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Bachelor’s Thesis

Bachelor’s Thesis Template

By

Author and Author

(Template by Peter Nilsson)

Department of Electrical and Information Technology
Faculty of Engineering, LTH, Lund University
SE-221 00 Lund, Sweden

Abstract

Here are my most important results described. The abstract is usually without abbreviations and references.

Acknowledgments

This Bachelor’s thesis would not exist without the support and guidance of …

Name of the Authors

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Preface (if necessary)

In this thesis work, author 1 has been working with X, author 2 has been working with Y, and part Z has been done together. This statement is a requirement if there are more than one thesis worker.

Here, scientific and popular papers contributing to this thesis can be listed, submitted as well.

1. Introduction

This chapter gives a brief description of the project …

1. Cross references

## Figures, tables, and captions

Table I shows the objects in Fig. 1 and in Table II, the objects in Fig. 2, are shown. Note that all figures and tables should be referred in the text, after appearance, like in the sentence.

1. The objects before collision.

|  |  |  |
| --- | --- | --- |
| A | B | C |

Using the IEEE standard, the table head font is in Small Caps using the font Times New Roman as shown in the table heads.

1. The objects after collision.

|  |  |  |
| --- | --- | --- |
| 1 | 2 | 3 |

In Fig. 1, there are three objects before collision. In Fig. 2, there are three objects after collision.



1. Three objects before collision.

The figure captions, in IEEE style, are written as “Fig. 1.” A figure is often referred in the text as “Fig. 1”, i.e. not as “Figure 1”. Whatever you choose, be consequent!



1. Three objects after collision.

## Headings, Table of Contents, and References

In the Microsoft Word Home tab you can press the arrow under styles to see all styles for this document. The styles used in this document are all beginning with “My …” I recommend to use them or to use your own defined styles. The only exception is “Heading 1 chapter”, “Heading 2”, and “Heading 3”, which is not changed.

To be able to generate a Table of Contents, you need styles for the different levels for the chapter and sections, see “Heading 1 chapter”, “Heading 2”, and “Heading 3”, in the styles menu. For unnumbered headings, use the style “My Head NoNum”. The unnumbered headings can be used for the abstract, acknowledgements, references, etc. To update the Table of Contents, go to the Table of contents and right click on one of the lines and click “Update field”.

## References and equations

Follow the reference style for books [1], conference papers [2], and journals [3], when referring to a bibliography item. Note that the style differs between [1], [2], and [3]. There should not be any bibliography items that do not appear the text. If possible, avoid references to web-pages since they often become out of date. References are preferably not placed in abstracts, captions, headings, etc., only in the body text. Note that the references should be numbered in the order they appear.

All equations should be referred in the text, usually on the IEEE form: “The function is shown in (1)”, not as “The function is shown in equation (1)”, or “The function is shown in equ. (1)”. The only exception is when the sentence starts with a reference, i.e. “Equation (1), shows the function” is correct but not “(1), shows the function” in the beginning of a sentence.

|  |  |
| --- | --- |
|  |  |

It can be feasible to use automatic numbering of references and equations as well. Note that the references and equations should be numbered in the order they appear.

Variables are in most cases written in italics, however not numbers and parentheses, which should be written with italics and roman (non-italics) for the numbers, like the variable *a*1(*k*), see (1). Matrices should be written in bold, but not in italics, like **A**, **H**, and **X**. Variables in digital design are large signal parameters. They are usually written with capitals, e.g. *VDD*, *VGS*, *ID* etc. A style with roman subscripts is also practiced, e.g. *V*DD, *V*GS, *I*D. Analog parameters are often small signal variables written as *vds*, *vgs*, *id* etc.

Unit values and units are written without space, in the IEEE style, like 3V, 4mW, and 2µA. However, this is in the contrary to the SI standard [5]. The SI standard seems to be the most common style. The recommendation is thus to be consequent! Note that the units are in non-italics. Values like 35cm x 48cm, 1MHz to 10MHz, and 123g ± 2g are preferred, but not 35 x 48cm, 35 x 48cm2, 1 to 10MHz, and 123 ± 2g.

