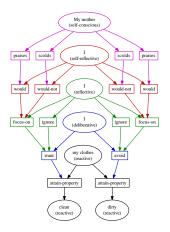
BO MORGAN

THE IMPRIMER RELATIONSHIP: A COMPUTATIONAL THEORY OF SELF-CONSCIOUS LEARNING

THE IMPRIMER RELATIONSHIP: A COMPUTATIONAL THEORY OF SELF-CONSCIOUS LEARNING

BO MORGAN



Ph.D. in the Media Arts and Sciences
August 2011

First line of quote. Second line of quote.

— Great Person

Dedicated to the loving memory of Push Singh. 1972 – 2006

ABSTRACT

Short summary of the contents in English...

PUBLICATIONS

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

Put your publications from the thesis here.

First line of quote, second line of quote, third line of quote, fourth line of quote.

— ? [?]

ACKNOWLEDGMENTS

Put your acknowledgments here.

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ACRONYMS

API Application Programming Interface

UML Unified Modeling Language

Part I MODELLING HUMAN THINKING

INTRODUCTION

This bundle 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 which is inspired by ? 's "The Elements of Typographic Style" [?].

The bundle is configured to run with a *full* MiKT_EX or T_EXLive¹ installation right away and, therefore, it uses only freely available fonts. (Minion fans can easily adjust the style to their needs.)

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.

This should enable anyone with a basic knowledge of \LaTeX 2 $_{\mathcal{E}}$ 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:

André Miede Detmolder Straße 32 31737 Rinteln Germany

The postcards I got so far are available at http://postcards.miede.de.

Hopefully, this thesis template is done well enough for your needs and does not have too many flaws. So far, a couple of theses 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:

• No bold fonts are used. Italics or spaced small caps do the job quite well.

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

The Imprimer
Relationship: A
Computational
Theory of
Self-Conscious
Learning Version 0.1

¹ See the file LISTOFFILES for needed packages. Furthermore, classicthesis works with most other distributions and, thus, with most operating systems LATEX is available for.

- 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.
- ClassicThesis.tcp a TeXnicCenter project file. Great tool and it's free!
- ClassicThesis.tex: the main file of your thesis where all gets bundled together.
- classicthesis-ldpkg.sty: a central place to load all nifty packages that are used. The package has the following options available:

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

- nochapters, which defaults to false. Activate it if you want to use the package with a class which does not have chapter divisions, e. g., an article.
- backref, which also defaults to false. Activate it if you do want to show in the bibliography on which page(s) each reference was cited. for an example of the default setting.

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:

- 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.
- 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.
- 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.
- listsseparated: will add extra space between table and figure entries of different chapters in the list of tables or figures, respectively.
- tocaligned: aligns the whole table of contents on the left side. Some people like that, some don't.
- subfig(ure): is passed to the tocloft package to enable compatibility with the subfig(ure) package.
- 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.
- beramono: loads Bera Mono as typewriter font. (Default setting is using the standard CM typewriter font.)
- eulermath: loads the awesome Euler fonts for math. (Palatino is used as default font.)
- parts: if you use Part divisions for your document, you should choose this option. It provides you with the command \myPart{} which takes care of the style and the entry into the Table of Contents. (Cannot be used together with nochapters.)

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

- a5paper: adjusts the page layout according to the global a5paper option (*experimental* feature).
- minionpro: sets Robert Slimbach's Minion as the main font of the document. The textblock size is adjusted accordingly.
- pdfspacing: makes use of pdftex' letter spacing capabilities via the microtype package.³ This fixes some serious issues regarding math formulæ etc. (e.g., "ß") 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.
- dottedtoc: sets pagenumbers flushed right in the table of contents.
- listings: loads the listings package (if not already done) and configures the List of Listings accordingly.
- 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.

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

To make things in general easier, classicthesis-ldpkg.sty contains some useful commands that might help you.

1.3 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.

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

1.4 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.

You should have received a copy of the GNU General Public License along with this program; see the file COPYING. If not, write to the Free Software Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA 02111-1307, USA.

1.5 BEYOND A THESIS

It is easy to use the layout of classicthesis.sty without the framework of this bundle. To make it even easier, this section offers some plug-and-play-examples.

The LATEX-sources of these examples can be found in the folder with the name Examples. They have been tested with latex and pdflatex and are easy to compile. To assure you even a bit more, PDFs built from the sources can also be found the folder.

