

YOUR THESIS TITLE HERE

YOUR NAME HERE

YOUR DEGREE

YOUR FACULTY  
UNIVERSITI TUNKU ABDUL RAHMAN  
MONTH YEAR

**YOUR THESIS TITLE HERE**

By

**YOUR NAME HERE**

A thesis submitted to the  
Department of Your Department,  
Your Faculty,  
Universiti Tunku Abdul Rahman,  
in partial fulfillment of the requirements for the degree of  
Your Degree  
Month Year

## **ABSTRACT**

### **YOUR THESIS TITLE HERE**

Your abstract content here. This should provide a comprehensive summary of your thesis, including the main contributions, methodologies, and findings.

## **ACKNOWLEDGEMENTS**

I would like to express my sincere gratitude to my supervisors for their invaluable guidance, insightful advice, and continuous support throughout my research. I am also sincerely grateful to Universiti Tunku Abdul Rahman for providing the funding, resources, and opportunities that were essential in completing this study.

[Your additional acknowledgments content here. Express gratitude to collaborators, family, and anyone else who supported your research.]

**Template Acknowledgement:** This thesis was prepared using a template originally developed by Tan Jing Jie. The template is available at: <https://github.com/jingjie00/utartemplate>

## **APPROVAL SHEET**

This thesis entitled “YOUR THESIS TITLE HERE” was prepared by YOUR NAME and submitted as partial fulfillment of the requirements for the degree of Your Degree at Universiti Tunku Abdul Rahman.

Approved by:

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Date: 25 October 2025

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(Co-Supervisor Name)

Date: 25 October 2025

Co-Supervisor

Department of Your Department,

Your Faculty,

Universiti Tunku Abdul Rahman

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(Co-Supervisor Name)

Date: 25 October 2025

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**YOUR FACULTY  
UNIVERSITI TUNKU ABDUL RAHMAN**

Date: 25 October 2025

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I understand that the University will upload softcopy of my thesis in pdf format into Institutional Repository Name, which may be made accessible to University community and public.

Your truly,

---

(YOUR NAME)

## **DECLARATION**

I hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Tunku Abdul Rahman or other institutions.

---

(YOUR NAME)

Date: 25 October 2025

## TABLE OF CONTENTS

	Page
<b>ABSTRACT</b>	ii
<b>ACKNOWLEDGEMENTS</b>	iii
<b>APPROVAL SHEET</b>	iv
<b>SUBMISSION SHEET</b>	v
<b>DECLARATION</b>	vi
<b>TABLE OF CONTENTS</b>	vii
<b>LIST OF TABLES</b>	xii
<b>LIST OF FIGURES</b>	xiii
<b>LIST OF ABBREVIATIONS</b>	xiv
 <b>CHAPTERS</b>	
<b>1 INTRODUCTION</b>	1
1.1 Preface	1
1.2 Research Background	1
1.3 Problem Statement	1
1.4 Objectives	2
1.5 Significance of Research	3
1.6 Thesis Outline	4
1.7 Epilogue	4
<b>2 LITERATURE REVIEW</b>	5
2.1 Preface	5
2.2 Theoretical Framework	5
2.2.1 a	6
2.2.2 b	7
2.2.3 c	7
2.3 Theoretical Models	7
2.3.1 a	7
2.3.2 b	7
2.3.3 c	9
2.3.4 d	9
2.4 Datasets and Corpora	9
2.5 Machine Learning Techniques	11
2.5.1 a	11
2.5.2 b	11

2.5.3	c	11
2.5.4	d	11
2.5.5	e	12
2.6	Class Imbalance Mitigation Techniques	12
2.7	Large Language Models (LLM)	12
2.7.1	a	12
2.7.2	b	12
2.7.3	c	12
2.8	Recognition Models	12
2.8.1	a	13
2.8.2	b	13
	2.8.2.1 a	13
	2.8.2.2 b	13
	2.8.3 c	13
2.9	Applications	13
2.9.1	a	13
	2.9.1.1 a	13
	2.9.1.2 b	13
2.9.2	b	13
	2.9.2.1 a	14
	2.9.2.2 b	14
2.10	Epilogue	14
<b>3</b>	<b>CHAPTER TITLE</b>	<b>15</b>
3.1	Preface	15
3.2	Methodologies	15
3.2.1	a	17
3.2.2	b	17
3.2.3	c	17
3.2.4	d	17
3.2.5	e	18
3.2.6	f	18
	3.2.6.1 a	18
	3.2.6.2 b	18
	3.2.6.3 c	18
	3.2.6.4 d	19
3.2.7	g	20
	3.2.7.1 a	20
	3.2.7.2 b	20
	3.2.7.3 c	20
3.2.8	h	20

