NJIT Format and Style for Theses and Dissertations

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PURPOSE OF DOCUMENT STANDARDIZATION

- To facilitate uniformity of NJIT thesis and dissertation documents via standard formatting.
- To develop consistency in written presentations and research.
- To expedite thesis and dissertation authoring.
- Approved format given in "Guidelines for Writing Thesis and Dissertations" *Herman A. Estrin and Timothy E. Roche* (2nd edition; out of print; can be found in the NJIT library).

THESIS AND DISSERTATION TEMPLATES

PROPER ORDER AND NUMBERING OF PAGES

- Abstract (no page number; counted as separate document; 1 page for a Master's Thesis; 2 pages maximum for a Doctoral Dissertation).
- Title Page (no page number but counted as page i).
- Copyright Page for Dissertation (no page number but counted as page ii; insert blank page for Thesis).
- Approval Page (no page number but counted as page iii).
- Biographical Sketch (counted as page iv and first page numbered on bottom).

PROPER ORDER AND NUMBERING OF PAGES

- Dedication Page (page number is shown).
- Acknowledgment Page (page number is shown).
- Table of Contents (page numbers are shown).
- List of Tables (if needed; page numbers are shown).
- List of Figures (if needed; page numbers are shown).
- List of Symbols and/or Abbreviations (if needed; page numbers are shown).
- Text (page numbers are shown, begins with page 1).
- Appendices (page numbers are shown).
- References (page numbers are shown).

GENERAL FORMATTING

- Spell check after all changes.
- Check grammar and syntax. Help is available; ask.
- Use consistent capitalization in Titles, Headings, Figures and Tables.
- Be consistent in the title of the document on Abstract/ Title Page/ Approval Page.
- Check correct order of sections and page numbers in Text with Table of Contents.
- Use correct font style and size – be consistent

Caution: Software spell checking may not distinguish between CAPITAL and small letters.

ABSTRACT

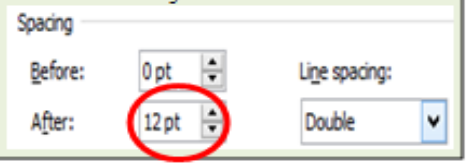
- Include brief problem statement, description of methods, summary of most important results and conclusions.
  - Write Conclusions section before you write Abstract.
  - Include a clear list of motivations for your research followed by a list of relevant objectives to be accomplished.
  - Minimize background information.
- Describe and emphasize what was actually done in the research in the third person and present tense.
- Use identical format and font size (use Arial or Times New Roman 12 pt.) of titles on Abstract page, Title page, Approval page and throughout document.

Use all CAPITALS followed by double space

Should be
1-Page for MS
2-Pages for PhD

Use all CAPITALS, single space inside the title, followed by double space.

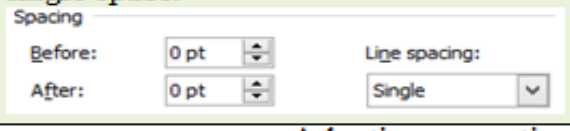
Your name needs the following paragraph settings in order to have the right space between your name and the first line of your abstract:



ABSTRACT

ADAPTIVE SPACE-TIME PROCESSING FOR WIRELESS COMMUNICATIONS

Write '**by**' in separate line, followed by single space.



by
Xiao Cheng Bernstein

Adaptive space-time processing techniques have been considered in the past to increase the capacity of two major, multiple-access wireless communication systems: Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA). Space processing uses multiple antennas which, in turn, provide alternative signal paths in order to cancel interferences and combat multipath fading. In this investigation, the *eigencanceler* method ~~was~~ **is** used to evaluate theoretical optimum combinations. The feasible *direct matrix inverse* (DMI) technique ~~was~~ **is** also evaluated. An analysis of the system performance revealed that when data sets are small, the eigencanceler technique is superior to the DMI technique. A simple projection-based algorithm ~~was~~ **is** proposed and its performance analyzed.

system performance revealed that when data sets are small, the eigencanceler technique is superior to the DMI technique. A simple projection-based algorithm ~~was~~ is proposed and its performance analyzed.

