How-To Write a Thesis (with prof. Patrignani)

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Here are a few common guidelines for writing a thesis (Section 1) and for the followup presentation (Section 2). This document concludes with what our expectations when you are doing a thesis with me (Section 3). Please follow them closely.

1 Writing Guidelines (it goes without saying, write in LaTeX)

All sections/chapters should contain a piece of text like the one below, which guides the reader into knowing what to expect, with the references to the related section/chapters subsections.

This section contains guidelines on the structure (Section 1.1), on writing style (Section 1.2), on useful LaTeXpackages (Section 1.3), and finally it contains some useful sources (Section 1.4).

1.1 Structure

Introduction Structure your introduction in these four paragraphs, in this precise sequence:

- **Context** This gives the reader useful information to understand the problem.
- **Problem** This tells the reader the problem your solution addresses. This paragraph typically starts with 'However', 'But', or something like that.
- **Solution** This tells the reader what you did. Make sure to spell out a list of contributions. If you want to see some examples, please look at my research papers.
- **Validation** This tells the reader why what you did is correct. Perhaps you ran some experiments, or you proved some theorems, these facts go here.
- **Outline** The final paragraph (or better, a subsection), tells the reader the organisation of the thesis, namely what sections are there and what they contain.

From a temporal perspective, often you first write the Solution, and the Validation, because those paragraphs describe what you have done, and ideally you write after having done them. Then, you work backwards and spell out the Problem and the Context.

Background The second section should be a background section, describing useful notions for the reader.

Core Then come the 1 or 2 core sections of your thesis, where you present your work in details, possible evaluations etc.

Related Work The related work section goes at the end, right before the conclusions.

1.2 Writing Style

- typically, write your thesis in english. There are few cases in which you can write in italian, e.g., if you did an industry thesis.
- do not use abbreviations: no 'it's', no 'we'll', no 'aren't', but 'it is', 'we will', 'are not'.
- no ' 's ' for inanimate objects (no 'the experiment's setup').
- when citing some work, do not say 'as [3] presents', but rather 'as Author et al. [3] present'.
- when referring to, for example, an image, this is wrong: "as we see in 1", this is appropriate: "as we see in *figure* 1". Use package `cleveref` for this (see below).

- capitalise all titles and section headers (like in this document).
- give names to definitions, lemmas, examples, etc.
- do not use passive voice: no 'an algorithm is presented' but 'this section presents an algorithm'.
- when using quotes, this is wrong: "wrong", and it was obtained with the same quotes before and after the word. You want to "open quotes", like I just did. It is done with a back-tick (key left of 1 in the US layout keyboard).

1.3 LaTeXPackages and Commands

Here is a list of LaTeXpackages that may come in handy:

- Generally useful:
  - `xspace`,
  - `cleveref`, (do not write "section \ref{...}", instead write "\Cref{...}")
  - `[colorinlistoftodos] todonotes` ;
- `[T1] fontenc` plus `[scaled=.83] beramono` for code listings;
- `lineno` for the *draft only* of your thesis, so I can give you precise feedback.

The following file contains useful macros for typesetting formal languages:

- https://squera.github.io/misc/cmds.tex You want to take a look at the `typerule` command.

1.4 Sources

Here is a good source on writing (papers, but theses are just longer papers):

- https://www.youtube.com/watch?v=WP-FkUaOcOM

2 Presenting Guidelines (present using your favourite tool)

Generally, you want to say and write all the things that (1) help the viewer understand where they are in the presentation, and (2) clarify what you did and why you did it (i.e., what problem are you addressing in your work).

- A good intuition is to have 1 slide per minute, for a presentation of 10 minutes, prepare ∼10 slides.
- The first slide must contain the title, your name, the advisor(s) names, the university logo.
- The presentation must contain an overview of the presentation, either as the second slide, or just after the problem statement.
- All slides should contain the slide number followed by the total of slides, so the title slide of a 10-slides presentation has the annotation '1/10' somewhere in the bottom.
- No 'wall-of-text' slides. The slides are not your script, but something for the audience to follow.
- As a general structure, the presentation must:
  1. present the context in which you did your work;
  2. present the challenges you addressed;

3. discuss your solution to the challenges;
4. present any evaluation of your solution.

- You need to emphasise what your contribution is (likely between points 2 and 3 above).

  Make sure to have a slide with bullet points where you spell out what is it precisely that you did. Ideally, this should come after some slides that present some form of problem, so you can then say that your contribution serves as a solution to said problem.

- Conclude with thanks and with a questions slide.

1 week before the presentation, schedule a dry-run with me. Ofc, practice before doing the dry-run.

3 Expectations, Yours and Mine

When you embark on a thesis with me, you can expect to be treated very autonomously. That is, do not expect me to give you precise tasks to complete, but you can expect to have a problem to solve (that you propose, that you found on my webpage, that I propose, ...), and the goal of the thesis is to explore possible solutions to that problem. I can guide you towards finding the solution, but I expect you to test out options, weigh alternatives, and explore potential solutions, even if they will turn out to be sub-optimal. I expect you to face the problem with a growth mindset: tackling something you do not yet know, but that you will know by the end of the thesis process.

If I gave you some advice that you think should be found here, please write me an email and I will update this document!