



University of Applied Sciences and Arts Northwestern Switzerland
School of Business

Enhanced Human-Banking-Interaction with Virtual Reality and Gesture Recognition

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the degree of Master of Science in Business Information Systems*

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The Thesis Abstract is written here (and usually kept to just this page)...

The acknowledgements and the people to thank go here, don't forget to include your project advisor...

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Chapter 1

Chapter Title Here

1.1 Learning L^AT_EX

L^AT_EX is not a WYSIWYG (What You See is What You Get) program, unlike word processors such as Microsoft Word or Apple's Pages. Instead, a document written for L^AT_EX is actually a simple, plain text file that contains *no formatting*. You tell L^AT_EX how you want the formatting in the finished document by writing in simple commands amongst the text, for example, if I want to use *italic text for emphasis*, I write the ‘\textit{ }’ command and put the text I want in italics in between the curly braces. This means that L^AT_EX is a “mark-up” language, very much like HTML.

1.1.1 A (not so short) Introduction to L^AT_EX

If you are new to L^AT_EX, there is a very good eBook – freely available online as a PDF file – called, “The Not So Short Introduction to L^AT_EX”. The book's title is typically shortened to just “lshort”. You can download the latest version (as it is occasionally updated) from here:

<http://www.ctan.org/tex-archive/info/lshort/english/lshort.pdf>

It is also available in several other languages. Find yours from the list on this page:

<http://www.ctan.org/tex-archive/info/lshort/>

It is recommended to take a little time out to learn how to use L^AT_EX by creating several, small ‘test’ documents. Making the effort now means you're not stuck learning the system when what you *really* need to be doing is writing your thesis.

1.1.2 A Short Math Guide for L^AT_EX

If you are writing a technical or mathematical thesis, then you may want to read the document by the AMS (American Mathematical Society) called, “A Short Math Guide for L^AT_EX”. It can be found online here:

<http://www.ams.org/tex/amslatex.html>

under the “Additional Documentation” section towards the bottom of the page.

1.1.3 Common L^AT_EX Math Symbols

There are a multitude of mathematical symbols available for L^AT_EX and it would take a great effort to learn the commands for them all. The most common ones you are likely to use are shown on this page:

<http://www.sunilpatel.co.uk/latexsymbols.html>

You can use this page as a reference or crib sheet, the symbols are rendered as large, high quality images so you can quickly find the L^AT_EX command for the symbol you need.

1.2 What this Template Includes

1.2.1 Folders

01_Chapters – this is the folder where you put the thesis chapters. The number of chapters is depending on the number of chapters needed for the *Body of Text*. Each chapter should go in its own separate ‘.tex’ file and they usually are split as:

- Chapter 1: Introduction
- Chapter 2: Literature review
- Chapter 3: Research Method
- Chapter 4: Body of Text (1)
- Chapter 5: Body of Text (2)
- Chapter 6: Body of Text (3)
- Chapter 7: Conclusion

02_Appendices – this is the folder where you put the appendices. Each appendix should go into its own separate ‘.tex’ file. A template is included in the directory.

03_Figures – this folder contains all figures (e.g. pictures, diagrams, visualisations, etc.) for the thesis. These are the final images that will go into the thesis document.

04_Packages – this folder contains missing L^AT_EX packages (‘.sty’ file) that are needed to compile this thesis document.

1.2.2 Files

Included are also several files, most of them are plain text and you can see their contents in a text editor. Luckily, many of them are auxiliary files created by L^AT_EX or BibT_EX and which you don’t need to bother about:

Bibliography.bib – this is an important file that contains all the bibliographic information and references that you will be citing in the thesis for use with BibT_EX. You can write it manually, but there are reference manager programs available that will create and manage it for you. Bibliographies in L^AT_EX are a large subject and you may need to read about BibT_EX before starting with this.

Thesis.cls – this is an important file. It is the style file that tells L^AT_EX how to format the thesis. It is not necessary to change this file, so please leave it as it is.

Author-Year-Title.pdf – this is your beautifully typeset thesis (in the PDF file format) created by L^AT_EX.

Author-Year-Title.tex – this is an important file. This is the file that you tell L^AT_EX to compile to produce your thesis as a PDF file. It contains the framework and constructs that tell L^AT_EX how to layout the thesis. It is heavily commented so you can read exactly what each line of code does and why it is there.

Files that are *not* included, but are created by L^AT_EX as auxiliary files include:

Author-Year-Title.aux – this is an auxiliary file generated by L^AT_EX, if it is deleted L^AT_EX simply regenerates it when you run the main ‘.tex’ file.

Author-Year-Title.bbl – this is an auxiliary file generated by BibT_EX, if it is deleted, BibT_EX simply regenerates it when you run the main tex file. Whereas the ‘.bib’ file contains all the references you have, this ‘.bbl’ file contains the references you have actually cited in the thesis and is used to build the bibliography section of the thesis.

