Very important thesis title

Less important thesis subtitle

by

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at

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Abstract

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Contents

I Introduction

This is a minimal, modern template for writing your Bachelor's, Master's, or PhD thesis. It was adjusted for students at Goethe University Frankfurt. You can find the source code on GitHub (https://github.com/goethe-tcs/thesis-template) or you can access the template directly on Overleaf (https://www.overleaf.com/read/xgvdxhsphjdq). If you want to use Overleaf, you need an Overleaf account and click "Copy Project" in the menu in order to create a private copy of the template that you can edit yourself.

1.1 History

This template is based on `latex-mimosis`, which in turn is based on the style advice given by people such as Robert Bringhurst [Bri12] or Edward R. Tufte [Tuf90, Tuf01].

1.2 How?

You can use `latex`, `xelatex`, or `lualatex`. If in doubt, prefer `lualatex`, which seems to be the most modern. The default fonts used by this document are good, but feel free to change them.

XeLaTeXand LuaLaTeXalso offer you a way to change the font that is used for mathematical equations. If installed, the `garamond-math` package permits you to choose from different stylistic sets that slightly change how certain mathematical symbols look. For instance, the following command changes 'Fraktur' symbols:

```
\setmathfont{Garamond-Math.otf}[StylisticSet={6}]
```

1.3 Features

The template automatically imports numerous convenience packages that aid in your typesetting process. Table 1.1 lists the most important ones. Let's briefly discuss some examples below. Please refer to the source code for more demonstrations.

Package	Purpose
`amsmath`	Basic mathematical typography
`amsthm`	Basic mathematical environments for proofs etc.
`babel`	Language settings
`booktabs`	Typographically light rules for tables
`bookmarks`	Bookmarks in the resulting PDF
`csquotes`	Language-specific quotation marks
`dsfont`	Double-stroke font for mathematical concepts
`graphicx`	Graphics
`hyperref`	Hyperlinks
`multirow`	Permits table content to span multiple rows or columns
`paralist`	Paragraph ('in-line') lists and compact enumerations
`scrlayer-scrpage`	Page headings
`setspace`	Line spacing
`siunitx`	Proper typesetting of units
`subcaption`	Proper sub-captions for figures

Table 1.1: A list of the most relevant packages required (and automatically imported) by this template.

1.3.1 Typesetting mathematics

This template uses `amsmath` and `amssymb`, which are the de-facto standard for typesetting mathematics. Use numbered equations using the `equation` environment. If you want to show multiple equations and align them, use the `align` environment:

$$V := \{1, 2, \dots\} \tag{1.1}$$

$$E := \big\{(u, v) \mid \operatorname{dist}\big(p_u, p_v\big) \leq \epsilon\big\} \tag{1.2}$$

Define new mathematical operators using `\DeclareMathOperator`. Some operators are already pre-defined by the template, such as the distance between two objects. Please see the template for some examples. Moreover, this template contains a correct differential operator. Use `\diff` to typeset the differential of integrals:

$$f(u) := \int_{v \in \mathbb{D}} \operatorname{dist}(u, v) \,\mathrm{d}v \tag{1.3}$$

You can see that, as a courtesy towards most mathematicians, this template gives you the possibility to refer to the real numbers $\mathbb{R}$ and the domain $\mathbb{D}$ of some function. Take a look at the source for more examples. By the way, the template comes with spacing fixes for the automated placement of brackets.

1.3.2 Typesetting text

Along with the standard environments, this template offers `paralist` for lists within paragraphs. Here's a quick example: The American constitution speaks, among others, of (i) life (ii) liberty (iii) the pursuit of happiness. These should be added in equal measure to your own conduct. To typeset units correctly, use the `siunitx` package. For example, you might want to restrict your daily intake of liberty to 750 mg.

Likewise, as a small pet peeve of the `latex-mimosis` author, the package offers specific operators for *ordinals*. Use `\th` to typeset things like July 4th correctly. Or, if you are referring to the 2nd edition of a book, please use `\nd`. Likewise, if you came in 3rd in a marathon, use `\rd`. This is my 1st rule.

