THESIS

COLORADO STATE UNIVERSITY LATEX THESIS TEMPLATE

Submitted by

John M. Doe

Department of Computer Science

In partial fulfillment of the requirements

For the Degree of Master of Science

Colorado State University

Fort Collins, Colorado

Spring 2015

Master's Committee:

Advisor: Advisor Name
Co-Advisor: Co-Adivisor Name

First Member
Second Member
Third Member

ABSTRACT

COLORADO STATE UNIVERSITY LATEX THESIS TEMPLATE

This document aims to get you started typesetting your thesis or dissertation in LaTeX. It serves both as a sample and as the documentation for this package. You may replace this text with your abstract.

ACKNOWLEDGEMENTS

We would like to thank the CSU Graduate Student Council for iniaiting and funding the creation of this project and to the CSU Graduate School for their assistance and feedback. Thank you to CSU for being awsome and to Elliott Forney for creating the initial version of this template. You may replace this text with your acknowledgements.

TABLE OF CONTENTS

DEDICATION

I would like to dedicate this thesis to my dog fluffy.

Chapter 1

Introduction

Thank you for downloading the Colorado State University (CSU) LaTeX document class and template for theses and dissertations. The goal of this document is to get you started writing and typesetting your thesis in LaTeX. This document serves both as a guide for using this package and as a sample template to get you started. After reading over this guide, please see the source code for this file to get started.

Please note that while this package was sponsored by the CSU Graduate Student Council and by the CSU Graduate School, it is not officially supported by CSU. Instead, it is intended that this document will be supported by its community of users and by the students themselves, that's you! This document is currently hosted on GitHub at https://github.com/idfah/csuthesis. If you have a patch or improvement that you would like included, please submit a pull request on GitHub. For information on the official guidelines for formatting your thesis, please visit the CSU electronic thesis and dissertation resources page at http://graduateschool.colostate.edu/for-current-students/completing-your-degree/thesis-dissertation/.

Also, note that this package is free, public domain software. See the header of the source code for the full copyright license. You are free to modify, distribute and fork this software in any that you would like.

Chapter 2

The Thesis Document Class

This package includes a LaTeX document class called *thesis.cls*, which extends the standard *book.cls* that is included with most LaTeX distributions. Most of the features that work in *book.cls* will also work in *thesis.cls*; however, the setup of the title and other preliminary pages and various aspects of the document's formatting have been modified. Also, *thesis.cls* provides a few extra commands that may be useful.

2.1 Required Packages

2.2 Document Class Options

The *thesis.cls* document class also provides a number of options that can be specified when the class is loaded. The following class options are supported:

- **bachelor** This sets the formatting style to be suitable for an undergraduate Honor's Thesis.
- **master** This sets the formatting style to be appropriate for a graduate Master's Thesis.
- **doctor** This sets the formatting style to be appropriate for a graduate PhD Dissertation.
- **nopdf** This prevents the use of features that are specific to pdf output formats. Specify this option if you are using a different format, such as PostScript or DVI.
- **subfigure** This enables compatibility with the *subfigure* package. Note that *subfigure* is now depreciated in favor of the *subfig* package, which is supported by default.

In addition to the above options, *thesis.cls* supports all of the options supported by *book.cls*. We recommend, however, that you double check the Graduate School's formatting guidelines before changing any of the options from *book.cls*.

2.3 Preliminary Pages

A number of commands are provided by *thesis.cls* to create the various preliminary pages that must be included in your thesis, e.g, title page, copyright page, abstract, table of contents, et cetra. The following commands provide information to *thesis.cls* about the contents of your preliminary pages and should be specified before `\begin{document}`.

- **\title** This command takes a single argument giving the title of your thesis.
- **\author** This command takes a single argument giving the name of the author.
- **\email** This command takes a single argument giving the author's email address.
- **\department** This command takes a single argument giving the name of the author's department, e.g., Department of Computer Science.
- **\semester** This command takes a single argument giving the semester during which the thesis will be defended, e.g., Summer 2017.
- **\advisor** This command takes a single argument giving the name of the author's advisor, do not include Dr. or Professor.
- **\coadvisor** This is an optional command that takes a single argument specifying the author's co-advisor. Omit this command if you don't have a co-advisor.
- **\committee** This command takes a single argument giving the name of a member of the author's committee. Use this command repeatedly to specify additional committee members.
- **\mycopyright** This command takes a single argument giving the text to display on the copyright page. Ask the graduate school for more information on choosing the copyright that is right for you.
- **\abstract** This command takes a single argument giving the text to display on the abstract page.

- **\acknowledgements** This command takes a single argument giving the text to display on the acknowledgements page.

After you have finished your preamble and specified `\begin{document}`, the following commands can be used to actually insert each preliminary page:

- **\maketitle** Makes the title page.
- **\makemycopyright** Makes the copyright page.
- **\makeabstract** Makes the abstract page.
- **\makeacknowledgements** Makes the acknowledgements page.
- **\tableofcontents** Makes the table of contents.
- **\listoftables** Makes the list of tables (optional).
- **\listoffigures** Makes the list of figures (optional).

