensor calculus"
  - Citation of obscure, inaccessible reference

Obfuscation

- Making of statement in ambiguous or convoluted terms, with the intention of hiding meaning, or of appearing to say much while actually saying little
- Vague statements are regrettably common –> preferable to be specific
  - Amelioration can lead to large savings
  - Amelioration led to savings of 12%~13% in our experiments
- Exaggeration, omission of relevant information, bold statement of conclusions
  - The status of the system is such that a number of components are now able to be operated
  - Several of the system' s components are working
  - In respect to the relative costs, the features of memory mean that with regard to systems today disk has grater associated expense for the elapsed time requirements of tasks involving access to stored data
  - Memory can be access more quickly than disk

Analogies

- Analogies are curious things: what seems perfectly alike or parallel to one person may seem entirely unalike to another
  - Writing a program is like building a model with connector blocks
  - What are "connector blocks", "How are they like programming"
  - This analogy seems to me to fail because it captures neither logic nor repetition
  - For an analogy to be worthwhile, it should significantly reduce the work of understanding the concept being described
- Simple analogies can undoubtedly help illustrate unfamiliar concepts
  - Contrasting look-ahead graph traversal with standard approaches, look-ahead uses a bird's-eye view of the local neighborhood to avoid dead ends, but at significant cost: it is necessary to feed the bird and wait for it to return after each observation
- Beware of analogies with situations that may be unfamiliar to the reader
  - One-sided protocols are like signals in football

Reference and Citation

- Explain the relationship of your new work to existing work, showing how your work builds on previous knowledge and how it differs from contributions in other, relevant papers
  - Bibliography, a list of such references in a standardized format, embedded in each paper’ s text there are citation to the publication
- Reference and discussion of them
  - Demonstrate that work is now
  - Claims of originality are much more convincing in the context of references to existing work that appear to be similar
  - Demonstrate your knowledge of the research area, which helps the reader to judge whether your statements are reliable
  - They are pointers to background reading

Reference and Citation

- Before including a reference
  - It will be of service to the reader
  - Should be relevant, up-to-date, and reasonably accessible, necessary
  - Don't add citation just to pad the bibliography
  - Original paper in preference to a secondary source
  - Formally published documents rather than Web pages
  - Avoid reference to private communications such as seminar or talks
- Don't cite to support common knowledge
  - Use of a binary tree in an algorithm doesn't require a reference to a data structure text
- Some of references are to previous published by the same author
  - Establish the author's credentials as someone who understand the area
  - Establish a research history for the paper
  - Allow the interested reader to gain a deeper understanding of the research by following it from its inception
  - Gratuitous self-reference undermines these purpose

Reference and Citation

- Inaccessible paper
  - Supposed that in 1981 Dawson write "Kelly (1959) shows that stable graphs are closed" but Kelly (1959) is inaccessible and Dawson (1981) does not give the details
  - Do not refer directly to Kelly
  - According to Dawson (1981), stable graphs have been shown to be closed
  - According to Kelly (1959; as quoted by Dawson 1981), stable graphs are closed
  - Knuth's Soundex algorithm, although Kruth is not the author and the algorithm was at least fifty years old when Knuth discussed it
- Some readers of a paper will not have access to the publications it cites, and so may rely on the paper's description of them
  - Describe results from other papers fairly and accurately
  - Robinson's theory suggests that a cycle of handshaking can be eliminated, but he did not perform experiments to confirm his results [22].
  - Robinson's theory suggests that a cycle of handshaking can be eliminated [22], but did not report experimental confirmation.
  - Robinson's theory suggests that a cycle of handshaking can be eliminated [22], but as yet there is no experimental confirmation.

Reference and Citation

- Avoiding pitfalls
  - Quote from the reference, particularly if it contains a short, memorable statement – one or two sentences, say that is directly pertinent
- Cited material often uses different terminology, spelling, or notation, or is written for an entirely different context
- References that are discussed should not be anonymous
  - Other work [16] has used an approach in which
  - Marsden [16] has used an approach in which…
  - Other work (Marden 1981) has used an approach in which
- Self-reference should not be anonymous
  - Smith et al. [10] found compressed list to be
  - In Smith et al. [10], we found the compressed list to be
- Avoid unnecessary discussion of references
  - Several authors have considered the problem of unbounded delay. We cite, for example, Hong and Lu (1981) and Wesley (1987)
  - Several authors have consider the problem of unbounded delay (hong and Lu 1981; Wesley 1987)

Reference and Citation

- Styles of citation
  - Ordinal-number style; is discussed by Whelks and Babb (1972) or [1972]
  - name-and-date or Harvard style; is discussed elsewhere (Whelks and Babb 1972) or [Whelks and Babb 1972]
  - Superscripted ordinal number; is discussed elsewhere[16]
  - Uppercase abbreviation; [MAR91]
  - Many publisher insist on a particular style
- When discussing a reference with more than tow authors, all but the first author name ban be replaced by "et al."
  - Howers, Mann, Thompson, and Wills [9[provide another example
  - Howerrs et al. [9] provide another example
- Format fields of the same type in the same way
  - Journal article
  - Conference papers
  - Books
  - Technical report
  - Web pages
  - Personal communication
  - All references

Quotation

- Text from another source, usually included in a paper to support an argument
- If short, quotation is enclosed in double quotes
  - Computer security forensic is "the study of matching an intrusion event to an IP address, location, and individual" (Brinton 1997)
  - As described by Kang [16], there are three stage

    First, each distinct word is extracted from the data…..
  - – The quoted material should be an exact transcription of the original data

Acknowledgement

- Thank everyone who made a contribution, whether advice, proofreading, coding or whatever
  - Include research students, research assistant, technical support, and colleagues
  - Funding source
  - Thank only those who contributed to the scientific content – don't thank your parents or your cat unless they really helped with research
- Common form of acknowledgement
  - I am grateful to Dale Washman, Kim Micale, and Dong Wen. I thank the Foundation for Science and Development for financial support : Kim might wonder why Dale was listed first
  - I am grateful to Dale Washman for discussing aspects of the proof of proposition section 4.1, to Kim Micale for identifying some technical errors in Theorem 3, and to Dong Wen for helping with use of the debugging tools. I thank the Foundation for Science and Development for a year of financial support
  - I am grateful to Dale Washman and Kim Micale for our fruitful discussions, and to Dong Wen for programming assistance. I thank the Foundation for Science and Development for a year of financial support
- I would like thank or I wish to thank – I wish to thank… but some reason I am unable to do so

Grammer

- Some people use what they believe to be traditional grammar to criticize other people’ s text, based on rules such as
  - Don’ t split infinivies : "to *boldly* go where no man has gone before";
  - Don’ t begin a sentence “and” or “but”
- Grammatical rules should be observed, but not at the cost of clarity or meaning

Beauty

- Some authorities on writing style argue that text should be crystalline, transparent, and have good rhythm and cadence
- One should dislike stuffy, soft, stodgy, and sagging sentences
  - Doubtless, well-crafted text is a pleasure to real
  - Ill-written text can be hard going, and good rhythm in text helps us to parse


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