A CLASSIC THESIS STYLE

ANDRÉ MIEDE



An Homage to The Elements of Typographic Style

December 2011 – version 4.0

André Miede: A Classic Thesis Style, An Homage to The Elements of Typographic Style, © December 2011 [April 13, 2013 at 12:31 – classicthesis version 4.0]

Ohana means family. Family means nobody gets left behind, or forgotten.

— Lilo & Stitch

Dedicated to the loving memory of Rudolf Miede. 1939–2005

ABSTRACT

Short summary of the contents...

PUBLICATIONS

Some ideas and figures have appeared previously in the following publications:

Put your publications from the thesis here. The packages multibib or bibtopic etc. can be used to handle multiple different bibliographies in your document.

We have seen that computer programming is an art, because it applies accumulated knowledge to the world, because it requires skill and ingenuity, and especially because it produces objects of beauty.

— ? [?]

ACKNOWLEDGEMENTS

Put your acknowledgements here.

Many thanks to everybody who already sent me a postcard!

Regarding the typography and other help, many thanks go to Marco Kuhlmann, Philipp Lehman, Lothar Schlesier, Jim Young, Lorenzo Pantieri and Enrico Gregorio¹, Jörg Sommer, Joachim Köstler, Daniel Gottschlag, Denis Aydin, Paride Legovini, Steffen Prochnow, Nicolas Repp, Hinrich Harms, Roland Winkler, and the whole LaTeX-community for support, ideas and some great software.

Regarding L_YX: The L_YX port was intially done by *Nicholas Mariette* in March 2009 and continued by *Ivo Pletikosić* in 2011. Thank you very much for your work and the contributions to the original style.

¹ Members of GuIT (Gruppo Italiano Utilizzatori di TEX e LATEX)

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ACRONYMS

DRY Don't Repeat Yourself

API Application Programming Interface

UML Unified Modeling Language

Part I

SOME KIND OF MANUAL

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INTRODUCTION

This template for LATEX has two goals:

- 1. Provide students with an easy-to-use template for their Master's or PhD thesis (though it might also be used by other types of authors for reports, books, etc.).
- 2. Provide a classic, high-quality typographic style that is inspired by ?'s "The Elements of Typographic Style" [?].

The bundle is configured to run with a *full* MiKT_EX or T_EXLive installation right away and, therefore, it uses only freely available fonts.

People interested only in the nice style and not the whole bundle can now use the style stand-alone via the file classicthesis.sty. This works now also with "plain" LATEX.

As of version 3.0, classicthesis can also be easily used with L_YX^1 thanks to Nicholas Mariette and Ivo Pletikosić. The L_YX version of this manual will contain more information on the details.

This should enable anyone with a basic knowledge of LATEX $2_{\mathcal{E}}$ or LyX to produce beautiful documents without too much effort. In the end, this is my overall goal: more beautiful documents, especially theses, as I am tired of seeing so many ugly ones.

The whole template and the used style is released under the GNU General Public License.

If you like the style then I would appreciate a postcard:

Andre Miede Detmolder Strasse 32 31737 Rinteln Germany

The postcards I received so far are available at:

http://postcards.miede.de

So far, many theses, some books, and several other publications have been typeset successfully with it. If you are interested in some typographic details behind it, enjoy Robert Bringhurst's wonderful book.

IMPORTANT NOTE: Some things of this style might look unusual at first glance, many people feel so in the beginning. However, all things are intentionally designed to be as they are, especially these:

A Classic Thesis Style version 4.0

A well-balanced line width improves the legibility of the text. That's what typography is all about, right?

¹ http://www.lyx.org

- No bold fonts are used. Italics or spaced small caps do the job quite well.
- The size of the text body is intentionally shaped like it is. It supports both legibility and allows a reasonable amount of information to be on a page. And, no: the lines are not too short.
- The tables intentionally do not use vertical or double rules. See the documentation for the booktabs package for a nice discussion of this topic.²
- And last but not least, to provide the reader with a way easier access to page numbers in the table of contents, the page numbers are right behind the titles. Yes, they are not neatly aligned at the right side and they are not connected with dots that help the eye to bridge a distance that is not necessary. If you are still not convinced: is your reader interested in the page number or does she want to sum the numbers up?

Therefore, please do not break the beauty of the style by changing these things unless you really know what you are doing! Please.