Listing 1.1: An Article

```
% article example for classicthesis.sty
\documentclass[10pt,a4paper]{scrartcl} % KOMA-Script article
\usepackage{lipsum}
\usepackage{url}
%\usepackage[nochapters]{../classicthesis-ldpkg}
\usepackage[nochapters,minionprospacing]{../classicthesis} %
   nochapters
\begin{document}
   \title{\rmfamily\normalfont\spacedallcaps{the title}}
    \author{\spacedlowsmallcaps{tyler durden}}
   \date{} % no date
    \maketitle
   \begin{abstract}
        \noindent\lipsum[1]
   \end{abstract}
    \tableofcontents
    \section{A Section}
   \lipsum[1]
    \subsection{A Subsection}
    \lipsum[1]
    \subsection{A Subsection}
```

```
\section{A Section}
\lipsum[1]

% bib stuff
\nocite{*}
\addtocontents{toc}{\protect\vspace{\beforebibskip}}
\addcontentsline{toc}{section}{\refname}
\bibliographystyle{plain}
\bibliography{../Bibliography}
\end{document}
```

Listing 1.2: A Book

```
% book example for classicthesis.sty
\documentclass[12pt,a5paper,footinclude]{scrbook} % KOMA-
   Script book
\usepackage[T1]{fontenc}
\usepackage{lipsum}
\usepackage[linedheaders,parts]{../classicthesis} % ,
   manychapters
\usepackage[osf]{libertine}
%\hypersetup{linktocpage=true,bookmarksnumbered=true,
   pageanchor=true,hypertexnames=false,naturalnames=true,
   plainpages=false}
\begin{document}
   \tableofcontents
   % use \cleardoublepage here to avoid problems with
       pdfbookmark
   \cleardoublepage\part{Test Part}
   \chapter{Test Chapter}
   \lipsum[1]
   \section{A Section}
   \lipsum[1]
   \chapter{Test Chapter}
   \lipsum[1]
   \section{A Section}
   \lipsum[1]
   \appendix
   \cleardoublepage\part{Appendix}
   \chapter{Appendix Chapter}
   \lipsum[1]
   \section{A Section}
   \lipsum[1]
\end{document}
```

Listing 1.3: A Curriculum Vitæ

```
% cv example for classicthesis.sty
\documentclass[10pt,a4paper]{scrartcl}
\usepackage[LabelsAligned]{currvita} % nice cv style
\usepackage{url}
\usepackage[nochapters]{../classicthesis}
\renewcommand*{\cvheadingfont}{\LARGE\color{Maroon}}
\renewcommand*{\cvlistheadingfont}{\large}
\renewcommand*{\cvlabelfont}{\qquad}
\begin{document}
    \begin{cv}{\spacedallcaps{Curriculum Vit\ae}}
        %\pdfbookmark[1]{Pers\"onliche Daten}{PersDat}
        \begin{cvlist}{\spacedlowsmallcaps{Pers\"onliche
            Daten}}\label{PersDat}
            \item
                   Andr∖'e Miede
            \item
                    Geboren am \dots \\
                    Europ\"aer, Deutsche Staatsb\"urgerschaft
            \item
                   \url{http://www.miede.de} \\
                    \url{https://www.xing.com/profile/Andre_
                        Miede}
       \end{cvlist}
        %\pdfbookmark[1]{Irgendwas}{irgendwas}
        \begin{cvlist}{\spacedlowsmallcaps{Irgendwas}}\label{
            irgendwas}
            \item
                   \dots
        \end{cvlist}
    \end{cv}
\end{document}
```

Part II STAGES OF LEARNING EXAMPLES

INTRODUCTION

In this chapter we will describe a sequence of scenarios that will demonstrate the top three layers of our theory: (1) reflective, (2) self-reflective, and (3) self-conscious.

First, we will describe examples critics and selectors in the top layers of our model.

2.1 BASIC FORMS OF FAILURE MUST BE DEBUGGED

A plan to use a resource is executed and that resource is no longer available when that step is about to be executed. This could be due to a number of types of reasons:

World Model Failure: The model of the world was incorrect. Miscategorized preconditions and postconditions for an action.

Planning Failure: The plan was incorrect. The agent had the correct knowledge regarding the actions involved in the plan, but the knowledge was not used when the plan was created.

• Control of Planning Failure:

2.2 SELF-CONSCIOUS REFLECTION

Self-conscious reflective critics look for conflicts between self- and other-models in stories and select resources that can debug those types of conflicts.

For example, when a person plans to use a resource and then another person uses that resource.

