Aalto University
School of Electrical
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How to Write a Good Paper?

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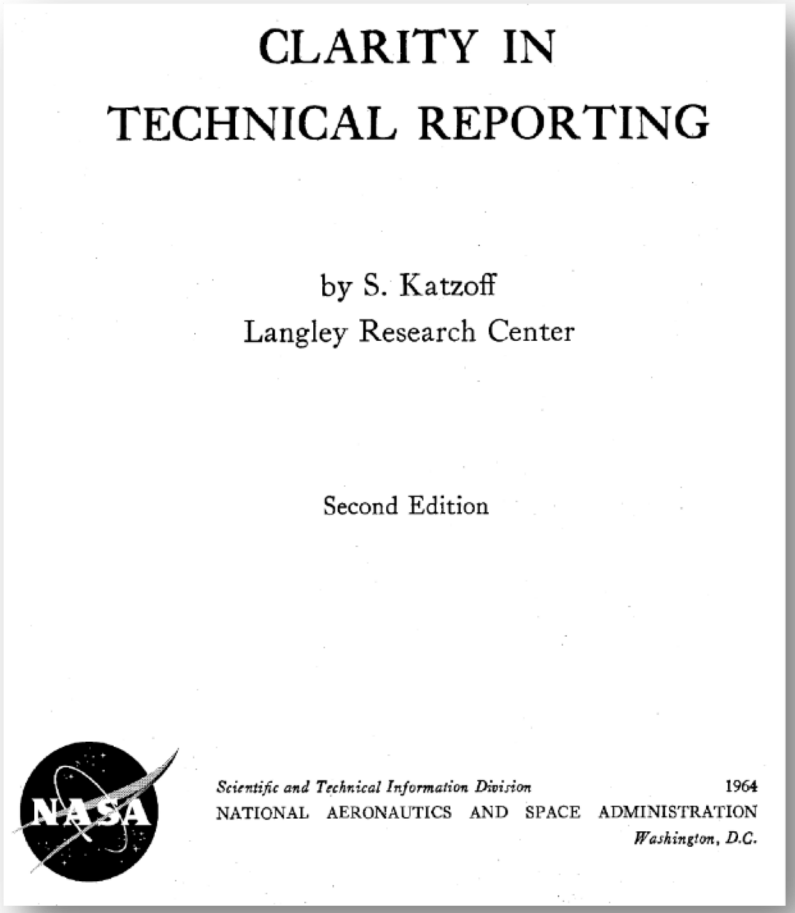
Excellent article on technical writing

- Also main source for this presentation
- S. Katzoff, ”Clarity in Technical Reporting,” NASA report SP-7010, Second Edition, 1964.
- http://www.ifs.tuwien.ac.at/~silvia/research-tips/NASA-64-sp7010.pdf



CLARITY IN
TECHNICAL REPORTING

by S. Katzoff
Langley Research Center

Second Edition

Scientific and Technical Information Division 1964
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

Structure of a report (part 1/2)

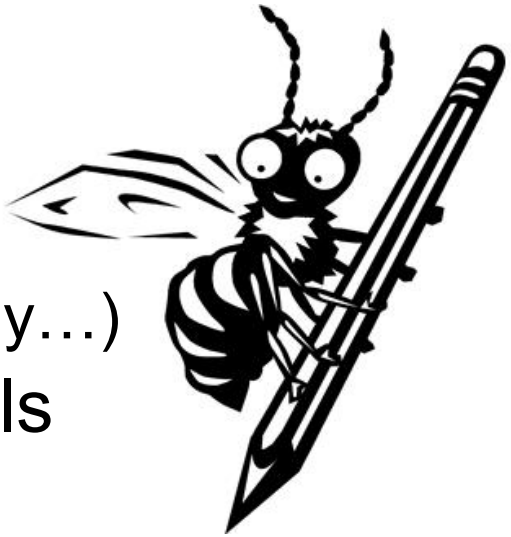
- Title
  - Descriptive; not necessarily the same as your “topic”
- Abstract (summary)
  - Your paper in a nutshell
  - ”Stand-alone” approach

- Introduction
  - Background, problem statement, motivation, many references, description of contents

Structure of a report (part 2/2)

- The actual text (the “beef”)
  - Methods
  - Results
  - Analysis
- Conclusion
  - “Standalone”
- References (bibliography)

Text style



- Formal & clear
  - Avoid exaggeration (very, extremely…)
- Use your own words and symbols
  - No “copy-and-paste”
- Avoid long and complicated sentences
- Do not make your paragraphs too long
- Passive voice often suggested
  - “It was observed that ...”
- Use the template for acoustics seminar!

