



UPPSALA  
UNIVERSITET

## MASTER THESIS SPECIFICATION

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### Title

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**Department of Information Technology**

February 03, 2026

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**NOTE:** For updated instructions, please refer to the latest guidelines.

**Title**

**Abstract**

**Background**

**Description of Tasks**

**Methods**

**Relevant Courses**

**Delimitations**

**Time Plan**

## Bibliography

- [1] E. Bell, A. Bryman, and B. Harley, *Business research methods*, Fifth edition. Oxford University Press, 2019.
- [2] A. Avizienis, J.-C. Laprie, B. Randell, and C. Landwehr, “Basic concepts and taxonomy of dependable and secure computing,” *IEEE Transactions on Dependable and Secure Computing*, vol. 1, no. 1, pp. 11–33, 2004, doi: 10.1109/TDSC.2004.2.
- [3] Uppsala University, “Almedalen.” Accessed: June 17, 2024. [Online]. Available: <https://www.uu.se/>

## A Some Tips for Typst Usage

To **refer** to sections, figures, tables, etc., use `<sec:label>` or `#label("sec:label")` to “set a mark” in the text or figure, and `@sec:label` or `#ref(sec:label)` to refer to it, for example, Read more on page 7 about naming sections, figures, etc. In Typst you can’t label and refer to general text, but you can use headings for that, e.g.,

```
= Methods <sec:method>
// #label("sec:methods")
```

followed by

As mentioned in~@sec:methods...

To prevent references from appearing immediately after a **line break**, use a non-breaking space like~this, where the tilde character ~ creates a non-breaking space. This is also generally correct to use before numbers (and in large numbers in English, e.g., 100~000 for 100,000), and of course also before references to figures @fig.

To create a **paragraphbreak** it’s best to use a blank line or `#parbreak()`.

To create a **page break** where the rest of the page becomes blank, use `#pagebreak()`

## B Hayagriva for Bibliography and References

To manage bibliography (**references**) smoothly, use Hayagriva! Hayagriva is a new bibliography file format designed for use with Typst. Read more at [here](#) and use this as a guide for file format. An example bibliography file is provided as `ref_examples.yml`. Typst also has support for Bib(La)Tex files, but Hayagriva is more powerful and has a nicer syntax.

```
harry:
  type: Book
  title: Harry Potter and the Order of the Phoenix
  author: Rowling, J. K.
  volume: 5
  page-total: 768
  date: 2003-06-21
```

```
electronic:
  type: Web
  title: Ishkur's Guide to Electronic Music
  serial-number: v2.5
  author: Ishkur
```

```
url:
  value: http://www.techno.org/electronic-music-guide/
  date: 2026-01-26
```

Multiple authors are presented as an array of strings.

```
author: ["Omarova, Saule", "Steele, Graham"]
```

And some fields accept composite data such as the `url` field above where the date specifies access date.

## C References

**NOTE: important!** There are at least three purposes for the design of references and the reference list.

1. One should find the reference (from the text) in the reference list.
2. One should understand what is being referred to (what type of reference it is) so that one can evaluate it.
3. One should be able to find the reference in reality.

Always strive to achieve all three.

Use numerical references (IEEE style [42]) or keyword-based [Lam86], not footnote style. The references are sorted alphabetically by author/etc. in the reference list. In Typst, use `#bibliography{"refs.yml", style: "ieee"}`, see the `main.tex`.

References are written in direct connection to what prompted the reference (e.g., a statement or result), before any punctuation, and with a non-breaking space to the previous word. In Typst, write `~@Lam86` to get a “non-breaking space.”

One should *not* write the references after a longer paragraph (as some seem to be taught to do, somewhere). This usually makes it unclear what is actually taken from, or supported by, the references. In some cases, you may want to provide a short summary of what an author writes in an article, etc., but just adding a reference at the end of the paragraph is not clear enough. It is much better and clearer to start the paragraph by writing something like “Lisa Lagom describes~@lagom-bok how X depends on Y and in her analysis, she shows in detail how the relationship looks...”

Repeating the same reference often in a paragraph (maybe after every sentence) makes it more difficult to read. Try to rewrite the paragraph so

that it becomes clear that it is all based on the reference, which should preferably be used early. Example: “In a study by WHO~@who, the consequences of XYZ and the indirect risks that arise are described,” and then the different consequences and risks can be discussed in the same paragraph without it becoming unclear.

When referencing “thick” items like books, it is appropriate to specify page numbers (as @example:alma[pp. 211-214]) which becomes [1, pp. 211-214], but for “thinner” items, you only need to do this to specifically point out if you mean a particular part of the reference (maybe it describes three different ways to do X and you want to point to the 3rd, not the first two).