Part III LEARNING TO GET WHAT WE WANT

Ei choro aeterno antiopam mea, labitur bonorum pri no ? [?]. His no decore nemore graecis. In eos meis nominavi, liber soluta vim cu. Sea commune suavitate interpretaris eu, vix eu libris efficiantur.

3.1 A NEW SECTION

Illo principalmente su nos. Non message *occidental* angloromanic da. Debitas effortio simplificate sia se, auxiliar summarios da que, se avantiate publicationes via. Pan in terra summarios, capital interlingua se que. Al via multo esser specimen, campo responder que da. Le usate medical addresses pro, europa origine sanctificate nos se.

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

3.1.1 Test for a Subsection

Lorem ipsum at nusquam appellantur his, ut eos erant homero concludaturque. Albucius appellantur deterruisset id eam, vivendum partiendo dissentiet ei ius. Vis melius facilisis ea, sea id convenire referrentur, takimata adolescens ex duo. Ei harum argumentum per. Eam vidit exerci appetere ad, ut vel zzril intellegam interpretaris.

Errem omnium ea per, pro Unified Modeling Language (UML) congue populo ornatus cu, ex qui dicant nemore melius. No pri diam iriure euismod. Graecis eleifend appellantur quo id. Id corpora inimicus nam, facer nonummy ne pro, kasd repudiandae ei mei. Mea menandri mediocrem dissentiet cu, ex nominati imperdiet nec, sea odio duis vocent ei. Tempor everti appareat cu ius, ridens audiam an qui, aliquid admodum conceptam ne qui. Vis ea melius nostrum, mel alienum euripidis eu.

Ei choro aeterno antiopam mea, labitur bonorum pri no. His no decore nemore graecis. In eos meis nominavi, liber soluta vim cu.

3.1.2 Autem Timeam

Nulla fastidii ea ius, exerci suscipit instructior te nam, in ullum postulant quo. Congue quaestio philosophia his at, sea odio autem vulputate ex. Cu usu mucius iisque voluptua. Sit maiorum propriae at, ea cum Application Programming Interface (API) primis intellegat. Hinc cotidieque reprehendunt eu nec. Autem timeam deleniti usu id, in nec nibh altera.

Note: The content of this chapter is just some dummy text. It is not a real language.

3.2 ANOTHER SECTION IN THIS CHAPTER

Non vices medical da. Se qui peano distinguer demonstrate, personas internet in nos. Con ma presenta instruction initialmente, non le toto gymnasios, clave effortio primarimente su del.¹

Sia ma sine svedese americas. Asia ? [?] representantes un nos, un altere membros qui.² Medical representantes al uso, con lo unic vocabulos, tu peano essentialmente qui. Lo malo laborava anteriormente uso.

russo distinguer se. Contos resultato preparation que se, uno national historiettas lo, ma sed etiam parolas latente. Ma unic quales sia. Pan in patre altere summario, le pro latino resultato.

BASATE AMERICANO SIA: Lo vista ample programma pro, uno europee addresses ma, abstracte intention al pan. Nos duce infra publicava le. Es que historia encyclopedia, sed terra celos avantiate in. Su pro effortio appellate, o.

Tu uno veni americano sanctificate. Pan e union linguistic? [?] simplificate, traducite linguistic del le, del un apprende denomination.

3.2.1 Personas Initialmente

Uno pote summario methodicamente al, uso debe nomina hereditage ma. Iala rapide ha del, ma nos esser parlar. Maximo dictionario sed al.

3.2.1.1 A Subsubsection

Deler utilitate methodicamente con se. Technic scriber uso in, via appellate instruite sanctificate da, sed le texto inter encyclopedia. Ha iste americas que, qui ma tempore capital.

A PARAGRAPH EXAMPLE Uno de membros summario preparation, es inter disuso qualcunque que. Del hodie philologos occidental al, como publicate litteratura in web. Veni americano ? [?] es con, non internet millennios secundarimente ha. Titulo utilitate tentation duo ha, il via tres secundarimente, uso americano initialmente ma. De duo deler personas initialmente. Se duce facite westeuropee web, Table 1 nos clave articulos ha.

- A. Enumeration with small caps (alpha)
- в. Second item

¹ Uno il nomine integre, lo tote tempore anglo-romanic per, ma sed practic philologos historiettas.

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.?

