University of Stirling

Faculty of Natural Sciences

Division of Computing Science and Mathematics

Title of your project

Author:
Your Name

Supervisor:
Dr. Supervisor Name

Dissertation submitted in partial fulfillment for the degree of Master of Science in *(insert your degree title)*

September 202x

UNIVERSITY of STIRLING

Abstract

Summary of the dissertation ***within one page***.

This template starts the page numbering at the foot of this page. While you are printing drafts, you might find it useful to add the printing date and time into the footer – to help you, and your supervisor, tell which version is most current.

It is suggested that the abstract be structured as follows:

- Problem: What you tackled, and why this needed a solution
- Objectives: What you set out to achieve, and how this addressed the problem
- Methodology: How you went about solving the problem
- Achievements: What you managed to achieve, and how far it meets your objectives.

Attestation

I understand the nature of plagiarism, and I am aware of the University's policy on this.

I certify that this dissertation reports original work by me during my University project except for the following (*adjust according to the circumstances*):

- The technology review in Section 2.5 was largely taken from [17].
- The code discussed in Section 3.1 was created by Acme Corporation (`www.acme-corp.com/JavaExpert`) and was used in accordance with the licence supplied.
- The code discussed in Section 3.5 was written by my supervisor.
- The code discussed in Section 4.2 was developed by me during a vacation placement with the collaborating company. In addition, this used ideas I had already developed in my own time.

Signature: *(you must delete this, then sign and date this page)* **Date**

Acknowledgements

Acknowledge anyone that you wish to thank who has helped you in your work or supported you in any way: such as your supervisor, technical support staff, fellow students, external organisations or family. Acknowledge the source of any work that is not your own.

Contents

List of Figures

1 Introduction

For editorial consistency, it is important to use LaTeX formatting properly. To use italics, replace the dots in `\textit{...}` with the text you would like to be italicized. To make text bold, use `\textbf`.

Chapters are entered using the `\chapter` command. For example, this chapter begins with `\chapter{Introduction}` in the `.tex` file. The chapter command automatically moves to the start of a new page and supplies the next chapter number. The first paragraph after a heading automatically will have no indent on the first line. In the `.tex` file, it does not matter whether you leave a blank line after the `\chapter` command or not – the typeset pdf will have it anyway.

The remaining paragraphs will have an indent.

In general, use the default spacing that headings and paragraphs give you. Avoid using new-lines or spaces to format text. If you need to use quotes, preferably use single curly quotes '...'. In the `.tex` file, the opening quote is typed as a grave accent (`) and the closing quote is typed as an apostrophe ('). If you wish to emphasise something, usually use italic font. **Remember to save frequently while you are working!**

1.1 General Context and motivation

Give the background to your project and context of what you have done. Sections within a chapter are entered using the `\section` command, which automatically supplies the next section number.

1.2 Aim and Objectives

Define the scope and objectives of your project.

1.3 Achievements

Summarise what this project has achieved. Avoid terms like I achieved this or that.

1.4 Overview of Dissertation

Briefly overview the contents of what follows in the dissertation.

2 Background

Write any technical background related to your work.

3 State-of-the-Art

Summarise current knowledge and what others have done in the various topics of your dissertation – in the application area and in the various technologies that you might have used or did use.

Do a good literature survey and maximise academic references. All references must be entered in your *reference.bib* file and call the variable name here similar to this example, Bhowmik and Feng [1] discussed Blockchain here. Their method explained how watermarking can be used for content authentication purposes [1].

You can create separate sections for various sub topic.

4 Technical Chapters (change this to something appropriate)

Note: This part of the dissertation will normally be expanded to be a *series of chapters*.

The technical body of the dissertation consists of a number of chapters (just one here, but there will usually be more). Follow a logical structure in how you present your work. This will usually be the phases of the software development cycle, the modules of your system, etc. ***However, please do not write your dissertation to read like a diary.***

Include a chapter demonstrating what you have achieved and how your system is used in practice – for example showing a typical session as a series of pasted in screen shots, with an accompanying commentary.

You ***should*** also include a chapter explaining how you obtained feedback from your "customer" or potential users of your system, what feedback you actually obtained, and your analysis and comments.

4.1 First Section

Subdivide your text into sections, using the `\section` command.

4.1.1 First Subsection

If necessary, also use subsections. Subsections are entered using the `\subsection` command (all these heading styles are self-numbering).

4.1.2 Second Subsection

And, as required, more subsections.

4.2 Bulleted and Numbered Lists

Note: This section begins with the code `\section{Bulleted and Numbered Lists}` in the `.tex` file.

Bulleted or numbered lists are entered using the `itemize` and `enumerate` environments, respectively. An **environment** in LaTeX is a block of code in between a `\begin` and `\end` command. For example, the code

```
\begin{itemize}
    \item Up
    \item Down
    \item Left
    \item Right
\end{itemize}
```

would produce the following list:

- Up
- Down
- Left
- Right

The indentation is not necessary (the pdf will look the same even it the `.tex` file does not use indents), but it helps make the code easier to read.

