Imperial College London

GroupLogo

# Thesis Template in Latex: An example using Roboto Font and Color Sections


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A thesis submitted in fulfilment of the requirements for the degree of *Philosophiae Doctor*


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A quote from some person with some kind of meaning.

---

The Person - *The Source*

A short sentence.

*A dedication to people for their support.*

# Declaration

A declaration of originality in your own words.

Be specific about any published papers and which chapters they refer to. Any illustrations created by you and and used prior to this Thesis could be declared.

State that this Thesis has only every been submitted for the purpose of PhD degree.

If using this template, you should also attribute the formatting to Rob Robinson [1] and link to the original template or thesis https://github.com/mlnotebook.

# Copyright

The University will have a standardized copyright notice. You should write it here.

# Acknowledgements

Funding sources and acknowledgement of any groups, professional bodies, companies etc could be written about here.

Any work from which the Thesis is derived could also be mentioned here.

# Abstract

*The overall abstract for the Thesis should be written here. It brings together all of the work and contributions in to one place including specific results.*

*Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.*

# Contents

# List of Figures

# List of Tables

# List of Source Code

# Acronyms

**DSC** Dice Similarity Coefficient. 22

Chapter 1

# Introduction

*The abstract for this chapter of the Thesis. Can contain multiple paragraphs.*

*Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.*

A small description or statement about the chapter can go here.

## 1.1 Overview

An overview of the context for the Thesis. The current state of affairs and a general description of the problems that will be tackled.

If using this template, you should also attribute the formatting to Rob Robinson [1] and link to the original template or thesis https://github.com/mlnotebook.

## 1.2 Contributions

Short statements on the motivation for the following contributions.

**1. Contribution 1**

A summary of the first contribution. Should be fairly short so that summaries of the three contribution chapters can be put one after the other. The background is shaded in the same colour as all other boxes, except for the limitations boxes in the Conclusions chapter which are shaded red/pink. Links to the appropriate chapters can be included in these boxes.

**2. Contribution 2**

A summary of the first contribution. Should be fairly short so that summaries of the three contribution chapters can be put one after the other. The background is shaded in the same colour as all other boxes, except for the limitations boxes in the Conclusions chapter which are shaded red/pink. Links to the appropriate chapters can be included in these boxes.

**3. Contribution 3**

A summary of the first contribution. Should be fairly short so that summaries of the three contribution chapters can be put one after the other. The background is shaded in the same colour as all other boxes, except for the limitations boxes in the Conclusions chapter which are shaded red/pink. Links to the appropriate chapters can be included in these boxes.

Describe the structure of the thesis - what is in each section and how does the story flow from one to the next.

Chapter 3

# Contribution 1 Title

*The abstract for this chapter of the Thesis.*

*Can contain multiple paragraphs.*

*Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.*

A small description or statement about the chapter, *e.g.*"This chapter was published at the SUPER conference in 2020" [1].

## 3.1 Overview

An overarching overview of the Chapter contents.

If using this template, you should also attribute the formatting to Rob Robinson [1] and link to the original template or thesis https://github.com/mlnotebook.

## 3.2 Introduction

General introduction to the area with which this chapter is concerned. It should set the scene and identify the need for research in this area.

The next chapter deals with the related work which tries to address this need (and places the Thesis research in context).

### 3.2.1 Contributions

A short introduction to the contributions that are made by the work in this Thesis.

## 3.3 Related Works

This section identifies and describes the relevant literature that aims to address the issue raised in the introduction.

### 3.3.1 Some theme around the research area.

Subsections can be used if the area can be broken down into different strategies or methods for tackling the same problem. Pros/cons of the methods can be addressed and related to how the method presented in the Thesis may overcome these.

# 3.4 Materials and Methods

A short overview of the data and methods that will be introduced in the following subsections - tables, sources *etc.*

#### 3.4.0.1 Some Dataset.

Descriptions and examples of the dataset that is being used.

## 3.4.1 Method

This subsection describes the methods used in this Chapter.

Use 'fref' to refer to figures as "figure (X.X) on page (X)". 'Fref' (note the capital F) will capitalize 'figure' to 'Figure'. *e.g.*figure 3.1 on the following page or Figure 3.1 on the next page.