To refer to multiple things simultaneously, write multiple reference keys after each other @example:alma @example:dependability which becomes [1], [2].

Note that news articles (newspaper articles and the like) almost always have a publication date, which should be shown (e.g., in the date field).

Even if a reference has a URL to the actual text, it is not necessarily a web reference, but sometimes an article/book, etc., that happens to be available online. It should then be described as an article/book/etc. (but of course preferably with the URL) so that one can make a preliminary assessment of the reference already when reading the reference list.

Try to find authors and publication dates (year, month) even for web references, and **always** specify when they were accessed, as they can be updated at any time. This is done by setting the composit values

```
{value: X, date: Y}
```

on the url field. An example is [3] (see refs.yml).

## D Formulas, Figures, Images, Code, Timelines

Formulas, figures, and equations must be described. This means, for example, that each symbol must be explained in the text.

Figures and tables that are “floats” in LaTeX are more deterministic in Typst and generally end up within a page of where you place them. Still let figures and tables end up where Typst thinks they should, and adjust the placement only in the final version and if it is really necessary.

Figure captions should describe what we see in the figure, not just what type of figure it is. Writing “System structure” or “The structure of our system” for a picture of the system structure is not sufficient. Help the reader understand by also (or instead) describing the content, e.g., “The green circles represent users, and components with shaded background are external. Input comes from the left, and output is delivered to the right.” It is therefore *not* enough to describe the figure in the running text — but of course, it should also be described there.

In English text, you write “Figure 3,” not “figure 3,” since it functions as a name for the figure (and similarly for Table, Section, Appendix, etc.).

All figures and images that are not your own must have references to the source.

If you include code snippets, make sure they are relevant and commented, so they can be understood. Alternatively, for short snippets: provide the corresponding explanation in the text. In Typst you use raw elements for this purpose, see the code snippet in Section E.5. In this project supported languages are formatted using codly.

## E Examples

Some examples for different commands in Typst.

### E.1 References

Uppsala University has 52 917 students [3].

Bell et al. [1, p. 312] describes...

Chapter E outlines ... and check out Section A as well as Section E.3.

### E.2 Acronyms

**NOTE:** Example usage of Acronyms. Acronyms list can be seen in abbreviations section as it can’t be displayed twice.

#### Constrained Equations

Boundary Conditions(BCs) constrain the Degrees of Freedom(DOFs) of the Partial Differential Equations(PDEs) they act on.

BCs constrain the DOFs of the PDEs they act on.

The Method of Lines↔(MOL) is a procedure to solve PDEs in time.

**A note about trains showcasing alt**

The High speed train↔(**TGV**, from French *Train à haute vitesse*) has a commercial speed of up to 320 km/h.

### E.3 Figures

Look at this fabulous building and statue in Figure 1.



Figure 1: University Hall or the University Main Building is the main building of Uppsala University in Uppsala, Sweden. The statue in front of the building is Erik Gustaf Geijer (1783-1847), a Swedish writer, historian, poet, philosopher, and composer. Photo: ScanianDragon (2023).

### E.4 Tables

Tables can also be placed in figures as seen in Table 1.


	Students	Employees
<i>Quantity</i>	52 917	7 622

Table 1: Number of students and employees at Uppsala University.

### E.5 Code

Finally, you can insert code in a figure as in Listing 1. I like `codly` for syntax highlighting.

```
1 # Sum
2 def sum(x, y):
3     return x + y
4
5 print("Sum:", sum(1,1))
```

 Python

Listing 1: Python implementation of adding two numbers.

## E.6 Math

You can decide if you want math in text such as  $a^2 + b^2 = c^2$  or as a block like in Equation 1.

$$A = \frac{\pi r^2}{2} = \frac{1}{2}\pi r^2 \quad (1)$$

Placing spaces after the opening dollar sign and whitespace before the closing dollar sign is the shorthand for blocking. You can also add alt text using the `#math.equation`(alt: "alt text", content) syntax. If you want the equation syntax to block use the block option

`#math.equation`(block: true) as in Equation 2

$$\int_1^\infty ax^2 + b \, dx \quad (2)$$

### Example of both in text match and blocks

Let  $a$ ,  $b$ , and  $c$  be the side lengths of right-angled triangle. Then, we know that:

$$a^2 + b^2 = c^2 \quad (3)$$

Prove by induction:

$$\sum_{k=1}^n k = \frac{n(n+1)}{2} \quad (4)$$

## E.7 Timelines in typst

It is always nice to have timelines in reports. For this purpose I prefer using the `timelney` package. Here is an example of a timeline for a optimization project and more info can be found on the project page:

