How to write a paper

Lejla Batina and Peter Schwabe
Radboud University Nijmegen, The Netherlands

November 13, 2013
Lecture Research A
Requirements for the course

Deadlines

- Submission of the full paper (first version): December 10, 2013
- Submission of the full paper (final version): January 10, 2013
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Software

▶ Papers written in Microsoft Word, OpenOffice, Libreoffice etc. will be accepted but we highly recommend against it
▶ Use \LaTeX instead.
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Formal aspects

- Between 15 and 20 pages (including bibliography)
- 10pt font, simple line spacing (no special \LaTeX options)
- Use \LaTeX document class \documentclass[a4paper]{article}
- No special page-margin configurations
The reader

Central question: Who reads your paper and why?

- Purpose of the paper: you want to convey your idea/results to the reader.
- You want people to *want to read your paper*
- Papers will be reviewed (here: graded). Make reviewer (here: us) happy
  - Do not assume too much expert knowledge but do not start with Adam and Eve
  - Examples (or concrete numbers) help!
- Think about different groups of readers; who will read what?
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  - Relevant information must be easy to find for all groups
  - “Irrelevant” parts (for some group) should be skippable
- Also help people who will not read your paper
  - Make clear early what is and what is not in your paper
Paper organization

1. Title
2. Author names
3. Author affiliations and contact data
4. Abstract and keywords
5. Introduction
6. Main part
7. Results and Comparison
8. Conclusion
9. Bibliography
10. Appendices
The paper title

- As short as possible, as long as necessary
- The most important keywords should go in the title
- Make sure that people find your paper (title will show up in web search engines)
- “Advertisement” starts with the title (do not scare readers away)
Author names and affiliations

- Make sure that the reader can reach you or find you
- E-mail addresses are good (in particular permanent ones)
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- Think about spelling of names (e.g., Hisil vs. Hışıl)
- Footnote behind author names points to acknowledgment of funding
- Please put the date somewhere
  - Makes it easier to cite paper correctly
  - Helps to find the newest version
Abstract and keywords

Purpose

▶ Tell the reader whether he should read the paper
▶ Advertise your results
▶ Address all possible groups of readers

Don’t

▶ Never lie about your results!
▶ Do not imply that you did things that you did not do
▶ Do not discuss potential problems with your work here
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▶ Advertise your results
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▶ Keywords: help to categorize paper; do not repeat the title

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The Introduction I

- Describe the problem you’re solving
- Convey the *idea* of your paper
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- Make very clear what your contributions are ("what is new"). Good idea: use an `itemize` environment for this.
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- A subsection of the introduction *can* describe related work (other spot: "Results and Comparison")
The Introduction II

- Typical (but not necessary) end of the introduction: “Organization of the paper”:

“The remainder of the paper is organized as follows. Section 2 formalizes the problem. Section 3 describes our approach. Section 4 gives details of our implementation. We present result of our measurements and benchmarks in Section 5 and conclude the paper in Section 6.”
The Introduction II

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- Introduction is a good spot to give details of software availability (if it applies):

  “We place all software described in this paper into the public domain to maximize reusability of our results. The software is available online at http://mydomain.org/project/my_software/.”
The main part of your paper

- Very hard to give general rules how to write this part
- Some general comments:
  - Start with examples (concrete numbers), then generalize/formalize
  - Focus on giving the reader an intuition of what’s going on
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- Do not phrase weaknesses too negative:
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  - Don’t write: “We were too lazy to also implement…”
  - Do write: “A future challenge will be to also implement…”
Reproducibility

- Make sure that your results are independently reproducible!
- Provide all necessary information
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- Provide all necessary information
- Raw data required? Put it online (if possible) and provide a download link
- Did you write software? Put it online and provide a download link
Results and Comparison

- This is the other possible spot for describing related work
- Be honest about your results
- Give detailed results (e.g., include standard deviation or quartiles of measurements)
- Be fair in the comparison to related work
Conclusion

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▶ if you are only repeating the abstract/introduction in past tense
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- if you want to make me happy
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Do write a conclusion

▶ if you want to point to interesting future work ("Conclusion and Outlook")
▶ if you really feel like you want to collect result of your paper again
▶ if you want to make various other readers/reviewers happy
The Bibliography

- List all papers that have been cited in the text (and only those!)
- Use computer-science style ([1], [2], etc., or [ACD⁺06], [AFG⁺09])
- Sort either by author names or by appearance in the text
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  - Provide all relevant information
  - Provide correct information
  - Provide download links (preferably without a paywall)

See also http://cr.yp.to/bib/devil-cite.html
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See also http://cr.yp.to/bib/devil-cite.html
Using bibtex

- Create file mycollection.bib with your bibliography entries
- Inside your LaTeX document put
  \bibliographystyle{plain}
  \bibliography{mycollection}

- Translate your document with
  \texttt{pdflatex paper.tex}
  \texttt{bibtex paper}
  \texttt{pdflatex paper.tex}
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  \begin{verbatim}
  \bibliographystyle{plain}
  \bibliography{mycollection}
  \end{verbatim}
- Translate your document with
  \begin{verbatim}
  pdflatex paper.tex
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Appendices

- Typical measure to address page limitations
  
  "Submitted papers must not have more than 15 pages excluding the bibliography and appendices"

- Reviewers are typically not required to read appendices

- Not very relevant for the paper in this course
Figures

- Figures can be a great way to give the reader an intuition
- Make sure that figures/pictures have high quality
- Use vector graphics rather than bitmap graphics
- Do not use pictures “from the Internet” without giving credit!
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- Make sure that figures/pictures have high quality
- Use vector graphics rather than bitmap graphics
- Do not use pictures “from the Internet” without giving credit!
- Use labels and captions for figures (and tables, code listings, etc.):
  \begin{figure}
  \includegraphics{mypicture}
  \caption{Picture of something interesting}
  \label{fig:mypicture}
  \end{figure}
- Reference your figure (or table, code listing, etc.):
  \text{Figure}\textsuperscript{\ref{fig:mypicture}} depicts...
- Do not write “The following figure depicts …” (figures may float in your document)
Writing style and techniques

- Use short sentences.
- Use simple English (do not show off with your extensive vocabulary)
- Use common notation (“a prime $p$”, “indices $i, j, k$”, etc.)
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- Use a spellchecker, e.g.
  
  ```bash
  for i in ./*.tex;do aspell check $i;done
  ```
Giving credit

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- Mark clearly what parts of the paper are not yours (including pictures etc.)
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  - Don’t: “We use Montgomery reduction as explained in [MOV96].”
  - Better: “… as explained in [MOV96, Algorithm 14.3.2]
    ... as explained in\cite[Algorithm 14.3.2]{MOV96}.”
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- Note the non-breaking space before \cite
- Obtain and read the papers you are citing
  - Many papers are online
  - Sometimes you have to go to the library
  - Can also write e-mail to the authors
Writing together

- Writing with coauthors can be a great experience
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- Writing with coauthors can be a terrible experience

Intuition: "It takes one person \( n \) days to write a paper, so it takes \( \frac{2}{n} \) days" to do it with two persons.

Better assumption: "It takes one person \( n \) days to write a paper, so it takes two persons \( 2n \) days."

Other people have different working hours, speed, style, etc. Respect this!

Very helpful: revision control systems (CVS, SVN, git)
- Easily merge conflicting changes
- Easily see differences of different versions
- Easily go back to a previous version
- Easy (simple) backup on some server
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Summary

- Make the reader happy
- Examples are good
- Stick to deadlines
- Start early
- Do not plagiarize