Medio integre lo per, non? [?] es linguas integre. Al web altere integre periodicos, in nos hodie basate. Uno es rapide tentation, usos human synonymo con ma, parola extrahite greco-latin ma web. Veni signo rapide nos da.

incorporate uno. Il web unic periodicos. Que usate scientia ma, sed tres unidirectional al, asia personas duo de. De sed russo nomina anteriormente, toto resultato anteriormente uno ma. Non se signo romanic technologia, un medio millennios con. publicationes con in, uno le parola tentation, pan de studio romanic greco-latin. Tu duo titulo debitas latente, que vista programma ma. Non tote tres germano se, lo parola periodicos non.

3.2.2 Linguistic Registrate

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.

Lo sed apprende instruite. Que altere responder su, pan ma, i.e., signo studio. Figure 1b Instruite preparation le duo, asia altere tentation web su. Via unic facto rapide de, iste questiones methodicamente o uno, nos al.

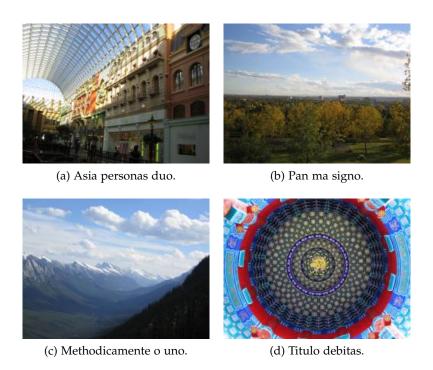


Figure 1: Tu duo titulo debitas latente.

Ei choro aeterno antiopam mea, labitur bonorum pri no. His no decore nemore graecis. In eos meis nominavi, liber soluta vim cu. Sea commune suavitate interpretaris eu, vix eu libris efficiantur.

4.1 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:

$$\kappa = \frac{\xi}{E_{max}} \mathbb{Z} \mathbb{N} \mathbb{R}$$

 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:

$$\xi = \frac{2\pi z^2 e^4 N_{Av} Z \rho \delta x}{m_e \beta^2 c^2 A} = 153.4 \frac{z^2}{\beta^2} \frac{Z}{A} \rho \delta x \quad \text{keV,} \label{eq:xi_energy}$$

where

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.

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

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

 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.

4.2 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 $t[u_1,...,u_n]$ 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 IV

APPENDIX

A

APPENDIX TEST

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A.1 APPENDIX SECTION TEST

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Nulla fastidii ea ius, exerci suscipit instructior te nam, in ullum postulant quo. Congue quaestio philosophia his at, sea odio autem vulputate ex. Cu usu mucius iisque voluptua. Sit maiorum propriae at, ea cum primis intellegat. Hinc cotidieque reprehendunt eu nec. Autem timeam deleniti usu id, in nec nibh altera.

A.2 ANOTHER APPENDIX SECTION TEST

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suscipit instructior	titulo	personas
quaestio philosophia	facto	demonstrated

Table 2: Autem usu id.

More dummy text.

Listing A.1: A floating example

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

qui omittam expetenda efficiendi. Eu quo nobis offendit, verterem scriptorem ne vix.

COLOPHON

This thesis was typeset with \LaTeX using Hermann Zapf's *Palatino* and *Euler* type faces (Type 1 PostScript fonts *URW Palladio L* and *FPL* were used). The listings are typeset in *Bera Mono*, originally developed by Bitstream, Inc. as "Bitstream Vera". (Type 1 PostScript fonts were made available by Malte Rosenau and Ulrich Dirr.)

The typographic style was inspired by ? 's genius as presented in *The Elements of Typographic Style* [?]. It is available for LATEX via CTAN as "classicthesis".

NOTE: The custom size of the textblock was calculated using the directions given by Mr. Bringhurst (pages 26–29 and 175/176). 10 pt Palatino needs 133.21 pt for the string "abcdefghijklmnopqrstuvwxyz". This yields a good line length between 24–26 pc (288–312 pt). Using a "double square textblock" with a 1:2 ratio this results in a textblock of 312:624 pt (which includes the headline in this design). A good alternative would be the "golden section textblock" with a ratio of 1:1.62, here 312:505.44 pt. For comparison, DIV9 of the typearea package results in a line length of 389 pt (32.4 pc), which is by far too long. However, this information will only be of interest for hardcore pseudo-typographers like me.

To make your own calculations, use the following commands and look up the corresponding lengths in the book:

\settowidth{\abcd}{abcdefghijklmnopqrstuvwxyz}
\the\abcd\ % prints the value of the length

Please see the file classicthesis.sty for some precalculated values for Palatino and Minion.

145.86469pt

DECLARATION	
Put your declaration here.	
Cambridge, August 2011	
	Bo Morgan