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COLLEGE OF ENGINEERING

Dissertation

A BU THESIS LATEX TEMPLATE

by

JOE CANDIDATE

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Second Reader

First M. Last
Associate Professor of ...

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*Facilis descensus Averni;
Noctes atque dies patet atri janua Ditis;
Sed revocare gradum, superasque evadere ad auras,
Hoc opus, hic labor est.* Virgil (from Don's thesis!)

Acknowledgments

Here go all your acknowledgments. You know, your advisor, funding agency, lab mates, etc., and of course your family.

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The stylistic and aesthetic conventions implemented in this LaTeX thesis/dissertation format would not have been possible without the help from Brendan McDermot of Mugar library and Martha Wellman of CAS.

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Janusz Konrad

Professor

ECE Department

A BU THESIS LATEX TEMPLATE

JOE CANDIDATE

Boston University, College of Engineering, 2024

Major Professors: First M. Last, PhD

Professor of Electrical and Computer Engineering

Secondary appointment

First M. Last, PhD

Professor of Computer Science

ABSTRACT

Have you ever wondered why this is called an *abstract*? Weird thing is that its legal to cite the abstract of a dissertation alone, apart from the rest of the manuscript.

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List of Figures

List of Abbreviations

As per BU library instructions, the list of abbreviations must be in alphabetical order by the **abbreviation**, not by the explanation, or it will be returned to you for re-ordering. **This comment must be removed in the final document.**

CAD	.....	Computer-Aided Design
CO	.....	Cytochrome Oxidase
DOG	.....	Difference Of Gaussian (distributions)
FWHM	.....	Full-Width at Half Maximum
LGN	.....	Lateral Geniculate Nucleus
ODC	.....	Ocular Dominance Column
PDF	.....	Probability Distribution Function
\mathbb{R}^2	.....	the Real plane

Chapter 1

Introduction

1.1 A few remarks before you start

Please read the short pointers below and on the subsequent pages; this will help you avoid frustrations when submitting the final dissertation to the library.

Your thesis should have 1.5in left and top margins, and 1in right and bottom margins. Getting this right is tricky since it may depend on your particular Latex installation. Most likely you will need to adjust some of the dimensions set up at the beginning of "bu_ece.thesis.sty" in this folder. Basically, every installation should have the base margin of 1in at the left and top, but this is not always the case. For example, the TexStudio/MiKTeX installation this document was set up on, has the default top margin of 0.3125in and so an additional margin of 0.6875in was added via `\topmargin`. In order to adjust these dimensions, you may want to follow these steps:

- compile the document into PDF,
- open the document in Acrobat Reader, set it to full-page viewing and magnification to 100%
- navigate to a "full" page with the text extending from the very top to the very bottom and full-width left to right,
- measure the margins and adjust accordingly,

- if you are planning to print a hardcopy, you need to make sure to select "Page scaling" to "None" in Acrobat.

Another issue that BU librarians may complain about and you are likely to encounter are long URLs or other unbreakable text. In case of long URL addresses, you should use the URL package; please see suitable documentation on-line.

However, if you encounter a long unbreakable word (e.g., foreign) the URL package does not help. Have a look at the example extending into the page margin:

Consider the following Java-JDT plugin name in German: "‘Plugin-Entwicklungsumgebung’'.

Clearly, this is a problem, and BU librarians will complain. One way of fixing this issue is to enclose the offending paragraph in `\begin{sloppypar}` and `\end{sloppypar}`, resulting in the following outcome:

Consider the following Java-JDT plugin name in German: "‘Plugin-Entwicklungsumgebung’'.

Indeed, although the paragraph spacing becomes sloppy, at least you can hand in the thesis!

LaTeX has a steep learning curve. You can use the original book by Lamport to learn more ([Lamport, 1985](#)), but there are many on-line resources with excellent instructions and examples. Just Google a LaTeX topic you would like to explore.

As far as editing and compilation of LaTeX sources, if you have not found one yet, TexStudio seems to be quite popular.

Chapter 2

The KamLAND-ZEN Detector

KamLAND, the **K**amioka **L**iquid-scintillator **A**nti Neutrino **D**etector, is a large liquid scintillator calorimeter detector situated 1km below mt. Ikenoyama in Gifu prefecture, Japan. I will describe the KamLAND detector's and the corresponding KamLAND experimental area's important components and features in this chapter. I will also explain how each component contributes to the KamLAND's scientific goals and the work of this thesis.

2.1 KamLAND

Here goes all the important stuff, likely with a lot of graphics like this Figure ?? below.

In all likelihood, you will need to insert tables, like Table [2.1](#) on the next page.

Table 2.1: Absolute disparity error per pixel for the test data from Fig. ?? and different parameter values. In each experiment one parameter is adjusted while other parameters are unchanged.

