

Title of Your Project

*Submitted in partial fulfillment of the
requirements for the degree*

of

Bachelor of Science in Electrical and Electronics Engineering

by

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**MARMARA
UNIVERSITY**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FACULTY OF ENGINEERING

MARMARA UNIVERSITY

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DECLARATION OF AUTHORSHIP

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SUBMITTED TO THE DEPARTMENT OF ELECTRICAL AND ELECTRONICS
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DEGREE OF
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I would like to extend my sincere thanks to

I would like to thank

I was lucky to meet many

Finally, I would like to thank my family and friends

First Author, Second Author, Third Author, Forth Author

Marmara University

Date: February, 2024

ABSTRACT

Write the abstract here.

Keywords: Artificial Intelligence, Internet of Things (IoT). (write in alphabet order)

ABBREVIATIONS

AWGN	Additive White Gaussian Noise
BPSK	Binary Phase Shift Keying
MMSE	Minimum Mean Square Error

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Chapter 1

INTRODUCTION

Chapter 1 should provide a clear statement of the problem posed by the project, and why the problem is of interest. It should reflect the scenario, if available. The introduction also needs to present background information so that the reader can understand the significance of the problem.

1.1 Thesis Background

With the aim to provide an overview of relevant research, studies, and theories related to the problem or topic addressed in the project. Why the problem is of interest and importance now; Who will use your proposed solution; State the potential impact of your project results. Describe the current situation or existing solutions and their shortcomings. Conclude by bridging into the project definition and/or objectives.

You can use the following itemization for related information [1].

- bla
- blabla
- blablalba
- blablalbla

1.2 Project Definition

Define the problem in terms of the technical details and features that the product, service, or process should have. These details are often set by your advisors to make sure the project is challenging and appropriate for a project. Here's how to break it down:

1.2.1 Problem Statement

State the problem in a single sentence or a brief paragraph.

1.2.2 Context and Scope

Define the scope of the problem—what aspects it encompasses and what it does not cover.

1.2.3 Significance and Implications

Explain why solving this problem is important. What are the potential consequences of not addressing it?

Remember to keep the definition of the problem concise, focused, and aligned with the goals of your project. It should be easy to understand and provide a clear sense of direction for the rest of the proposal.



Figure 1.1: A magnificent bird.

If you want to cite a reference, you should use the following structure: [2, 3, 4]. The names of the cited documents are specified in references.bib file.

Let's say you want to make a list of different fruit types with enumeration, you can use the following structure.

1. apple
2. banana
3. grape

1.3 A Meaningless Section

"Velit dolor illum facilisis zzril ipsum, augue odio, accumsan ea augue molestie lobortis zzril laoreet ex ad, adipiscing nulla. Veniam dolore, vel te in dolor te, feugait dolore ex vel erat duis nostrud diam commodo ad eu in consequat esse in ut wisi. Consectetur dolore feugiat wisi eum dignissim tincidunt vel, nostrud, at vulputate eum euismod, diam minim eros consequat lorem aliquam et ad. Feugait illum sit suscipit ut, tation in dolore euismod et iusto nulla amet wisi odio quis nisl feugiat adipiscing luptatum minim nisl, quis, erat, dolore. Elit quis sit dolor veniam blandit ullamcorper ex, vero nonummy, duis exerci delenit ullamcorper at feugiat ullamcorper, ullamcorper elit vulputate iusto esse luptatum duis autem. Nulla nulla qui, te praesent et at nisl ut in consequat blandit vel augue ut.

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Chapter 2

RESEARCH OBJECTIVE

The objectives of a project outline the specific goals and outcomes you and your team aim to achieve through the project. These objectives guide your team and provide a clear focus. When writing the objectives section, make sure they are **specific, measurable, achievable, relevant, and time-bound (SMART)**. State the first objective in clear terms. Make it specific and measurable. Describe what you plan to achieve with this objective. Make it specific and measurable.

2.1 Adding Mathematical Expressions

If you want to add a mathematical expression, you can use the following structure.

$$E = MC^2 \tag{2.1}$$

$$P = IV \tag{2.2}$$

$$4 = \frac{8}{2} \tag{2.3}$$

$$\sum_{i=0}^{\infty} 2^i = \tag{2.4}$$

$$\lim_{s \rightarrow 0} s - 1 = \tag{2.5}$$

$$e^{\pi i} + 1 = 0 \tag{2.6}$$

You should give the equation references as follows:

When you consider (2.1), the relation between the energy and the speed of the matter will be understood. On the other hand, we know (2.6).

