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Faculty of Mechanical Engineering
Universiti Teknologi Malaysia
2025

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ACKNOWLEDGEMENT

In preparing this thesis, I was in contact with many people, researchers, academicians, and practitioners. They have contributed towards my understanding and thoughts. In particular, I wish to express my sincere appreciation to my main thesis supervisor, Professor Dr. Mohd Shariff Nabi Baksh, for encouragement, guidance, critics and friendship. I am also very thankful to my co-supervisor Professor Dr Awaluddin Mohd Shaharoun and Associate Professor Dr. Hishamuddin Jamaluddin for their guidance, advices and motivation. Without their continued support and interest, this thesis would not have been the same as presented here.

I am also indebted to Universiti Teknologi Malaysia (UTM) for funding my Ph.D study. Librarians at UTM, Cardiff University of Wales and the National University of Singapore also deserve special thanks for their assistance in supplying the relevant literatures.

My fellow postgraduate student should also be recognised for their support. My sincere appreciation also extends to all my colleagues and others who have provided assistance at various occasions. Their views and tips are useful indeed. Unfortunately, it is not possible to list all of them in this limited space. I am grateful to all my family member.

TIPS FOR WRITING THE ACKNOWLEDGEMENT SECTION

Be Sincere and Professional. Express genuine gratitude without being overly emotional.
Start with Formal Acknowledgements. Thank your supervisor, institution, and any official support first.
Include Personal Acknowledgements. Briefly thank family or friends, if relevant.
Keep It Brief. One page or less is sufficient.
Use Proper Titles and Full Names. Show respect by addressing people formally.
Avoid Humor or Informal Language. Maintain an academic tone throughout.

ABSTRACT

The phenomenon of Unidentified Flying Objects (UFOs) has long intrigued the public and scientific community alike. While traditionally discussed in speculative contexts, the recent release of official military and aviation data has provided an opportunity for scientific scrutiny. This study aims to explore the engineering implications of UFO sightings by analyzing their reported flight dynamics, structural profiles, and propulsion characteristics. The main objective is to extract and assess patterns from a selected dataset of 120 documented UFO sightings recorded between 2000 and 2023, focusing on those with technical data such as estimated speed, altitude, and maneuverability. The scope includes high-reliability sightings sourced from declassified military reports, pilot testimonies, and radar-confirmed events. Methodology involves statistical analysis of flight parameters, reverse-engineering based estimations, and CFD (Computational Fluid Dynamics) simulations to compare observed performance against conventional aerospace benchmarks. Key findings indicate that approximately 12% of the analyzed cases exhibit acceleration beyond 100G, with instantaneous directional changes unachievable by current aerospace technology. Around 8% of the sightings involved objects traveling at estimated speeds exceeding Mach 15 without visible propulsion or sonic booms. CFD analysis on hypothetical disc- and tic-tac-shaped models revealed aerodynamic anomalies under conventional physics assumptions. These findings suggest the presence of unconventional propulsion or control mechanisms, warranting further investigation. In conclusion, the study highlights the importance of integrating credible UFO flight data into aerospace research. While the majority of sightings align with known technology, the outliers present opportunities for disruptive innovation in materials, propulsion systems, and flight control architecture. The research proposes the need for open, interdisciplinary frameworks to systematically explore unexplained aerial phenomena from an engineering perspective.

TIPS FOR WRITING AN ABSTRACT

Keep it concise – Around 150–300 words.
State the objective – What is the purpose of your study?
Describe the methodology – Briefly mention how the study was done.
Summarize key findings – Highlight the main results, quantitatively.
Mention the conclusion – What does the study conclude or suggest?
Use clear, formal language – Avoid jargon and keep it academic.

The Malay abstract must be translated on a sentence-to-sentence basis. If the English abstract contains 10 sentences, the Malay abstract must also contain 10 sentences.

Use the "Kamus Kejuruteraan" by Dewan Bahasa dan Pustaka for the translation of scientific terms.