$\eta = 6000, \mu = 2000$			$K = 10, \mu = 2000$			$K = 10, \eta = 6000$		
K	u_1	u_2	η	u_1	u_2	μ	u_1	u_2
3	0.52	0.46	1000	0.54	0.45	100	1.00	1.16
7	0.47	0.43	3000	0.43	0.40	1000	0.53	0.47
10	0.35	0.36	6000	0.35	0.36	2000	0.35	0.36
12	0.37	0.36	9000	0.37	0.37	3000	0.44	0.43

Of course, there must be a Table of Contents, List of Figures and List of Tables at the beginning of the thesis, but this is all set up automatically.

Important: You will also be using a lot of citations. The format in this template follows the so-called APA style and looks as follows in the document body: (Lamport, 1985), (Debreuve et al., 2001). There are no numbers in the list of references – the list is sorted alphabetically according to the first author’s last name.

Other styles of references are allowed by the library as well, e.g., “plain” or “iee”, which use numbers in square brackets both in the document body and in the list of references. In order to use another style of references, e.g., “plain”, follow the steps below:

1. In “thesis.tex” file:
 - comment out the line “\usepackage{apalike}” at the top of the file,
 - replace “\bibliographystyle{apalike}” with “\bibliographystyle{plain}” towards the bottom of the file.
2. In “bu_ece.thesis.tex” file, comment out all lines in the BIBLIOGRAPHY section (lines 503-517) and save it!
3. Recompile “thesis.tex” twice

Chapter 3

Important Details

The use of Type 1 fonts and font embedding into the document are both dependent on a specific Latex installation and even on operating system. There is a good chance that it will work with no problem for you. However, should your thesis PDF be returned, please consider the following remedies discovered by students over many years.

3.1 Type 1 fonts

All Boston University thesis and dissertation submissions must use only Type 1 fonts to assure high-quality rendering. Type 3 fonts are not acceptable.

For some students adding the following two lines in “thesis.tex” preamble has worked:

```
\usepackage[T1]{fontenc}
\usepackagepslatex
```

The easiest way to check if fonts are embedded well and of what type, is to use Adobe Acrobat’s Preflight – it shows exactly where the Type 3 fonts are in the thesis. You can learn more here: <https://community.adobe.com/t5/acrobat/figure-out-where-a-specific-font-is-used-in-a-pdf/m-p/10880057?page=1#M238035>

If you don’t have Adobe Acrobat (BU students get it for free), you can quickly check which fonts have which type by looking into Files >> Properties >> Fonts,

but it doesn't tell where the text with a specific font type is.

Linux/Unix: If you are using LaTeX or Unix, the problem is that, by default, LaTeX uses Type 3 fonts. Since most users have a tendency to use the default settings, then Type 3 fonts will be used by default. You can try to change the first line in the preamble in “thesis.tex” to:

```
\documentstyle[12pt,times,letterpaper]{report}
```

since then Times fonts will be used (which are not Type 3). If there are mathematical formulas in the text, it is better to use:

```
\documentstyle[12pt,times,mathptm,letterpaper]{report}
```

3.2 Font embedding

All fonts must be embedded into the final PDF file. If they are not, sometimes equations may look strange or may not show up at all for several pages. This is often due to unembedded font problem. Should you have a font-embedding issue, this page may prove useful:

<https://www.karlrupp.net/2016/01/embed-all-fonts-in-pdfs-latex-pdflatex>

For those using Overleaf, this page might help: https://www.overleaf.com/learn/latex/Questions/My_submission_was_rejected_by_the_journal_because_%22Font_XYZ_is_not_embedded%22._What_can_I_do%3F

Chapter 4

Conclusions

4.1 Summary of the thesis

Time to get philosophical and wordy.

Important: In the list of references at the end of thesis, abbreviated journal and conference titles aren't allowed. Either you must put the full title in each item, or create a List of Abbreviations at the beginning of the references, with the abbreviations in one column on the left (arranged in alphabetical order), and the corresponding full title in a second column on the right. Some abbreviations, such as IEEE, SIGMOD, ACM, have become standardized and accepted by librarians, so those should not be spelled out in full.

Appendix A

Proof of xyz

This is the appendix.

References

- Debreuve, E., Barlaud, M., Aubert, G., Laurette, I., and Darcourt, J. (2001). Space-time segmentation using level set active contours applied to myocardial gated SPECT. *IEEE Trans. Med. Imag.*, 20(7):643–659.
- Lamport, L. (1985). *TEX—A Document Preparation System—User’s Guide and Reference Manual*. Addison-Wesley.

CURRICULUM VITAE

Joe Graduate

Basically, this needs to be worked out by each individual, however the same format, margins, typeface, and type size must be used as in the rest of the dissertation.