3.3	Evaluations	21
3.3.1	a	21
3.3.2	b	22
3.4	Results	22
3.4.1	a	22
3.4.2	b	24
3.4.3	c	27
3.4.4	d	29
3.5	Epilogue	31
<b>4</b>	<b>CHAPTER TITLE</b>	<b>32</b>
4.1	Preface	32
4.2	Methodologies	32
4.2.1	a	34
4.2.2	b	34
4.2.2.1	a	34
4.2.2.2	b	34
4.2.2.3	c	34
4.2.2.4	d	34
4.2.2.5	e	35
4.2.3	c	35
4.3	Evaluations	35
4.3.1	a	35
4.3.2	b	35
4.3.3	c	35
4.4	Results	35
4.4.1	a	35
4.4.2	b	35
4.4.2.1	a	35
4.4.2.2	b	36
4.4.2.3	c	36
4.4.2.4	d	36
4.4.3	c	36
4.4.3.1	a	36
4.4.3.2	b	36
4.4.3.3	c	36
4.4.3.4	d	36
4.4.4	d	36
4.4.5	e	37
4.5	Epilogue	37
<b>5</b>	<b>CHAPTER TITLE</b>	<b>38</b>

5.1	Preface	38
5.2	Methodologies	38
5.2.1	a	38
5.2.2	b	38
	5.2.2.1 a	38
	5.2.2.2 b	39
	5.2.2.3 c	39
5.2.3	c	39
5.3	Evaluations	39
5.3.1	a	39
5.3.2	b	40
5.4	Results	40
5.4.1	a	40
5.4.2	b	40
5.5	Epilogue	41
<b>6</b>	<b>CHAPTER TITLE</b>	<b>42</b>
6.1	Preface	42
6.2	Methodologies	42
6.2.1	a	42
6.2.2	b	44
	6.2.2.1 a	44
	6.2.2.2 b	44
	6.2.2.3 c	44
6.2.3	c	44
6.3	Evaluations	45
6.3.1	a	45
6.3.2	b	45
6.4	Results	45
6.4.1	a	46
6.4.2	b	46
6.4.3	c	46
6.5	Epilogue	46
<b>7</b>	<b>CHAPTER TITLE</b>	<b>47</b>
7.1	Preface	47
7.2	Methodologies	47
7.2.1	a	47
7.2.2	b	49
	7.2.2.1 a	49
	7.2.2.2 b	49
7.2.3	c	49

7.3	Evaluations	49
7.3.1	a	49
7.3.2	b	49
7.4	Results	49
7.4.1	a	49
7.4.2	b	50
7.4.3	c	50
7.4.4	d	50
7.5	Epilogue	50
<b>8</b>	<b>CONCLUSION</b>	<b>51</b>
8.1	Preface	51
8.2	Recapitulation	51
8.2.1	a	51
8.2.2	b	51
8.2.3	c	51
8.2.4	d	51
8.2.5	e	51
8.3	Future Works	51
8.3.1	a	52
8.3.2	b	52
8.3.3	c	52
8.3.4	d	52
8.4	Epilogue	53
<b>REFERENCES</b>		<b>54</b>
<b>APPENDICES</b>		<b>55</b>
.1	Datasets	55
.2	Code Repository and Resources	56
.3	Publication	57

## **LIST OF TABLES**

<b>Table</b>		<b>Page</b>
2.1	Your caption here	7
2.2	Your caption here	8
2.3	Your caption here	9
2.4	Your caption here	9
2.5	Your caption here	10
2.6	Your caption here	11
2.7	Your caption here	11
2.8	Your caption here	11
2.9	Your caption here	11
3.1	Your caption here	25
3.2	Your caption here	26
3.3	Your caption here	28
3.4	Your caption here	28
3.5	Your caption here	31
6.1	Your caption here	43
7.1	Your caption here	48
7.2	Your caption here	50
7.3	Your caption here	50
7.4	Your caption here	50
7.5	Your caption here	50

