

# Writing a Project Report: Style Matters

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# Writing for Computing

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- Why ask me to do this ?
  - I write a lot
    - papers, chapters, project proposals;
  - I read a lot
    - Papers, books, project proposals, student thesis chapters;
  - I review a lot
    - Journal and conference papers, research project proposals, examining PhDs;
- So some people think I do it well ?
- Can I identify why I (and others) do it well, what is the key, and can I describe it and pass this on to you in a lecture ?
  
- Absolutely not ! So why bother with a lecture ?

# Writing for Computing

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- ❑ If I pass on my “pearls of wisdom”, you might pick up something useful ? Maybe.
- ❑ No value just from a checklist of do/don't ?
- ❑ Raising awareness, highlighting the topic, showing you, makes you more conscious of it;
- ❑ “Most of us learn how to write technical articles by osmosis ... we unconsciously pick up the common patterns of the field and begin to imitate them.”[1]
- ❑ Preparing this is difficult ... difficult to formalise what seems natural after practice...
- ❑ Materials to use ... I used Zobel's book [2] and his website [3] ... but is all about awareness and practice, practice, practice !

# Why Bother to Write Properly ?

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- ❑ We shouldn't be content with bad writing;
- ❑ Ambiguity leads to misunderstandings; omissions frustrate; obscurity makes it hard for readers to figure what the author meant; effort wasted on "parsing" is better spent on understanding content;
- ❑ Good writing & presentation can persuade readers that content is of value ... unjustly ... with the subconscious messages that spelling errors, bad layout and lazy presentation suggesting little care has been taken;

# Side Effect of Writing

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- The discipline of stating ideas as organised text forces you to formulate and clarify thoughts (even truer for giving a lecture);
  - Vague concepts are made concrete;
  - Writing suggests new concepts;
  - Written material is easy to discuss with others;
  - Sometimes referred to as the “blackboard” or “janitor” approaches;
- So writing actually SHAPES the research whereas styling and presenting FOLLOWS it;
- I see this regularly;

# Skepticism

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- ❑ A unifying principle in science is skepticism, the open-minded approach to knowledge;
- ❑ We accept the writings of others as true given reasonable evidence but we examine, turn over and need to be persuaded of relevance and correctness;
- ❑ We should not be easily blown over just because somebody says something;
- ❑ Skepticism is good science;
- ❑ So ... proper writing is hugely important.

# Writing Styles

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- Your writing is mostly essays, reports, functional specifications, and exams, and they all have similar styles, they are scientific and must be informational, and must argue and defend propositions;
- Mostly it must be accurate and clear, but it doesn't have to be dull ... lively writing suggests a lively mind with interesting things to say;
- Other writings have different styles:
  - Books (represent opinions and knowledge);
  - Newspaper articles;
  - Magazine articles;
  - Poetry;
- Style is a matter of taste in that there are not rules or laws, but guidelines which can be broken;

# How to Learn to Write

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- ❑ Writing is learnt thoroughly by doing it, but it gets better with practice, quite quickly, if we are willing to learn and to accept criticism;
- ❑ I see this with PhD student chapters regularly;
- ❑ Few of us are natural writers and those who are have learned through experience;
- ❑ Lectures like this are only useful as introductions to the topics of good writing, practice is the most important thing to do.

# How to Practice ?

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- ❑ Nobody writes perfectly first time;
- ❑ MS Word has made us lazy with automatic spelling correction ... texting is giving you bad habits ... when you are forced to write, by hand, on paper, the quality is generally very poor;
- ❑ Even word processed materials can be very lazy;
  
- ❑ Get somebody to read your materials before submitting ... DO IT !

# Good Style - Characteristics

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- Economy - cut the waffle
- Tone
- Examples
- Motivation for article
- Voice
- Having the Upper Hand and Obfuscation

# Economy of Text

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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.

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**So much waffle in this piece.**

**So many superfluous words,**

**complex sentences, illogical flow.**

**Read it, get the message,**

**and reduce to 50 words**

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# Tone

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- ❑ Nuance, ambiguity, metaphor and sensuality are inappropriate for technical work;
- ❑ The primary objective is to inform, not entertain;
- ❑ A direct simple style is most appropriate, so use simple rules such as:
  - One idea per sentence or paragraph;
  - Simple, logical organisation
  - Short words, short sentences, short paragraphs and simple structure
  - Avoid buzzwords, clichés and slang
  - Omit unnecessary material
  - Be specific rather than vague or abstract
  - Break these rules if there is a good reason !

# Using Examples

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- ❑ Use examples whenever they add clarification, including small illustrative examples;
- ❑ Generalising from concrete instances to abstractions is how we learn, so examples help;
- ❑ “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”
- ❑ “Algorithms that involve bit manipulation cannot be efficiently implemented in these languages. For example, Huffman coding is impractical because it involves processing a stream one bit at a time”

# Motivation for Article Organisation

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- ❑ Structure of an article should be obvious to the reader, with parts ordered logically, and this logic communicated;
- ❑ Introduction should give some indication of the document organisation by outlining results and their context;
- ❑ Brief summaries at the start & end of each section are helpful;
- ❑ Link text together as a narrative with each section telling a clear story;

# Voice

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- Indirect statements (passive voice) should be avoided as it is less stilted, easier to read;
  - The following theorem can now be proved.
  - We can now prove the following theorem.
- “We” is used to distinguish what is included as a contribution of your article vs. elsewhere;
- Example ... “it is shown that graphs are used” ... where, in this paper or elsewhere ?

# Upper Hand and Obfuscation

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- ❑ Write for the ordinary reader, as your equal, avoid swagger, showing off;
- ❑ “Experiments, with the improved version of the algorithm as we have described, are the step that confirm our speculation that performance would improve. The previous version of the algorithm is rather slow on our test data and improvements lead to better performance.”
- ❑ ... much is true, but not informative, and tautologous !

# What do ask of a (technical) article

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- What is the main result ?
- How precise are the claims ?
- How could the outcomes be used ?
- What is the evidence and how was it gathered ?
- How were measurements taken ?
- How carefully are the algorithms and experiments described ?
- What makes the article trustworthy ?
- Is the right background literature discussed ?

# Some Examples

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- ❑ As search engines emerge as the principle information finding tool within commercial enterprises due to the enormous popularity of WWW technology, the lack of options for integrating text and relational data on the web is becoming critical.
- ❑ Information retrieval systems appear in the Web with the purpose of managing, retrieving and filtering the information available there.
- ❑ There are increasingly more online databases in the current climate of electronic publishing.
- ❑ The age of the mobile internet is dawning rapidly day by day and will demand more and more efficient solutions as disparate online resources are integrated in numbers of new ways.

# Some Examples

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- The difference in the previous results and the results from this study are an artifact of the different collections that are being used in the two studies.
- The method to be chosen is active mapping, as it is definitely superior on each experiment.
- One of these tools is one which automatically creates a short version which contains as much of the content as possible as the original.
- There are some audio-visual speech recognition systems that process both the audio and visual channels, and complete recognition in real-time.

## Materials used:

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1. <http://www.cs.cmu.edu/~jrs/sins.html>
2. “Writing for Computer Science”, Justin Zobel, Springer, 2nd Edition, 2004.
3. <http://www.justinzobel.com>