2.2 Project Specifications

Given the project objectives above, you are asked to provide the detailed technical requirements, features, and characteristics that your project must adhere to in order to meet its objectives. These include technical needs, performance expectations, design elements, functionalities, compatibility, and security measures. Specifications guide the project's development, ensuring it meets its objectives effectively and aligns with established criteria.

2.2.1 Adding Tables in \LaTeX :

You can use different types of table structures in \LaTeX . One of them is as follows:

Table 2.1: Example Table

Hyperparameter	Value
Optimizer	Adam [4]
Objective function	Fusion of softmax and center loss
Epochs	450
Initial learning rate	5×10^{-3}
Mini-batch size	256

Also you can use the following type:

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

Table 2.2: Your caption.

You can give a reference to Table 2.1 and 2.2.

2.3 Another Meaningless Section

"Velit dolor illum facilisis zzril ipsum, augue odio, accumsan ea augue molestie lobortis zzril laoreet ex ad, adipiscing nulla. Veniam dolore, vel te in dolor te, feugait dolore ex vel erat duis nostrud diam commodo ad eu in consequat esse in ut wisi. Consectetuer dolore

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2.3.1 A Very Important Subsection

Illum suscipit delenit commodo augue exerci magna veniam hendrerit dignissim dui ut feugait amet dolor dolor suscipit iriure veniam. Vel quis enim vulputate nulla facilisis volutpat vel in, suscipit facilisis dolore ut veniam, dui facilisi wisi nulla aliquip vero praesent nibh molestie consectetur nulla. Wisi nibh exerci hendrerit consequat, nostrud lobortis ut praesent dignissim tincidunt enim eum accumsan. Lorem, nonummy dui iriure autem feugait praesent, dui, accumsan tation enim facilisi qui te dolore magna velit, iusto esse eu, zzril. Feugiat enim zzril, te vel illum, lobortis ut tation, elit luptatum ipsum, aliquam dolor sed. Ex consectetur aliquip in, tation delenit dignissim accumsan consequat, vero, et ad eu velit ut dui ea ea odio.

Chapter 3

RELATED LITERATURE

The purpose of the Chapter 3 is to reveal the related studies. You should mention all the studies you inspired. Try to answer the following questions: Who did try to solve a similar problem? What are their results? Which parts of these results are unsatisfactory? What are the contributions you achieved in your study? In which ways your study related to the previous study? etc.

Chapter 4

SYSTEM DESIGN

Chapter 4 provides an overview of the implementation and testing phases of the proposed project. This chapter is dedicated to explaining how the project will be executed, the system will be tested, and the obtained results will be analyzed and discussed. The following subsections guide the presentation of this information and Chapter 4 must include all of them:

4.1 Realistic Constraints and Conditions

In this subsection, you must include factors such as environmental issues, sustainability, manufacturability, ethics, health, safety, and social and political issues, in accordance with the nature of the design.

4.2 Cost of the Design

In this subsection, you must include the cost of your design in detail in accordance with the concept of the design. You can provide price of each components that you used in your project. Please be specific and present each values in a neat way. You can use a table as we defined in Table 2.1 and 2.2 .

4.3 Engineering Standards

In this subsection, you must provide and discuss the engineering standards used in your design.

4.4 Details of the System Design

In this subsection, you must provide a detailed explanation of your design.

Chapter 5

METHODS

You should discuss the logic behind your study in detail. Give all the experimental setups, algorithms, Hardware design specifics in this chapter. You should explain the simulations you have done if available.

Use sections to organize your paragraphs.



Figure 5.1: A Printed Circuit Board.

If you want to make a reference to a figure, you can do this as follows: It is widely known that printed circuit boards are very essential in electronics and one example is given in Figure 5.1.

Chapter 6

RESULTS AND DISCUSSION

In the previous chapter, you have introduced your project. Now, you will present the results of your study. Comment on the results and try to answer the below questions:

- Are they satisfactory enough to solve your problem mentioned in chapter 1 and chapter 5?
- What are the strong and weak parts of your results?
- Discuss the satisfactory/unsatisfactory parts.

6.1 Simulation Results

You have mentioned about the simulations of your project in the previous chapter. In this section, you should introduce your findings.

With some figures...