## **LIST OF FIGURES**

<b>Figure</b>	<b>Page</b>
2.1 Example figure: Neural Network architecture	6
2.2 Your caption here	12
2.3 Your caption here	12
2.4 Your caption here	12
2.5 Your caption here	12
3.1 Your caption here	16
3.2 Your caption here	17
3.3 Your caption here	17
3.4 Your caption here	19
3.5 Your caption here	23
3.6 Your caption here	29
3.7 Your caption here	29
3.8 Your caption here	30
4.1 Your caption here	33
4.2 Your caption here	34
4.3 Your caption here	34
4.4 Your caption here	34
4.5 Your caption here	34
4.6 Your caption here	36
4.7 Your caption here	37
5.1 Your caption here	38
5.2 Your caption here	39
5.3 Your caption here	40
5.4 Your caption here	40
5.5 Your caption here	40
5.6 Your caption here	40
6.1 Your caption here	42
6.2 Your caption here	45
6.3 Your caption here	45
6.4 Your caption here	45
6.5 Your caption here	46
6.6 Your caption here	46

7.1	Your caption here	47
7.2	Your caption here	49

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Preface**

Your content here. This section introduces the research topic and provides context for the study ([Author and Author, 2024](#)).

### **1.2 Research Background**

Your content here

### **1.3 Problem Statement**

Your content here

1. Problem statement item 1
2. Problem statement item 2
3. Problem statement item 3
4. Problem statement item 4
5. Problem statement item 5

## **1.4 Objectives**

Your content here

1. Objective 1
2. Objective 2
3. Objective 3
4. Objective 4
5. Objective 5

## **1.5 Significance of Research**

Your content here

## **1.6 Thesis Outline**

Your content here

The **5 core research works (RWs)** presented in this thesis include:

- RW1** Research Work 1 Title  
(Chapter [3](#), Abbreviation)
- RW2** Research Work 2 Title  
(Chapter [4](#), Abbreviation)
- RW3** Research Work 3 Title  
(Chapter [5](#), Abbreviation)
- RW4** Research Work 4 Title  
(Chapter [6](#), Abbreviation)
- RW5** Research Work 5 Title  
(Chapter [7](#), Abbreviation)

## **1.7 Epilogue**

Your content here

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Preface**

Your content here. This section reviews relevant literature and theoretical frameworks ([Author, 2022](#); [Smith and Doe, 2020](#)).

#### **2.2 Theoretical Framework**

Your content here. The theoretical framework is based on established models [Jones \(2021\)](#).

