

Hints for Writing a Seminar Report, a Papers, or a Thesis

Prof. Philipp Slusallek, translated by Florian Winter
Saarland University

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Abstract

Studies at a university to a large degree involves passive, reproductive activities that often require little creative work by the students. Most study programs contain only few opportunities, apart from theses and seminars, to practice the independent writing of longer texts. However, this particular skill is of significant importance for a later scientific or industry career, for example for writing reports or conference papers. It is therefore in your own interest to make best use of the few existing opportunities of training this skill at a university.

This document, on one hand, will give you hints for your report and, on the other hand, serves as a meta document that demonstrates what such a text may look like. You can and should also use it as a template for writing your own report. Furthermore, the LaTeX source code of this report can be used to get started in writing LaTeX.

1 Introduction

Strengthening the active aspects of university education in order to better prepare students for their later career (a part of “soft skills”) is a frequently discussed topic. There, it is not enough to be able to acquire knowledge from books and other sources, but it is also important to summarize this acquired knowledge in written form and to present it to others in a compact way.

Seminar reports and theses offer the best opportunity in the context of university education to practice active writing. Yet, first drafts of Bachelor or Master theses frequently and clearly show that these opportunities are not sufficiently used by students.

The following section presents the requirements for reports and introduces the criteria for

grading them. The following section then provides hints how to write a report. Of course, these hints cannot be complete and are meant solely as a coarse framework for your work. You can find further hints for writing texts in the literature (e.g. [vW93], in German).

1.1 Format

The optimal length of a report depends to a large extent on the type of a course (seminar, Bachelor thesis) and on the topic. Please refer to the information about the course in this regard and discuss with your advisor. Remember that a short and succinct report is always better than a lengthy text with little content.

In most courses, you can write your work in German. But if you prefer, you can also try to write your text in English. We will factor in language deficits accordingly when grading.

I recommend to write your work in L^AT_EX, since this is the best :-) and most widely used system for scientific work. You should find the sources of this (meta) report on the same website where you got this one and can use it as template and starting point. It shows most important aspects of L^AT_EX.

1.2 Grading

Your grade will, on the one hand, depend on technical aspects: Correctness of content, thematic completeness with respect to available space and understandability. As in any paper, the form of presentation also affects grading: Structure of the paper, structural completeness, language, readability, clarity of the text and the images. In scientific papers, of course, relevance of the topic, novelty of the contribution, technical solution etc. also count, however we cannot and will not grade these aspects in seminars.

2 Report

This section contains some hints about writing your report. Most of these hints also apply to other scientific publications or technical reports in a similar way.

2.1 General

In general, you should not assume that a report will be read completely before at least a first (sometimes, however, even the last) impression is formed by the reader.

At first, someone will typically read the abstract of the report to find out what the paper is all about, what to expect, and whether it is worth reading the text. Here, you must grab the attention of the reader, you must motivate him to read on, and set up the right expectations for what is to come. Next, the reader will likely browse through the paper and skim it by means of the chapter headings, images, and illustrations (especially in computer graphics). This means that these aspects should outline the content of the paper and tell the core of the “story” (e.g. repeat the most important results, e.g. as captions of good, expressive figures).

After this, typically, the results and conclusions are read, to assess, whether the paper is worth giving it a closer look. For a report, it is therefore highly important to get all these aspects well done for turning a potential reader into an actual reader.

Once this has been achieved, you are in a good position: from now on is the actual content of your report that counts and decides about success or failure of a report.

The following hints for the individual parts of a report should point out the structure of a report as well as provide tips concerning the content of a text.

2.2 Title

The title of your work should describe the topic in a few keywords as exactly as possible. The author, his affiliation (i.e. university), and a date of publication should be included below the title.

2.3 Abstract

The abstract is the initial contact of the reader with the report. It must motivate the reader

to continue reading the paper, but it must also achieve the appropriate expectations, such that the reader will not be disappointed if the content doesn't fulfill the initial promises.

A common recipe for an abstract is the following:

- 1-2 sentences about the environment of the report: What is it all about? What is the current state of the art?
- 1-2 sentences describing the problem: What kind of problem do we want to solve, why is it important and relevant to the reader?
- 1-2 sentences about the approach or the solution strategy: How is the problem approached? What is the solution based on? If appropriate, a very short description of the solution can follow here.
- 1-2 sentences about results: Point out can be done with what is described in the text.

2.4 Introduction

The introduction is, in principle, a more detailed abstract and an introduction to the topic in general. Here is the opportunity to motivate the topic more precisely, define the environment, discuss the problem, previous work, and to give an overview of the paper. Usually, the own, novel contributions are also summarized here. Some of these aspects may form a separate (sub-)section if necessary and important enough.

2.5 Previous Work

A very important part of a report is the reference to and discussion of previous work. Here, all relevant previous work should be mentioned (with references to literature, see below). In particular, it is important to discuss, why these approaches may not be as good, not relevant, less efficient etc. and why the approach presented by your report is in some way better or at least different from other approaches.

Again, this section is sometimes embedded into other sections or even placed at the end of the report. But it may never be missing.

2.6 Main Text

These sections you describe the actual problem, solution, etc. The structure therefore depends

strongly on the particular topic. In general, you should pick some core issues and focus on describing and discussing these. A paper can rarely treat a topic comprehensively and must therefore be limited to the essential ideas. It is often a good idea to first present an overview of the technique and then discuss different aspects in separate section. This provides the reader with a context to interpret the text in.

