

Guideline for writing a Bachelor or Master thesis



This guide helps you to successfully carry out your Bachelor or Master thesis at the Institute of Signal Processing (ISP).

Practical Part

The best approach to receive your Bachelor or Master thesis at the ISP is to get an overview of what we are doing on our homepage¹ and subsequently to shoot us an email that you are interested in any of our topics. After stopping by to clarify some details concerning the thesis you can start right away. Here are some hints you should consider while working on your thesis:

- Try to get a good picture of what the objectives of your thesis are. Your supervisor most probably will tell you the overall goal (or the idea), however it is not possible to define every single intermediate step in advance. Planning the necessary tasks for achieving the overall goal is part of your thesis!
- Set up a realistic schedule and define deadlines for intermediate goals (e.g. literature review, algorithm implementation, ...).
- Especially in the beginning of your thesis we strongly recommend to work in our students laboratory. Students have shown to be more effective when doing so. Furthermore your supervisor is just around the corner and consequently is able to discuss any issue arising.
- Try to make appointments with your supervisor as frequently as possible to talk about your progress and open issues.
- For the time between the appointments you can always inform your supervisor about your progress via email.
- The worst thing you can do is to stop contacting your supervisor! In case you are busy doing other (important) things, it is usually no problem to extend deadlines, however your supervisor needs to stay up-to-date!

Writing the Thesis

After carrying out the practical part of your thesis (literature review, development of a device or software, ...) you need to document your work properly and present it in front of a wider audience. The following paragraphs should help you to create a structured document and also provide some hints for the presentation.

General Information

Please use the official JKU title page² for your Bachelor or Master thesis. The following sworn declaration should appear on the second page of your thesis:

¹<http://www.jku.at/isp/content>

²<http://www.jku.at/content/e262/e241/e3285>

English version:

I hereby declare under oath that the submitted Master's (Bachelor's) degree thesis has been written solely by me without any third-party assistance, information other than provided sources or aids have not been used and those used have been fully documented. Sources for literal, paraphrased and cited quotes have been accurately credited. The submitted document here present is identical to the electronically submitted text document.

German version:

Ich erkläre an Eides statt, dass ich die vorliegende Masterarbeit (Bachelorarbeit) selbstständig und ohne fremde Hilfe verfasst, andere als die angegebenen Quellen und Hilfsmittel nicht benutzt bzw. die wörtlich oder sinngemäß entnommenen Stellen als solche kenntlich gemacht habe. Die vorliegende Masterarbeit (Bachelorarbeit) ist mit dem elektronisch übermittelten Textdokument identisch.

Structure

Basically the thesis should be divided in the following chapters³.

1. Abstract / Kurzfassung
2. Introduction
3. Theoretical Background (optional)
4. Methods
5. Results
6. Discussion
7. Appendix (optional)
8. Bibliography

Abstract / Kurzfassung

The abstract is a summary of your work, which is also divided into objectives, methods, results and conclusion. The German version of the abstract is called 'Kurzfassung' and should be included below the abstract. Both, the abstract and the Kurzfassung should be approximately half a page long. Try to summarize the most important statements of each chapter in two or three sentences.

Introduction

As the title states, this chapter is there for introducing the reader to the aim of your work. Try to highlight the significance of your work and the motivation behind it. Clearly define the problem statement (objectives, specification, ...) and briefly discuss the most important publications of the last decades dealing with this problem.

³You are allowed to change this structure, but please talk to your supervisor before doing so.

Theoretical Background

This chapter should be added, if your thesis deals with a topic, which is not that common in the signal processing community (e.g. providing medical background). Talk to your supervisor to clarify whether you should add this chapter or not.

Methods

This chapter includes a complete description of the devices, materials, software and methods used in the work. Do not forget to describe the methods chosen for validating your work and generating according results. The description should be sufficiently detailed to allow other researchers to exactly reproduce your work. However, methods or procedures which are assumed to be generally known, do not have to be explained in detail. In case that methods used in your thesis are published somewhere else, remember to refer to the according work.

Results

This chapter might be quite short, since you should only present your results. Do not describe how the results were achieved (Chapter Methods) or which conclusion could be drawn (Chapter Discussion). Results of single experiments are usually not very informative. Testing your algorithm only on a single data set, e.g., is typically not sufficient. Whenever possible, try to generalize your results by appropriate statistical methods (mean, standard deviation, ...).

Always choose the type of visualization which best represents the information/results (table, boxplot, diagram, ...). Do not present the same data in a table and in a figure.

Discussion

Within this chapter the results should be critically interpreted (advantages/disadvantages of the methods used to generate your results, comparison with other publications, ...). This critical interpretation is particularly valuable in order to estimate the importance of your work. One of the most common mistakes is to repeat the results instead of discussing them.

This chapter ends by a conclusion answering the following questions:

- Have the objectives been achieved?
- Which further considerations can be derived from this work?

Appendix

This is the place for longer derivations or extensive results.

Bibliography

Citation examples:

Journal: [1]

Conference: [2]

Book: [3]

Bibliography

- [1] M. Lunglmayr, M. Krueger, and M. Huemer, “Feasibility study of particle filters for mobile station receivers,” In *IET Journal of Circuits, Devices & Systems*, Vol. 2, No. 1, pp. 81–86, February 2008.
- [2] R. Gierlich, J. Huttner, A. Dabek, and M. Huemer, “Performance Analysis of FMCW Synchronization Techniques for Indoor Radiolocation,” In Proceedings of the *10th European Conference on Wireless Technologies (ECWT’ 2007)*, pp. 24–27, Las Palmas de Gran Canaria, Spain, October 2007.
- [3] S. M. Kay, *Fundamentals of Statistical Signal Processing: Estimation Theory*, Vol. 1. Prentice Hall, 1993.