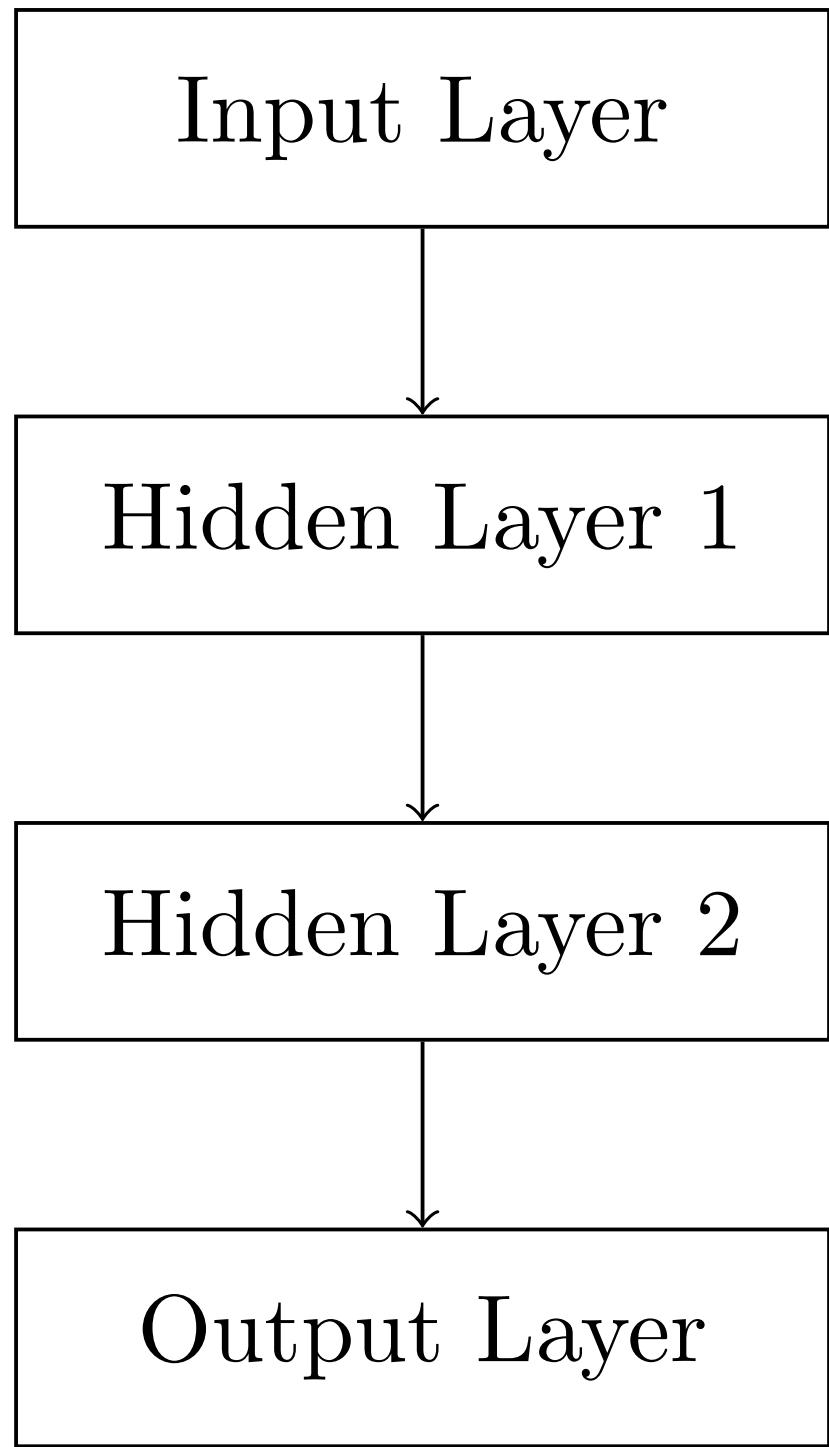


Figure 2.1: Example figure: Neural Network architecture

### 2.2.1 a

Your content here

### **2.2.2 b**

Your content here

### **2.2.3 c**

Your content here

## **2.3 Theoretical Models**

Your content here

### **2.3.1 a**

Your content here

Table 2.1: Your caption here

<b>Column 1</b>	<b>Column 2</b>
Data	Data

### **2.3.2 b**

Your content here

Table 2.2: Your caption here

Table content placeholder
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### **2.3.3 c**

Your content here

Table 2.3: Your caption here

Table content placeholder
---------------------------

### **2.3.4 d**

Your content here

Table 2.4: Your caption here

Table content placeholder
---------------------------

## **2.4 Datasets and Corpora**

Your content here

Table 2.5: Your caption here

Column headers	
Table content placeholder	

## **2.5 Machine Learning Techniques**

Your content here

### **2.5.1 a**

Your content here

Table 2.6: Your caption here

Table content placeholder
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### **2.5.2 b**

Your content here

Table 2.7: Your caption here

Table content placeholder
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### **2.5.3 c**

Your content here

Table 2.8: Your caption here

Table content placeholder
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Table 2.9: Your caption here

Table content placeholder	
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### **2.5.4 d**

Your content here

### **2.5.5 e**

Your content here

PLACEHOLDER: Figure showing neural network architecture

Figure 2.2: Your caption here

PLACEHOLDER: Figure showing RNN architecture

Figure 2.3: Your caption here

PLACEHOLDER: Figure showing LSTM architecture

Figure 2.4: Your caption here

PLACEHOLDER: Figure showing Transformer architecture

Figure 2.5: Your caption here

## **2.6 Class Imbalance Mitigation Techniques**

Your content here

### **2.7 Large Language Models (LLM)**

Your content here

#### **2.7.1 a**

Your content here

#### **2.7.2 b**

Your content here

#### **2.7.3 c**

Your content here

## **2.8 Recognition Models**

Your content here

### **2.8.1 a**

Your content here

### **2.8.2 b**

Your content here

#### **2.8.2.1 a**

Your content here

#### **2.8.2.2 b**

Your content here

### **2.8.3 c**

Your content here

## **2.9 Applications**

Your content here

### **2.9.1 a**

Your content here

#### **2.9.1.1 a**

Your content here

#### **2.9.1.2 b**

Your content here

### **2.9.2 b**

Your content here

### **2.9.2.1 a**

Your content here

### **2.9.2.2 b**

Your content here

## **2.10 Epilogue**

Your content here

## **CHAPTER 3**

### **CHAPTER TITLE**

#### **3.1 Preface**

Your content here

The key contributions of this work are as follows:

- Contribution 1
- Contribution 2
- Contribution 3

#### **3.2 Methodologies**

Your content here

PLACEHOLDER: Figure showing methodology diagram

Figure 3.1: Your caption here

*Yourequationhere* (3.1)

PLACEHOLDER: Figure showing label distribution

Figure 3.2: Your caption here

PLACEHOLDER: Figure showing dataset split

Figure 3.3: Your caption here

*Yourequationhere* (3.2)

### **3.2.1 a**

Your content here

### **3.2.2 b**

Your content here

### **3.2.3 c**

Your content here

### **3.2.4 d**

Your content here

*Yourequation* (3.3)

*Yourequation* (3.4)

### **3.2.5 e**

Your content here

### **3.2.6 f**

Your content here

#### **3.2.6.1 a**

Your content here

$$Your equation here \quad (3.5)$$

#### **3.2.6.2 b**

Your content here

$$Your equation here \quad (3.6)$$

#### **3.2.6.3 c**

Your content here

$$Your equation here \quad (3.7)$$

$$Your equation here \quad (3.8)$$

$$Your equation here \quad (3.9)$$

### 3.2.6.4 d

Your content here

*Youre*quation (3.10)

PLACEHOLDER: Figure showing loss visualization

Figure 3.4: Your caption here

### **3.2.7 g**

Your content here

#### **3.2.7.1 a**

Your content here

*Yourequationhere* (3.11)

#### **3.2.7.2 b**

Your content here

*Yourequationhere* (3.12)

*Yourequationhere* (3.13)

#### **3.2.7.3 c**

Your content here

*Yourequationhere* (3.14)

### **3.2.8 h**

Your content here

---

**Algorithm 1** Your algorithm caption

---

**Require:** Input parameters

**Ensure:** Output

1: Algorithm steps

---

### 3.3 Evaluations

#### 3.3.1 a

Your content here

*Yourequationhere* (3.15)

*Yourequationhere* (3.16)

*Yourequationhere* (3.17)

*Yourequationhere* (3.18)

*Yourequationhere* (3.19)

*Yourequationhere* (3.20)

*Yourequationhere* (3.21)

*Yourequationhere* (3.22)

*Yourequationhere* (3.23)

*Youre equation here* (3.24)

### **3.3.2 b**

Your content here

*Youre equation here* (3.25)

Where:

- Description 1
- Description 2

## **3.4 Results**

Your content here

### **3.4.1 a**

Your content here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Dataset 1

(b) Dataset 2

Figure 3.5: Your caption here

### **3.4.2 b**

Your content here

Table 3.1: Your caption here

Table content placeholder
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Table 3.2: Your caption here

Table content placeholder
---------------------------

### **3.4.3 c**

Your content here

Table 3.3: Your caption here

Table content placeholder
---------------------------

Table 3.4: Your caption here

Table content placeholder
---------------------------

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Dataset 1

(b) Dataset 2

Figure 3.6: Your caption here

### 3.4.4 d

Your content here

PLACEHOLDER: Figure 1

PLACEHOLDER: Figure 2

(a) Subfigure 1

(b) Subfigure 2

PLACEHOLDER: Figure 3

PLACEHOLDER: Figure 4

(c) Subfigure 3

(d) Subfigure 4

Figure 3.7: Your caption here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Dataset 1

