Word template for KTH first level theses

Subtitle of thesis

First name Surname

3/6/2022

Bachelor’s Thesis

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Abstract

Write an abstract with the following components:

* What is the topic area? (optional) Introduces the subject area for the project.
* Short problem statement
* Why was this problem worth a Master’s thesis project? (i.e., why is the problem both significant and of a suitable degree of difficulty for a Master’s thesis project? Why has no one else solved it yet?)
* How did you solve the problem? What was your method/insight?
* **Results/Conclusions/Consequences/Impact**: What are your key results/conclusions? What will others do based upon your results? What can be done now that you have finished - that could not be done before your thesis project was completed?

Keywords

5-6 keywords

FPGA, Daughterboard, Manufacturing, Testing, Assembly, Prototyping

Sammanfattning

Nyckelord

5-6 nyckelord

FPGA, Dotterkort, Tillverkning, Testning, Montering, Prototyp

Acknowledgments

I would like to thank xxxx for having yyyy.

Stockholm, Month Year  
Author’s name

Albin Jonsson

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List of acronyms and abbreviations

|  |  |
| --- | --- |
| ASIC | Application-Specific Integrated Circuit |
| CPU | Central Processing Unit |
| FPGA | Field-Programmable Gate Array |
| GPIO | General Purpose Input Output |
| GPU | Graphics Processing Unit |
|  |  |
|  |  |
| ICT | Information and Communication Technology |
| IO | Input Output |
|  |  |
|  |  |
| VHDL | VHSIC Hardware Description Language |
| VHSIC | Very High Speed Integrated Circuit |
| WWW | World Wide Web |

# Introduction

This chapter describes the specific problem that this thesis addresses, the context of the problem, the goals of this thesis project, and outlines the structure of the thesis.

Give a general introduction to the area. (Remember to use appropriate references in this and all other sections.)

## Background

Present the background for the area. Set the context for your project – so that your reader can understand both your project and this thesis. (Give detailed background information in Chapter 2 - together with related work.)

Sometimes it is useful to insert a system diagram here so that the reader knows what are the different elements and their relationship to each other. This also introduces the names/terms/… that you are going to use throughout your thesis (be consistent). This figure will also help you later delimit what you are going to do and what others have done or will do.

As one can find in RFC 1235 [1] multicast is useful for xxxx[[1]](#footnote-1).

## Problem

Longer problem statement

If possible, end this section with a question as a problem statement.

## Purpose

State the purpose of your **thesis** and the purpose of your **degree project**.

Describe who benefits and how they benefit if you achieve your goals. Include *anticipated* ethical, sustainability, social issues, etc. related to your project. (Return to these in your reflections in Section 6.4.)

## Goals

State the goal/goals of this degree project.

The goal of this project is XXX. This has been divided into the following three sub-goals:

1. Subgoal #1
2. Subgoal #2
3. Subgoal #3

The goal of this project is to manufacture a daughterboard for a FPGA board. This has been divided into the following x subgoals:

1. Collect all the requirements for the daughterboard
2. Create prototype for the daughterboard
3. Have the daughterboard manufactured

In addition to presenting the goal(s), you might also state what the deliverables and results of the project are.

## Research Methodology

Introduce your choice of methodology/methodologies and method/methods – and the reason why you chose them. Contrast them with and explain why you did not choose other methodologies or methods. (The details of the actual methodology and method you have chosen will be given in Chapter 3. Note that in Chapter 3, the focus could be research strategies, data collection, data analysis, and quality assurance.)

In this section you should present your philosophical assumption(s), research method(s), and research approach(es).

## Delimitations

Describe the boundary/limits of your thesis project and what you are explicitly **not** going to do. This will help you bound your efforts – as you have clearly defined what is **out of the scope** of this thesis project. Explain the delimitations. These are all the things that could affect the study if they were examined and included in the degree project.

## Structure of the thesis

Chapter 2 presents relevant background information about xxx. Chapter 3 presents the methodology and method used to solve the problem. …

# Background

This chapter provides basic background information about xxx. Additionally, this chapter describes xxx. The chapter also describes related work xxxx.