## 3.4.2 Evaluation Strategies

This section can hold the methods used for evaluating the experiments performed in the this Chapter.

#### 3.4.2.1 Some Metric

Equations can be used in a number of ways. The Dice Similarity Coefficient (DSC) is used as an example below.

**1** Simple Display Equation:

$$\mathrm{DSC} = \frac{2\,|\mathbf{A} \cap \mathbf{B}|}{|\mathbf{A}| + |\mathbf{B}|} \tag{3.1}$$

**2** Annotated Display Equation: 'falign' adds a title to the left (or right) of the equation. Uses the table cell notation '&&' to separate the left, middle and right parts.

Dice Similarity Coefficient:
$$\mathrm{DSC} = \frac{2\,|\mathbf{A} \cap \mathbf{B}|}{|\mathbf{A}| + |\mathbf{B}|} \tag{3.2}$$

**3** Multi-Equation: 'align' can align multiple equations by using the '&' symbol on the equals sign and '\\' where the newline begins. Multiple labels can be used - one for each equation.

$$y = (x+1)^2 \tag{3.3}$$
$$y = (x^2 + 2x + 1) \tag{3.4}$$

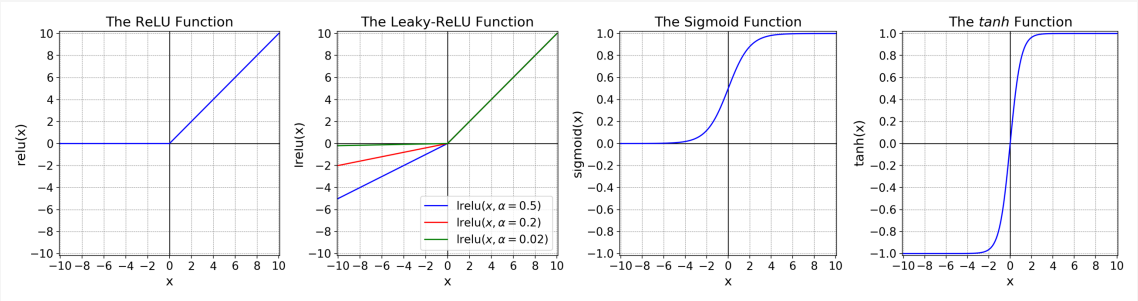


**Figure 3.1: This is the title of the figure - it will also appear in the contents table.** This is the rest of the caption.

# 3.5 Results

An introduction to the results.

## 3.5.1 Experiment A Results: Experiment name.

Tables are enclosed in a 'colorbox' which makes the background white against the 'mdframe' of the float object. Checks and crosses are created from custom commands that use dings: `\cmark` and `\xmark`.

**Table 3.1: Caption Title goes here (appears in TOC).** Rest of the caption goes here

| Experiment | Dataset | Size | GT | Seg. Method |
|---|---|---|---|---|
| A | Hammersmith | 100 | ✓ | RF |
| B | UKBB-2964 | 4,805 | ✓ | RF and CNN |
| C | UKBB-18545 | 7,250 | ✗ | Multi-Atlas |

Multiple tables can be stacked using minipages. Note the `[t]` in the minipages to keep them aligned at the top.

**Table 3.2: Table Title (appears in TOC)** The rest of the caption goes here.

| Class | Metric | Acc. | TPR | FPR |
|---|---|---|---|---|
| **LVC** | DSC | 0.998 | 1.000 | 0.000 |
| | MSD | 1.000 | 1.000 | 0.000 |
| **LVM** | DSC | 0.051 | 1.000 | 0.001 |
| | MSD | 1.000 | 1.000 | 0.000 |
| **RVC** | DSC | 0.901 | 1.000 | 0.033 |
| | MSD | 0.997 | 0.997 | 0.000 |
| **Av.** | DSC | 0.650 | 1.000 | 0.011 |
| | MSD | 0.999 | 0.999 | 0.000 |
| **WH** | DSC | **0.998** | **1.000** | **0.000** |
| | MSD | **1.000** | **1.000** | **0.000** |

| | MAE | | | |
|---|---|---|---|---|
| **Class** | **DSC** | **MSD** (mm) | **RMS** (mm) | **HD** (mm) |
| **LVC** | 0.082 | 0.386 | 0.442 | 1.344 |
| **LVM** | 0.268 | 0.510 | 0.547 | 2.127 |
| **RVC** | 0.146 | 0.588 | 0.656 | 2.086 |
| **Av.** | 0.165 | 0.495 | 0.548 | 1.852 |
| **WH** | **0.089** | **0.460** | **0.509** | **1.698** |

# 3.6 Conclusions

A list of the conclusions from the chapter. Each with a title and an explanation.