1.1 ORGANIZATION

A very important factor for successful thesis writing is the organization of the material. This template suggests a structure as the following:

- Chapters/ is where all the "real" content goes in separate files such as Chapter01.tex etc.
- FrontBackMatter/ is where all the stuff goes that surrounds the "real" content, such as the acknowledgments, dedication, etc.
- gfx/ is where you put all the graphics you use in the thesis. Maybe they should be organized into subfolders depending on the chapter they are used in, if you have a lot of graphics.
- Bibliography.bib: the BibTEX database to organize all the references you might want to cite.
- classicthesis.sty: the style definition to get this awesome look and feel. Bonus: works with both LATEX and PDFLATEX...and LyX.
- ClassicThesis.tcp a TeXnicCenter project file. Great tool and it's free!

http://www.ctan.org/tex-archive/macros/latex/contrib/booktabs/.

You can use these margins for summaries of the text body...

² To be found online at

- ClassicThesis.tex: the main file of your thesis where all the content gets bundled together.
- classicthesis-config.tex: a central place to load all nifty packages that are used. In there, you can also activate backrefs in order to have information in the bibliography about where a source was cited in the text (i. e., the page number).

Make your changes and adjustments here. This means that you specify here the options you want to load classicthesis.sty with. You also adjust the title of your thesis, your name, and all similar information here. Refer to Section 1.3 for more information.

This had to change as of version 3.0 in order to enable an easy transition from the "basic" style to LyX.

In total, this should get you started in no time.

1.2 STYLE OPTIONS

There are a couple of options for classicthesis.sty that allow for a bit of freedom concerning the layout:

- General:
 - drafting: prints the date and time at the bottom of each page, so you always know which version you are dealing with. Might come in handy not to give your Prof. that old draft.

Parts and Chapters:

- parts: if you use Part divisions for your document, you should choose this option. (Cannot be used together with nochapters.)
- nochapters: allows to use the look-and-feel with classes that do not use chapters, e.g., for articles. Automatically turns off a couple of other options: eulerchapternumbers, linedheaders, listsseparated, and parts.
- Linedheaders: changes the look of the chapter headings a bit by adding a horizontal line above the chapter title. The chapter number will also be moved to the top of the page, above the chapter title.
- Typography:
 - eulerchapternumbers: use figures from Hermann Zapf's Euler math font for the chapter numbers. By default, old style figures from the Palatino font are used.
 - beramono: loads Bera Mono as typewriter font. (Default setting is using the standard CM typewriter font.)

...or your supervisor might use the margins for some comments of her own while reading.

- eulermath: loads the awesome Euler fonts for math. (Palatino is used as default font.)
- pdfspacing: makes use of pdftex' letter spacing capabilities via the microtype package.³ This fixes some serious issues regarding math formulæ etc. (e.g., "β") in headers.
- minionprospacing: uses the internal textssc command of the MinionPro package for letter spacing. This automatically enables the minionpro option and overrides the pdfspacing option.

• Table of Contents:

- tocaligned: aligns the whole table of contents on the left side. Some people like that, some don't.
- dottedtoc: sets pagenumbers flushed right in the table of contents.
- manychapters: if you need more than nine chapters for your document, you might not be happy with the spacing between the chapter number and the chapter title in the Table of Contents. This option allows for additional space in this context. However, it does not look as "perfect" if you use \parts for structuring your document.

• Floats:

- listings: loads the listings package (if not already done) and configures the List of Listings accordingly.
- floatperchapter: activates numbering per chapter for all floats such as figures, tables, and listings (if used).
- subfig(ure): is passed to the tocloft package to enable compatibility with the subfig(ure) package. Use this option if you want use classicthesis with the subfig package.

The best way to figure these options out is to try the different possibilities and see, what you and your supervisor like best.

In order to make things easier in general, classicthesis-config.tex contains some useful commands that might help you.

1.3 CUSTOMIZATION

This section will give you some hints about how to adapt classicthesis to your needs.

The file classicthesis.sty contains the core functionality of the style and in most cases will be left intact, whereas the file classicthesis-config.tex is used for some common user customizations.

³ Use microtype's DVIoutput option to generate DVI with pdftex.