1. About Writing a Thesis

## Format

The format of the thesis is 16.9 x 23.9 cm, like this template. The margins should be 2 cm on all sides. The text is preferably aligned to both right and left margins. The print will be two-sided, which affects the pagination, chapter pages, etc. That is, all page numbers cannot be to the right or to the left. They should be centered or alternating. Furthermore, if the first page of a chapter happens to be placed on a left page, a blank page should be inserted so that it will be placed on a right page. The front and back cover is designed by the printing office. Note that the thesis will be printed in black and white. A reasonable number of pages are around 50 to 100. The font is preferably 11pt Times New Roman, with single line spacing.

## Hints about the writing

These hints are based on experiences that have been drawn from many first drafts of theses. It is appreciated if you check them before you hand in your first draft.

* In the area of Electrical Engineering, American English is commonly used.
* The forms can’t, haven’t etc. are not used in technical writing. It should be cannot, have not etc.
* Sentences should not begin with “So”, “And”, or “But”. “However,” can sometimes replace “But”. The word “so” should be excluded in the text as well since it is more like “spoken language”.
* In American English, several listed possibilities should be written “a, b, and c”, note the comma after b, but not “a, b and c”, which is British English.
* The words “I” and “we” can be used but not too often.
* Avoid statements like “as described above”. It is better to write “as described in section x.y” or “as described on page z.”
* Abbreviations should be defined first time they are used on the form “Device Under Test (DUT)” not “DUT (Device Under Test)”. It is also convenient for the reader have them redefined a few times later in the text.
* The form for your work should be written as “… which **is** implemented …”, but when referring to another work the form should be as “… which **was** implemented by Smith”
* A comma should separate in the case of “which” such as “A new method, which is good for …”, but not in the case of “that” like “A new method that is good for …”
* Avoid expressions like “It is obvious that …”, “The rest is trivial”, “It is clear that …,” etc. especially if it is not like that.
* Compared to or compared with? “Compared to” is the most commonly used when comparing statistical facts, results, etc. such as “Architecture A consumes 10mW, which is lower compared to architecture B that consumes 20mW.” “Compared with” is used for generalizations, such as “Compared with students in general; we are studying much more at home”.
* Hyphens: When hyphenating a row, next row should start with a consonant followed by a vowel. Like syllabification can be hyphenated in many places, syl-la-bi-fi-ca-tion. The exception is when it is a compound word, like look-up table or astro-physics.

 (To be continued)

## Figures

Fig. 3 shows a diagram, which is not acceptable. The text and the numbers on the axes are too small.



1. A figure with too small text

Fig. 4 show another figure taken direct from an Electronic design automation (EDA) tool. It is very hard to follow the block diagram. Often it is better to draw it by hand in black on white background.



1. An example on a figure that should be drawn by hand instead.

## Should it be one or two thesis students?

It is OK to be one or two students in a thesis project. Two is to prefer since the project benefits from the interaction with each other. However, in the case of two students it is important to state how the work has been divided in the thesis, see the preface.

1. The Presentation

## Presentation

The presentation should **NOT** take more than 20 minutes. That means a maximum of 20 slides. Do a dry run in front of your friends before the presentation. Some hints:

* Start with a presentation of yourself.
* Content list can be used but it is not necessary. An alternative is to start by shortly answer the questions:
	+ What?
	+ Why?
	+ How?
* Stand up and use the pointer.
* Switch the slides yourself.
* Talk in front of the audience.
* Do not read directly from a manuscript or the slides.

## Opposition

You need to act as an opponent on another thesis work. It does not have to be in the same area as yours but it can be in the same area. To be approved on the opposition, you should ask about 5 relevant questions about the work. It should not be on the level “Here is a miss spelling.” Comments like that are appreciated and can be given to the presenter in person afterwards.

There can be opponents on your presentation but that is not a requirement.

## The procedure

The usual procedure is like:

* The supervisor or examiner takes a few minutes to present you.
* The thesis worker(s) presents the work within 20 minutes.
* The opponents, if any, ask their questions.
* The rest of the audience can ask questions.
* The examiner decides if you are approved on the presentation.