If appropriate, the paper can refer to another report or to literature for further details. However, the basic idea of the paper should be roughly comprehensible by an experienced reader even without additional literature. If another paper is required for understanding, provide at least a summary of the relevant aspects.

2.6.1 The Story

Even a scientific text should have a “story”. You are not trying to write the most boring text possible, but you want to captivate the reader by the possibly boring topic. Build up a tension curve like any other good story. There are different ways to achieve this: For example you can begin with the dramatic “murder” (main result), then fill in the details how it came to happen this way. A more common approach is the “happy end” approach: present all the required details of the detective work and finally put it all together at the end.

2.6.2 No enumerations

It is important, in this regard, that you do not give in to the temptation to just enumerate the things you did for solving the problem (“first I did this, then I did that”). This is a popular mistake of beginners.

Much more important for the reader is the motivation and justification of the decisions made and the necessary background information. Why has this approach been taken? What are the fundamental principles? What is the environment in which this development has been made? Which alternatives have been considered and why have they not been used? What are the limitations of this method? Any (honest) paper should always contain this information.

2.6.3 Figures

At important positions, it is essential to use images, illustrations, and other graphical representations to make the written statements more

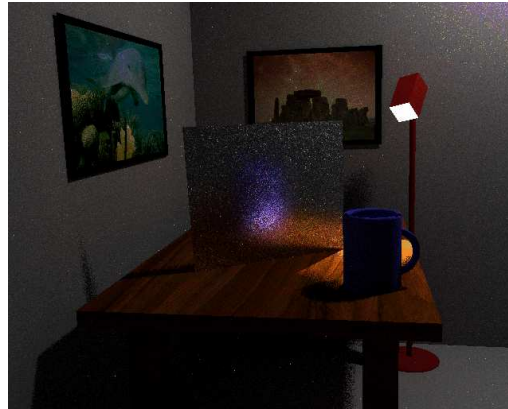


Figure 1: This is a detailed caption of a figure, which explains that in the figure you can see the impressive result of a Monte Carlo simulation of global illumination. Besides, it also serves as an example how to embed postscript images in L^AT_EX.

First column	Condition	Value
Name1	true	123 000.00
Name2	false	1.00
Name3	don't know	0.25
Sum		123 001.25

Table 1: Again this is a long caption explaining what can be seen in this table, what to look for, and how to interpret the data. Help the reader in making sense of the data you provide.

clear (see Figure 1). These should always have a detailed caption which should also be understandable without reading the text (see the note above). Every figure should be referenced from the text and should appear as close to the reference as possible and in the order they are first references (sometimes exceptions to this rule are necessary).

The same is true for tables that present data or results as in Table 1. Also note, that in English you write “section”, “figure”, and “table” when talking about them in general, but use capital letters when you refer to a specific table, such as Table 1.

2.6.4 Math and Formulas

Of course, you can simply integrate formulas into the text ($a^2 + b^2 = c^2$) or you can also generate separated display formulas with or without numbering (see Formula 1). Formulas that appear in the text, like

$$L^r(x, \omega_o) = \int_{\Omega_+} f_r(\omega_i, x, \omega_o) L^i(x, \omega_i) \cos \theta_i d\omega_i$$

and

$$A = \pi r^2, \tag{1}$$

are parts of sentences and should therefore also contain the appropriate interpunctuation symbols.

2.7 Results

In particular in computer graphics, this section is often the crucial point. Almost no paper is accepted that can't demonstrate the results at least by a few examples. Countless papers have already been rejected because of the absence of convincing results, even if the ideas by themselves might have been very nice. But even the best ideas sometimes do not work out at the end when you try to realize them. Papers without implementation have become rare, which has significantly contributed to the credibility of computer graphics. Of course, expressive color pictures are appreciated here.

2.8 Conclusions

Here you should once again briefly describe the content of the paper and mention the most important results and your own contributions. This is also the right place to discuss still unanswered questions, extensions, and future work.

In German papers, this section is often also called “Zusammenfassung” (summary), like the abstract. For a seminar report, this is also the right place to have a critical look at the given topic and provide your opinion.

2.9 Bibliography

Here, all used literature should be listed. The easy management of citations is reason enough to use L^AT_EX. You can generate the bibliography section automatically by using the “bibtex” program. Simple \cite commands in the text insert references to literature that can be managed in a separate bib-file. If you are using “emacs”, this will also help you with entering literature into the bib-file according to the different classifications (e.g. book, article, in proceedings, etc.). Please just copy and paste the provided entries or check with other literature regarding the best use of bibtex.

3 Results

The result of the preceding sections should be, that you hopefully got at least a rough idea about the structure and content of a technical, a seminar report, or a thesis.

4 Conclusions

This paper contains the most important information about written reports in the context of seminars and theses. It is also a meta document that you can use as a template for your own work because it contains the most important L^AT_EX commands. Further details about L^AT_EX can be found e.g. in [Lam94]

References

- [Lam94] Leslie Lamport. *LaTeX: A Document Preparation System*. Addison-Wesley, 1994.
- [vW93] Lutz von Werder. *Lehrbuch des wissenschaftlichen Schreibens*. Schibri-Verlag, 1993.