If you want to write a text in German and use German hyphenation rules, set the language of your text to german using `\selectlanguage{ngerman}`, or add

```
\PassOptionsToPackage{spanish}{babel}
```

before the `\documentclass` command to load a specific language. The languages `ngerman`, `french`, and `english` are loaded by default, with `english` being selected.

Quotation marks can be typeset using the `\enquote{...}` command from the `csquotes` package, which is preloaded by `latex-mimosis`. Depending on the currently selected language, quotes will look like "this", „this", or « this ». One must never use "ASCII" quotation marks or even 'apostrophe' symbols.

1.4 Changing things

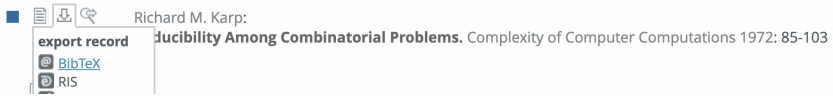
Since this class heavily relies on the `scrbook` class, you can use *their* styling commands in order to change the look of things. For example, if you want to change the text in sections to **bold** you can just use

```
\setkomafont{sectioning}{\normalfont\bfseries}
```

at the end of the document preamble—you don't have to modify the class file for this. Please consult the source code for more information.

1.5 Citations

All publications that you cite should be added to the file `Thesis.bib` and cited using the `\cite` command. Citation data in computer science can be found at DBLP (https://dblp.org). Whenever possible, use the "standard" BibTex record that is provided by DBLP when you click this link:



Here are a couple more rules for the references:

- Always prefer citing the latest peer-reviewed version of a document. That is, cite arXiv papers only if the paper has not been published in conference proceedings or in a scientific journal yet, or if the particular result that you are quoting only occurs in the arXiv version. Likewise, always prefer citing the journal version over the conference proceedings version if a journal version is available.
- Add the doi (digital object identifier) entry whenever possible and make sure the doi shows up in the references as a clickable link.
- Bibtex messes with the capitalization, particularly in the title field. Make sure that words that should be capitalized, such as names (Turing, Boolean, etc.) or acronyms (CSP, FPT, etc.), are enclosed in a pair `{}` of curly braces.

2 Preliminaries

Try to make your thesis self-contained! You should include here all the preliminary material (notation, definitions, etc.) that is necessary to understand your thesis. As a rule of thumb, you can assume that your reader is a competent computer scientist who has finished their Master's degree. For example, the reader knows all standard undergraduate material in theoretical computer science and/or discrete mathematics. However, you cannot assume that the reader knows the notation you are going to use or has read any specific paper that you may have read.

For example, you can assume that the reader knows what a graph is and how Dijkstra's algorithm works, but not necessarily whether the graphs in this thesis will be directed or undirected, whether you write edges as uv, $\{u, v\}$, or (u, v), or which specific formulation of Dijkstra's algorithm you may be referring to.

It is sometimes difficult to decide what to put in the preliminaries, what to leave out completely, and what to introduce later. As a rule of thumb: If a concept is only used once, then this concept is best introduced just before it is used. If a concept is used several times throughout your document, it should be introduced in the preliminaries. If a concept is very important to your document, then it should probably be introduced in a separate chapter and not in the preliminaries. For example, if you are implementing an algorithm from a paper, then it is best to describe the algorithm and its properties in its own chapter.

3 Conclusion

Here, you should briefly reiterate your main results. Do not simply copy/paste them, but restate them at a high level and reflect on them critically. Did you achieve what you set out to do? What limitations does your approach have? What else could/should be done in a future project? Which problems are left open by this thesis?

Bibliography

[Bri12] Robert Bringhurst. *The Elements of Typographic Style*. Hartley & Marks Publishers, Vancouver, British Columbia, Canada, 4 edition, 2012.

[Tuf90] Edward R. Tufte. *Envisioning information*. Graphics Press, Cheshire, CT, USA, 1990.

[Tuf01] Edward R. Tufte. *The visual display of quantitative information*. Graphics Press, Cheshire, CT, USA, 2 edition, 2001.