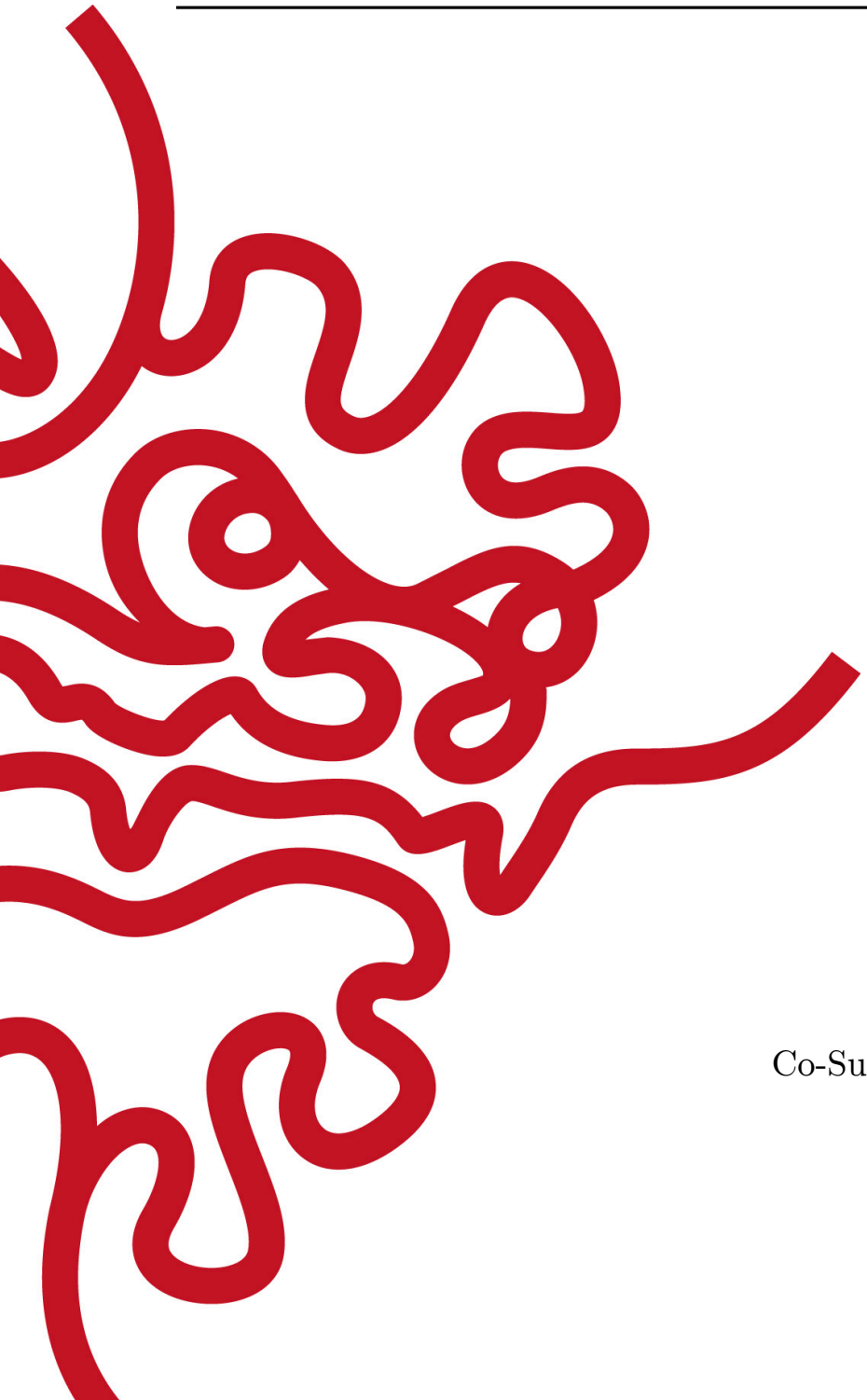
Okinawa Institute of Science And Technology
Graduate University

Thesis submitted for the degree

Doctor of Philosophy

Typst Dissertation Template



by

Kazuma takada

Supervisor: **S. Upervisor**
Co-Supervisor: **C. O'Supervisor**

August 2025

Declaration of Original and Sole Authorship

I, Kazuma takada, declare that this thesis entitled *Typst Dissertation Template* and the data presented in it are original and my own work.

I confirm that:

- No part of this work has previously been submitted for a degree at this or any other university.
- References to the work of others have been clearly acknowledged. Quotations from the work of others have been clearly indicated, and attributed to them.
- In cases where others have contributed to part of this work, such contribution has been clearly acknowledged and distinguished from my own work.
- None of this work has been previously published elsewhere, with the exception of the following: (provide list of publications or presentations, or delete this part). (If the work of any co-authors appears in this thesis, authorization such as a release or signed waiver from all affected co-authors must be obtained prior to publishing the thesis. If so, attach copies of this authorization to your initial and final submitted versions, as a separate document for retention by the Graduate School, and indicate on this page that such authorization has been obtained).

