

# Scientific Writing

T-110.551 Internetworking Seminar

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# Content

- Scientific writing and technical writing
- Language
- Structure
- References

# Scientific and Technical Writing

- What is the problem and why is it essential?
- How is the problem solved?
- What new questions does it raise?
  
- Scientific: new knowledge
- Technical: new gadgets and how they work

# Language

- Clear = the audience can understand
  - Scientific writing does not mean complex sentences and words
- Justified = the audience can believe
- The language affects the style
  - Transition between sentences, sections,..  
“For example, this. However, that”
  - More in the Scientific English lecture

# Language (cont.)

- Remember proofreading!!
  - For example, ispell (M-x ispell-buffer in emacs)
- Remember your audience
  - Here: Mainly computer science students with major of Telecommunications Software
- Choose British or American English

# Structure of Scientific Paper

- Abstract
- Introduction
- Methods
- Results, and
- Discussion

# Abstract

- You need to get the reader to read your whole paper with the abstract of the paper!
- Scope,
- Methods,
- Summarize results, and
- Main conclusions

# Introduction

- Nature and scope of the problem
- Review of the literature
- Reasons for the choice of the method
- Principal conclusions suggested by the results

# Methods

- Describe the experimental design
- Someone else can repeat your work
- Examples of methods:
  - Modeling,
  - Computational methods,
  - Experimental methods,
  - Case studies, and
  - Statistical methods

# Results

- Description of the experiment
- Presents the data: what you find
  - “The fool collects facts, the wise man selects them.”
- Also, what you did not find

# Discussion

- Presents the principles, relationships, and generalizations shown by the results
- Point out the exceptions or lack of correlation
- Show how your results agree with previously published work
- Don't be shy, discuss the implications of your work
- Summarize your evidence for each conclusion

# References

- You are not alone in the universe of scientific work and papers -> refer to previous work!
- Better to write with your own words (show that you understand the subject), but
  - Mark the references when you use them (during writing process), not afterwards
  - Mark the references where you use them, not after each section (as many text books do)
- Use quotation marks (“”) if borrowing text directly + mark the reference
  - too much or unnecessary quotations makes text less understandable & does not show that you understood the subject

# How to Find Good Sources

- No tutorials, no web pages, no commercial material, no fellow students' seminar papers...
- Standards, Journals, Conference Proceedings,...
  - <http://lib.hut.fi/Ecollections/ecollections.html>
  - <http://citeseer.nj.nec.com/cs>
  - <http://www.ieee.org/ieeexplore>
- “Search for Scientific Information” course at HUT
  - <http://lib.hut.fi/Opetus/Informatiikka/english/>

# Annotated Bibliography using BibTeX

```
@InProceedings{BFL96,  
  author =      {Matt Blaze and Joan Feigenbaum and Jack Lacy},  
  title =      {Decentralized Trust Management},  
  booktitle =  {{IEEE} Conference on Security and Privacy, Oakland, CA, May 1996},  
  year =      1996,  
  month =     {May},  
  annote =     {First paper introducing trust management problem and introduces a solution, named PolicyMaker.  
               Principles for trust management system: unified mechanisms, flexibility, locality of control,  
               separation of mechanism from the policy. First tool for processing signed requests and check if  
               they comply with the policy. How to express the security policy and how to use the information  
               gained from the certificates. Language for policy and trust relationships and mechanism for  
               checking that request compies with the policy. Decentralized system, those who have something  
               to protect defines the rules. },  
  annote =     {referred 4.4.2000},  
  annote =     {**lissu/PolicyMaker-kansio, atk},  
  URL =       {ftp://research.att.com/dist/mab/policymaker.ps}  
}
```

# More Information and References of This Presentation

- Martha Davis: *Scientific papers and presentation*, Academic Press, 1997
- R. A. Day, *How to Write and Publish a Scientific Paper, 5th Ed.* Cambridge University Press, 1998
- Many other books and sources:
  - <http://www.tcs.hut.fi/Studies/T-0.050/2003S/index.shtml#material>