The first line of the 2nd paragraph is indented.

The capacity of CDMA communication systems is normally restricted by multiple-access interferences (MAI). It ~~was~~ is shown that spatial and temporal processing can be combined to increase the capacity of CDMA-based wireless communications systems. The degrees of freedom provided by space-time processing ~~were~~ are exploited to combat both fading and MAI. Specifically, the following methods ~~were~~ are considered: (1) space-time diversity, (2) cascade optimum spatial-diversity temporal, (3) cascade optimum spatial-optimum temporal, and (4) joint-domain optimum processing. It ~~was~~ is proved that, due to its interference cancellation capability, *optimum combining* provides significantly better performance than diversity techniques.

TITLE PAGE

- View format of Title pages for various disciplines
  http://www.njit.edu/graduatestudies/Titles.php
- Follow samples provided precisely.
- Identify correct month (August, January, or May) and year of graduation.
- Provide correct degree title.
- Check correct department/program title.

ADAPTIVE SPACE-TIME PROCESSING FOR WIRELESS COMMUNICATIONS

You have 17 or 18 single spaces here depending on the length of your title.

Make sure your name appears in the middle of the page.

by
Xiao Cheng Bernstein

You have 14 single spaces here

A Dissertation
Submitted to the Faculty of
New Jersey Institute of Technology
in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy in Electrical Engineering

Department of Electrical and Computer Engineering

January 1996

Use two single spaces and then enter the date of graduation (either January, May or August + Year)

Make sure you list the right title and department here. A list of the title page samples is available at http://www.njit.edu/graduatesudies/Title.php

APPROVAL PAGE

- Three MS Thesis Committee members (minimum) needed for thesis approvals including thesis advisor.
- Chair of the Committee, (usually the thesis advisor), must be a faculty member holding a tenure-track position.
- Five PhD Committee members (minimum) needed for dissertation approvals, including the dissertation advisor.
- Check composition of committee with the Office of Graduate Studies. Submit the signed Committee Appointment Report to GSO for approval as early as possible.
- Use correct spelling of names and proper academic titles of faculty members. (Check with your department administrative assistant for correct spelling of names, faculty ranks and titles. Remember websites are not always up to date.)

At least five signatures are required for a Doctoral Dissertation. At least three signatures for a Master's Thesis.

The required qualification for dissertation or thesis advisors and for committee members can be found in the online graduate catalog under Academic Policies and Procedures, or consult with the Graduate Studies Office.

APPROVAL PAGE

ADAPTIVE SPACE-TIME PROCESSING FOR WIRELESS COMMUNICATIONS

Xiao Cheng Bernstein

Dr. Alexander M. Haimovich, Dissertation Advisor — Date
Associate Professor of Electrical and Computer Engineering, NJIT

Dr. Yeheskel Bar-Ness, Committee Member — Date
Distinguished Professor of Electrical and Computer Engineering, NJIT

Dr. Michael Porter, Committee Member — Date
Professor of Mathematics, NJIT

Dr. Zoran Siveski, Committee Member — Date
Assistant Professor of Electrical and Computer Engineering, NJIT

Dr. Jack H. Winters, Committee Member — Date
Member of Technical Staff, AT&T Bell Laboratories, Holmdel, NJ

BIOGRAPHICAL SKETCH

- Provide correct title and date of current degree.
- Use correct spacing and number of tabs.
- Include month and year of degree (not defense).
- Enter “New Jersey Institute of Technology” and any other institutional name on a single line.
- Include all prior degrees, in chronological order, but begin with the NJIT degree you will receive.

Use the "TAB" key for alignment (activate "Show ¶"to double-check.