ABSTRAK

Fenomena Objek Terbang Tidak Dikenal (UFO) telah lama menarik minat masyarakat umum dan komuniti saintifik. Walaupun sebelum ini sering dibincangkan dalam konteks spekulatif, pendedahan data rasmi oleh pihak tentera dan penerbangan baru-baru ini telah membuka ruang untuk kajian saintifik. Kajian ini meneroka implikasi kejuruteraan daripada penampakan UFO dengan menganalisis dinamik penerbangan, profil struktur, dan ciri-ciri pendorongan yang dilaporkan. Objektif utama kajian ini adalah untuk mengekstrak dan menilai corak daripada set data terpilih yang mengandungi 120 penampakan UFO yang didokumentasikan antara tahun 2000 hingga 2023, dengan tumpuan kepada data teknikal seperti anggaran kelajuan, altitud, dan kebolehan manuver. Skop kajian merangkumi penampakan yang diperoleh daripada laporan tentera yang telah dinyahklasifikasikan, testimoni juruterbang, dan kejadian yang disahkan melalui radar. Metodologi melibatkan analisis statistik terhadap parameter penerbangan, anggaran berasaskan kejuruteraan songsang, serta simulasi CFD bagi membandingkan prestasi objek yang diperhatikan dengan penanda aras teknologi aeroangkasa konvensional. Penemuan utama menunjukkan bahawa kira-kira 12% daripada kes yang dianalisis menunjukkan pecutan melebihi 100G, disertai perubahan arah secara serta-merta yang tidak dapat dicapai oleh teknologi aeroangkasa semasa. Sekitar 8% daripada penampakan melibatkan objek yang bergerak pada anggaran kelajuan melebihi Mach 15 tanpa pendorongan yang kelihatan atau gelombang bunyi. Analisis CFD ke atas model berbentuk cakera dan "tic-tac" menunjukkan keanehan aerodinamik yang tidak selaras dengan andaian fizik konvensional. Penemuan ini mencadangkan kewujudan mekanisme pendorongan atau kawalan yang tidak konvensional. Sebagai kesimpulan, kajian ini menekankan kepentingan untuk mengintegrasikan data penerbangan UFO yang boleh dipercayai ke dalam penyelidikan aeroangkasa. Walaupun majoriti penampakan selaras dengan teknologi yang diketahui, kes-kes luar jangka membuka peluang kepada inovasi disruptif dalam bidang bahan, sistem pendorongan, dan seni bina kawalan penerbangan. Kajian ini mencadangkan keperluan untuk rangka kerja terbuka dan antara disiplin bagi meneroka fenomena udara yang tidak dapat dijelaskan secara sistematik dari perspektif kejuruteraan.

TABLE OF CONTENTS

Please follow the UTM thesis format for the writing of the table of contents and other related pages.

Ensure that the reference style follows the UTM thesis format. UTM typically uses the APA style.

Key Features of APA Style for UTM Theses:

In-text citations: Author(s) and year (e.g., Smith, 2020).

Reference list: Organized alphabetically by the author's last name. Hanging indent for each reference.

Example of Reference Formats:
Books: Smith, J. (2020). Introduction to engineering. Academic Press.

Journal Articles: Brown, T. (2019). Advances in engineering technology. Engineering Journal, 12(3), 45–56.

Proceeding: Smith, J. A., & Brown, T. R. (2020). Sustainable energy solutions for the future. Proceedings of the Global Energy Conference (pp. 45-60). GreenTech Publishing. https://doi.org/10.5678/efgh9012

Websites: Davis, M. (2021, August 12). Understanding renewable energy. Renewable Energy Online. https://www.renewable-energy.com

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ANN	-	Artificial Neural Network
GA	-	Genetic Algorithm
PSO	-	Particle Swarm Optimization
MTS	-	Mahalanobis Taguchi System
MD	-	Mahalanobis Distance
TM	-	Taguchi Method
UTM	-	Universiti Teknologi Malaysia
XML	-	Extensible Markup Language
ANN	-	Artificial Neural Network
GA	-	Genetic Algorithm
PSO	-	Particle Swarm Optimization

LIST OF SYMBOLS

δ	-	Minimal error
D, d	-	Diameter
F	-	Force
v	-	Velocity
p	-	Pressure
I	-	Moment of Inersia
r	-	Radius
Re	-	Reynold Number

Please write the equation using the Math Editor in MS Word.

Open MS Word: Make sure your document is open.

Insert an Equation: Click on the "Insert" tab in the Ribbon. In the "Symbols" group, click on "Equation". This will open a box where you can type or select predefined equations.

Use the Equation Tools: After inserting an equation, the "Equation Tools" tab will appear in the Ribbon. You can type the equation directly using the equation editor or use the "Design" tab for more options, such as adding fractions, exponents, integrals, etc.

