Communication in Science

Part I: the craft (and art) of scientific writing

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"The craft of scientific communication" - preview

I: The craft (and art) of scientific writing: [J. Pozorski]
- research reports,
- conference contributions,
- journal papers,
- PhD theses

II: The craft (and beauty) of oral presentations: [P. Lampart]
- seminars, conference talks, poster sessions, PhD presentation, etc.

III: The craft (and pain) of getting funded: [A. Cenian]
- applying for a scholarship or research stay abroad,
- writing a grant proposal, preparing an offer for business partners,
- writing a young researcher’s CV, etc.
Disclaimer ;-) 

None of the instructors at this Workshop is a native English speaker, so their use of the language is not perfect.

We will do our best for you, yet: everything that is said or written here should be taken with caution!

So, please:
- tell us about any mistakes/errors/faults noticed during the classes,
- do feel free to interrupt us at any moment, if anything sounds/looks unclear

The craft (and art) of scientific writing: layout

1. Some hints on actually doing research

2. Describing the structure of typical written documents:
   - examples, particularities (earlier homework: two journal papers)
   - introduction: context, motivation, state of the art, preview of the contents
   - body of the work: method/tools/results, going (hopefully) beyond state of the art
   - conclusions / discussion / perspectives

3. Technical editing issues

4. Publishing your research
   - target readership and journal
   - submitting the manuscript: cover letter, copyright agreement
   - surviving the review process: answers, rebuttal, revision

5. Ethical issues while publishing:
   - contributors (authorship),
   - acknowledging others’ work (papers, unpublished work/ideas, figures, etc.) (plagiaty?)
   - referring to one’s own earlier work; (autoplagiaty?)
PhD student: processing information (a controversial view)

Information: IN / OUT

Energy: IN

Is it enough?

Well, a standard PC does it, too! →

An „internal source term“ is crucial for a successful (and brilliant) PhD work!

Some hints on actually doing research

Factors of success: ingeniosity, creativity, and hard work

**Information IN:**

**Energy IN:**

**Internal source term:**

*depends on your innate talents, motivation, acquired skills,*

*can be stimulated in various ways*

A helpful trick: journal / diary *(dziennik pokładowy)*

The aim of the present „Soft Skills“ workshop: **Information OUT**

How to produce a better document (not necessarily a good one!)
PART I:  The craft (and art) of scientific writing

The structure of a standard written document:
- **front matter**: title, author(s), abstract, key words,
  (less author-dependent: book data, report number, journal information, etc.)
- **body**: text, mathematical formulae, and artwork (figures, tables)
- **back matter**: acknowledgement, bibliography, appendix

*(take a closer look at the two journal papers…)*

A good text processor (e.g., LaTeX) can help a lot:
- offers ready-to-use framework for the above structure
- contains sectioning commands (`\part`, `\chapter`, `\section`, `\subsection`, etc.)
- produces nice math formulae
- provides auto-numbering of equations, referencing scheme, and many more

Examples: `\book`, `\report`, `\article`

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A closer look at the front matter

The most important part of your written document *(everybody reads it!)*:
- **title**: how to chose it?
- **authors**: selection, order, affiliation, contact info?
- **abstract**: thow to write it? (also, use of acronyms, references)
- **keywords**: proper choice

abstract / summary vs. extended abstract vs. executive summary

Specific remarks:
books, monographs, research reports (and PhD report), journal papers, conference contributions
**Remarks on math formulae**

\[ u(x,t) = \sum_{k=1}^{K} a^{(k)}(t)\phi^{(k)}(x) + u_0(x,t) \]

\[ \phi^{n+1} = \phi^n + f(t_n, \phi^n) \Delta t , \]

How to produce quality math?
Where to place it: displayed, in text?
How to use the punctuation marks?
How to refer to them in the text? Order?

**Remarks on „math-like” material**

**Artwork: figures and tables**

Types of figures:
- various plots (line plots, scatter plots, surface plots, isoline plot, etc.)
- cartoon
- sketch, scheme
- photograph, plate

Example of figure: plot(s), caption, numbering, B&W vs. colors, axes, lines, readability, etc.

How to produce quality artwork?
Where to place figures?
How to refer them in the text? Order?

**Remarks on tabular material (numbers, „matrix-type” data)**
Artwork: figures and tables (cntd.)

Examples of figures: cartoon, scatter plot, surface plot.