Author-Year-Title.blg – this is an auxiliary file generated by BibT_EX, if it is deleted BibT_EX simply regenerates it when you run the main ‘.tex’ file.

Author-Year-Title.lof – this is an auxiliary file generated by L^AT_EX, if it is deleted L^AT_EX simply regenerates it when you run the main ‘.tex’ file. It tells L^AT_EX how to build the ‘List of Figures’ section.

Author-Year-Title.log – this is an auxiliary file generated by L^AT_EX, if it is deleted L^AT_EX simply regenerates it when you run the main ‘.tex’ file. It contains messages from L^AT_EX, if you receive errors and warnings from L^AT_EX, they will be in this ‘.log’ file.

Author-Year-Title.lot – this is an auxiliary file generated by L^AT_EX, if it is deleted L^AT_EX simply regenerates it when you run the main ‘.tex’ file. It tells L^AT_EX how to build the ‘List of Tables’ section.

Author-Year-Title.out – this is an auxiliary file generated by L^AT_EX, if it is deleted L^AT_EX simply regenerates it when you run the main ‘.tex’ file.

1.3 Thesis Features and Conventions

1.3.1 Printing Format

This thesis template is designed for single sided printing as most theses are printed and bound this way. This means that the left margin is always wider than the right (for binding). Four out of five people will now judge the margins by eye and think, “I never noticed that before.”.

The headers for the pages contain the page number on the right side (so it is easy to flick through to the page you want) and the chapter name on the left side.

The text is set to 11 point and a line spacing of 1.3. Generally, it is much more readable to have a smaller text size and wider gap between the lines than it is to have a larger text size and smaller gap.

1.3.2 References

The ‘natbib’ package is used to format the bibliography and inserts references such as this one (?). The options used in this thesis mean that the references are listed in numerical order as they appear in the text. Multiple references are rearranged in numerical order e.g. (??) and multiple, sequential references become reformatted to a reference range e.g. (???). Further information regarding citation in L^AT_EX can be found here.

Did you know that also Mendeley is supporting L^AT_EX ? If not have a look at this blog post and get to know the power of these powerful tools.

Scientific references should come *before* the punctuation mark if there is one (such as a comma or period) together with a ~ in front of the citation command. The same goes for footnotes¹. You can change this but the most important thing is to keep the convention consistent throughout the thesis. Footnotes themselves should be full, descriptive sentences (beginning with a capital letter and ending with a full stop).

To see how L^AT_EX typesets the bibliography, have a look at the very end of this document (or just click on the reference number links).

1.3.3 Glossary and Abbreviations

You can reference any glossary term that you have defined at the beginning of this document, by the following commands ‘\gls’ (singular) or ‘\glspl’ (plural). An example is provided below:

Java is a object-oriented programming language that is maintained and released by Oracle. Oracle’s main competitor in this field is Microsoft.

In addition to that is also possible to reference any abbreviations in the same way. However, if you reference an abbreviation the first time it will show you the full name plus the abbreviation itself in the brace. From the second time you reference the same abbreviation it will only show you the abbreviation itself. An example is provided below:

First use Support Vector Machine (SVM) and second use SVM.

Further information regarding glossary and abbreviations can be found [here](#) and [here](#).

1.3.4 Figures

There will hopefully be many figures in your thesis (that should be placed in the ‘03_Figures’ folder). The way to insert figures into your thesis is to use a code template like this:

```
\begin{figure}[htbp]
\centering
\includegraphics[width=13cm]{01_Campus/Campus01ten.jpeg}
\rule{35em}{0.5pt}
```

¹Such as this footnote, here down at the bottom of the page.

```
\caption[Campus Olten]{FHNW Campus Olten.}  
\label{fig:Campus}  
\end{figure}
```

Also look in the source file. Putting this code into the source file produces the picture of the electron that you can see in the figure below.



FIGURE 1.1: FHNW Campus Olten.

Sometimes figures don't always appear where you write them in the source. The placement depends on how much space there is on the page for the figure. Sometimes there is not enough room to fit a figure directly where it should go (in relation to the text) and so \LaTeX puts it at the top of the next page. Positioning figures is the job of \LaTeX and so you should only worry about making them look good!

Figures usually should have labels just in case you need to refer to them (such as in Figure 1.1). The '`\caption`' command contains two parts, the first part, inside the square brackets is the title that will appear in the 'List of Figures', and so should be short. The second part in the curly brackets should contain the longer and more descriptive caption text.

The '`\rule`' command is optional and simply puts an aesthetic horizontal line below the image. If you do this for one image, do it for all of them.

The \LaTeX Thesis Template is able to use figures that are either in the PDF or JPEG file format.

1.3.5 Tables

L^AT_EX is capable to create beautiful tables from scratch, to improve them even more we implemented the **booktabs** package for you. Further information regarding this package and why it's not recommend to use horizontal lines can be found [here](#).