The source code of this document also provides an example of how to add your own preliminary pages, such as a dedication or list of symbols.

2.4 Front, Main, Back and Appendix Regions

Please note that *thesis.cls* requires you to denote the various regions of your document using the same conventions as *book.cls*. The following command denote the beginning of each corresponding region:

- **\frontmatter** This command denotes the beginning of the preliminary pages, such as the title page, copyright page, table of contents, et cetra.
- **\mainmatter** This command denotes the beginning of the main thesis text. This is where you will write the bulk of your thesis.

- **\appendix** This command denotes the beginning of any appendices that you may wish to add. Appendices are created just like chapters but are labeled differently.

- **\backmatter** This command denotes the beginning of unnumbered supplementary material. Notably, this includes your bibliography.

Chapter 3

Figures, Tables and Floats, Oh My!

3.1 Figures

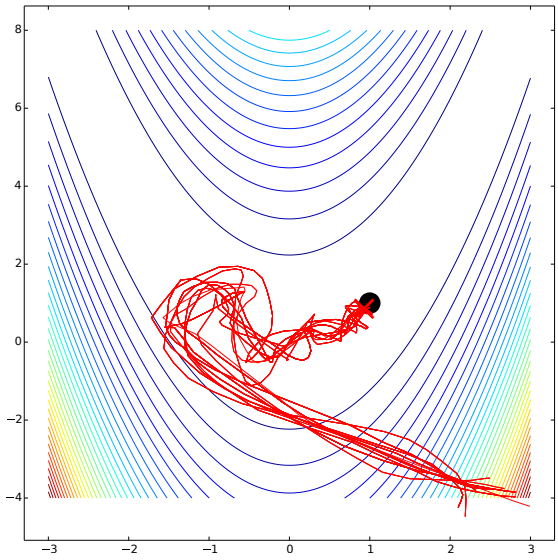
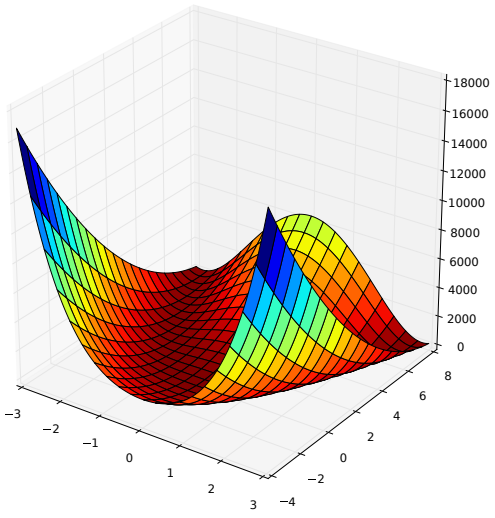


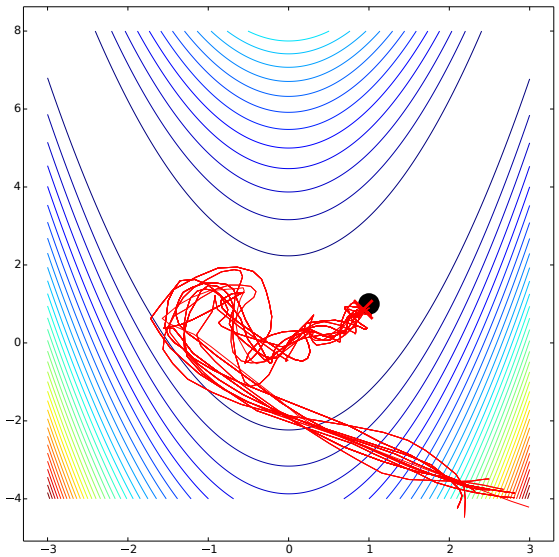
Figure 3.1: A particle swarm optimizing the Rosenbrock banana function.