## Hints about the slides

* All backgrounds are preferably white. Background color and patterns should be avoided.
* Colors can preferably be used to increase the clarity. Green color and light colors should be avoided.
* Animations can be used if it increases the clarity.
* Do not use too much text on the slides. It is better to split the slide into two.
* Figures are often better than text.
* Arial and Verdana are fonts that are recommended.
	+ 36 to 44 pt for titles
	+ 36 pt for sub-titles
	+ 28 pt for major bullets
	+ 24 pt for indented bullets
	+ 24 pt (minimum) for text on graphs and figures.
1. Academic Honesty

Note that this chapter should not be in the thesis! It is just for information about what is allowed and not.

Every year the Disciplinary Committee of Lund University convicts and suspends 30-40 students because of plagiarism or other kinds of cheating. A fairly large number of all students that are caught for plagiarism at Lund University are exchange students from foreign countries. Exchange are not more willing to cheat, but we are certain that because of different traditions at some universities, students might be caught cheating because of the very strict rules at Lund University.

## What is plagiarism?

Plagiarism is the adoption or reproduction of ideas, words or statements of another person without acknowledgment of the original author or creator.

Three quick examples of plagiarism:

* A false claim that you have written a paper, when it is in fact another student who has done all work. It is considered as plagiarism even if the other student has given his/her permission.
* If you rewrite a section from a book/article/website without mentioning that the information is from that source.
* To copy a section of a book/article/website without mentioning that the information is copied from that source.

## How does Lund University work with plagiarism?

Lund University has a long experience of working against plagiarism. All mentors and teachers are educated to look for signs of plagiarism in the students’ work. As a complement Lund University also uses complex computer software to scan all essays to find traces of plagiarism.

### What does Lund University require from you?

First of all, Lund University recommends you to pay attention to all information regarding academic writing that can be found on the university homepage (www.lu.se) and at the webpage of your specific department. You must always state the source when using other people’s work in your own text, regardless if the source is a book, a magazine article, the Internet or even a verbal communication. Any departure from this rule will be reported to the vice-chancellor who then reports to the Disciplinary Committee (Disciplinnämnden) at Lund University.

As long as you take notice of the rules of academic writing and implement these methods in your work you will not only be free of plagiarism, but also be able to publish a better essay. It is in your very best interest to read about academic writing and work in that manner.

Source: Lund University

More information is given in [4].

1. Results

A summary of your results is presented here.

1. Conclusions

A short summary of your work is presented here.

1. Future Work

Here are your thoughts about a future continuation of your work.

References

1. A. LastName, B. LastName, and C. LastName,“*Name of Book in italics*,” Place of Publication, Publisher, ISBN, year.
2. A. LastName and B. LastName, “Title of conference paper,” in the *proceedings of xxx xxx in italics*, ISBN, pp. first-last, conference location, country, month and year.
3. A. LastName, “Title of paper,” *Name of Journal in italics*, vol., no., pp first-last, ISSN, month and year.
4. By the board of Faculty of Engineering, Lund University http://www.lth.se/fileadmin/lth/anstallda/projektdatabas/ak\_hederlighet/PolicyPlagiarismLTH20100408.pdf
5. http://physics.nist.gov/cuu/Units/checklist.html

List of Figures (Not necessary)

* First time: Go to the “References tab.” Press “Insert Table of Figures.” Press “Options” and choose Style “My Figure Caption.” Press NO on “do you want to replace …” if it appears.
* After that: Right click on the table and “Update field.”

[Fig. 1. Three objects before collision. 8](#_Toc381356403)

[Fig. 2. Three objects after collision. 9](#_Toc381356404)

[Fig. 3. A figure with too small text 13](#_Toc381356405)

[Fig. 4. An example on a figure that should be drawn by hand instead. 13](#_Toc381356406)

List of Tables (Not necessary)

* First time: Go to the “References tab.” Press “Insert Table of Figures.” Press “Options” and choose Style “My Table Head.” Press NO on “do you want to replace …” if it appears.
* After that: Right click on the table and “Update field.”

[Table I. The objects before collision. 7](#_Toc354141417)

[Table II. The objects after collision. 7](#_Toc354141418)

List of Acronyms (Not necessary)

CDMA Code Division Multiple Access

CMOS Complementary Metal Oxide Semiconductor

GSM Global System for Mobile Communications

PDA Personal Digital Assistant

UWB Ultra Wide Band Technology

Appendix A: Extended Material

Some extra information for readers who would like more.