[Łuniewski 2009: particle-laden turbulent jet (scatter plot)]

Artwork: figures and tables (cntd.)

Examples of figure: photograph, „creative figure”.

Landing gear (podwozie lądującego samolotu) („Fluent News”, 2004)
Symulacje niestabilności przepływu

warstwa ściśnająca (nieciągłość styczna)

eksperyment (Huerre, 2000)

obserwacja: chmury

symulacja numeryczna („Fluent News”, 2004)

Some more remarks: captions, referencing the artwork

A good caption is: Avoid „in-plot” captions

Referencing the artwork:
„Figure 1 contains…
As shown in Fig. 1 (b,c),,,,

Some nice Latin phrases, use of italics:
et al. (i in., i wsp.)
cf.
vs.
pp.3-4ff.
i.e.
e.g.
i.a.
etc.
a priori, a posteriori
A closer look at the back matter

you rarely do your research completely on your own:
- prior knowledge,
- supervising, technical assistance, used tools (software, experimental facilities),
- funding schemes

**Back matter - an often neglected part of your written document:**

- **acknowledgement:** who and what to acknowledge?
- **bibliography:** choice of the optimum scheme (Harvard, alpha)
- **abstract:** thow to write it? (also, use of acronyms, references)

**Bibliography / References / Literature / Work cited**
Bibliografia / Piśmiennictwo / Literatura / Prace cytowane

Various types of entries, Website and unpublished work (to be avoided?)
Specific remarks:
research reports (and PhD report), journal articles, conference papers

Bibliography and citation schemes

**Harvard** scheme:

**alpha** scheme:

Some nice **Latin** phrases, use of italics:
et al. (et alli) (i in., i wsp.)
cf. (confer), ibid., etc.
i.e. (id est), i.a. (inter alia), e.g. (exempli gratia),
QED (quod erat demonstrandum)
a priori, a posteriori, ex ante, ex post, idem, caveat

**Some English abbreviations:** pp.3-4ff., vs.,
Finalizing the document: checklist for text

- does the document read smoothly?
- is the main idea clearly coded in the title, summarised in abstract, and well supported by the conclusions?
- is the sectioning logical and natural?
- is the math typing clear and of the right size?
- is every bibliographic entry referred to in text (in order -for numbers)?
- spell check (GB or US English?), przenoszenie wyrazów

Final result: source file, viewable file (*.ps, *pdf, *doc), hardcopy, archival copies

Finalizing the document: checklist for artwork

- good informative value of figures (readability, size) in the final document?
- every figure referred to in text and appears in order?
- every figure appears in text on the very page or later (never earlier) where it is first referred to?
- for journal submission: separate figure files suitably named?
- sometimes, all figures at the end (+ list of figures)

Similar checklist also for tabular material
Scientific writing: how to publish

Ethical issues while publishing:
- contributors (authorship),
- employer consent,
- acknowledging others' work,
- referring to one's own earlier work

Technical editing issues
- choice of text processor
- making advantage of its functionalities: structuring the document,
- citing the bibliography, (auto)numbering of equations, figures, etc.
- spell-checking, pisownia + przenoszenie wyrazów
- fonts, size, bold, italics, Courier, one vs. two-column, ToC, list of symbols
- use of colors (?)
- math-typing, figure-making, final result: (*.txt + *.fig) lub *.doc, + hardcopy

Scientific writing: how to publish

Publishing your research:
- target readership and journal
- submitting the manuscript: cover letter, copyright agreement
- surviving the review process: answers, rebuttal, revision

Side issues while publishing:
- offprints,
- being cited (JCR: H-index),
-
Conclusion

Final remark on written communication:
- doing research (at any stage) involves a craft (and art) of good writing
  "Publish or perish!"

Anticipated final remark on oral communication:
- presenting one’s own work is an inherent part of researcher’s job
  „Show off or perish!”

Anticipated final remark on applications for money:
- working as a researcher is also (after PhD: mostly;-) about fund rising
  „Get funded or perish!”

Acknowledgements:

- Project „InterPhD“ (POKL 4.1.1) for funding

- Michael Alley „The Craft of Scientific Writing” and
  Beth Luey „Handbook for Academic Authors” for many good ideas

- many of you: for interactive participation!

Workshop:
(and not a lecture)