Chapter 7

CONCLUSION

Chapter 7 should summarize the key findings and outcomes of your project. This section serves to highlight the achievements, a brief discuss the implications of your work, and offer recommendations for future steps. The following subsections guide the presentation of this information:

7.1 Conclusion

- Reiterate the problem addressed, the objectives achieved, and the impact of your proposed solution.
- By reflecting on the significance of the proposal, you can emphasize the contributions made to the field and the potential benefits to stakeholders.

7.2 Future Recommendation

- Provide recommendations for future steps based on your project's outcomes.
- Identify areas where further refinement, expansion, or exploration will be warranted. These recommendations provide valuable guidance for subsequent stages of the project or for other researchers interested in building upon your work.

Appendix A

A.1 A Proof

"Velit dolor illum facilisis zzril ipsum, augue odio, accumsan ea augue molestie lobortis zzril laoreet ex ad, adipiscing nulla. Veniam dolore, vel te in dolor te, feugait dolore ex vel erat duis nostrud diam commodo ad eu in consequat esse in ut wisi. Consectetur dolore feugiat wisi eum dignissim tincidunt vel, nostrud, at vulputate eum euismod, diam minim eros consequat lorem aliquam et ad. Feugait illum sit suscipit ut, tation in dolore euismod et iusto nulla amet wisi odio quis nisl feugiat adipiscing luptatum minim nisl, quis, erat, dolore. Elit quis sit dolor veniam blandit ullamcorper ex, vero nonummy, duis exerci delen

A.2 Some Matlab Code

```
1 x=[0:0.1:pi];
2 hold on % Plot multiple traces on one figure
3 plot(x,sin(x))
4 plot(x,cos(x),'--r')
5 plot(x,tan(x),'-g')
6 title('Some Trig Functions Over 0 to \pi') % Note LaTeX markup!
7 legend('\it sin}(x)', '\it cos}(x)', '\it tan}(x)')
8 hold off
9 set(gca,'Ylim',[-3 3]) % Adjust Y limits of "current axes"
10 set(gcf,'Units','inches') % Set figure size units of "current figure"
11 set(gcf,'Position',[0,0,6,4]) % Set figure width (6 in.) and height (4 in.)
12 cd n:\thesis\plots % Select where to save
13 print -dpdf plot.pdf % Save as PDF
```

A.3 An Algorithm

Algorithm 1 presents the procedure:

Algorithm 1 Query Algorithm

Require: $n \geq 0$ **Ensure:** $y = x^n$

```
1:  $y \leftarrow 1$ 
2:  $X \leftarrow x$ 
3:  $N \leftarrow n$ 
4: while  $N \neq 0$  do
5:   if  $N$  is even then
6:      $X \leftarrow X \times X$ 
7:      $N \leftarrow \frac{N}{2}$  {This is a comment}
8:   else if  $N$  is odd then
9:      $y \leftarrow y \times X$ 
10:     $N \leftarrow N - 1$ 
11:   end if
12: end while
```

A.4 Some C code

This code is a random C code.

```
1  /* Infinite loop */
2  /* USER CODE BEGIN WHILE */
3  while (1)
4  {
5  HAL_GPIO_WritePin(GPIOD, GPIO_PIN_13 , GPIO_PIN_SET);
6  HAL_Delay(1000);
7  HAL_GPIO_WritePin(GPIOD, GPIO_PIN_13 , GPIO_PIN_RESET);
8  HAL_Delay(1000);
9  // Alternatively
10 /*
11 HAL_GPIO_TogglePin(GPIOD,GPIO_PIN_13);
12 HAL_Delay(1000);
13 */
14 /* USER CODE END WHILE */
15 /* USER CODE BEGIN 3 */
16 }
17 /* USER CODE END 3 */
```

REFERENCES

- [1] Author/ Organization. Title of webpage, Year Published/ Last Updated.
- [2] D. Tse and P. Viswanath. *Fundamentals of Wireless Communication*. Cambridge Univ. Press, UK, 2005.
- [3] Sumudu Samarakoon et al. Backhaul-aware interference management in the uplink of wireless small cell networks. *IEEE Trans. Wireless Commun.*, 12(11):5813–5825, 2013.
- [4] P. Key, L. Massoulie, and D. Towsley. Path selection and multipath congestion control. In *IEEE Conf. Comput. Commun. (IEEE INFO- COM)*, pages 143–151, 2007.