(b) Dataset 2

Figure 3.8: Your caption here

$$Your equation here \quad (3.26)$$

$$Your equation here \quad (3.27)$$

$$Your equation here \quad (3.28)$$

Table 3.5: Your caption here

Table content placeholder
---------------------------

### 3.5 Epilogue

Your content here

# **CHAPTER 4**

## **CHAPTER TITLE**

### **4.1 Preface**

Your content here

1. Research Question 1
2. Research Question 2
3. Research Question 3

### **4.2 Methodologies**

Your content here

- Contribution 1
- Contribution 2
- Contribution 3

PLACEHOLDER: Figure showing methodology diagram

Figure 4.1: Your caption here

#### **4.2.1 a**

Your content here

#### **4.2.2 b**

Your content here

##### **4.2.2.1 a**

Your content here

PLACEHOLDER: Prompt example figure

Figure 4.2: Your caption here

##### **4.2.2.2 b**

Your content here

PLACEHOLDER: Prompt example figure

Figure 4.3: Your caption here

##### **4.2.2.3 c**

Your content here

PLACEHOLDER: Prompt example figure

Figure 4.4: Your caption here

##### **4.2.2.4 d**

Your content here

PLACEHOLDER: Prompt example figure

Figure 4.5: Your caption here

#### **4.2.2.5 e**

Your content here

#### **4.2.3 c**

Your content here

### **4.3 Evaluations**

Your content here

#### **4.3.1 a**

Your content here

#### **4.3.2 b**

Your content here

#### **4.3.3 c**

Your content here

### **4.4 Results**

Your content here

#### **4.4.1 a**

Your content here

#### **4.4.2 b**

Your content here

#### **4.4.2.1 a**

Your content here

#### **4.4.2.2 b**

Your content here

#### **4.4.2.3 c**

Your content here

#### **4.4.2.4 d**

Your content here

#### **4.4.3 c**

Your content here

#### **4.4.3.1 a**

Your content here

#### **4.4.3.2 b**

Your content here

#### **4.4.3.3 c**

Your content here

#### **4.4.3.4 d**

Your content here

#### **4.4.4 d**

Your content here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Subfigure 1

(b) Subfigure 2

Figure 4.6: Your caption here

PLACEHOLDER: Figure showing cost analysis

Figure 4.7: Your caption here

#### **4.4.5 e**

Your content here

### **4.5 Epilogue**

Your content here

# **CHAPTER 5**

## **CHAPTER TITLE**

### **5.1 Preface**

Your content here

1. Contribution 1
2. Contribution 2
3. Contribution 3

### **5.2 Methodologies**

Your content here

PLACEHOLDER: Figure showing JAM architecture

Figure 5.1: Your caption here

#### **5.2.1 a**

Your content here

*Yourequationhere* (5.1)

#### **5.2.2 b**

Your content here

##### **5.2.2.1 a**

Your content here

*Yourequationhere* (5.2)

*Youre*equation*here* (5.3)

*Youre*equation*here* (5.4)

*Youre*equation*here* (5.5)

### **5.2.2.2 b**

Your content here

*Youre*equation*here* (5.6)

PLACEHOLDER: Figure showing LAJ mechanism

Figure 5.2: Your caption here

### **5.2.2.3 c**

Your content here

### **5.2.3 c**

Your content here

## **5.3 Evaluations**

Your content here

### **5.3.1 a**

Your content here

### **5.3.2 b**

Your content here

## **5.4 Results**

Your content here

### **5.4.1 a**

Your content here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Dataset 1

(b) Dataset 2

Figure 5.3: Your caption here

### **5.4.2 b**

Your content here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Dataset 1

(b) Dataset 2

Figure 5.4: Your caption here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Subfigure 1

(b) Subfigure 2

PLACEHOLDER: Figure 3 PLACEHOLDER: Figure 4

(c) Subfigure 3

(d) Subfigure 4

Figure 5.5: Your caption here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Subfigure 1

(b) Subfigure 2

PLACEHOLDER: Figure 3 PLACEHOLDER: Figure 4

(c) Subfigure 3

(d) Subfigure 4

Figure 5.6: Your caption here

## **5.5 Epilogue**

Your content here

# **CHAPTER 6**

## **CHAPTER TITLE**

### **6.1 Preface**

Your content here

- Research Question 1
- Research Question 2
- Research Question 3

### **6.2 Methodologies**

Your content here

PLACEHOLDER: Figure showing ADAM architecture

Figure 6.1: Your caption here

#### **6.2.1 a**

Your content here

*Yourequationhere* (6.1)

Where:

- Description 1
- Description 2

Table 6.1: Your caption here

Table content placeholder
---------------------------

## **6.2.2 b**

Your content here

### **6.2.2.1 a**

Your content here

*Yourequationhere* (6.2)

*Yourequationhere* (6.3)

*Yourequationhere* (6.4)

Where:

- Description 1
- Description 2
- Description 3

## **6.2.2.2 b**

Your content here

*Yourequationhere* (6.5)

## **6.2.2.3 c**

Your content here

*Yourequationhere* (6.6)

