Written Report

How to Write a Paper

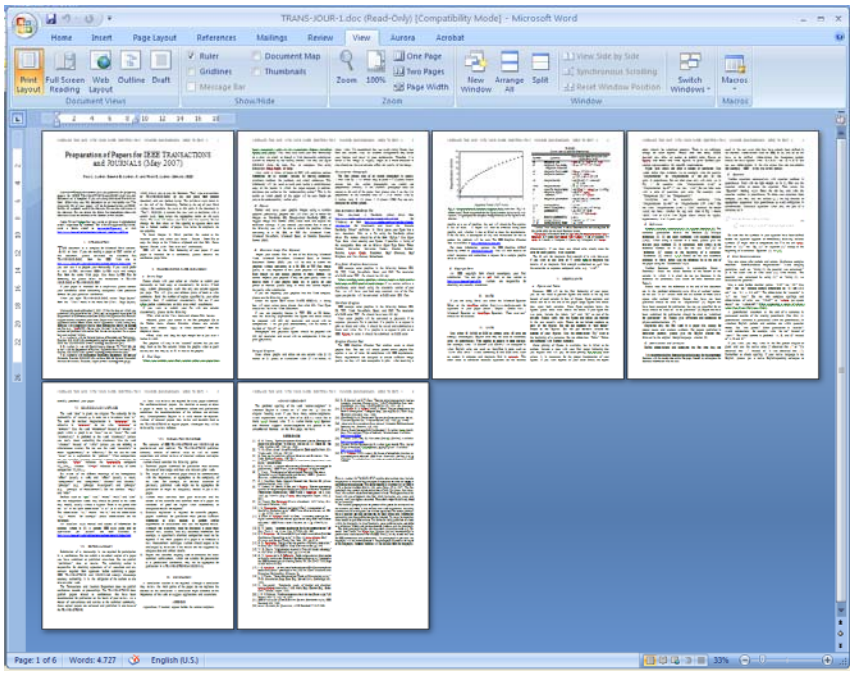
Adapted from slides provided by Michael Bang Nielsen

!!!

- Your project reports must be written and handed in individually
- The deadline is Monday 10th January 2010 at noon.
  - Hand in at the Information Office, Dept. Computer Science (red box or in person)
  - Hand in two copies

Template

- We have decided that you hand in your reports as papers
- Use IEEE template for formatting
  - http://www.ieee.org/web/publications/authors/transjnl/index.html
  - Instructions:
    - **Article Preparation and Submission**
  - Templates (Word & Latex):
    - **Template for all Transactions**



Formalities

- Your paper cannot exceed 8 pages (excluding appendix)
  - IEEE style, two columns
  - Write in Danish or English
- Every paper should include an appendix containing
  - Source code for all kernels (and kernel wrappers if non-trivial)
  - Source for all additional _device_ functions
  - Source code for additional "crucial" CPU functions
  - A link to the full source code and executable with necessary data files
  - A brief summary of how to run your application
  - A "GPU time summary plot" obtained e.g. by the CUDA Visual Profiler (can be moved to the results section)

Front page

- Remember to put your name
- and – if applicable –
  - Also include the names of your group members

Goals

from course announcement

- At the end of the course the participants must be able to:
  - programme graphics cards for general purpose computing.
  - formulate and judge parallel algorithms for medical image computing.
  - implement and evaluate the above mentioned algorithms.
  - understand and relate the contents of the scientific papers presented in class

How to write a research paper

The publication process

1. You spend one year doing research.
2. You spend two weeks, working day and night, writing a research paper.
3. You submit it to a conference or journal.
4. The reviewers (referees) assigned to your paper review your paper and each fill out a review form with comments. The reviewers are anonymous to you. In some cases you are anonymous to the reviewers too. This initial review process typically takes two to three months.
5. You receive your review forms. For conferences your paper is either accepted or rejected. For journals the review process is two-way: You respond to the reviewers' comments and they respond to your comments hence forming an iterative process. In the end your paper is either accepted or rejected. Each iteration may take a month or more.
6. If your paper was accepted it is finalized and sent to print. For journals this may take anywhere from a couple of months to well over a year. Usually available online immediately however. For conferences the turn-around time is usually faster.
7. If your paper was rejected, you re-write it based on the reviewers' comments and re-submit it elsewhere.