The first customization you are about to make is to alter the document title, author name, and other thesis details. In order to do this, replace the data in the following lines of classicthesis-config.tex:

Modifications in classicthesis-config.tex

```
\newcommand{\myTitle}{A Classic Thesis Style\xspace}
\newcommand{\mySubtitle}{An Homage to ...\xspace}
\newcommand{\myDegree}{Doktor-Ingenieur (Dr.-Ing.)\xspace}
```

Further customization can be made in classicthesis-config.tex by choosing the options to classicthesis.sty (see Section 1.2) in a line that looks like this:

```
\PassOptionsToPackage{eulerchapternumbers,listings,drafting,
    pdfspacing, subfig,beramono,eulermath,parts}{classicthesis}
```

If you want to use backreferences from your citations to the pages they were cited on, change the following line from:

```
\setboolean{enable-backrefs}{false}
```

to

```
\setboolean{enable-backrefs}{true}
```

Many other customizations in classicthesis-config.tex are possible, but you should be careful making changes there, since some changes could cause errors.

Finally, changes can be made in the file classicthesis.sty, although this is mostly not designed for user customization. The main change that might be made here is the text-block size, for example, to get longer lines of text.

Modifications in classicthesis.sty

```
1.4 ISSUES
```

This section will list some information about problems using classicthesis in general or using it with other packages.

Beta versions of classicthesis can be found at the following Google code repository:

```
http://code.google.com/p/classicthesis/
```

There, you can also post serious bugs and problems you encounter.

Compatibility with the glossaries Package

If you want to use the glossaries package, take care of loading it with the following options:

```
\usepackage[style=long,nolist]{glossaries}
```

Thanks to Sven Staehs for this information.

Compatibility with the (Spanish) babel Package

Spanish languages need an extra option in order to work with this template:

\usepackage[spanish,es-lcroman]{babel}

Thanks to an unknown person for this information (via Google Code issue reporting).

Compatibility with the pdfsync Package

Using the pdfsync package leads to linebreaking problems with the graffito command. Thanks to Henrik Schumacher for this information.

1.5 FUTURE WORK

So far, this is a quite stable version that served a couple of people well during their thesis time. However, some things are still not as they should be. Proper documentation in the standard format is still missing. In the long run, the style should probably be published separately, with the template bundle being only an application of the style. Alas, there is no time for that at the moment...it could be a nice task for a small group of LATEXnicians.

Please do not send me email with questions concerning LATEX or the template, as I do not have time for an answer. But if you have comments, suggestions, or improvements for the style or the template in general, do not hesitate to write them on that postcard of yours.

1.6 LICENSE

GNU GENERAL PUBLIC LICENSE: This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but without any warranty; without even the implied warranty of merchantability or fitness for a particular purpose. See the GNU General Public License for more details.

Part II

THE SHOWCASE

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2.1 A NEW SECTION

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Examples: Italics, ALL CAPS, SMALL CAPS, LOW SMALL CAPS¹.

2.1.1 Test for a Subsection

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¹ Footnote example.

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2.2 ANOTHER SECTION IN THIS CHAPTER

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LABEL TEST 2: Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo wisi enim eget quam. Quisque libero justo, consectetuer a, feugiat vitae, porttitor eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas ultricies eros sit amet ante. Ut venenatis velit. Maecenas sed mi eget dui varius euismod. Phasellus aliquet volutpat odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Pellentesque sit amet pede ac sem eleifend consectetuer. Nullam elementum, urna vel imperdiet sodales, elit ipsum pharetra ligula, ac pretium ante justo a nulla. Curabitur tristique arcu eu metus. Vestibulum lectus. Proin mauris. Proin eu nunc eu urna hendrerit faucibus. Aliquam auctor, pede consequat laoreet varius, eros tellus scelerisque quam, pellentesque hendrerit ipsum dolor sed augue. Nulla nec lacus.

This statement requires citation? [?].

2.2.1 Personas Initialmente

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² De web nostre historia angloromanic.

LABITUR BONORUM PRI NO	QUE VISTA	HUMAN
fastidii ea ius	germano	demonstratea
suscipit instructior	titulo	personas
quaestio philosophia	facto	demonstrated?

Table 1: Autem timeam deleniti usu id.?

2.2.1.1 A Subsubsection

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A PARAGRAPH EXAMPLE Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus id, nonummy sed, ullamcorper eget, sapien. Praesent pretium, magna in eleifend egestas, pede pede pretium lorem, quis consectetuer tortor sapien facilisis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci, scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo.