What does a reader (another x student -- where x is your study line) need to know to understand your report?

What have others already done? (This is the “related work”.) 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.

## Major background area#1

There are xxx characteristics that distinguish *yyy* from other information and communication technology (ICT) system, as shown in Figure 2‑1. Table 2.1 summarizes these characteristics.

MC900083195[1]

Figure 2‑1: Lots of stars (Inspired by Figure x.y on page z of [xxx])

|  |  |
| --- | --- |
| Characteristics | Description |
| **xxx** |  |
| **yyyy** |  |
|  |  |

Table 2.1: *XXX* characteristics

### Subarea #1#1

Entangled states are an important part of quantum cryptography, but also relevant in other domains. This concept might be relevant for neutrinos, see for example [2].

### Subarea*.* #1*#2*

Computational methods are increasingly used as a third method of carrying out scientific investigations. For example, computational experiments were used to find the amount of wear in a polyethylene liner of a hip prosthesis in [3].

## Major background area#2

## Related work

### Major related work #1

### Major related work #2

Geo‑distributed data centers are increasingly used to provide increased availability and reduce latency; however, the *physically* nearest data center may not be the best choice as shown by Kirill Bogdanov, et al. in their paper “The Nearest Replica Can Be Farther Than You Think” [4].

…

### Major related work #n

Carrier clouds have been suggested as a way to reduce the delay between the users and the cloud server that is providing them with content. However, there is a question of how to find the available resources in such a carrier cloud. One approach has been to disseminate resource information using an extension to OSPF-TE, see Roozbeh, Sefidcon, and Maguire [5].

Minor related work #1

…

### Minor related work #n

## Summary

# <Engineering-related content, Methodologies and Methods> Use a self-explaining title

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

Give a theoretical description of the scientific or engineering methodology are you going to use and why have you chosen this method. What other methods did you consider and why did you reject them.

In this chapter, you describe what engineering-related and scientific skills you are going to apply, such as modeling, analyzing, developing, and evaluating engineering-related and scientific content. The choice of these methods should be appropriate for the problem. Additionally, you should be consciousness of aspects relating to society and ethics (if applicable). The choices should also reflect your goals and what you (or someone else) should be able to do as a result of your solution - which could not be done well before you started.

The purpose of this chapter is to provide an overview of the research method used in this thesis. Section 3.1 describes the research process. Section 3.2 details the research paradigm. Section 3.3 focuses on the data collection techniques used for this research. Section 3.4 describes the experimental design. Section 3.5 explains the techniques used to evaluate the reliability and validity of the data collected. Section 3.6 describes the method used for the data analysis. Finally, Section 3.7 describes the framework selected to evaluate xxx.

## Research Process

Figure 3.1 shows the steps conducted in order to carry out this research.

C:\Documents and Settings\Gerald Maguire\Local Settings\Temporary Internet Files\Content.IE5\2XCDIHAD\MC900056797[1].wmf

Figure 3.1: Research Process

## Research Paradigm

## Data Collection

(This should also show that you are aware of the social and ethical concerns that *might* be relevant to your data collection method.)

### Sampling

1. Aa
2. Bb
3. Cc

### Sample Size

### Target Population

## Experimental design/Planned Measurements

### Test environment/test bed/model

Describe everything that someone else would need to reproduce your test environment/test bed/model/… .

### Hardware/Software to be used

The software that will be used in this project is:

1. KiCad
2. CircuitCam
3. Quartus Prime version 18.1

The hardware which will be used in this project is:

1. Mill at KTH mentor space
2. Computer for using the software
3. Atlas-SOC
4. USB A to micro USB cable
5. Buttons
6. Switches
7. LEDS
8. 7-segmented display
9. Old FPGA board

## Assessing reliability and validity of the data collected

### Reliability

How will you know if your results are reliable?

### Validity

How will you know if your results are valid?

