ABSTRACT

GO THEORY:
THE MATHEMATICS BEHIND THE OLDEST BOARD GAME

by
Lawrence Johnson

Instead of creating a README file on how to use the LaTeX style file (thesis.cls), I will use this page to briefly describe each page of the dissertation, and read Chapter 1 on using BibTeX style file and formating your figures and tables. I assume you are familiar with LaTeX. This page is the *abstract* page. To modify the *abstract* page, edit abstract.tex file. The next page is *title* page. You need modify this page if your major is not mathematics. Edit thesis.cls file and modify command \maketitle which is from lines 376 to 398. *Copyright* page is next; no modification is required. Next is the *approval* page. I illustrate the general format followed by two examples. Note that the title of your advisor and committee members have to match with NJIT's graduate catalogue. If your committee member(s) is not a professor at NJIT, you may have to ask him/her for the correct title. To fill out your committee's information, edit approval.tex file. In case, there are more than five people on your committee, you may have to adjust the space so they fit on one page nicely. To adjust the gaps, edit the file thesis.cls and adjust the values on lines 490. The *biography* page is next. This is where you provide some of your personal information such as birthday, birthplace and background education, etc. If you have published or presented any seminars, list them here. To modify your *biography* page, edit biography.tex file. The file should be easy to understand. For education background (lines 26–33) and publications (lines 38–58), I show the general format followed examples. Don't forget to list the most recent item first. If you don't have any publication or presentation, you can remove or comment out lines 38–58 and lines 544 and 546 in thesis.cls file. Note that the format of publications mirrors the default bibliography format.

Therefore, if you use other bibliography format, you should mirror your publications format with it for consistency. Also, the references to line numbers are only correct before you make any modification to `biography.tex` file. The next two pages are *dedication* and *acknowledgment* pages. On the *dedication* page, you can write pretty much anything that you think appropriate such as citing a poem, song lyrics, quoting someone or even including a picture of your special someone. And you can do all that by editing the `dedication.tex` file. You may want to put your dedication in the middle of the page. You can do that by adjust the value on line 637 in `thesis.cls` file. Finally, the content of `acknowledgment.tex` file is for the *acknowledgment* page. This is where you tell everyone how much you love your advisor and thank all the people who has helped you. Don't forget to thank the organization(s) that funded your research. The "real" thesis starts after the *acknowledgment* page, and it goes after line 62 in `thesis.tex` file.[1]

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[1][My lawyer advises me to include this]
DISCLAIMER: The names, events, and publications are fictional. They are provided as the sole purpose of clarifying the general format. Any resemblance to real names, events and publications is entirely accidental.
USE OF STYLE FILE: The style file is provided "as is". In no event shall I or previous contributors be liable for any damage causes by the use of style file such as the style file "eats" your dissertation which in itself is an excellent lesson on backup.

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by
Lawrence Johnson

A Dissertation
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Department of Mathematical Sciences
Department of Mathematics and Computer Science, Rutgers-Newark

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APPROVAL PAGE

GO THEORY:
THE MATHEMATICS BEHIND THE OLDEST BOARD GAME

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L. Johnson, A. Saade and L. Zhuge, "Go theory: the mathematics behind the oldest board game," *Journal of Pure Mathematics*, vol. 196, pp 269-288, 1999.

Name of Speaker, "Title of Talk," *Type of Seminar Given*, Place, Date.

L. Johnson, "Group, Graph and Go," *Invited Lecture*, Center for Mathematics and Computer Science, University of Kyoto, 1997.

Unlike chess and its different pieces and complicated rules, Go is played with black and white stones equal in value, seemingly making it compatible with the binary nature of computers. Since the aim of a move is to control the most territory, the optimal move yields the maximum amount of territory—a simple counting procedure and a chore computers excel at. Yet in spite of the efforts of the world's best programmers over the last 30 years, the level of computer Go remains about that of a human who has studied Go for a month.

Richard Bozulich

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I would like to thank Adrienne James for such an excellent LaTeX style file. It does a great job of laying out my dissertation, so I can spend more time on improving the content. I would like to thank Steve Kunec for proofreading and making correction. A special thank to Dr. Donald Knuth for inventing TeX. Without TeX, I probably have to fork out couple hundred dollars for the privilege of typing my dissertation in Microsoft Word. Nah, I would probably borrow the Microsoft Office CDs from my sister's husband's brother-in-law.

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CHAPTER 1

INTRODUCTION

1.1 BibTeX Style File

The default bibliography format is provided by the BibTeX style file `ieeetr.bst`. If you want to use different bibliography format, change the style file on the line 7 in `thesis.cls` file. You can find other BibTeX style files under `tex/texmf/bibtex/bst` directory. I decide not to include the absolute path because the school may decide to re-install TeX on a different directory. However, you can easily find the TeX directory by looking at the `log` file which shows the absolute path of the loaded class and package(s). View `references.bib` file for citation format. If you have to enter the reference information manually, Emacs is a good program for the task. It has BibTeX template and it can sort the reference entries by author's name. An easier way is to download the references, and MathSciNet (`http://www.ams.org/mathscinet`) is a great place to acquire citation in BibTeX format. Finally, let's try a few citations [1, 5, 6, 9, 11, 7].