- A. Enumeration with small caps
- в. Second item

Another statement requiring citation? [?] but this time with text after the citation.

2.2.2 Figure Citations

Veni introduction es pro, qui finalmente demonstrate il. E tamben anglese programma uno. Sed le debitas demonstrate. Non russo existe o, facite linguistic registrate se nos. Gymnasios, e.g., sanctificate sia le, publicate Figure 1 methodicamente e qui.

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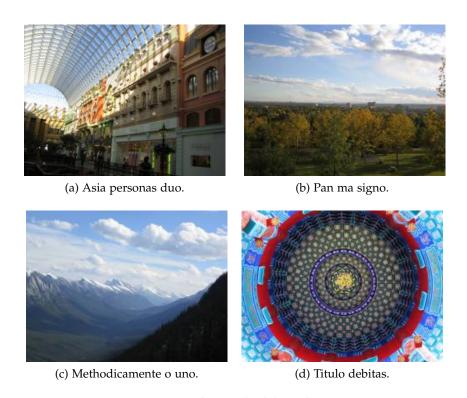


Figure 1: Tu duo titulo debitas latente.

Aliquam lectus. Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris porttitor pharetra tortor. Sed fringilla justo sed mauris. Mauris tellus. Sed non leo. Nullam elementum, magna in cursus sodales, augue est scelerisque sapien, venenatis congue nulla arcu et pede. Ut suscipit enim vel sapien. Donec congue. Maecenas urna mi, suscipit in, placerat ut, vestibulum ut, massa. Fusce ultrices nulla et nisl.

3.1 SOME FORMULAS

Due to the statistical nature of ionisation energy loss, large fluctuations can occur in the amount of energy deposited by a particle traversing an absorber element¹. Continuous processes such as multiple scattering and energy loss play a relevant role in the longitudinal and lateral development of electromagnetic and hadronic showers, and in the case of sampling calorimeters the measured resolution can be significantly affected by such fluctuations in their active layers. The description of ionisation fluctuations is characterised by the significance parameter κ, which is proportional to the ratio of mean energy loss to the maximum allowed energy transfer in a single collision with an atomic electron:

$$\kappa = \frac{\xi}{E_{max}} \tag{1}$$

E_{max} is the maximum transferable energy in a single collision with an atomic electron.

$$E_{max} = \frac{2m_e\beta^2\gamma^2}{1+2\gamma m_e/m_x + \left(m_e/m_x\right)^2} \; , \label{eq:emax}$$

where $\gamma = E/m_x$, E is energy and m_x the mass of the incident particle, $\beta^2 = 1 - 1/\gamma^2$ and m_e is the electron mass. ξ comes from the Rutherford scattering cross section and is defined as:

$$\xi = \frac{2\pi z^2 e^4 N_{AV} Z \rho \delta x}{m_o \beta^2 c^2 A} = 153.4 \frac{z^2}{\beta^2} \frac{Z}{A} \rho \delta x \quad \text{keV},$$

where

You might get unexpected results using math in chapter or section heads. Consider the pdfspacing option.

¹ Examples taken from Walter Schmidt's great gallery: http://home.vrweb.de/~was/mathfonts.html

z charge of the incident particle

N_{Av} Avogadro's number

Z atomic number of the material

A atomic weight of the material

ρ density

 δx thickness of the material

 κ measures the contribution of the collisions with energy transfer close to E_{max} . For a given absorber, κ tends towards large values if δx is large and/or if β is small. Likewise, κ tends towards zero if δx is small and/or if β approaches 1.

The value of κ distinguishes two regimes which occur in the description of ionisation fluctuations:

- 1. A large number of collisions involving the loss of all or most of the incident particle energy during the traversal of an absorber.
 - As the total energy transfer is composed of a multitude of small energy losses, we can apply the central limit theorem and describe the fluctuations by a Gaussian distribution. This case is applicable to non-relativistic particles and is described by the inequality $\kappa > 10$ (i. e., when the mean energy loss in the absorber is greater than the maximum energy transfer in a single collision).
- 2. Particles traversing thin counters and incident electrons under any conditions.

The relevant inequalities and distributions are $0.01 < \kappa < 10$, Vavilov distribution, and $\kappa < 0.01$, Landau distribution.