3.1.1 Subfigures

3.2 Sideways Pages

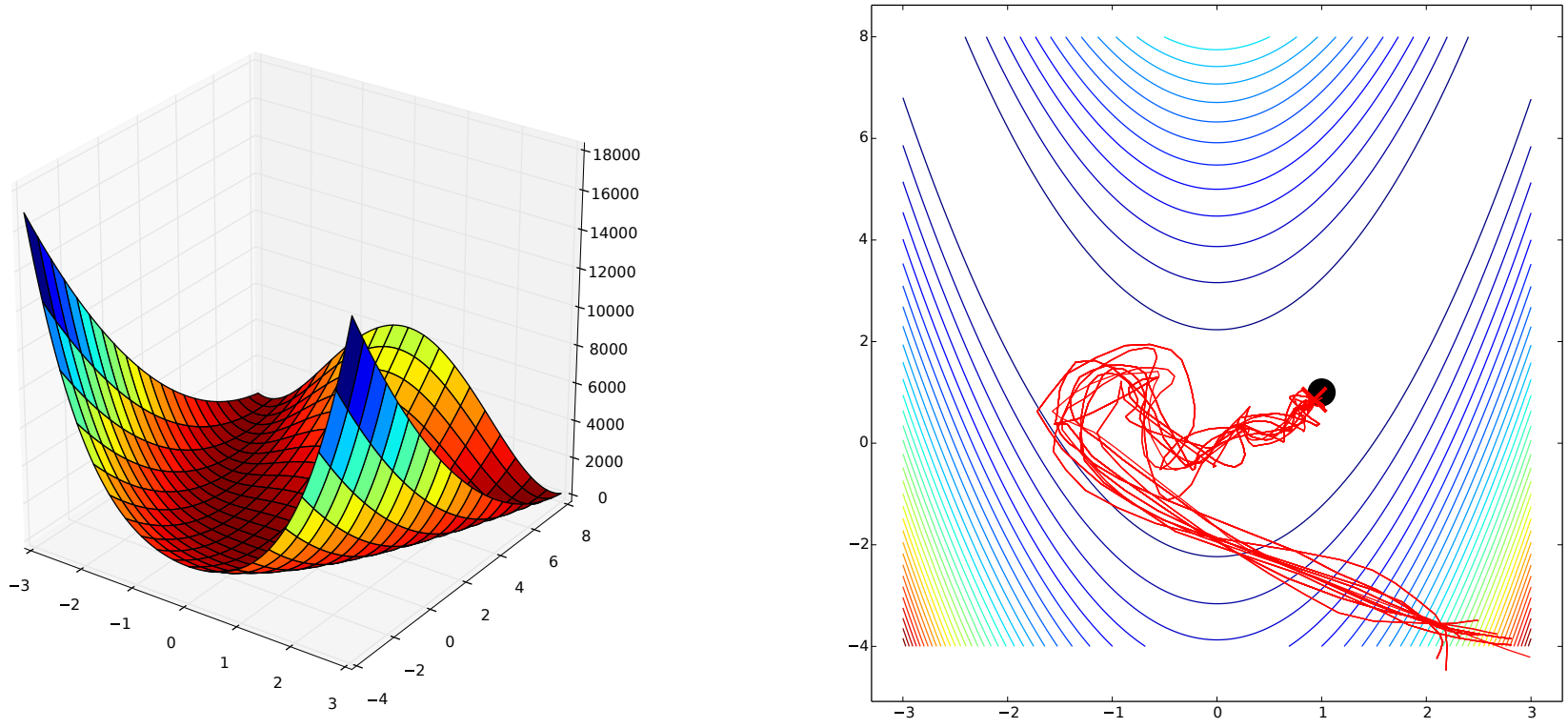


(a) The Rosenbrock banana function.



(b) Path of the particles.

Figure 3.2: Using PSO to optimize the Rosenbrock banana function. (a) The function to optimize. (b) The path of the particles as they find the global minima.



(a) The Rosenbrock banana function.

(b) Path of the particles.

Figure 3.3: Using PSO to optimize the Rosenbrock banana function. (a) The function to optimize. (b) The path of the particles as they find the global minima.

3.3 Tables

Table 3.1: Sample table. Caption goes above the table.

Data-A	Data-B	Data-C	Data-D
0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5
Mean	0.5	0.5	0.5

We can reference Table 3.1 like this.

3.4 Equations

Equations are the same as they are in most other LaTeX documents. For example,

$$\mathbf{z}(t) = \phi(\mathbf{H}\bar{\mathbf{x}}(t) + \mathbf{S}\mathbf{z}(t-1)), \tag{3.1}$$

where $\mathbf{z}(t)$ is the output of some function at time t. We typically refer to equations as something like (3.1).

Chapter 4

References

4.1 Citation

4.2 Footnotes

4.3 Bibliography

Let's cite a bunch of things [1–5].

Chapter 5

Formatting Tips and Tricks

Appendix A

A Bunch of Cryptic Text

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetuer.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

Bibliography

[1] Elliott Forney and Charles Anderson. Classification of EEG during imagined mental tasks by forecasting with elman recurrent neural networks. *International Joint Conference on Neural Networks (IJCNN)*, pages 2749–2755, 2011.

[2] Department of Compter Science at Colorado State University. CEBL: Colorado EEG and Brain-Computer Interface Laboratory. http://www.cs.colostate.edu/eeg/main/software/cebl3, March 2016.

[3] Elliott Forney. Electroencephalogram classification by forecasting with recurrent neural networks. Master's thesis, Department of Computer Science, Colorado State University, Fort Collins, CO, 2011.

[4] Elliott M. Forney, Charles W. Anderson, William J. Gavin, Patricia L. Davies, Marla C. Roll, and Brittany K. Taylor. Echo state networks for modeling and classification of EEG signals in mental-task brain computer interfaces. Technical report, Colorado State University, Department of Computer Science, November 2015.

[5] Simon Haykin. *Neural networks and learning machines*, volume 3. Pearson Upper Saddle River, NJ, USA:, 2009.