Formatting a Thesis with LaTeX

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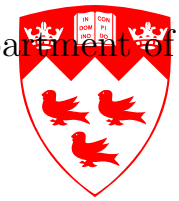

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November 2015

A thesis submitted to McGill University in partial fulfillment of the requirements for the degree of Whatever.

2015/11/06

Abstract

This report describes the use of LaTeX to format a thesis. A number of topics are covered: content and organization of the thesis, LaTeX macros for controlling the thesis layout, formatting mathematical expressions, generating bibliographic references, importing figures and graphs, generating graphs in MATLAB, and formatting tables. The LaTeX macros used to format a thesis (and this document) are described.

Acknowledgments

Thesis regulations require that contributions by others in the collection of materials and data, the design and construction of apparatus, the performance of experiments, the analysis of data, and the preparation of the thesis be acknowledged.

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List of Acronyms

16-QAM	16-point Quadrature Amplitude Modulation
3GPP	Third Generation Partnership Project
3GPP2	Third Generation Partnership Project 2
64-QAM	64-point Quadrature Amplitude Modulation
ADSL	Asymmetric Digital Subscriber Line
ARQ	Automatic Repeat Request
WPAN	Wireless Personal Area Network

Chapter 1

Thesis Organization

A thesis should present results in a scholarly fashion. The following discusses the organization of a thesis, such as would be appropriate to presenting research results pertaining to Electrical & Computer Engineering.

1.1 Scope of a Thesis

The terms of reference differ for a Master's Thesis and a Doctoral Thesis. For the Master's Thesis, the Faculty of Graduate Studies and Research at McGill University [**?**] gives the following guidelines.

The terms of reference state that "In most disciplines, Master's theses will not exceed 100 pages."

Chapter 2

Mathematical Layout Styles

TEX does a marvelous job of setting mathematical formulas, most often choosing pleasing spacing. However, on occasion one should intercede to improve the layout. This chapter defines a few such occasions. In addition, this chapter documents some features of the `amsmath` package which overcome difficulties in typesetting some mathematical forms. The `amsmath` package is documented in *The LATEX Companion* [**?**].

The modified setup is typeset as

$$G(z) = \begin{cases} \dfrac{P(z)}{1+z^{-1}} & \text{for } p \text{ even,} \\ P(z) & \text{for } p \text{ odd.} \end{cases} \tag{2.1}$$

With the modified definitions, we get the following.

$$\begin{aligned} \boldsymbol{d}^{(i)} &= \hat{\boldsymbol{v}}^{(i)} - \hat{\tilde{\boldsymbol{v}}}^{(i)} \\ \boldsymbol{n}^{(i)} &= \boldsymbol{u}^{(i)} - \tilde{\boldsymbol{v}}^{(i)} \end{aligned} \tag{2.2}$$

Chapter 3

Tables

3.1 Tables in LaTeX

Tables of many different sorts can be made with LaTeX. This chapter gives suggestions on producing tables, along with a number of examples.

To illustrate these rules, here is a table and the LaTeX input which was used to generate it.

Table 3.1 Filter specifications

Taps (N)	Transition Band	Stopband Weighting (α)	Passband Ripple dB	Stop-band Rejection dB	Ultimate Stop Band dB
8	A	1	0.06	31	31
12			0.025	48	50
16			0.008	60	75
12	B	1	0.04	33	36
16			0.02	44	48
24			0.008	60	78
16	C	1	0.07	30	36
24		1	0.02	44	49
32		2	0.009	51	60
48		2	0.006	50	66
24	D	1	0.1	30	38
48		2	0.006	50	66
64		5	0.002	65	80
48	E	2	0.07	32	46
64		5	0.025	40	51

Transition Code Letter	Normalized Transition Band
A	0.14
B	0.10
C	0.0625
D	0.043
E	0.023

The normalized transition band is the width of the transition band normalized to 2π; that is, $(\omega_s - \pi/2)/(2\pi)$.

Appendix A

LaTeX Macros

The LaTeX commands and macros used in formatting the title page for this document are shown in this appendix.

A.1 Thesis Preamble

The commands used to create the title page for a thesis are shown below. The McGill University crest is brought in via a macro `McGillCrest` which allows for setting the size and colour of an imported PostScript file which contains the actual crest. The title page also includes a red separator line.