LIST OF APPENDICES

This is a main chapter and must begin on a right-hand page.
Ensure that the page number is an odd number.

CHAPTER 1

INTRODUCTION

The ever-increasing demand for sustainable and efficient energy solutions has positioned solar energy at the forefr[redacted]ar panels, which limits their ability to capture maximum sunlight throughout the day. This dissertation explores the design and development of a [redacted]ound of the problem, clearly articulates the issues faced by static solar setups, and establishes the objectives and scope of developing a more adaptive and efficient solar tracking solution. Through this work, we aim to [redacted]and environmental sustainability.

This chapter will talk about the Problem Background, Problem Statement, Objective of Project, Scope of Project and the Significance of Study.

Odd-numbered pages on the right-hand page.

It is appropriate to begin this subtopic at the top of the page as it is an important subtopic.

1.1 Problem Background

The need for green energy, especially solar power, arises because we must deal with environmental, economic, [redacted] and rising sea levels, highlight the importance of switching to cleaner options.

Green energy, like solar power, is crucial for [redacted] Moreover, solar power can be used locally, which helps [redacted] energy problems and uncertainties.

Solar panels [redacted] electrons creates an electric current, generating direct current (DC) electricity.

The sun's [redacted] ranging from 30% to 40%, is a key factor leading to energy losses in photovoltaic panels

The Incidence Angle Modifier (IAM) is a [redacted] of sunlight on the efficiency of solar panels. The angle of incidence refers to the angle at which sunlight strikes the surface of a s[redacted] cells is reduced. Solar panels are

most efficient [redacted] the day and across different seasons.

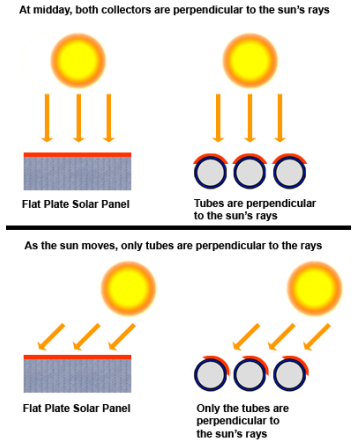

Figure 1.1 Comparison between Incidence Angle Modifier

Solar panels co[redacted] ar tracking systems provide significant benefits in solar energy applications, including increased power efficienc[redacted] compared to fixed systems. Its primary purpose is to maximise the absorption of sunlight by ensuring that solar panels or[redacted] electricity generation from solar power systems. The goal is to keep the panels perpendicular to incoming sunlight, thereby optimising the conversion [redacted] cking the sun's position throughout the day.

Solar trackers come in various types, eac[redacted]pes are single-axis trackers and dual-axis trackers.

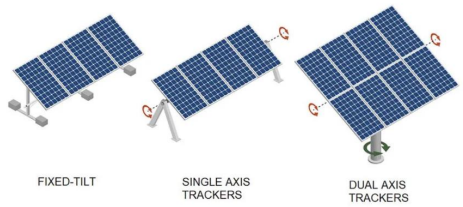

Figure 1.2 Types of Solar Tracking System

At present, th[redacted]ple gap exists as there is a lack of similar systems specifically designed for residential or home use at an affordable rate. This project aims to a[redacted]crocontroller to create a cost-effective control system for a dual-axis tracking solar setup. The objective is to develop a straig[redacted] sustainable energy solutions at the household level.

It is appropriate to begin this subtopic at the top of the page as it is an important subtopic.

1.2 Problem Statement

In the world of renewable energy, [redacted] especially in homes. The commonly used fixed solar panels in residential setups operate at less than optimal efficiency. This ineffic[redacted]out the day.

The main issue lies i[redacted] leads to significant energy losses, worsened by seasonal changes in the sun's path.

While solar track[redacted]nstallation, making them impractical for regular homeowners. There's a noticeable gap in the market for a [redacted] efficient sola[redacted]homes.

The challeng[redacted]l needs of residential settings. This system should be small, easy to install and maint[redacted]erson. It should also [redacted]and operation.

Referring to the [redacted] panel, single-axis and dual-axis sun tracking solar panel systems ,the results demonstrated that the dual-axis system produces an addi[redacted]

It is appropriate to begin this subtopic at the top of the page as it is an important subtopic.