**A Conclusion 1 Title**

Explanation of Conclusion 1.

**B Conclusion 2 Title**

Explanation of Conclusion 2.

Chapter 6

# Conclusions

*This is the Conclusions chapter. It reiterates conclusions made throughout the Thesis and explores the limitations. Comments on future work are also made.*

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This chapter recounts the main conclusions of this work including its limitations. A discussion is begun on potential avenues for future work.

# 6.1 Main Conclusions

A brief summary of the ideas that this Thesis has explored. The main contributions are then laid out in summary below then discussed further afterwards.

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**Chapter 1 Title**

**A** Conclusion 1.

**B** Conclusion 2.

**C** Conclusion 3.

**Chapter 2 Title**

**A** Conclusion 1.

**B** Conclusion 2.

**C** Conclusion 3.

**Chapter 3 Title**

**A** Conclusion 1.

**B** Conclusion 2.

**C** Conclusion 3.

## 6.1.1 Chapter 1 Conclusions

Explanation of the conclusions gathered from Chapter 1 and how they fit into the overall idea of the Thesis.

## 6.1.2 Chapter 2 Conclusions

Explanation of the conclusions gathered from Chapter 2 and how they fit into the overall idea of the Thesis.

## 6.1.3 Chapter 3 Conclusions

Explanation of the conclusions gathered from Chapter 3 and how they fit into the overall idea of the Thesis.

## 6.2 Limitations

The primary limitations are laid out here and then discussed afterwards.

**Chapter 1 Title**

**A** Limitation 1.

**B** Limitation 2.

**C** Limitation 3.

**Chapter 2 Title**

**A** Limitation 1.

**B** Limitation 2.

**C** Limitation 3.

**Chapter 3 Title**

**A** Limitation 1.

**B** Limitation 2.

**C** Limitation 3.

### 6.2.1 Chapter 1 Limitations

Explanation of the limitations gathered from Chapter 1 and potential approaches for overcoming them.

### 6.2.2 Chapter 2 Limitations

Explanation of the limitations gathered from Chapter 2 and potential approaches for overcoming them.

### 6.2.3 Chapter 3 Limitations

Explanation of the limitations gathered from Chapter 3 and potential approaches for overcoming them.

## 6.3 Further Work

Outline of the future work to be done in this area. What are the immediate next steps for this line of research? What would be done further down the line? Which areas are interesting to explore? What has changed since this work was done?

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# References

[1] Robinson, R. D. “Reliable Machine Learning for Medical Imaging Data through Automated Quality Control and Data Harmonization”. In: (July 2020).

# Appendices

*The GitHub repository at https://github.com/mlnotebook contains the code used in this work as well as those snippets shown here.*

**Listing 1:** Add two Integers in Python.

**Listing 6.1: Example Source Code - Add Two Integers** Python code to perform addition of two integers.

```
""" Example Script for Thesis Template

R. Robinson 2020 https://github.com/mlnotebook
"""

import argparse
import numpy as np


def add_two_integers(num1, num2):
    """ Function to add two integers.

    Args:
        num1 (int): an integer to add to num2
        num2 (int): an integer to add to num1
    Returns:
        result (unt): the sum of the two integers
    """
    assert ((type(num1) == int) & (type(num2) == int)), \
        f"num1 and num2 should both be integers. Got {type(int1)} and {type(int2)}."

    result = int(num1 + num2)

    return result


if __name__ == "__main__":
    parser = argparse.ArgumentParser(description='Add two integers.')
    parser.add_argument('num1', type=int, help='first integer to add')
    parser.add_argument('num2', type=int, help='second integer to add')

    args = parser.parse_args()

    result = add_two_integers(args.num1, args.num2)

    print(f"{args.num1} + {args.num2} = {result}")
```