Metathesis: A LaTeX Style for University of Wolverhampton PhD Theses

Your Name

A thesis submitted in partial fulfilment of the requirements of the University of Wolverhampton for the degree of Doctor of Philosophy

2010

Signature: . . . . . .

Date: . . . . . .

Abstract

An abstract is a synopsis of the thesis, and it goes in the file `abstract.tex`.

Acknowledgements

Your acknowledgements should go in `ack.tex`.

We would like to acknowledge Donald Craig at Memorial University, Newfoundland who published the meta-thesis on which this template is based. You can find Donald's work on his web site, here: http://www.cs.mun.ca/~donald/metathesis/.

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Chapter 1

Introduction

1.1 Basics

1.1.1 Chapters and sections

Place each of your chapters in a separate file in the `chapters/` directory and make sure you add them to both the `Makefile` and `thesis.tex`.

It is a good idea to add a sensible label to every chapter and significant sections, so that you can easily cross-reference them later. For example, this is section 1.1.1 in chapter 1 and the next chapter will start on page 11.

Also note that each appendix of your thesis should be typeset like an ordinary chapter.

1.1.2 Notes

[META: *A "note" can be written with the* `note` *directive. Notes allow you to write meta-comments about your work while you are drafting your thesis. Make sure you take them all out before submitting!*]

1.1.3 Citations

Use `cite` to enter a citation into the main text of your thesis, e.g.: [1]. You can list a number of citations at once, by separating the references inside the

`cite` directive with commas, like this: [2, 3, 4]. Do *not* place spaces inside a `cite`ation. You should place your BibTeX references in files inside the `refs/` directory and add the file names to the file `bib.tex`. A list of references will be automatically generated and placed after the main chapters of your thesis, just before any appendices.

1.1.4 Lists

LaTeXhas three types of list: itemized lists, enumerated lists and description lists. Because most of this thesis template is double-spaced, in order to make lists readable, you should use the `compresslist` directive after each `being{listtype}` statement.

1.1.4.1 Itemized lists

- foo
- bar

1.1.4.2 Enumerated lists

1. foo
2. bar

1.1.4.3 Description lists

foo bar

baz arg

1.1.5 Quotations

This template provides three ways to typeset quotations and similar content: footnotes[1], ordinary quotes, with a citation, and "bare" quotes, without a citation. Ordinary quotations are typeset with the `wlvquote` directive and look like this:

> "*Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.*" [5]

"Bare" quotations, without a citation are typeset with `wlvbarequote`, and look essentially the same:

> "*Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.*"

1.1.6 Figures

You can import any type of graphics file (.jpg, .png, etc) into your document using the `wlvfig` command. You should place your figures in the `figures/` directory and add them to `Makefile`. Figures will automatically be added

[1] Example footnote.

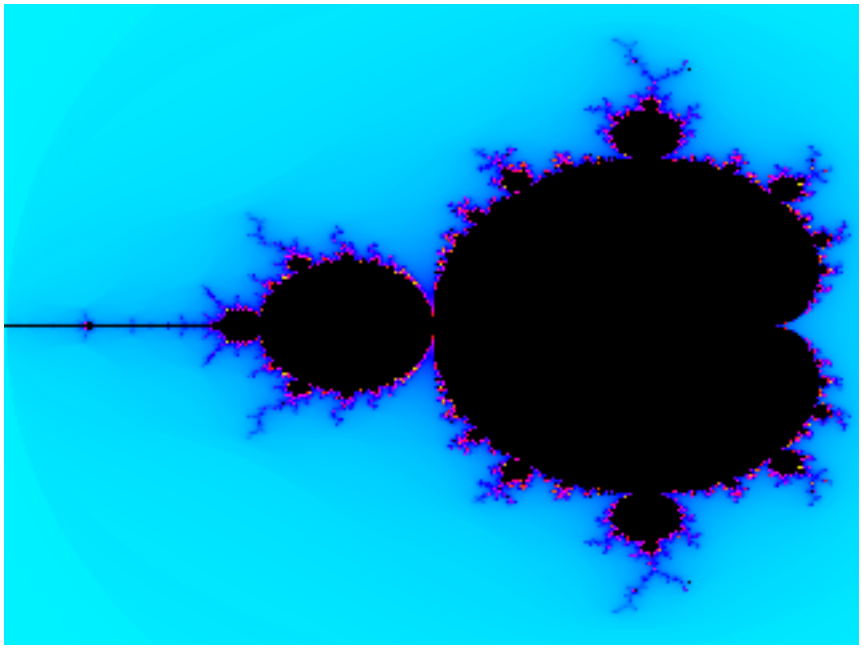

Figure 1.1: This is a caption for a PNG figure.

to the list of figures at the beginning of the thesis using the caption, which is the second argument to `wlvfig`.

Figures, such as figure 1.1 on page 4 are automatically given labels of the form `fig:FILENAME`. This is the argument that you need to pass to `ref` or `pageref`.

Figure 1.1 was inserted with the command:

```
\wlvfig[1.0]{mandelbrot}{This is a caption for a PNG figure.}
```

The corresponding graphics file is `figures/mandelbrot.png` and we can refer to the figure with the command `\ref{fig:mandelbrot}`. The first argument, `1.0` tells LaTeX to scale the figure to 0.1 times the original size (keeping the aspect ratio fixed).

