The best scheduler in the world implemented in P4

or how to make kick-ass software

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swedish title if needed

swedish subtitle if needed, max one line

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Faculty of Health, Science and Technology

Master thesis in Computer Science

Second Cycle, 30 hp (ECTS)

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Karlstad, June 19th, 2020 (adjust date to match final version)

Abstract

This is a template for writing thesis reports for the CS department at KAU. I do not own any of the images provided in the template and this can only be used to submit thesis work for KAU. The report needs to be compiled using XeLaTeX as different fonts are needed for the project to look like the original report. You might have to change this manually in overleaf. This template was created by Andreas Kassler <andreas.kassler@gkau.se> based on the template from KTH, which was done by Hannes Rabo <hannes.rabo@gmail.com or hrabo@kth.se>.

Write an abstract. Use ca. 5 paragraphs:

Par1: Introduce the subject area for the project and why this is important area

Par2: describe the main problems that are connected to your work in this subject area

Par3: Present the main objectives and goals of your thesis like: In this thesis, ...

Par4: Present how the problems have been solved, methods used and approach

Par5: Present results for the project.

The presentation of the results should be the main part of the abstract. Use max 1 A4-page including key words. English abstract

Keywords

Template, Thesis, Keywords ...

Sammanfattning

Svenskt abstract Svensk version av abstract – samma titel på svenska som på engelska.

Skriv samma abstract på svenska. Introducera ämnet för projektet och beskriv problemen som löses i materialet. Presentera

Nyckelord

Kandidat examensarbete, ...

Acknowledgements

Write a short acknowledgement section. Don't forget to give some credit to the supervisor and examiner.

Acronyms

CPU Central Processing Unit

Contents

Chapter 1

Introduction

Page count between 3 and 8 pages.

Provide here a general introduction to the area for the degree project. Say why this area is interesting or important. Use references!

Link things together with references. This is a reference to a section: 1.1.

1.1 Background

Present the background for the area. Give the context by explaining the parts that are needed to understand the degree project and thesis. (Still, keep in mind that this is an introductory part, which does not require too detailed description).

Use references[1]

Detailed description of the area should be moved to Chapter 2, where detailed information about background is given together with related work.

This background presents background to writing a report in latex.

Example citation [4] or for two authors: [4, 5]. More citations [1–3, 6–8]. Unused references won't appear in the bibliography at the end of the document.

Look at sample table 1.1.1 for a table sample.

Table 1.1.1: Sample table. Make sure the column with adds up to 0.94 for a nice look.

SAMPLE	TABLE
One	Stuff 1
Two	Stuff 2
Three	Stuff 3

[1]You can also add footnotes if you want to clarify the content on the same page.

Boxes can be used to organize content

Development environment for prototype

```
Operating systems
computer: Linux - kernel 4.18.5-arch1-1-ARCH
android phone: 8.1.0

Build tools
exp (build tool): version 55.0.4

...
```

Listings to show code (can be put into a figure to float it).

```c
#include <stdio.h>

int main() {
    printf("Hello World\n");
    return 0;
}
```

1.2 Problem Description

Present the main problems found in the area which are connected to your thesis. Preferable use and end this section with a question as a problem statement.

Use references Preferable, state the problem, to be solved, as a question. Do not use a question that can be answered with yes and/or no.

Example: In this thesis, we aim to answer the question of ”How can we use Software Defined Networking to configure the elements within TimeSensitive Networking?”

Use acronyms: The Central Processing Unit (CPU) is very nice. It is a CPU. Observe how the first usage of an acronym is expanded, but subsequent are not.

1.3 Thesis Objective

The objective of the degree project/thesis is the objective of the written material, i.e., the thesis. The thesis presents the work / discusses / illustrates and so on.

It is not “The project is about” even though this can be included in the objective. If so, state the objective of the project after objective of the thesis).

1.4 Thesis Goals

The goal means the goal of the degree project. Present following: the goal(s), deliverables and results of the project.

1.5 Ethics and Sustainability

Describe the ethical issues (what ethical problems can arise) and the sustainability aspects of the project. If there are none, reason why is this.

Use references!

1.6 Methodology

Describe and introduce the methodology and methods that are used in the degree project. Must be described on the level that is enough to understand the contents of the thesis.

Use references!

For example, say you first design, then implemented and evaluated. Then redesign based on observations. Evaluation can be in form of simulator, emulator, testbed, etc.

Detailed description of these methodologies and methods should be presented in Chapter 3. In chapter 3, the focus could be research strategies, data collection, data analysis, and quality assurance.

1.7 Stakeholders

Present the stakeholders for the degree project. E.g. you did it for company XXX, describe why and how the company benefits from your work.