BIOGRAPHICAL SKETCH

Author: Xiao Cheng Bernstein

Degree: Doctor of Philosophy

These two entries will not appear online on the NJIT library

Date: January 1996

Date of Birth: November 3, 1965

Place of Birth: Shanghai, P. R. China

Undergraduate and Graduate Education:

List the most recent degree first

- Doctor of Philosophy in Electrical Engineering,
  New Jersey Institute of Technology, Newark, NJ, 1996
- Master of Science in Electrical Engineering,
  Shanghai Jiao Tong University, Shanghai, P. R. China, 1991
- Bachelor of Science in Electrical Engineering,
  Shanghai Jiao Tong University, Shanghai, P. R. China, 1988

Major: Electrical Engineering

Indicate your current degree program

Presentations and Publications:

Use hanging indent under Format → Paragraph → Special

Xiao C. Wu and Alexander M. Haimovich, "Adaptive arrays for increased performance in mobile communications," The Sixth International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'95), Toronto, Canada, September 1995.

Xiao C. Wu and Alexander M. Haimovich, "Space-time processing for CDMA communications," Proceedings of the 1995 Conference on Information Science and Systems, Baltimore, MD, pp. 371-376, March 1995.

Xiao C. Wu and Alexander M. Haimovich, "A simple projection based adaptive array with applications to mobile communications," Proceedings of the 1994 Adaptive Antenna Systems Symposium, Melville, NY, pp. 37-42, November 1994.

This is the first page where a page number should occur (Roman Numerals). It should be centered, bold, and 12 pt like the text. It should be ½ inch from physical bottom of the page within a footer

iv

DEDICATION PAGE

- Be completely personal but professional.
- Use full names with correct spelling.
- View Examples at the Library ETD web site.

ACKNOWLEDGMENT PAGE

- Spell “acknowledgment” with or without “e” between “g” and “m”; both are acceptable.
- Begin with the advisor and then committee members.
- Recognize any financial support sources. Also ask your advisor for grant support information.
- Identify scientific or other support, e.g.,
  - Valuable input that affected your research from fellow students, or others at conferences or other meetings.
  - Software (or equipment) that you received for free, were able to use or donated to do part of your work.
- Recognize friends or colleagues in your laboratory or classmates.
- Use correct spelling of names and consistent capitalization.
- Check grammar.

TABLE OF CONTENTS, LIST OF TABLES, AND LIST OF FIGURES

- Use consistent titles, punctuation and capitalization.
- Use bold for the titles above the columns only.
- Use all capitalized letters for CHAPTER TITLES.
- Enter two spaces between each chapter and section number and its title.
- Place dots consistently leading from each chapter and section title to its page number.
- Right justify page numbers (in their own column).
- Include (Continued) in parenthesis at top of second and following pages.

The Table of Content has to be created manually, and has to follow the format presented here. The 'Split Cells' function is very helpful here. Note: For detail instructions look into the Guide for Creating the Table of Contents on the Graduate Studies web page.

TABLE OF CONTENTS

Chapter Titles appear in all CAPITALS

Provide two spaces between Chapter no. and Chapter title.

Provide two spaces between Section no. and Section title.

Provide two spaces between Sub Section no. and Sub Section title.

TEXT

- Be consistent and use third person throughout the document.
- Set margins as: left 1.5 inches; right/top/bottom, 1 inch
- Use Arial or Times New Roman fonts size 12 pt.
- Format chapters, sections, and subsections consistently.
- Enter all page numbers in the footer, 0.5 inches from the bottom located within the margin. All page numbers must be bold and 12 pt. Font styles & sizes must be identical to text.
- Number Appendix pages and Reference pages like chapters.

Make sure you have double space between CHAPTER 1 and INTRODUCTION, then one empty line (**two** double spaces) before subsection heading.

If you use the template from the webpage:

- Use first the template styles aChapterHeading.
- When hitting 'Enter' the next line is automatically template style aTitle.
- Type title of your Chapter 1.
- When hitting 'Enter' again the next line is automatically template style aSection2.
- Type title of your subsection
- In this way you also automatically have the right spacing.

CHAPTER 1

INTRODUCTION

1.1 Objective

The first paragraph of each chapter /section is always flushed to the left. You can use the template style aBodyFirst

The objective of this dissertation is to present applications of space-time processing for the following multiple-access, wireless communication systems: time-division division multiple-Access (TDMA) and code division multiple-access (CDMA)

Use template style aBody for the following paragraph.