Date: August 2025

Signature:

Abstract

The abstract should fit within a page. It should be written in a way that is accessible to a general audience, summarizing the main findings and significance of the research.

Acknowledgments

Please refer to the https://groups.oist.jp/grad/academic-program-policies for specifications.

List of Abbreviations

Please refer to the https://groups.oist.jp/grad/academic-program-policies for specifications.

Here is an example of how to write a list of abbreviations. You can use the following format:

OIST	Okinawa Institute of Science and Technology
e.g.	For example
etc.	And so on
PPT	positive partial transpose
SRPT	Schrödinger-Robertson partial transpose

Glossary

Please refer to the https://groups.oist.jp/grad/academic-program-policies for specifications.

Here is an example of how to write a glossary. You can use the following format:

Dipole Blockade	Phenomenon in which the simultaneous excitation of two atoms is inhibited by their dipolar interaction.
Cavity Induced Transparency	Phenomenon in which a cavity containing two atoms excited with light at a frequency halfway between the atomic frequencies contains the number of photons an empty cavity would contain.

Nomenclature

Please refer to the https://groups.oist.jp/grad/academic-program-policies for specifications.

Here is an example of how to write a list of abbreviations. You can use the following format:

c	Speed of light (2.997 924 58 times 10^8 m/s)
e.g.	For example
etc.	And so on
PPT	positive partial transpose
SRPT	Schrödinger-Robertson partial transpose

Dedication

This is where you can write a dedication.

Table of Contents

List of Figures

List of Tables

Introduction

This is the introduction. You might want to leave it unnumbered, as it is now. If you want to number it, treat it like any other chapter.

Chapter 1

Guidelines on the preparation of theses

Please refer to https://groups.oist.jp/grad/academic-program-policies for specifications.

Many of the formatting requirements such as page size, fonts, etc are built-in into this template. Do not modify them.

For the bibliography, we recommend using BibTeX or BibLaTeX and through the file `Preamble/Thesis_bibliography.bib`. Citing one reference can be done like so: (Lee & Scully, 1998) and multiple references in one go like so (Filipp et al., 2009; Lee & Scully, 1998; Mücke et al., 2010).

Chapter 2

How to use the templates

This is a practical guide into how to use this template, by explaining the role of the different folders, and an option of `#raw("\documentclass{oist_thesis}")`, which accepts either `#raw("temporary")` or `#raw("final")`.

2.1 Folders

The main folder contains three folders detailed here:

- **Images.** This folder should contain all the images that you will use in your thesis. It can contain subfolders, for example one for each chapter. To include an image from the main text, use something like `#raw("\includegraphics{subfolder/image.jpg}")` without worrying about the `#raw("Images")` path.
- **MainText.** This folder contains a series of `LaTeX` files that form the main text: introduction, chapters, conclusion, appendices and published articles. The introduction and conclusion as they are now are not numbered, which creates a few difficulties with the headers of the thesis. Those are solved by including the commands `#raw("\unnumberedchapter{}")` and `#raw("\numberedchapter")` before including the files in `#raw("xxx_Thesis.tex")`. If you want the introduction and conclusion to be numbered, re-write and treat them as regular chapters.
- **Preamble.** This folder contains a series of `LaTeX` files with the pages that will appear before the main text. Please write (or copy and paste) your own text in those files and delete the dummy text when appropriate. The files are:
  - `#raw("abbreviations.tex")` — List of abbreviations. If the list goes over one page, create another table.

- `#raw("abstract.tex")` — Abstract. Follow directions in the file.
- `#raw("acknowledgments.tex")` — Acknowledgments. Follow directions in the file.
- `#raw("declaration.tex")` — Declaration of Original and Sole Authorship. Only modify the last item. This page needs to be signed once printed.
- `#raw("dedication.tex")` — Dedication (optional). Should only be a very few lines.
- `#raw("glossary.tex")` — Glossary (optional). If the list goes over one page, create another table.
- `#raw("nomenclature.tex")` — Nomenclature (optional). If the list goes over one page, create another table.
- `#raw("physics_bibstyle.bst")` — Bibliography style file modified by Jeremie Gillet in 2011 to suit his thesis. Might be suitable for physics. If you want to use another custom bibliography style, include the file in this folder.
- `#raw("Thesis_bibliography.bib")` — BibTeX file containing your bibliography.

2.2 `Thesis.tex`

This is the main file, the only one that needs to be compiled to build the thesis. Compile once with `LaTeX`, once with BibTeX and finally twice with `LaTeX` to get all the references right. At the top of this file, you can see `#raw("\documentclass[temporary]{oist_thesis}")`. When you submit a temporary version to the graduate school, do not modify it. When you submit a final version, use `#raw("\documentclass[final]{oist_thesis}")` instead.

Let's go through each section and comment them briefly. The last section will emphasize the differences between options `#raw("\documentclass[temporary]{oist_thesis}")` and `#raw("\documentclass[final]{oist_thesis}")`.

2.2.1 PACKAGES AND OTHER DOCUMENT CONFIGURATIONS

This section contains the minimum number of packages and definitions to compile the thesis. No line should be removed or modified.