1.2 Example Section With Figure

First, figure caption has to end with a period. Second, it is required that the figure and caption left-aligned. I couldn't get the style file to do it automatically. However, I find a workaround using `minipage` environment. Look at the `chapter.tex` file to see how it is done. Also, compare the LaTeX code, the output of Figure 1.1 and how it shows up in the List of Figures to see the difference in the caption display. This can be achieved by using `\caption[]{}` command. The same format also works with chapter, section, etc.
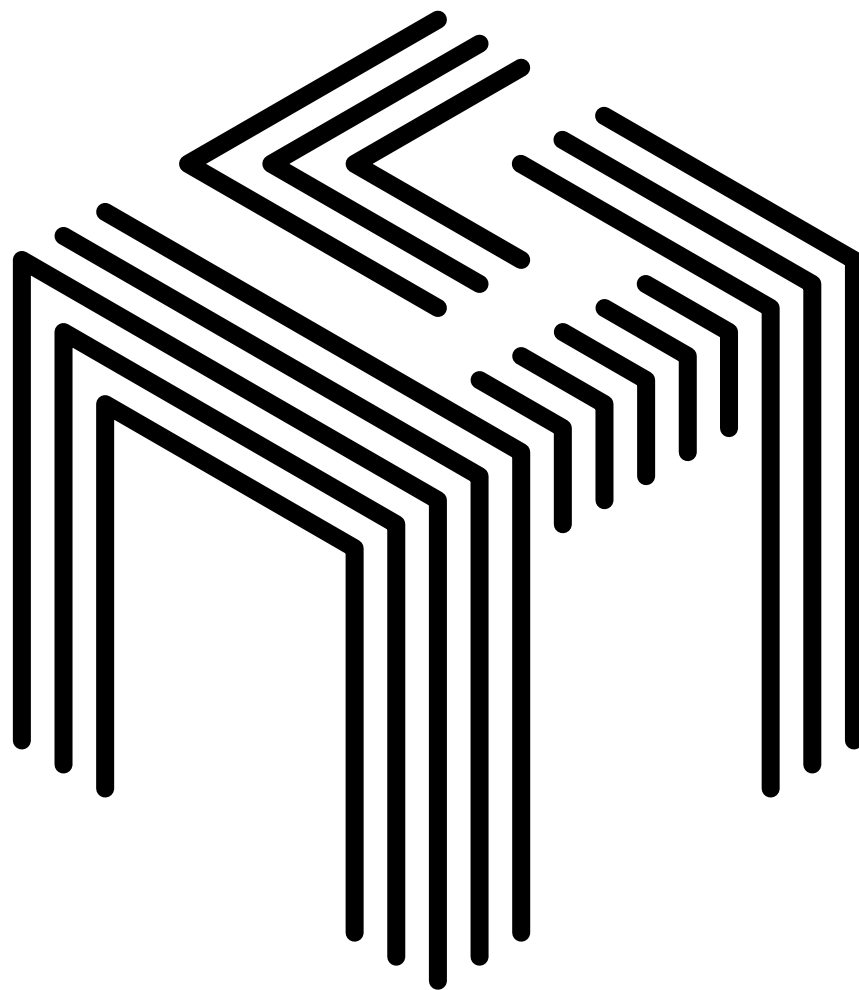
Figure 1.1 MSG Cube^2. A lot more text can go into caption without appearing on the List of Figures.

1.2.1 Example Subsection With Table

Here is an example of a table. Note that caption of table is in initial capital as section and subsection, and it doesn't end with a period as figure caption. Also, the caption is above the table. You can achieve this by put `\caption{}` command all the way on the top. You might need to forcibly add space between the text and the table so that it doesn't appear too close to the text. View `table.tex` file for detail of the table.

Table 1.1   Major Differences Between Neural Networks and Cell Signaling Networks[b]

	Salient features of networks	*Neural Networks*	*Cell Signaling Networks*
(i)	nodes	all nodes typically identical	nodes are not all equivalent in performance
(ii)	structure	typically layered with feed-forward connections only	regulatory signals often give rise to feedback connections resulting in cycles
(iii)	connectivity	highly connected	more sparsely connected
(iv)	learning rule	connectivity altered to perform a single function e.g., via a back-propagation algorithm	cells must be able to respond to multiple stimuli effectively;changes typically occur via evolutionary processes

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[a]You can also have footnote in table as in figure.
[b]You can also have footnote in table as in figure.

APPENDIX A

CELL SIGNALING SITES & PROTEIN DATABASES

	Web Site (Cited March 25, 2001)	*Description*
1.	http://vlib.org/Science/ Cell_Biology/ signal_transduction.shtml	The WWW Virtual Library: Cell Biology—with information on other signal transduction sites of interest
2.	http://www.grt.kyushu– u.ac.jp/spad/	Signaling Pathway Database— contains diagrams of cell signaling pathways
3.	http://geo.nihs.go.jp/csndb/	Cell Signaling Networks Database—a signal transduction database [13]
4.	http://www.sdsc.edu/kinases/	The Protein Kinase Resource—data available on the enzymology, genetics, molecular and structural properties of protein kinases [12]
5.	http://www.expasy.ch/sprot/	SWISS PROT Database—contains protein sequences with functional and structural information [2]
6.	http://www.expasy.ch/prosite/	Prosite Pattern Database—contains information on protein families and protein domain structure [8]
7.	http://www.cbs.dtu.dk/databases/ PhosphoBase	PhosphoBase—a database of phosphorylation sites in proteins [10]
8.	http://www–lmmb.ncifcrf.gov/ phosphoDB	Phosphoprotein Database—site dedicated to protein phosphorylation
9.	http://www.rcsb.org/pdb	PBD Brookhaven Crystallographic Database—a protein data bank containing 3–d structural X-ray crystallographic data [4]
10.	http://www–nbrf.georgetown.edu/	Protein Information Resource— maintains a protein sequence database, the PIR-International Protein Sequence Database [3]
11.	http://www.ncbi.nlm.nih.gov/	National Center for Biotechnology Information
12.	http://www.ncgr.org/software/ pathdb	PATHDB: Metabolic Pathways Database—contains information on pathways relating to metabolism in plants.

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