For the TDMA system, the following spatial processing techniques: *optimum combining* and *direct matrix inverse* (DMI) were reviewed; and eigenanalysis-based processing, or the eigencanceler was proposed. An analysis of system performance shows that the eigencanceler is superior to DMI when small data sets are available.

For the CDMA system, the following receiver consecrations are formulated and compared: (1) space-time *maximum ratio combining* (SMRC/TMRC) (in effect space-time diversity), (2) cascade optimum space-MRC time (SOPT/TMRC) (optimum spatial processing cascaded with a RAKE receiver) and (3) cascade optimum space-optimum time (SOPT/TOPT).

1.2 Background Information

Template style aSection2

Wireless communication offers universal network access by removing users' location and time constraints. As wireless networks proliferate and the subscriber community increases, the load on the network increases. The tremendous growth in network bandwidth has driven the convergence of voice, video, and data to IP based networks. The bandwidth available on wired networks is increasing by a factor

Page number on the first page of a new chapter is centered at the bottom, **bold**, and should appear ½ inch from the physical bottom of the page within the footer.

1

FIGURES AND TABLES

- Use Portrait or Landscape for figures. If Landscape is used, figure should face out. Page number must still be portrait.
- A caption that describes a Figure must follow just below the Figure.
- The Title of a Table must be in a header just above the Table.
- Numbering follows the chapter (e.g., Figure 1.1 for the first figure in the first chapter).
- Samples of appropriate format are available in the sample document on the GSO web site. http://www.njit.edu/graduatestudies/docs/thesis/doc_body_commented_v2.pdf

EQUATIONS

- Place equations between paragraphs.
- Enter double space before and after equation.
- Use Equation Editor to enter equation.
- Center equation and right justify equation number.
- Number equations in X.y form (where X is the chapter number and y is the equation number).

Tables are identified in the header with a title. You can use the template Style aTable. Make sure that only **Table X.Y** is bold. There is no period after table title.

Table 2.1 Diffusion Coefficients and Molecular Diameters of Non-electrolytes

Molecular Weight g/(g-mol)	**Diffusivity in Solution** 10^{-5} *(cm^2 /s)	**Molecular Diameter** 10^{-8} * cm
10	2.20	2.9
100	0.70	6.2
1,000	0.25	13.2
10,000	0.11	28.5
100,000	0.05	62.0
1,000,000	0.025	132.0

Source: W.S. Winston Ho and Norman N. Li , "Membrane Processes," Perry's Chemical Engineers' Handbook, ed. Robert H. Perry and Don W. Green, 6th ed. (New York: McGraw-Hill,1984)17-20.

Sources are identified in the caption using 10pt and can be numbered or spelled out.

Depending on the style you have chosen, you can use
1) Full text of the reference
2) Number of the reference in brackets [#]
3) Author and year

A qualitative picture of the longitudinal electric field at the axis of the electron avalanche is given in Figure 16.7. The x=0 plane corresponds to the front of the

Equations have to have a double space before and after. They are centered and numbered in X.Y form (Where X is the Chapter number and Y is the equation number). This number has to be right justified. Use a table with one row and two columns.

$$E=MC^2 \qquad (2.1)$$

The electron energy distribution is far from equilibrium. It is enriched with high – energy electrons, a consequence of the large electric field. Furthermore, the distribution is anisotropic in the high energy.

Template style aFigure.

Figures are centered and are identified in the caption with a description. They have to end in a period. They are numbered in X.Y form (Where X is the Chapter number and Y the figure number) and **Figure X.Y** is bold.

