Typical structure of papers, theses, ...

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Outline

• Ziel einer Ausarbeitung
• Struktur
• Sprache
• Korrektes Zitieren
• Weitere Informationen
• Zusammenfassung

Word-smithing is a much greater percentage of what I am supposed to be doing in life than I would ever have thought.

DONALD KNUTH
Goals of a paper, a thesis, a seminar writeup, …

- Efficiently communicate information
- Explain technical facts
- Discuss options, give recommendations
- Weigh arguments against each other
- Draw conclusions

- Seminars: Let’s practice that, using reasonably complex material
  - Hard to do based on trivial material
Structure of a typical paper (NOT a seminar paper)

- Title
- Abstract
- Introduction
- Related work
- Main body
- Conclusions, summary
- Future work
- References
- Appendix (sometimes)
Title, abstract

• Title
  • Ideally: Clear statement of topic
  • Goal: Attract the reader

• Abstract
  • Gives a short, concise summary of the ENTIRE paper
  • Think of it as advertisement material: goes on a website, prospective readers can quickly check whether they are interested
  • Therefore: Summarize the problem the paper solves, its assumptions, the core contribution, the main results
  • NO background material, …
  • In up to a few hundred words, typically
Introduction

• Explains what the problem, the challenge is
  • Why it is important, interesting, worthwhile, novel
• Roughly outlines the approach the authors took to solve it
• Summarizes the core contributions of the authors
  • Why is this paper a step forward for mankind?

• May give a roadmap how the remainder of the paper is structured
  • But that is often awkward and not compulsory
Related work

• No scientific work stands alone
  • We have background we built upon
  • and we have competition
  • “Related work” section covers both

• **Background**: If necessary, introduce necessary background a reader might not be familiar with (if very long, also ok to do a separate section here)

• **Competition**: What did other people do to
  • Solve similar problems?
  • Solve different problems with similar methods?
  • Commonalities and differences in problem, assumptions, setup, scenario, methods, approach, results, …
  • Explain why the paper is a step forward, different from these papers
  • TYPICAL BEGINNER’S MISTAKE: Only write what other people did, but does not relate it to the authors’ new contribution

• **Location in text**
  • Typically after introduction as separate section
  • Also ok to weave it into the introduction – can read very nicely if done well
  • Sometimes, towards the end – might make it easier to contrast own work with related work
Actual main body

• The part with the actual, real information
  • Explain assumptions
  • Describe method of investigation
    • Analysis, simulation, experiment, architecture work, …
  • Describe the actual investigation
    • E.g., experimental setup, parameters, …
  • Shows the results
    • Quantitative measurements
    • Maybe experiences, …

• No uniform structure, this heavily varies
Conclusions/summary

- Final (real) section
- Weak version: Summary
  - Only summarizes what has been said before
  - Not very useful
  - Really weak when it just repeats the abstract
  - (Again, typical beginner’s mistake, in particular for a thesis)
- Much stronger: Conclusion
  - What can be concluded from all these results? what does it MEAN?
  - Puts result into bigger perspective and context
  - Can give recommendations
    - e.g., “stay away from the architecture proposed here”
  - Can also explain limitations, further challenges
Seminar papers – special case!

- Seminar papers have no “own work” to be reported in the body!
- In a very real sense, they are very much extended “related work” sections
  - But since there is no “own” work, it makes no sense to “relate” the other stuff to it
- Also, an own conclusion is usually not there; but instead, an extensive discussion, comparison, ... should take place

Hence: seminar papers have a slightly different pattern

- Title, abstract
- Introduction
  - Problem to be solved, outline possible approaches, REQUIREMENTS for a good solution
- Solution 1
- Solution 2
- ...
- Comparison, discussion
  - Check solutions against requirements made clear in introduction
- Summary

Dare to deviate!
Seminar papers

• Common issue:

In a seminar paper, it makes ZERO SENSE to have a section called "Related Work"
Correct citations

• Purpose: Allow reader to find material that you used
  • To double check, to look for more details, ...

• Requiered
  • In reference description: all that is need to find source
    • Conventional: author, title, venue, year, location, page numbers, ...
      • Details vary with what you are citing
    • Modern: DOI (but not yet commonly accepted)
  • In text: pointer to particular reference
    • Various style: [1], (Smith & Miller, 2002), ...

• Tools
  • By all means, use tools to produce the reference lists and the pointers from the text
  • Standard solution: bibtex
  • Better: biblatex / biber
Korrekte Zitierungen

- Zitieren als Referenz auf Originalquellen - intellektuelle Ehrlichkeit
- Literaturangaben sollen Auffinden der Quellen möglichst einfach machen - Archivcharakter
- Unterscheide:
  - Quellenangabe im Literaturverzeichnis - enthält alle bibliographischen Informationen
  - Referenz im Text → Index in Literaturverzeichnis
    - Meist als Zahl: [17]
    - Selten als Abkürzung der Autoren, Erscheinungsjahr: [MS97]
    - Fast nie: Autor-Jahr (Müller und Schmidt, 1997)
- Formulierung:
  - ... diese Resultate konnten bestätigt werden [17].
  - Wie in Referenz [18] diskutiert, ...
  - Wie Müller und Schmidt [17] gezeigt haben, ...
  - Aber nie: [18] diskutiert ... (ein Artikel diskutiert nichts)
Weitere Informationen

- Bücher zum Thema Schreiben, Organisation von Texten, Stil

- Web-Seiten
  - Siehe Web-Seite dieser Veranstaltung
  - Überblick: http://www.cs.cmu.edu/afs/cs.cmu.edu/user/mleone/web/how-to.html mit Links zu einer Reihe von Artikeln
Zusammenfassung

• Ausarbeitung soll effizient Informationen vermitteln
  • Alles andere ist lediglich Mittel zum Zweck

• Struktur einer Ausarbeitung
  • Abstrakt, Einleitung, Rumpf, Zusammenfassung

• Sprache
  • Vor allem: Präzision und Klarheit
  • Primat des Inhalts
  • Achten auf Stil
  • Schreiben Sie auf Englisch!

• Zitieren Sie korrekt und vollständig