1.3 Objectives of Project

i. To design and develop [redacted] solar panels.

ii. To correlate a simple and reliable [redacted]

1.4 Scope of Project

i. Design a reliable and [redacted]

ii. Implement an Arduino Microcontroller [redacted]

iii. Develop the system for residential use, [redacted]

iv. Collect the data of Solar Radiation at [redacted]

v. Conduct a comprehensive analysis [redacted]

It is appropriate to begin this subtopic at the top of the page as it is an important subtopic.

1.5 Significance of study

The significance of study derives from the crucial [redacted] achieve the maximum efficiency. Many solar energies are wasted during the energy conversion process to electrical energy. This is because it is in stationary pos[redacted]st solar energy throughout the day.

The primary challenge lie[redacted]ng systems, is designed for larger applications and proves impractical for homes due to complexity, bulkiness, and high costs. Recognizing this gap in the mar[redacted]residential use.

The objective is to [redacted]wners. This system must be compact, easy to install and maintain, and reasonably priced for the typical individual. It should be flexible to man[redacted]

Odd-numbered pages on the right-hand page.

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All main chapters must begin on the right-hand page. Ensure that the page number for right-hand pages is always an odd number. Even-numbered pages should be on the left, and odd-numbered pages on the right.

Since the previous chapter ends on a right-hand page, a dummy (blank) page must be inserted to ensure that the next chapter begins on a right-hand page as well. This blank page should include a note stating "This page is intentionally left blank" to inform readers and examiners that the page has been deliberately left empty.

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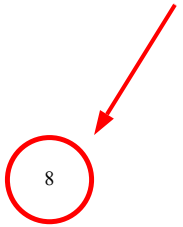

CHAPTER 2

This is a main chapter and must begin on a right-hand page. Ensure that the page number is an odd number.

LITERATURE REVIEW

2.1 Introduction

Many factors have contrib[redacted]ts. This has prompted utility companies and consumers to explore alternative energy sources.

Alternative energy co[redacted]ese sources aligns with green technology principles. According to Racharla and Rajan (2017), the power intercepted by the Earth from the sun is appro[redacted] MW, which significantly exceeds the current consumption rate of all [redacted]system depends on harnessing maximum solar irradiation and the cost of the photovoltaic (PV) system.

Solar tracking s[redacted]n the sun throughout the day.

The significance of [redacted] he sun's movement across the sky. This dynamic adjustment ensures that the solar panels receive maximum sunlight exposure, leading to increased energy production.

In this project, we[redacted]ng it a better and more efficient choice for houses.

To understand this better, [redacted]rrent (AC), which is suitable for household use.

Ensure that the figure or image is clear, sharp, not blurry, and meaningful. Please include appropriate labels to enhance reader understanding. Borders or frame lines are not required for figures, images, or graphs.

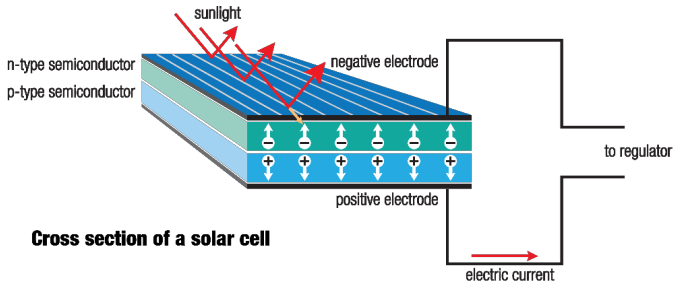

Figure 2.1 Working Principle of Solar Panels

The caption for a figure must be placed below the figure.

2.2 Solar Irradiance

Understanding solar irradi[redacted]s or pyrheliometers are commonly used to measure solar irradiance, providing essential information for various scientific and practical purposes related to solar energy utilisation and environmental studies.

Solar irradiance, in the cont[redacted]her we're using sunlight for electricity or heating water, having enough sunlight at our location is essential.

The sun is not only a s[redacted]direct distance between the Earth and the Sun changes throughout the year, causing variations in the sunlight we receive.