Your Assumptions

- ”The most dangerous mistake you can make when writing a paper is assuming that the reviewer will understand the point of your paper”.
- ”Your paper will get rejected unless you make it **very clear**, up front, what you think your paper has contributed”.

A good paper...

- ...takes time to write.
  - Don’t write it in the last minute!!!
- A research paper takes weeks to write
  - Your reports should also not be hasted.
  - A good project does not receive top grades if the quality of the report does not match the quality of the implementation!

The Fundamental Structure of a Paper

Title of My Project

Name of Student*
University of Aarhus, Denmark

Figure 1: Teaser image showing a smoke simulation with my new method.

Abstract

I have developed a method for...

CR Categories: : Three-Dimensional Graphics and Realism—Animation; Curve, Surface, Solid and Object Representations; : Computational Geometry and Object Modeling—Physically Based Modeling; : Types of Simulation—Animation

Keywords: Computational fluid dynamics.

1 Introduction

2 Contributions and Outline of Paper

3 Related Work

My work is based on [Stam 1999] and [Fedkiw et al. 2001].

4 Equations of Fluid Flow

Fluid flow and terminology.

5 Sections Describing Your Method

6 Results and Discussion

Figure 2: Result 1. Figure spanning only a single column.

7 Conclusion and Future Work

*e-mail: student@daimi.au.dk, Aarskort-nummer: 007

References

FEDKIW, R., STAM, J., AND JENSEN, H. W. 2001. Visual simulation of smoke. In *Proceedings of ACM SIGGRAPH 2001*, Computer Graphics Proceedings, Annual Conference Series, 15–22.

STAM, J. 1999. Stable fluids. In *Proceedings of SIGGRAPH 99*, Computer Graphics Proceedings, Annual Conference Series, 121–128.

The Teaser

Discontinuous Fluids

Jeong-Mo Hong*
Korea University

Chang-Hun Kim†
Korea University

Figure 1: Capillary instability of a liquid jet; liquid pouring on to a sphere; and bubbly water.

Rigid Fluid: Animating the Interplay Between Rigid Bodies and Fluid

Mark Carlson Peter J. Mucha Greg Turk
Georgia Institute of Technology*

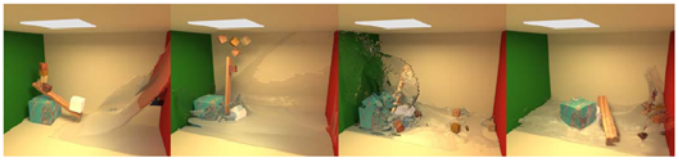


Figure 1: A silver block catapulting some wooden blocks into an oncoming wall of water.

The Abstract

- Is brief: 200-300 words.
- Summarizes your work:
  - What problem does this paper solve?
  - Why is this problem important for medical image computing (the **context** and **motivation**)?
  - How does your method work?
  - How does it differ from previous work?
  - How much better than previous work is it?
- There are usually no references in the abstract
- The abstract should be readable and understandable by non-experts

The Introduction I

- The introduction must be **dynamite.**
  - The reader forms an oppinion of the work right from the start…
- The introduction is an extension of the abstract.
- Should be easy to read and understand
- Should make it easy for anyone to tell
  - What your paper is about
  - What problem it solves
  - Why the problem and solution is interesting and relevant (motivation and context). Is it a long-outstanding problem?
  - What is new in your paper and how (much) does it improve on the strongest alternatives/previous work (include a few of the most relevant references here).

The Introduction II

- Start the introduction with the motivation. Think in *large contexts* and don't be afraid to be a poet.
- All implications, contributions and key points of your work must be included here.
- Make it very clear how your work will *impact* the future of medical image computiing (will people use it?).
- If your work is pioneering, s-p-e-l-l i-t o-u-t.
- Briefly make it clear how you evaluate your method in the Results section.
- Make sure to explain where your method applies and where it does not apply (limitations).

The Contributions and Outline Section

- Assign a special section or at least paragraph to describe your contributions: **What is new in this paper compared to previous work**.
- List contributions in bullets to give a better overview.
- Provide a structural organization and overview of your paper: What can the reader expect to read in the sections to come.
- Likewise start each section by clarifying what you will be presenting in that section. Refer back to the overview and at the end of the section, chain this section to the next section.

The Previous Work

- Describe and reference previous work that is relevant to your work.
- The previous work section is mostly descriptive.
- Address the weaknesses of the previous methods.
- You should not do a full comparison between your method and previous work here. Leave that for the Results section.
- You can however distinguish yourself from previous work by saying something like ”In contrast to method X, my method...”, or ”The main difference between my work and X is...”.