If the `enumerate` environment is used instead, the bullets are replaced by numbers. For example, the code

```
\begin{enumerate}
    \item Up
    \item Down
    \item Left
    \item Right
\end{enumerate}
```

produces the list

1. Up
2. Down
3. Left
4. Right

4.3 Figures and Captions

As an example of a figure, consider Figure **??**. Captions are entered using the `figure` environment (read the previous section for information about environments in general). The code

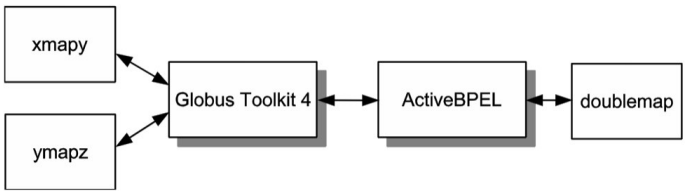

Figure 4.1: Highly Technical Diagram

```
\begin{figure}[h]
    \center\includegraphics[width=12cm]{image.png}
    \caption{Highly Technical Diagram}
    \label{mylovelydiagram}
\end{figure}
```

will produce the following figure **if the file *image.png* is in the same folder as your `.tex` file**.

The `[tb]` direction after the beginning of the environment causes the figure to be placed "here" in the text (at least approximately – sometimes TEX will move the figure slightly if the spacing does not work well in exactly the given location). For large figures, use `[t]` or `[b]` instead to place the figure at the top or bottom of a page. You can also leave off the `[h]` entirely to have TEX make its best guess for where the figure should go.

The `\includegraphics` command puts an image file from your computer into your finished pdf. **If there is no file with the given name in the folder with your `.tex` file, your document will not compile at all.** The bracket text `[width=12cm]` is optional; without it, TEX will use the normal size of the image. Sometimes this will be far too large, so it is a good idea to specify a width directly.

Figures have automatic numbering, and it is possible to make cross-references to figures. The code `\Fig{mylovelydiagram}` will create a link to Fig. 4.1 in the text with the number of that figure. You can change the text "mylovelydiagram" to be anything you want – it never appears in the final pdf.

4.4 Source Code

To include programming source code in your document, use the `lstlisting` environment. The LATEX code

```
\begin{lstlisting}[language=Python, frame=single]
    def factorial(n):
        if n == 0:  return 1
        else:  return n * factorial(n-1)
\end{lstlisting}
```

produces the following in the pdf:

Listing 4.1: Some Python code

```
def factorial(n):
        if n == 0: return 1
        else: return n * factorial(n-1)
```

You can change `language=Python` to `language=Java`, etc., for different programming languages. The `frame=single` can be removed if you do not want the border around your code snippet. See https://en.wikibooks.org/wiki/LaTeX/Source_Code_Listings for syntax coloring and other option. You can reference the listing with the command, `\ref{lst:label}`, as in see listing 4.1.

5 Results and Discussions

5.1 Dataset

Description of the dataset(s)

5.2 Experimental setup

Say what is the experimental set up, parameters that were used.

5.3 Results

Stand back and evaluate what you have achieved and how well you have met the objectives. Evaluate your achievements against your objectives in Section 1.2. Demonstrate that you have tackled the project in a professional manner.

The previous paragraph demonstrates the use of automatic cross-references: The "1.2" is a *cross-reference* to the text in a numbered item of the document; you do not type it as `1.2` but by using the `\Sec` command. The number that appears here will change automatically if the number on the referred-to section is altered, for example, if a chapter or section is added or deleted before it. Cross-references to section are entered with the `\ref` command just like for figures. The TEX code above reads

```
Evaluate your achievements against your objectives
in section \ref{objectives sec}.
```

For this to work, the code for the text on page **??** must read

```
\section{Scope and Objectives} \label{objectives sec}
```

As with figure labels, the text inside of `\label` and `\Fig` never appears in the final pdf; you can make it whatever you want as long as you use the same text in each to complete the reference.

5.4 Discussions

Analyse your results and discuss it by including your insight. For example why the results are behaving like this, why there is an outlier etc.

6 Conclusions & Future Work

6.1 Conclusions

Summarise what you have achieved. Again do not say I achieved this. Say what the project has achieved.

6.2 Future Work

Explain any limitations in your results and how things might be improved. Discuss how your work might be developed further. Reflect on your results in isolation and in relation to what others have achieved in the same field. This self-analysis is particularly important. You should give a critical evaluation of what went well, and what might be improved.

Bibliography

[1] D. Bhowmik and T. Feng, “The multimedia blockchain: A distributed and tamper-proof media transaction framework,” in *IEEE International Conference on Digital Signal Processing (DSP)*, 2017, pp. 1–5.

Appendix 1

You may have one or more appendices containing detail, bulky or reference material that is relevant though supplementary to the main text: perhaps additional specifications, tables or diagrams that would distract the reader if placed in the main part of the dissertation. Make sure that you place appropriate cross-references in the main text to direct the reader to the relevant appendices.

Note that you should ***not*** *include your program listings as an appendix or appendices.* You should submit one copy of such bulky text as a separate item, perhaps on a disk.

Appendix 2 – User guide

If you produced software that is intended for others to use, or that others may wish to extend/improve, then a user guide and an installation guide appendices are ***essential***.

Appendix 3 – Installation guide

If you produced software that is intended for others to use, or that others may wish to extend/improve, then a user guide and an installation guide appendices are ***essential***.