Tables are in many ways like figures as such it is also possible to define the position, to attach a caption or to add a label (see Table 1.1). The number of rows respectively their size and behaviour can be defined in the header of the within the ‘`\tabular`’ command. In this example we have defined two top-aligned paragraphs with a predefined size. Further row types and explanations can be found [here](#).

The **booktabs** package offers furthermore the opportunity to define a horizontal line at the beginning (`\toprule`), between (`\midrule`) and the end (`\bottomrule`) of the table.

However, in order to start a new column you can simply add a `$` at the end of your current column. In the same way you can also start a new row by adding a `\\` at the end of your text.

Schools	Locations
School of Applied Psychology	Olten
School of Business	Basel, Olten, Windisch
School of Education	Aarau, Basel, Windisch, Liestal, Solothurn
School of Engineering	Muttenz, Olten, Windisch
School of Life Sciences	Muttenz

TABLE 1.1: Locations of the different schools of FHNW

1.3.6 Typesetting mathematics

If your thesis is going to contain heavy mathematical content, be sure that L^AT_EX will make it look beautiful, even though it won't be able to solve the equations for you.

The “Not So Short Introduction to L^AT_EX” ([available here](#)) should tell you everything you need to know for most cases of typesetting mathematics. There are many different L^AT_EX symbols to remember, luckily you can find the most common symbols [here](#).

You can write an equation, which is automatically given an equation number by L^AT_EX like this:

```
\begin{equation}
```

```
E = mc^{2}
\label{eqn:Einstein}
\end{equation}
```

This will produce Einstein’s famous energy-matter equivalence equation:

$$E = mc^2 \tag{1.1}$$

All equations you write (which are not in the middle of paragraph text) are automatically given equation numbers by L^AT_EX. If you don’t want a particular equation numbered, just put the command, ‘`\nonumber`’ immediately after the equation.

Furthermore you can also write inline equations by inserting a ‘\$’ in front and end of the equation, like that $E = mc^2$.

1.4 Sectioning and Subsectioning

You should break your thesis up into nice, bite-sized sections and subsections. L^AT_EX automatically builds a table of Contents by looking at all the ‘`\chapter{}`’, ‘`\section{}`’ and ‘`\subsection{}`’ commands you write in the source.

The table of Contents should only list the sections to three (3) levels. A ‘`\chapter{}`’ is level one (1). A ‘`\section{}`’ is level two (2) and so a ‘`\subsection{}`’ is level three (3). In your thesis it is likely that you will even use a ‘`\subsubsection{}`’, which is level four (4). Adding all these will create an unnecessarily cluttered table of Contents and so you should use the ‘`\subsubsection*`’ command instead (note the asterisk). The asterisk (*) tells L^AT_EX to omit listing the subsubsection in the Contents, keeping it clean and tidy.

1.5 In Closing

You have reached the end of this mini-guide. You can now remove this chapter (00_HowToUseLatex.tex) from your content in the Author-Year-Title.tex file and start writing your thesis. The easy work of setting up the structure and framework has been taken care of for you. It’s now your job to fill it out!

Guide written by Sunil Patel
and adapted by Michael Stauffer

Chapter 2

Introduction

2.1 Introduction

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam ultricies lacinia euismod. Nam tempus risus in dolor rhoncus in interdum enim tincidunt. Donec vel nunc neque. In condimentum ullamcorper quam non consequat. Fusce sagittis tempor feugiat. Fusce magna erat, molestie eu convallis ut, tempus sed arcu. Quisque molestie, ante a tincidunt ullamcorper, sapien enim dignissim lacus, in semper nibh erat lobortis purus. Integer dapibus ligula ac risus convallis pellentesque.

2.1.1 Subsection 1

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2.1.2 Subsection 2

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ornare odio. Proin accumsan, massa viverra cursus pharetra, ipsum nisi lobortis velit, a malesuada dolor lorem eu neque.

2.2 Background

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2.3 Problem Statement

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2.4 Thesis Statement

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2.5 Research question

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2.6 Research objectives

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2.7 Short overview

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2.8 Delineations and Limitations

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2.9 Underlying Assumptions

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2.10 Definition of terms and concepts

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2.11 Significance

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2.11.1 Theoretical

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2.11.2 Practical

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2.12 Thesis structure and brief chapter overviews

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2.13 Any other institutional requirement not covered here

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Chapter 3

Literature Review

3.1 Main Section 1

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3.1.1 Subsection 1

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3.1.2 Subsection 2

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3.2 Main Section 2

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Chapter 4

Research Method

4.1 Philosophy

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4.1.1 Subsection 1

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4.1.2 Subsection 2

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4.2 Approach

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4.3 Strategy

blub

4.4 Timeline

blub

4.5 Data collection

blub

4.6 Data analysis

blub

Statement of Authenticity

I, Fabian SCHÄR, hereby confirm that this report was performed autonomously using only the sources, aids and assistance stated in the report, and that quotes are readily identifiable as such.

Signed:

Date:

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Appendix A

Appendix Title Here

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Appendix B

Appendix Title Here

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