## **6.2.3 c**

Your content here

### **6.3 Evaluations**

Your content here

#### **6.3.1 a**

Your content here

#### **6.3.2 b**

Your content here

### **6.4 Results**

Your content here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Subfigure 1

(b) Subfigure 2

PLACEHOLDER: Figure 3 PLACEHOLDER: Figure 4

(c) Subfigure 3

(d) Subfigure 4

PLACEHOLDER: Figure 5

(e) Subfigure 5

Figure 6.2: Your caption here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Dataset 1

(b) Dataset 2

Figure 6.3: Your caption here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Dataset 1

(b) Dataset 2

Figure 6.4: Your caption here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Subfigure 1

(b) Subfigure 2

PLACEHOLDER: Figure 3 PLACEHOLDER: Figure 4

(c) Subfigure 3

(d) Subfigure 4

PLACEHOLDER: Figure 5

(e) Subfigure 5

Figure 6.5: Your caption here

PLACEHOLDER: Figure 1 PLACEHOLDER: Figure 2

(a) Subfigure 1

(b) Subfigure 2

PLACEHOLDER: Figure 3 PLACEHOLDER: Figure 4

(c) Subfigure 3

(d) Subfigure 4

PLACEHOLDER: Figure 5

(e) Subfigure 5

Figure 6.6: Your caption here

#### **6.4.1 a**

Your content here

#### **6.4.2 b**

Your content here

#### **6.4.3 c**

Your content here

### **6.5 Epilogue**

Your content here

# **CHAPTER 7**

## **CHAPTER TITLE**

### **7.1 Preface**

Your content here

- Contribution 1
- Contribution 2
- Contribution 3

### **7.2 Methodologies**

Your content here

PLACEHOLDER: Figure showing framework

Figure 7.1: Your caption here

#### **7.2.1 a**

Your content here

Table 7.1: Your caption here

Table content placeholder
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### **7.2.2 b**

Your content here

#### **7.2.2.1 a**

Your content here

#### **7.2.2.2 b**

Your content here

### **7.2.3 c**

Your content here

PLACEHOLDER: Figure showing feature visualization

Figure 7.2: Your caption here

## **7.3 Evaluations**

Your content here

### **7.3.1 a**

Your content here

### **7.3.2 b**

Your content here

## **7.4 Results**

Your content here

### **7.4.1 a**

Your content here

Table 7.2: Your caption here

Table content placeholder
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#### **7.4.2 b**

Your content here

Table 7.3: Your caption here

Table content placeholder
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#### **7.4.3 c**

Your content here

Table 7.4: Your caption here

Table content placeholder
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#### **7.4.4 d**

Your content here

Table 7.5: Your caption here

Table content placeholder
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### **7.5 Epilogue**

Your content here

## **CHAPTER 8**

### **CONCLUSION**

#### **8.1 Preface**

Your content here

#### **8.2 Recapitulation**

Your content here

##### **8.2.1 a**

Your content here

##### **8.2.2 b**

Your content here

##### **8.2.3 c**

Your content here

##### **8.2.4 d**

Your content here

##### **8.2.5 e**

Your content here

#### **8.3 Future Works**

Your content here

**8.3.1 a**

Your content here

**8.3.2 b**

Your content here

**8.3.3 c**

Your content here

**8.3.4 d**

Your content here

## **8.4 Epilogue**

Your content here

## **REFERENCES**

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- D. Author. *Example Book Title*. Publisher Name, 2022.
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## **APPENDICES**

### **.1 Datasets**

Your datasets description here

- **Dataset 1 Name**

[DatasetURL](#)

- **Dataset 2 Name**

[DatasetURL](#)

## .2 Code Repository and Resources

Your code repository description here

- **Chapter 3**

Chapter Title:  
[RepositoryURL](#)

- **Chapter 4**

Chapter Title:  
[RepositoryURL](#)

- **Chapter 5**

Chapter Title:  
[RepositoryURL](#)

- **Chapter 6**

Chapter Title:  
[RepositoryURL](#)

- **Chapter 7**

Chapter Title:  
[RepositoryURL](#)

Each link provides access to the corresponding chapter's codebase and resources. For setup instructions and further details, please consult the README files in each repository.

### **.3 Publication**

Your publication information here

#### **Articles derived from this Degree thesis**

- Publication entry 1
- Publication entry 2

#### **Articles related to this Degree thesis**

- Publication entry 1
- Publication entry 2

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