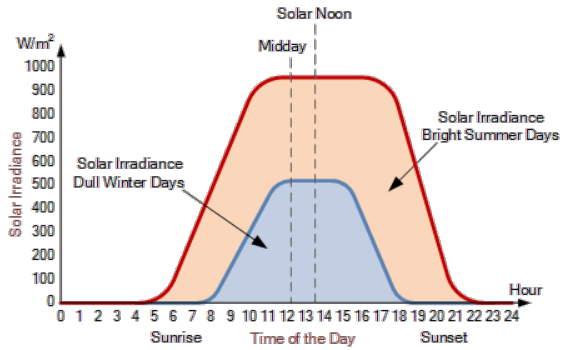

Figure 2.2 Changes of Solar Irradiance in different time and season

NASA tells u[redacted] the Earth.

Understanding these var[redacted] ght available.

2.3.3 Single-Axis Solar Tracking System

Single-axis tracking sy[redacted] bit limitations in adapting to certain seasonal variations, affecting efficiency during specific times of the year.

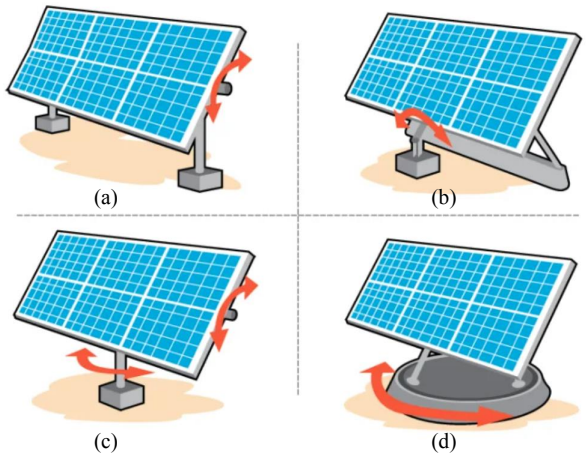

Figure 2.3 Illustration of the types of single-axis solar tracking systems: (a) upper left, (b) upper right, (c) lower left, and (d) lower right.

When presenting four images, each image should be labeled as (a), (b), (c), and (d). Each label must be clearly explained in the corresponding figure caption to ensure clarity and understanding.

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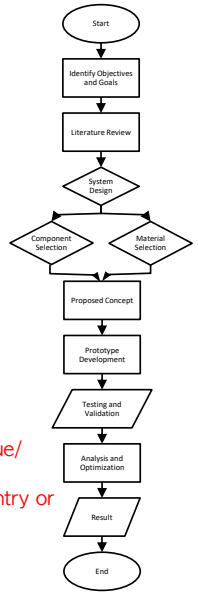
CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The design and development proc[redacted]original idea to the completed implementation.



Please construct the flowchart properly, as each shape carries a specific meaning. It is recommended to include decision boxes (diamond shapes) where appropriate. Discuss the design with your supervisor.

Quick overview of common flowchart symbols:

Oval: Start or end of a process.
Rectangle: A process or operation.
Diamond: A decision point (yes/no, true/false).
Parallelogram: Input or output (data entry or display).

Figure 3.1 Flow Chart of Methodology

3.2 System Design

Developing an effective sola[redacted]ble solar tracking system.

3.2.1 Design Requirements and Specifications

The design requireme[redacted]e angles. The system must function without manual intervention. Furthermore, the design must be compatible with residential solar panel installations, with dime[redacted]tandard configurations.

The mechanical [redacted]made of aluminium or coated steel. The structure must be able to support the weight of residential solar panels. Electrically, the system should operate using a solar panel, battery backup, or grid power, with an Arduino microcontroller servi[redacted]herproof and UV resistant.

The software specifi[redacted]ng system's own energy consumption to ensure a net energy gain. The system should operate reliabl[redacted]ntime or

maintenance, with [redacted] materials and components.

Cost conside[redacted]dential rooftops or ground mounts, taking into consideration typical space constrain[redacted] inspections and repairs. Thorough testing under a variety of conditions will validate tracking accuracy, reliability, and energy effici[redacted] use. This phase entails converting the project's objectives and requirements into a functional and efficient design.

3.2.2 Conceptual Design

3.2.2.1 Morphology Chart

Table 3.1: Morphology Chart

Function	Option 1	Option 2	Option 3
[redacted]ctuat[redacted]	DC Motor	Servo motor	Stepper motor
[redacted]	Single Axis	Dual Axis	Azimuth-Altitude
[redacted]e	Fixed	Adjustable	Movable
[redacted]	Gear System	Belt and Pulley	Lead Screw (Linear Actuator)
[redacted]ntrol Sy[redacted]	[redacted]icrocontroller (Arduino)	PLC (Programmable Logic Controller)	Raspberry Pi
Power Source	Solar Panel (Direct)	Battery	Grid Power
Material	Aluminium	Mild Steel	PVC

The caption for a table should be placed above the table.