## Planned Data Analysis

### Data Analysis Technique

### Software Tools

## Evaluation framework

# [What you did – Choose your own chapter title to describe this]

What have you done? How did you do it? What design decisions did you make? How did what you did help you to meet your goals?

## Hardware/Software design …/Model/Simulation model & parameters/…

Figure 4‑1 shows a simple icon for a home page. The time to access this page when served will be quantified in a series of experiments. The configurations that have been tested in the test bed are listed in Table 4‑1.

Figure 4‑1: Homepage

Table 4‑1: Configurations tested

|  |  |
| --- | --- |
| Configuration | Description |

|  |  |
| --- | --- |
| 1 | Simple test with one server |
| 2 | Test with 4 servers |

## Implementation …/Modeling/Simulation/…

# Results and Analysis

In this chapter, we present the results and discuss them.

## Major results

Some statistics of the delay measurements are shown in Table 5‑1.

The delay has been computed from the time the GET request is received until the response is sent.

|  |  |  |
| --- | --- | --- |
| Configuration | Average delay (ns) | Median delay (ns) |

|  |  |  |
| --- | --- | --- |
| 1 | 467.35 | 450.10 |
| 2 | 1687.5 | 901.23 |

Table 5‑1: Delay measurement statistics

## Reliability Analysis

## Validity Analysis

## Discussion

# Conclusions and Future work

<<Add text to introduce the subsections of this chapter.>>

## Conclusions

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

Discuss the positive effects and the drawbacks.

Describe the evaluation of the results of the degree project.

Did you meet your goals?

What insights have you gained?

What suggestions can you give to others working in this area?

If you had it to do again, what would you have done differently?

## Limitations

What did you find that limited your efforts? What are the limitations of your results?

## Future work

Describe valid future work that you or someone else could or should do.

Consider: What you have left undone? What are the next obvious things to be done? What hints can you give to the next person who is going to follow up on your work?

## Reflections

What are the relevant economic, social, environmental, and ethical aspects of your work?

References

<< Let Zotero or other tool fill this in for you. I suggest an extended version of the IEEE style – to include URLs, DOIs, ISBNs, etc. – to make it easier for your reader to find them. This will make life easier for your opponents and examiner.>>

[1] J. Ioannidis and G. Maguire, ‘Coherent File Distribution Protocol’, *Internet Req. Comments*, vol. RFC 1235 (Experimental), Jun. 1991 [Online]. Available: http://www.rfc-editor.org/rfc/rfc1235.txt

[2] Y. S. Kim, G. Q. Maguire Jr., and M. E. Noz, ‘Do Small-Mass Neutrinos Participate in Gauge Transformations?’, *Adv. High Energy Phys.*, vol. 2016, pp. 1–7, 2016. DOI: 10.1155/2016/1847620

[3] Gerald Q Maguire Jr., Marilyn E. Noz, Henrik Olivecrona, Michael P. Zeleznik, and Lars Weidenhielm, ‘A New Automated Way to Measure Polyethylene Wear in THA Using a High Resolution CT Scanner: Method and Analysis’, *Sci. World J.*, vol. 2014, pp. 1–9, 2014. DOI: 10.1155/2014/528407

[4] Kirill Bogdanov, Miguel Peón-Quirós, Gerald Q. Maguire, and Dejan Kostć, ‘The nearest replica can be farther than you think’, in *Proceedings of the ACM Symposium on Cloud Computing 2015*, 2015, pp. 16–29 [Online]. DOI: 10.1145/2806777.2806939

[5] Amir Roozbeh, Azimeh Sefidcon, and Gerald Q. Maguire, ‘Resource Monitoring in a Network Embedded Cloud: An Extension to OSPF-TE’, in *Proceedings of the 2013 IEEE/ACM 6th International Conference on Utility and Cloud Computing*, 2013, pp. 139–146 [Online]. DOI: 10.1109/UCC.2013.36

Appendix A: xxx

1. An example of the placement of a footnote. [↑](#footnote-ref-1)