Abstract

- Tell **everything** very briefly
  - **M**otivation (Why this work?)
  - **P**roblem statement (What problem?)
  - **A**pproach (How is it solved?)
  - **R**esults (How good?)
  - **C**onclusion (What are the implications?)

- Don’t write a short version of introduction!

Reference: ”How to Write an Abstract” by Philip Koopman, Carnegie Mellon University, October, 1997: http://www.ece.cmu.edu/~koopman/essays/abstract.html

Example abstract (100 words)

V. Välimäki, "Discrete-time synthesis of the sawtooth waveform with reduced aliasing," *IEEE Signal Processing Letters*, 12(3): 214-217, 2005.

Abstract—An efficient signal processing algorithm for generating a sawtooth waveform is proposed. The algorithm improves the trivial waveform sampling method, which suffers from low sound quality due to aliasing. The basic version of the new algorithm differentiates a piecewise parabolic waveform. Another version of the algorithm oversamples and decimates the parabolic wave with a simple filter prior to differentiation. The two algorithm variants improve the signal-to-noise ratio (SNR) over the trivial method by 10 and 15 dB, respectively. A perceptually weighted SNR suggests a larger subjective improvement. The proposed methods are applicable in a digital signal processor (DSP) implementation of subtractive sound synthesis.

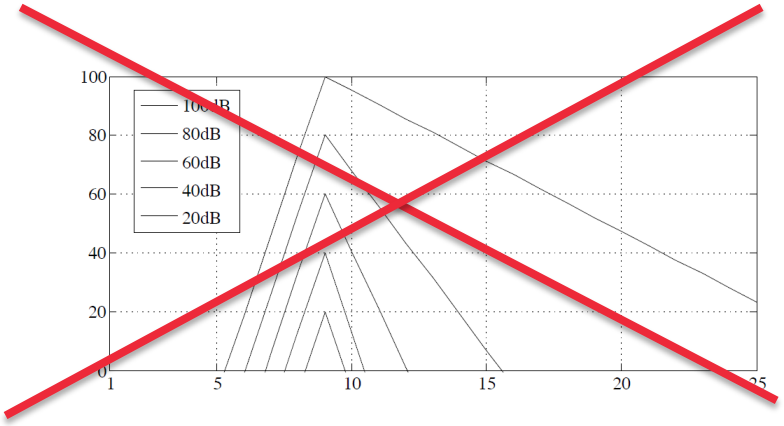
M/P

A

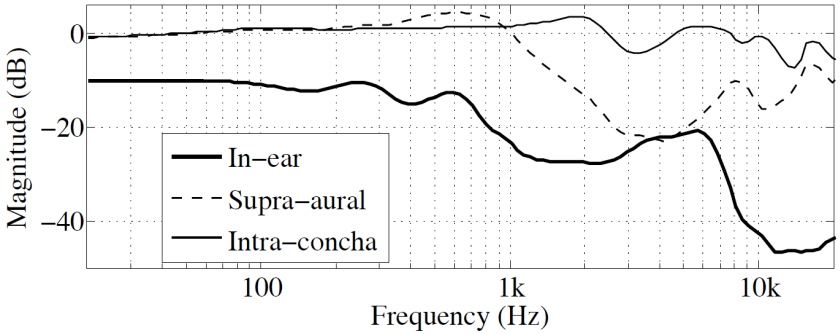
R

C

Figures



- Strive for clarity!
  - Type of plot
  - Font size & type
  - Axis names and units
  - Not too thin lines
  - Sufficient resolution
  - Use colors if allowed



- Use captions to make the figure self-explanatory
- “Anchor” the figure to the body text

Citing previous work

- You must always give a reference, when you mention non-obvious facts/results
  - Borrow, but do not steal
- **Always cite all your references**
- Applies also for figures!
  - In the figure caption: Adapted / adopted from [ref]
  - Give the ref, when a figure **idea** is not your own work
  - Give the ref, when you have copied a figure from another publication, from the web etc.
- Self-plagiation is also naughty!

How to write a conclusion

- A conclusion should review the main points
  - Do not replicate the abstract
- Do not introduce new results in the conclusion
- It may elaborate on the importance of the work
- It may suggest applications and extensions (speculations on future work)

Finalization

- Finally, check your report for
  - Typos, misspellings
  - References & bibliography
- Take the comments from the instructor and other students into account
- Revise your paper and respond to feedback
  - If a point in your text is criticized, change it
  - But you don’t have to agree on everything