2.2.2 ADD YOUR CUSTOM VALUES, COMMANDS AND PACKAGES

This section should not be modified directly. Instead, your packages and definitions should be included in `#raw("Preamble/mydefinitions.tex")`.

2.2.3 TITLE PAGE

Creates the title page. Do not modify.

2.2.4 PREAMBLE PAGES

Structures the style (header) for the preamble pages and builds them. Do not modify, except for deleting the optional preambles you might not want to include.

2.2.5 LIST OF CONTENTS/FIGURES/TABLES

Creates the different lists. Do not modify.

2.2.6 THESIS MAIN TEXT

Structures the style for the main text chapters and builds them.

The command `#raw("\numberedchapter")` is only relevant for a transition between unnumbered sections and numbered sections, it does not need to be included between each chapter.

2.2.7 BIBLIOGRAPHY

Builds the bibliography. The style of the bibliography can be defined in `#raw("Preamble/mydefinitions.tex")`.

2.2.8 APPENDICES

Structures the style for the appendices and builds them. The appendices are numbered with letters but are structured like regular chapters.

2.2.9 PUBLISHED ARTICLES

This last section add the PDF files of your previously published articles (or about to be published) to the thesis. You should only include PDF files provided by the publishing journal. This is strictly for the examiners' convenience in the temporary bound thesis, as for copyright reasons these files may not be published in the final version of the thesis.

2.2.10 Differences between a temporary version and final version

There are two main differences between `#raw("\documentclass[temporary]{oist_thesis}")` and `#raw("\documentclass[final]{oist_thesis}")`.

The first difference is that the final version (`#raw("\documentclass[final]{oist_thesis}")`) does not contain the published articles for copyright reasons.

The second difference is in the document style: page size, header and line spacing are different This might create small issues, such as page breaking with large tables, images or captions, when compiling the same content).

Chapter 3

Figures, tables and images

3.1 Figures

Figure 3.1: Full caption with all the details here.font size has to be 10pt, and sentences has to be left side.

Figure 3.2: This secret image won't be numbered and won't appear in the List of Figures because of the *

Refer to figure like this: Figure Figure 3.1 or this (Fig. Figure 3.1). If you want to include a list of figure, you can use a short version of the caption as shown in Figure Figure 3.1.

3.2 Tables

Table 3.1: Short heading for the List of Tables.

Parameter	Value
Δ	0, 150
α	85
ε	6
κ	6.8
γ	0.2

Table 3.2: This secret table won't be numbered and won't appear in the List of Figures because of the *

Parameter	Value
Δ	0, 1500
α	850
ε	60
κ	68
γ	2

Refer to tables this this: Table Table 3.1.

Table titles should be under the tables.

Visual of LaTeX's tables are beautiful, however inputting all tables manually was too much for me. So, I just created pictures of tables on power point by copy and paste from excel table. Then, inserted them into tables. I wish this way helps for chemists and biologist who utilize many tables.

AM/PM	24-hour time	Hour of day
0:00 a.m.	0:00	0.00
6:30 a.m.	6:30	6.50
0:25 p.m.	12:15	12.25
6:45 p.m.	18:45	18.75
11:59 p.m.	23:59	23.98

Figure 3.3: Example of Time Expression: Example of time expressed in AM/PM, 24-hour time (military time) and hour of day format. Feeding time which were originally military time format were converted to decimal time format (hour of day) for XX regression.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	p	p_{fdr}
Temperature (℃)	3	1	10	18	23	25	30	32	25	22	16	8	0.00E+00	0.00E+00
RH (%)	40	50	40	40	45	90	80	70	70	60	40	40	1.09E-299	2.70E-299

Figure 3.4: Statistic Characterization of Meteorological Data: P-values were calculated using Kruskal-Wallis tests across months. Significant differences were identified at a false discovery rate -adjusted p-value < 0.05.

Conclusion

This is the conclusion. You might want to leave it unnumbered, as it is now. If you want to number it, treat it like any other chapter.

Bibliography

Filipp, S., Maurer, P., Leek, P. J., Baur, M., Bianchetti, R., Fink, J. M., Göppl, M., Steffen, L., Gambetta, J. M., Blais, A., & Wallraff, A. (2009). Two-Qubit State Tomography Using a Joint Dispersive Readout. *Phys. Rev. Lett.*, *102*(20), 200402. https://doi.org/10.1103/PhysRevLett.102.200402

Lee, H., & Scully, M. (1998). The Physics of EIT and LWI in V-Type Configurations. *Found. Phys.*, *28*(4), 585–600. http://dx.doi.org/10.1023/A:1018709621908

Mücke, M., Figueroa, E., Bochmann, J., Hahn, C., Murr, K., Ritter, S., Villas-Boas, C. J., & Rempe, G. (2010). Electromagnetically induced transparency with single atoms in a cavity. *Nature*, *465*(7299), 495–498. http://dx.doi.org/10.1038/nature09093

Appendices

Chapter A

Appendix A

This is the first appendix.