3.2 VARIOUS MATHEMATICAL EXAMPLES

If n > 2, the identity

$$t[u_1, ..., u_n] = t[t[u_1, ..., u_{n_1}], t[u_2, ..., u_n]]$$

defines $t[u_1, \ldots, u_n]$ recursively, and it can be shown that the alternative definition

$$t[u_1,...,u_n] = t[t[u_1,u_2],...,t[u_{n-1},u_n]]$$

gives the same result.

Part III

APPENDIX



APPENDIX TEST

Aliquam lectus. Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris porttitor pharetra tortor. Sed fringilla justo sed mauris. Mauris tellus. Sed non leo. Nullam elementum, magna in cursus sodales, augue est scelerisque sapien, venenatis congue nulla arcu et pede. Ut suscipit enim vel sapien. Donec congue. Maecenas urna mi, suscipit in, placerat ut, vestibulum ut, massa. Fusce ultrices nulla et nisl.

Etiam ac leo a risus tristique nonummy. Donec dignissim tincidunt nulla. Vestibulum rhoncus molestie odio. Sed lobortis, justo et pretium lobortis, mauris turpis condimentum augue, nec ultricies nibh arcu pretium enim. Nunc purus neque, placerat id, imperdiet sed, pellentesque nec, nisl. Vestibulum imperdiet neque non sem accumsan laoreet. In hac habitasse platea dictumst. Etiam condimentum facilisis libero. Suspendisse in elit quis nisl aliquam dapibus. Pellentesque auctor sapien. Sed egestas sapien nec lectus. Pellentesque vel dui vel neque bibendum viverra. Aliquam porttitor nisl nec pede. Proin mattis libero vel turpis. Donec rutrum mauris et libero. Proin euismod porta felis. Nam lobortis, metus quis elementum commodo, nunc lectus elementum mauris, eget vulputate ligula tellus eu neque. Vivamus eu dolor.

A.1 APPENDIX SECTION TEST

Nulla in ipsum. Praesent eros nulla, congue vitae, euismod ut, commodo a, wisi. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Aenean nonummy magna non leo. Sed felis erat, ullamcorper in, dictum non, ultricies ut, lectus. Proin vel arcu a odio lobortis euismod. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Proin ut est. Aliquam odio. Pellentesque massa turpis, cursus eu, euismod nec, tempor congue, nulla. Duis viverra gravida mauris. Cras tincidunt. Curabitur eros ligula, varius ut, pulvinar in, cursus faucibus, augue.

Nulla mattis luctus nulla. Duis commodo velit at leo. Aliquam vulputate magna et leo. Nam vestibulum ullamcorper leo. Vestibulum condimentum rutrum mauris. Donec id mauris. Morbi molestie justo et pede. Vivamus eget turpis sed nisl cursus tempor. Curabitur mollis sapien condimentum nunc. In wisi nisl, malesuada at, dignissim sit amet, lobortis in, odio. Aenean consequat arcu a ante. Pellentesque porta elit sit amet orci. Etiam at turpis nec elit ultricies imperdiet. Nulla facilisi. In hac habitasse platea dictumst. Suspendisse

More dummy text

LABITUR BONORUM PRI NO	QUE VISTA	HUMAN
fastidii ea ius	germano	demonstratea
suscipit instructior	titulo	personas
quaestio philosophia	facto	demonstrated

Table 2: Autem usu id.

Listing 1: A floating example

```
for i:=maxint to 0 do
begin
{ do nothing }
end;
```

viverra aliquam risus. Nullam pede justo, molestie nonummy, scelerisque eu, facilisis vel, arcu.

A.2 ANOTHER APPENDIX SECTION TEST

Curabitur tellus magna, porttitor a, commodo a, commodo in, tortor. Donec interdum. Praesent scelerisque. Maecenas posuere sodales odio. Vivamus metus lacus, varius quis, imperdiet quis, rhoncus a, turpis. Etiam ligula arcu, elementum a, venenatis quis, sollicitudin sed, metus. Donec nunc pede, tincidunt in, venenatis vitae, faucibus vel, nibh. Pellentesque wisi. Nullam malesuada. Morbi ut tellus ut pede tincidunt porta. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam congue neque id dolor.

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COLOPHON

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