HOWEVER, YOU SHOULD NOT BEGIN A CHAPTER OR SUBTOPIC WITH A TABLE OR FIGURE. IT MUST BEGIN WITH A SENTENCE, EVEN IF IT IS JUST ONE LINE.

This is correct: the caption for the table should be placed above the table, and a subtopic must begin with a sentence.

3.2.5 Material Selection

Choosing the [redacted] nce, as shown in Table 3.4.

You must mention the table or figure number in your sentence.

Table 3.4 : Material Comparison

Property	Aluminum	Mild Steel	PVC
Density	~2.7 g/cm³	~7.85 g/cm³	~1.38-1.43 g/cm³
Tensile Strength	90-690 MPa (varies with alloy)	400-550 MPa	40-50 MPa
Elastic Modulus	~69 GPa	~210 GPa	~3 GPa
Corrosion Resi	Excellent	Moderate (can be improved with coatings)	Excellent
Melting P	~660°C	~1370-1510°C	~100-260°C
Worka	Good (easy to machine, weld, and form)	Good (easy to weld, form, and fabricate)	Excellent (easy to mold, cut, and join)
	Lightweight	Heavy	Lightweight
	Moderate to high (depending on alloy)	Low to moderate	Low
D ability	Good (especially in non-corrosive environments)	Excellent (strong and durable)	Moderate (can degrade under UV exposure)
Environmental Resistance	Good	Moderate	Excellent
UV Resistance	Moderate	Excellent	Poor

Mild steel was sele[redacted]en faced with different weather conditions, making it a sensible option for outdoor use. One major advantage of mild steel is its cost-effectiveness. It is more affordable than other metals such as stainless steel or aluminium, making it a more [redacted] weld, and fabricate, making manufacturing and assembly processes straightforward. With this feature, you can create customised frame designs and perfectly fit components, resulting in a strong and accurately aligned structure. While mild steel may not naturally [redacted]

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

This chapter show[redacted]iance, sun angle variations, and system configuration.

The chapter starts by [redacted] offering a clear visualisation of their performance profiles.

In addition, the disc[redacted] The interpretation of key findings takes into account theoretical expectations and industry sta[redacted]

In Chapter 4, an extensive [redacted] only confirm the advantages of solar tracking systems, but also provide valuable insights for [redacted]

4.2 Average Daily Solar Radiation Comparison

For the purpose of evaluating the efficiency of the solar tracking system in relation to a stationary solar panel setup, we gathered data on the average daily solar radiation over a span of ten days. The data reveals significant trends in energy capture efficiency between the two systems, offering valuable insights into their performance under different conditions.

Table 4.1 : Average Daily Solar Radiation of Fixed & Tracker

Day	Average Daily Solar Radiation (Wh/m²)		Improvements (%)
	Fixed	Tracker	
1	62.35	73.54	17.95
2	65.31	70.28	7.61
3	63.87	73.62	15.27
4	63.07	71.37	13.16
5	64.24	80.01	24.55
6	62.51	65.78	5.22
7	61.58	68.05	10.50
8	65.07	70.78	8.77
9	65.52	68.09	3.92
10	68.57	76.17	11.08
Average	64.21	71.77	11.77

A title for the graph is not required as the graph already has a caption below it.

No border or frame line is required for figures, images, or graphs.

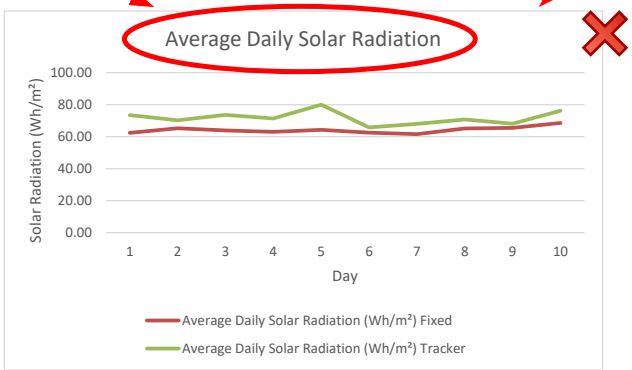


Figure 4.1 : Average Daily Solar Radiation of Fixed & Tracker

The solar trackin[redacted] exposure.