The Core of the Paper: Your Work I

- These sections should be adjusted to your particular work/method/application.
- Set/Assume a certain level of expertice from the reader for these sections. Remember that in the abstract and introduction, ”the grandmother principle” applies.
- An important approach to explaining your work is the **funnel principle:** Don’t jump into details right away. Start by providing an overview and progressively increase the technicality of the explanation. Make sure the reader always knows where he is in the presentation by frequently referring back to the overview.

The Core of the Paper: Your Work II

- Don’t use terminology that you haven’t introduced and don’t introduce terminology that you won’t use.
- In most cases, an illustration/figure is the key to explaining your idea or assisting your explanation: **A figure says a lot**.
- Provide enough technical details that others can re-produce your work.
- Spell out all assumptions made by your method.

About Images and Illustrations

- ”If you have good-looking pictures, you’ve got your foot in the door.”
- Can you get the point of the paper just by reading the captions to the illustrations?
  - To some extent it should be possible to read the paper by only looking at the pictures and their captions.

The Results I

- This section should make it clear (prove) how your paper differs from and improves on previous work.
- Present numerical results/tables
  - quantitative measures if possible.
- Discussion: Explain how the results (qualitative and quantitative) imply the implications and improvements that you claimed in the introduction (close the loop).

The Results II

- Whenever relevant and possible, always compare your method to the **strongest/best alternative** (previous work) and make it clear that you beat it.
- Be sure to also address weak points in your own work. When does it not work so well? The reviewers are researchers themselves: They know there is no silver bullet.
- Provide enough details in the experiments that others can re-produce the experiments and compare their method to yours (e.g. Experimental setup, Computer details (RAM, CPU etc)).

Future Work

- This section is usually combined with the conclusion section described next.
- State immediate extensions of your work, things you did not have time to do, or related well-known problems.
- If you state a future work problem that you don’t want others to steal, say you are already working on it or that it is ”almost” in submission elsewhere.

The Conclusion

- Briefly **motivate** your work and its **context**.
- Summarize your work/method and the results (it was X times better than the strongest alternative).
- Spell out the **implications** for and the **impacts** on ”parallel/medical image computing”. Why it is useful and interesting?
- **Keep in mind that the conclusion will be the last the reviewer reads: You want to leave him with a good impression.**
  - Don’t end the conclusion by saying ”My method can’t do that...” but end by stating its **importance** and **impact**.

Points Addressed by Reviewers

- Is your paper of interest to the relevant research communities?
- What is its novelty, impact and correctness?
- Is your paper well-organized?
- Is your paper complete/stand-alone? Does it contain all the details necessary to implement it? The results must be reproducable by a graduate student to have any value.
- Your paper must be easy to read.

The SIGGRAPH Review Form

1. Briefly describe the paper and its contribution to computer graphics and interactive techniques. Please give your assessment of the scope and magnitude of the paper's contribution.
2. Is the exposition clear? How could it be improved?
3. Are the references adequate? List any additional references that are needed.
4. Could the work be reproduced by one or more skilled graduate students? Are all important algorithmic or system details discussed adequately? Are the limitations and drawbacks of the work clear?
5. Please rate this paper on a continuous scale from 1 to 5, where: 1 = Reject, 2 = Doubtful, 3 = Possibly accept, 4 = Probably accept, 5 = Accept. Please base your rating on the paper as it was submitted.
6. Please rate your expertise in the subject area of the paper on a continuous scale from 1 to 3, where: 1 = Tyro, 2 = Journeyman, 3 = Expert.
7. Explain your rating by discussing the strengths and weaknesses of the submission. Include suggestions for improvement and publication alternatives, if appropriate. Be thorough -- your explanation will be of highest importance for any committee discussion of the paper and will be used by the authors to improve their work. Be fair -- the authors spent a lot of effort to prepare their submission, and your evaluation will be forwarded to them during the rebuttal period.
8. List here any questions that you want answered by the author(s) during the rebuttal period.
9. You may enter private comments for the papers committee here. These comments will not be sent to the paper author(s).

How to Get Good at Writing Papers

- Read a lot of papers.
- Learn the specific phrases/jargon that the papers use to emphasize the points I tried to make in this presentation.
- Write papers.
- Get tips from Professors.