1.1.6.1 Placement

Figures are placed either where you put them in the document, if this is possible, or failing that, at the top or bottom of the current page.

1.1.7 Tables

Tables, such as 1.1 can be typeset with the `wlvtab` directive. The second argument is a label which should be passed to `ref` as `tab:LABEL` for cross-referencing, the third argument is the table caption and the fourth is the contents of the table itself. Tables will be automatically added to the list of tables at the start of the thesis.

The first argument to `wlvtab` tells LaTeX how to lay the table out on the page. Table 1.1 was given the directive `|l||c|c|` which means "One column left-justified, two vertical bars, one column centered, one vertical bar, one column centered". If you use emacs, you will find `M-x align-regexp` to be very helpful in making LaTeX tables readable.

1.2 Typesetting mathematics

LaTeX has built in support for typesetting mathematics, but in a longer, more structured document you will want to use specific environments. This template provides support for the following: `theorem`, `lemma`, `definition`, `case`, which can be used as below:

	1	2	3	4	5
1	2.36	1.08	-0.49	-0.82	-0.65
2	-0.68	-1.13	-0.42	-0.72	1.51
3	-1.00	0.02	-0.54	0.31	1.28
4	-0.99	-0.54	0.97	-1.12	0.59
5	-2.35	-0.29	-0.53	0.30	-0.30
6	-0.10	0.06	-0.85	0.10	-0.60
7	1.28	-0.46	1.33	-0.66	-1.80
8	0.80	0.46	1.37	1.73	1.93
9	-0.75	0.28	0.51	0.19	0.58
10	-1.64	-0.12	-1.17	-0.10	-0.04

Table 1.1: Table example

Theorem 1.1. Square roots of even numbers are not rational.

Lemma 1.1. The square root of two is not rational.

1.2.1 Equations

Numbered equations can be typeset with the `wlveqn` directive, such as equation 1.1 on page 7. The first argument to this should be a label, which can be used for cross-referencing in the format `eqn:LABEL`. The second argument to `wlveqn` should be the equation itself.

$$F = ma \tag{1.1}$$

1.3 Thesis statement

In the introduction of your thesis you will most likely want to define a *thesis statement*, or hypothesis, or similar. You will want to refer back to this several times, and particularly in your conclusions. This template provides specific support for writing a thesis statement, using the `wlvthesis` directive, the first argument to which should be a label, the second should be the statement itself:

The thesis of this work is that LaTeX rocks! We justify this statement by...

1.4 Typesetting software

There are three ways to typeset code using the `listings` package. You can typeset code *inline*, using the `\lstinline` directive which will result in the following: `print('hello world!')` inline expression.

Alternatively, you can use `lstlisting` in a begin/end block with a caption. In which case, you can add a caption which will also appear in the list of listings at the beginning of the thesis. You can exclude the listing from the list of listings by adding `nolol` to the list of directives in the square brackets (look at the file `chapters/introduction.tex` for details):

```
>>> import math
>>> math.pi = 4.0
>>> 2.0 * math.pi ** 2
32.0
>>>
```

Listing 1.1: Redefining a constant of the Universe in Python

Lastly, and most useful of all, you can use `lstinputlisting` to include code from a separate file on disk. This means that you can edit your code without having to manually merge your efforts back into the thesis chapters:

```
#!/usr/bin/env python

"""
Hello world program.
"""

__author__ = 'Sarah Mount'
__date__ = 'August 2010'

```

```
10 def hello():
11     """Print a message to STDOUT.
12     Python3 syntax.
13     """
14     print('Hello world!')
15
16 if __name__ == '__main__':
17     hello()
```

Listing 1.2: This caption will appear under the listing

To add extra programming languages to listings, edit the `lstloadlanguages` directive in the file `thesis.tex`. If you want more fine-grained control over the way that listings are typeset, including control over syntax highlighting, edit the file `tango.tex`

Lastly, it is a good idea to read the listings manual, which you can find online here: http://mirror.ctan.org/macros/latex/contrib/listings/listings.pdf

Chapter 2

Example chapter

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Bibliography

[1] A. W. Roscoe, C. A. R. Hoare, and Richard Bird. *The Theory and Practice of Concurrency*. Prentice Hall PTR, Upper Saddle River, NJ, USA, 1997.

[2] Leo Geurts, Lambert Meertens, and Steven Pemberton. *ABC programmer's handbook*. Prentice-Hall, Inc., Upper Saddle River, NJ, USA, 1990.

[3] J.M.R. Martin. *The Design and Construction of Deadlock-Free Concurrent Systems*. PhD thesis, University of Buckingham, UK,, 1996.

[4] P.H.Welch, D.C.Wood, and J.Kerridge. Synchronisation Primitives for Highly Parallel Discrete Event Simulations. In R.H.Sprague Jnr, editor, *Proceedings of the 32nd Hawaii International Conference on System Sciences (HICSS-32)*, page 10. IEEE, IEEE Computer Society Press, January 1999.

[5] Ryo Sugihara and Rajesh K. Gupta. Programming models for sensor networks: A survey. *ACM Transactions on Sensor Networks*, 4(2):1–29, March 2008.

Appendix A

Example appendix

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