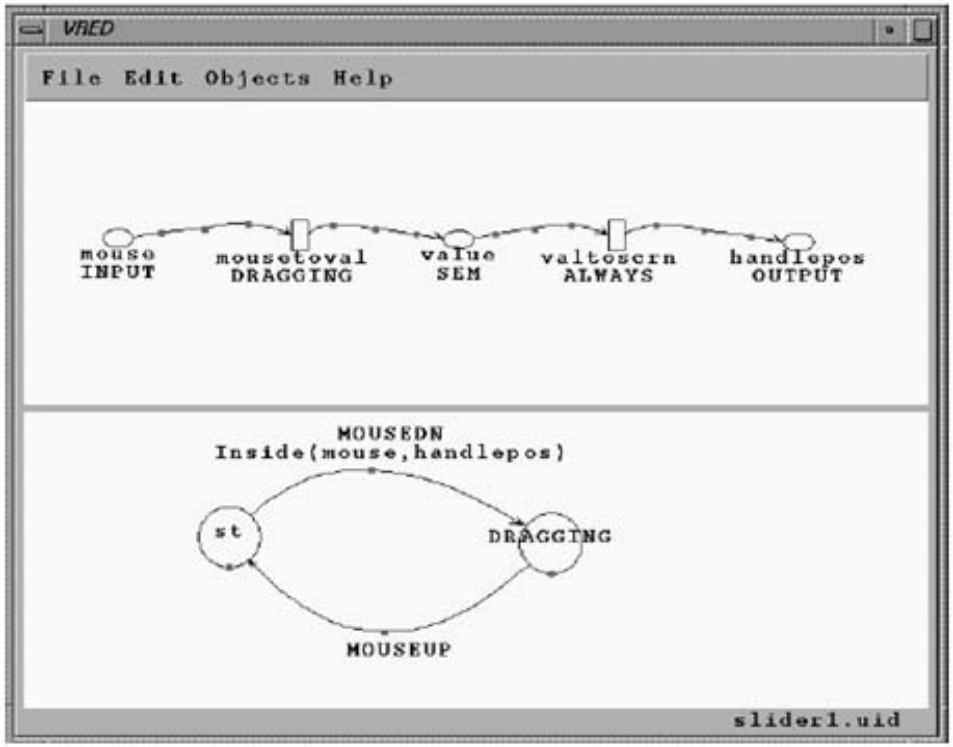


Figure 5.1 Specification of a simple slider, running in the VRED editor, to illustrate our graphical notation. The upper half of the screen shows the continuous portion of the specification, using ovals to represent variables, rectangles for links, and arrows for data flows. The lower portion shows the event handler in the form of a state diagram, with states represented as circles and transitions as arrows.

Source: Rober J. K. Jacob, Leonidas Deligiannidis, and Stephen Morrison "A Software Model and Specification Language for Non-WIMP User Interfaces" Tufts University, ACM Transactions on Computer-Human Interaction, Vol. 6, No. 1, March 1999, pp. 1–46. http://www.postech.ac.kr/~gkim/cse511/p1-jacob.pdf, accessed February 9, 2009.

Depending on the style you have chosen you can use

1) Full text of the reference
2) Number of the reference in brackets[#]
3) Author and year

Figure 5.1 shows the specification of this simple slider in our visual notation,

APPENDICES

- Determine if appendix is needed in consultation with your advisor.
- Format text, sections, page numbers, figures, and tables the same as you would for a chapter.
- Provide a title and brief introductory description of what is contained in each Appendix.
- Enter Title of each Appendix in all capitalized letters.
  - For a single appendix, the title should be “APPENDIX” (no letter).
- Multiple Appendices –“APPENDIX A”, “APPENDIX B”, and so on.
- Appendices appear before References in the document.

