Generic Thesis Outline

(Bachelor, Master, Ph.D.)

Title page

Abstract

Acknowledgements

Besides thanking pets, partners, peers, parents *et al.*, this section should crisply highlight joint efforts that are reflected in this thesis: Explain for multi-authored papers (i.e., papers written with peers from other institutions or other graduate students at the same institutions) that underline the thesis, who was involved in what aspects of the approach's elements presented in this thesis. For example, if there is a joint paper between three graduate students included as a chapter in the thesis, where one student designed a method, another one implemented it, and a third one ran experiments, each student would acknowledge what aspect of the work he or she was primarily involved in.

Table of content

List of figures (optional)

List of tables (optional)

Nomenclatura (optional)

For thesis that make heavy use of acronyms, uncommon terms, or symbols, this section presents in tabulated form the definition of these terms, symbols, and acronyms. This section is optional. It serves as a single point of entry to look up elements required to understand the discourse in this thesis.

Chapter 1 - Introduction

Motivation

This section sets the context for the problem addressed in this thesis by highlighting the bigger picture surrounding the problem context. This section is optional.

Problem Statement

This section defines the problem or the problems this thesis addresses. Basically, this section answers the questions:

- What is the problem addressed?
- Why is this an important, relevant, and interesting problem?
- Why is the problem non-trivial, i.e., what are the research challenges that were addressed in this thesis?

- What are the two to three approaches most closely related and how do they differ? Note, this is not the related work analysis that is presented in a separate chapter.

This section also defines and discusses the metrics applied to evaluating the approach to solving the problem defined.

Approach

This section summarizes the approach, describing its workings at a higher-level of abstraction, explaining how the challenges presented in the problem statement have been addressed, and previewing some of the main results achieved.

Contributions

This section lists and explains the contributions made by this thesis. For each contribution, explain what it is (i.e., the claim), then state the benefits resulting from the contributions now that it has been achieved (i.e., its advantages), and explain what is enabled by it (i.e., its consequences and projected impact). This section should also reference any publications and technical reports or other artifacts that have been created throughout the journey of this thesis. Finally, this section explains what contribution aspects are due to the thesis's author and what aspects may have been contributed by other authors, for multi-author research articles the thesis draws from.

Organization

This section provides one to a few sentence summaries of each subsequent chapter of this thesis.

Chapter 2 - Background (optional)

This chapter should review background material essential for an outsider to understand the thesis. As rule of thumb, any material that a computer engineering or computer science savvy graduate student does not know, should be considered background. The chapter is optional.

Chapter 3 - Related Work

This chapter analyzes the state-of-the-art as related to this thesis. The chapter explains where the state-of-the-art stops and where the thesis starts. That is, this chapter crisply explains what aspects of existing approaches for solving the problem addressed in this thesis are covered by the state-of-the-art and what aspects of these approaches fall short for the problem addressed. This is a required chapter. Subsequent chapters present the approach developed by this thesis and no longer bring up related approaches, unless specific elements of related approaches or certain background elements need to be credited by citing them at the latter point.

Chapter 4 - Content Chapter One

This chapter as well as subsequent chapters present the approach for solving the problem defined in the problem statement section of the introductory chapter. The exact

organization of these chapters depends on the exact nature of the thesis. For example, in one thesis, the main solution approach could be presented in the first chapter, various extensions and optimizations could be presented in a second chapter, and, finally, an experimental evaluation could be presented in a third chapter. Other organizations are possible too. For example, if a thesis looks at various sub-problems of a problem, each solution for a given sub-problem could be placed in a chapter together with an experimental evaluation in the same chapter or an experimental evaluation in a separate chapter that evaluates the entire approach.

Chapter 5 - Content Chapter Two

There may almost be an arbitrary amount of content chapters; usually, a thesis would have three to four such chapters.

Chapter 6 - Conclusions

This chapter summarizes the thesis and outlines avenues for future work. As part of the summary, the approach of this thesis can be discussed, highlighting pros and cons.

Bibliography (a.k.a. References)

The bibliography lists all the references used in this thesis. Particular attention should be paid to cleanly representing references, always including author names, title of work, publication venue, publication year, page numbers et al. The Chicago Manual of Style defines the proper citation format that should used here.

Appendix

The Appendix is optional. It may include supplemental material that does not fit into the main body of the thesis.

Cross-cutting Principles

Here, we list a few principles that cut across the entire “thesis writing project.”

- Plagiarism: Any form of copying (including the copying and modification) from published or unpublished material not written by the author him- or herself for the purpose of the thesis (or any other material released by the author) is not allowed (for a more formal definition, cf. the entry on plagiarism on Wikipedia.). If any form of plagiarism is detected, the thesis will be immediately dismissed and an incomplete (failing) will be assigned. Should plagiarism be detected after the student has graduated, the thesis may be rejected a posteriori. In 2011 and the following years, many popular plagiarism cases have gone through the press, leading to the revocation of degrees granted to high ranking politicians, resulting in their dismissal from office.
- *to be continued ...*

Writing Resources

Grammarly
https://www.grammarly.com/

The Elements of Style by Strunk and White
http://en.wikipedia.org/wiki/The_Elements_of_Style

Chicago Manual of Style
http://www.chicagomanualofstyle.org/home.html

Periodically offered writing course from Stanford
https://lagunita.stanford.edu/courses/Medicine/SciWrite./Fall2015/about
Besides Strunk and White, they recommend:

- *On Writing Well*, William Zinsser
- *Sin and Syntax*, Constance Hale
- *Essentials of Writing Biomedical Research Papers*, Mimi Zeiger
- *http://www.aacc.org/publications/clin_chem/ccgsw/Pages/default.aspx*
- *Science and Society: An Anthology for Readers and Writers*, eds: Nelson-McDermott, LePan, Buzzard