1.8 Delimitations

Explain the delimitations. These are all the things that could affect the study if they were examined and included in the degree project. Make clear what is in focus of the thesis and what is not considered but could impact your thesis. Use references!

1.9 Outline

In text, describe what is presented in Chapters 2 and forward. Exclude the first chapter and references as well as appendix.

For example: This thesis is structured as follows. In Chapter 2, we...

Chapter 2

Background and Related Work

Page count between 8 and 15 pages.

In this chapter, a detailed description about background of the degree project is presented together with related work. Discuss what is found useful and what is less useful. Use valid arguments.

Explain what and how prior work / prior research will be applied on or used in the degree project /work (described in this thesis). Explain why and what is not used in the degree project and give valid reasons for rejecting the work/research.

Use references!

2.1 Background

Present here the background necessary for others that are not in your research field to understand your work.

2.1.1 Related Work

Introduce work that is related to yours. For each related work, explain what is the main objective and goal of that, how is it working, what are its main limitations and what are the benefits. Then conclude with what your thesis work is related.

Chapter 3

<Science/Engineering-related content, Methodologies and Methods>

Chapter 3, 4, 5 together should be the meat of your thesis and contain most of the pages. In total 20 - 40 pages.

Describe the engineering-related contents (preferably with models) and the research methodology and methods that are used in the degree project.

Most likely it generally describes the method used in each step to make sure that you can answer the research question.

3.1 Engineering-related and scientific content:

Applying engineering related and scientific skills; modelling, analysing, developing, and evaluating engineering-related and scientific content; correct choice of methods based on problem formulation; consciousness of aspects relating to society and ethics (if applicable).

As mentioned earlier, give a theoretical description of methodologies and methods and how these are applied in the degree project.

Your work can span multiple chapters. For example, Chapter 3 presents your theoretical concept, Chapter 4 presents specific details/extensions/Design, Chapter 5 presents technical implementation aspects of your work.

Chapter 4

<The work>

Describe the degree project. What did you actually do? This is the practical description of how the method was applied.

This can be for example Design and Implementation

Chapter 5

<Evaluation and Result>

Page count between 10 and 20 pages.

Describe how you evaluated your work and the results of the degree project. Always discuss the results. In each section or at the end of chapter, use your judgement.

Chapter 6

Conclusions and Future Work

Page count between 2 and 4 pages.

Describe the conclusions (reflect on the whole introduction given in Chapter 1).

Research contribution: Summarize your research contribution in response to research objectives. Then generalize your contribution.

Discuss the positive effects and the drawbacks.

Describe the evaluation of the results of the degree project.

Do NOT actively discuss your result in this chapter; it should be in the previous chapter, but indicate what effects it has.

Describe valid future work.

The sections below are optional but could be added here.

6.1 Discussion

6.2 Conclusion

6.3 Future Work

If you are using mendeley to manage references, you might have to export them manually in the end as the automatic ways removes the ”date accessed” field

Bibliography

[1] Goldsmith, Andrea. *Wireless communications*. Cambridge university press, 2005.

[2] Høiland-Jørgensen, Toke. "Bufferbloat and Beyond: Removing Performance Barriers in Real-World Networks". PhD thesis. Karlstads universitet, 2018.

[3] *IEEE Criteria for Class IE Electric Systems*. 1969.

[4] Jones, Gareth J., Edwards, Michael B., Bocarro, Jason N., Bunds, Kyle S., and Smith, Jordan W. *Leveraging community sport organizations to promote community capacity: Strategic outcomes, challenges, and theoretical considerations*. 2017. DOI: 10.1016/j.smr.2017.07.006. URL: http://dx.doi.org/10.1016/j.smr.2017.07.006.

[5] Liu, Bo, Zhang, Yanxin, Liu, Fangcui Jiang Lei, and Gao, Yanping. "Group consensus for a class of discrete-time heterogeneous multi-agent systems in directed topology". In: 2017, pp. 376–381. ISBN: 9781538629017. DOI: 10.1109/YAC.2017.7967437.

[6] MultiMedia LLC. *MS Windows NT Kernel Description*. 1999. URL: http://web.archive.org/web/20080207010024/http://www.808multimedia.com/winnt/kernel.htm (visited on 09/30/2010).

[7] Stiller, Burkhard, Bocek, Thomas, Hecht, Fabio, Machado, Guilherme, Racz, Peter, and Waldburger, Martin. *Mobile Systems IV*. Tech. rep. University of Zurich, Department of Informatics, Jan. 2010.

[8] Waitzman, D. *Standard for the transmission of IP datagrams on avian carriers*. RFC 1149. RFC Editor, Apr. 1990.

Appendix - Contents

Appendix A

First Appendix

This is only slightly related to the rest of the report

Appendix B

Second Appendix

this is the information