Use the aAppendixHeading from the Thesis and Dissertation Template

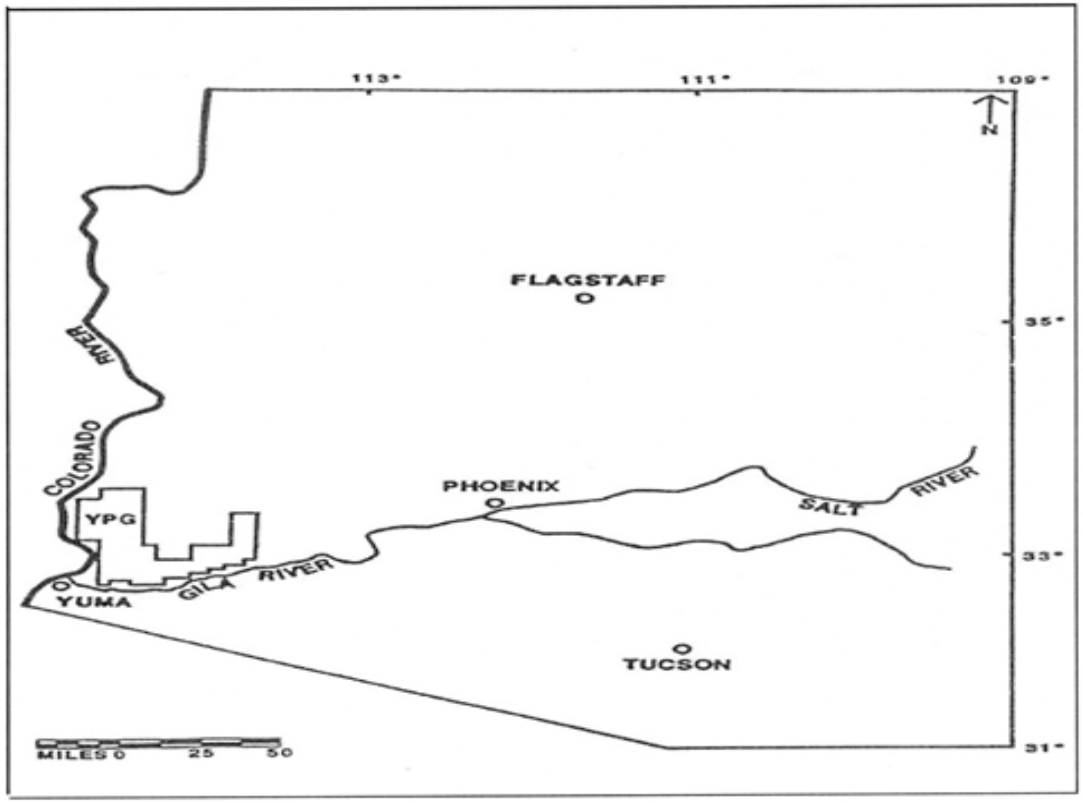
APPENDIX A

SAMPLING SITES

After hitting 'Enter' the template style changes to style aAppendixTitle for the appendix title

Figure A.1 to A.12 show sampling locations at YPG and APG sites.

Here a short description of the appendix is given



Use aFigure or aTable to insert the descriptions for figures or titles for tables

Figure A.1 Regional Map Depicting Yuma Proving Ground (U.S. Army YPG, 1999).

REFERENCES

- Select reference styles based on degree and discipline.
  - ➢ It is advised that you ask your advisor for the most representative journal in your field.
  - ➢ Wikipedia lists citation styles per discipline: http://en.wikipedia.org/wiki/Citation
- Use quotation marks, *italics* or underlining properly.
- Use consistent style format, capitalization and numbers.
- End Note software can be used to organize references. Links to download the software:

  Macintosh Users: http://ist.njit.edu/software/display.php?id=557

  Windows Users: http://ist.njit.edu/software/display.php?id=558

TWO BASIC STYLES

- **Numerical**
  - Use [21] in the text to cite a publication listed in the References section as:

    [21] J. Smith, Paper Title, Volume Number, Issue Number, Page number(s), Year.
- **Alphabetical**
  - Use [SmithYear] to cite a publication listed in the References section as:

    Smith, J. Year, Paper Title, Publication Title, Volume Number, Issue Number, Page

    number(s).

    For book citation: Book Title, Edition, Author Name(s), Publisher, City, State, Country, Year.

PAPER QUALITY

- One document must be submitted in pdf format on a CD-ROM.
- The printouts must be submitted on 25% cotton fiber paper, minimum 24 lbs.
- The paper must be bright white.
- Typical brands include Southworth (available at NJIT Bookstore), Eaton and Crane's.
- Paper can also be purchased online at Amazon, Office Depot and other vendors.
- Canon operates a custom printing facility in the basement of Cullimore Hall. (No printing in labs.)

QUESTIONS?

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NJIT New Jersey's Science & Technology University

THANK YOU

For appointments please contact

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Graduate Studies

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