

Introduction

- your final year thesis is probably the biggest report-like thing you have ever written
- you are probably anxious about this
- this talk reviews the thesis writing process, the thesis content, and extra materials
- disclaimer: this is my advice as a thesis writer, reader, advisor, and typographer
- your supervisor has the final say

The Process

Background Research

- reading required materials is not research
 - research is the discovery or creation of new knowledge
- keep an annotated bibliography of everything you read
- summarize the relevant materials' content and provide justification for your choices

Writing Tools

- Microsoft Word
 - poor layout, “easy” use, proprietary
- OpenOffice
 - for poor layout, “free”, open format
- LaTeX and BibTeX
 - beautiful layout, free, lets one focus on content rather than presentation

Your Laboratory Notebook

- as you work on your project, take notes of your thoughts, activities, goals, discoveries
- every day you work try to write a paragraph about your current focus
- connect different thoughts with dependencies and implications
- your notebook is likely your most important resource

Writing and Rewriting

- your lab notebook is a fertile source of ideas, paragraphs, and other bits and pieces
- plan on throwing away more than you keep
- rewrite the thesis at least three times
- print out and hand-edit with a (red) pen
 - do not edit on screen!

Your Abstract

- write an initial version first to provide a top-level summary of your intentions
- ensure that it is no longer than a paragraph
- rewrite after your detailed outline is done
- write anew after your 2nd draft
- write final version after thesis is complete

Writing an Outline

- use an outline editor
 - a useful tool for the rest of your career
- decompose the problem to two levels
- summarize the contents of each first-level item with a single sentence; each second-level item with a short paragraph
- avoid writing until your design is done

Refine Your Outline

- treat your thesis like a complex program
 - think, design, write, refactor, and test
- refine each single idea or concept in the outline into a paragraph or two
- justify your refinement and ensure you have covered only what is necessary
- when writing, attempt to write a page a day

The Content

Your Audience

- your audience is “professional” readers
- your readers are (perhaps proto) computer scientists with varying backgrounds
- write to their level (university and up)
- be very careful about domain term use, definitions, spelling, etc.
 - Perl, GNU, Linux, Java, LISP, etc.

Thesis Structure

- stick carefully to the project regulations
- there is a maximum size of 35 pages
 - there is no minimum size (less is more)
- a table of contents is common; a table of figures or a table of tables are optional
- a bibliography is mandatory

Table of Contents

- include only relevant way-points in the table of contents
 - i.e., do not include every subsection
- ensure the layout is attractive and correct
- hyperlink if possible
- remove if shorter than a half dozen lines

Tables and Figures

- number and label all tables and figures consistently
 - only sentences have a capital first letter and end with a period
- only use scalable formats for figures
 - bitmapped screenshots are so 80s
- tables and figures always precede the text that refers to them

Page Layout

- avoid orphans and widows
- stay within the bounding box of the text by introducing/hinting hyphens or rewriting
- anchor tables and figures in front of associated text and use automated layout
- do not muck with margins
- two sided layout is different than printing one sided layout duplex

Writing Sections

- focus on one big idea per section, one small idea per subsection
- ensure continuity between sections
 - the thesis is a scientific story, it must flow
- lead the reader on a path and help them reach the conclusion before you do
 - a happy reader is one who feels smart but is occasionally surprised

Writing a Paragraph

- a paragraph is a mini-story with one point
- the first sentence sets the stage by making a single point that the remainder of the paragraph's sentences support
- four sentences is the median length, but longer or shorter, if justified, is acceptable

Writing a Sentence

- use simple sentences
- avoid compound and complex sentences
- write definitively, actively, positively
- focus on facts and objectivity, not opinions and subjectivity
- avoid indefinite pronouns, helping verbs, and modal verbs (can, should, would, might)

Reminders and Resources

Writing Style

- stay away from the first person (“I”)
 - use the third person (with no mention of the author), but not stiffly (avoid “one”)
- use the same tense throughout a section, and preferably throughout the entire thesis
- justify each sentence, even each clause
 - mercilessly trim away the fat

Fonts and Letter Style

- use a single standard font for text and a complementary standard font for maths
- do not abuse letter styles (italics, bold, etc.)
- do not play with letter size, inter-character, inter-word, or inter-paragraph spacing
- an ugly thesis makes the reader grumpy
 - if you cannot make a readable thesis, why bother concentrating on the content?

Punctuation

- do not use questions or exclamations
- colons are for presenting sequences; semi-colons are for adjoining clauses
- a dash (‘-’) is for hyphenation
- en-dashes (‘—’) are for range expressions
- em-dashes (‘—’) are for optional clauses and do not have adjacent spaces

Abbreviations

- introduce your own and domain abbreviations the first time a term is used
- use standard English abbreviations properly
 - “e.g.” ~ “for example”
 - “i.e.” ~ “that is to say”
 - “etc.” ~ “et cetera” (do not abuse)

External Input

- we are all “too close” to our own work
 - it is very easy to forget to explain very basic, but important, background issues
- get two CSI friends, one non-CSI friend, and your girl/boyfriend, mom/dad, auntie/grannie to read and critique your thesis
- ensure your advisor has read and commented on your thesis...at least twice

Plagiarism Reminders

- know what plagiarism is and is not
- if in doubt, cite
- if one can Google a (non-quoted) clause of your thesis, it is likely plagiarism
- plagiarism is a very serious offense
 - in some Universities, you lose the degree!

Writing Resources

- The Elements of Style by Strunk and White
- Troublesome Words by Bill Bryson
- Eats, Shoots & Leaves by Lynne Truss
- Line by Line by Claire Cook
- read quality scientific writing
 - Scientific American, award-winning dissertations, ~~past years' theses~~ [1, 2]