The tracking sy[redacted] ng or potential system inefficiencies.

The solar trackin[redacted] ed to the cloud cover or suboptimal sun-tracking alignment.

The overall average [redacted] dent solar energy than fixed systems.

Results and Discussion – General Structure

Present the Results Clearly. Start by presenting your findings using text, tables, and figures where appropriate. Report only the key results that relate to your research questions or hypotheses. Ensure data is presented objectively and concisely, without interpretation at this stage.

Interpret the Results. Explain what the results mean in relation to your research objectives. Discuss any patterns, trends, or relationships observed in the data. Highlight significant findings and explain their implications.

Compare with Previous Studies. Compare your findings with previous research or theoretical expectations. Discuss similarities, differences, and potential reasons for any discrepancies. Discuss Limitations. Address any limitations that may have affected the results.

Mention factors such as sample size, methodology, or external influences. Suggest Implications and Applications. Explain how the findings contribute to the field. Suggest possible applications or further research based on your results.

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Tone and Language Tips
Use formal and precise language.
Avoid repetition and unsupported claims.
Maintain an objective and analytical tone throughout.

How to write a good conclusion:

Summarize Key Findings. Briefly restate the research objectives and summarize the main findings. Focus only on the most significant results that directly answer your research questions.

Highlight the Contribution. Emphasize the value or contribution of your research to the field of study. Mention how the findings fill a gap or offer new insight.

CHAPTER 5

Reflect on the Research. Discuss whether the objectives were achieved. Comment on any unexpected outcomes and what they might indicate.

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The study succes[redacted]n to fixed solar panels.

Furthermore, the focu[redacted]eds for residential applications.

The project utilised t[redacted] conditions and angles.

Ultimately, the triumph[redacted]vantages of solar tracking

5.2 Recommendation

To enhance the develop[redacted] component fabrication and improved alignment during assembly.

The existing prototype's [redacted] ementing weather-resistant coatings, seals, and more durable materials will greatly enhance the system's operational reliability and lifespan.

The data collection p[redacted] understanding of the tracking system's performance under different environmental conditions, leading to stronger and more dependable conclusions. Optimizing the tr[redacted] estigating sophisticated actuation techniques, such as linear actuators with enhanced precision, could [redacted]

How to write a good recommendation:

For Practice or Policy, suggest how your findings could be applied in real-world situations (e.g., in industry, education, or government). Be specific and realistic in your suggestions.

For Future Research, recommend areas for further study, especially if you encountered limitations. Suggest how future studies could improve or expand upon your work.

energy capture and minimizing adjus[redacted] actical usefulness in different conditions.

Although mild steel h[redacted] ness due to decreased inertia.

To optimize t[redacted] minimal maintenance will enhance attractiveness and utility for homeowners. Finally, further investigation is needed to examine the integration of the solar [redacted] prove broader-scale energy management, offering a more e[redacted] ng current limitations and fully unlocking the potential of solar tracking [redacted]

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Please ensure that the format and style of your references follow the UTM thesis guidelines. All references cited in your report must be included in the reference list.

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ABSTRACT

The phenomenon of Unidentified Flying Objects (UFOs) has long intrigued the public and scientific community alike. While traditionally discussed in speculative contexts, the recent release of official military and aviation data has provided an opportunity for scientific scrutiny. This study aims to explore the engineering implications of UFO sightings by analyzing their reported flight dynamics, structural profiles, and propulsion characteristics. The main objective is to extract and assess patterns from a selected dataset of 120 documented UFO sightings recorded between 2000 and 2023, focusing on those with technical data such as estimated speed, altitude, and maneuverability. The scope includes high-reliability sightings sourced from declassified military reports, pilot testimonies, and radar-confirmed events. Methodology involves statistical analysis of flight parameters, reverse-engineering based estimations, and CFD (Computational Fluid Dynamics) simulations to compare observed performance against conventional aerospace benchmarks. Key findings indicate that approximately 12% of the analyzed cases exhibit acceleration beyond 100G, with instantaneous directional changes unachievable by current aerospace technology. Around 8% of the sightings involved objects traveling at estimated speeds exceeding Mach 15 without visible propulsion or sonic booms. CFD analysis on hypothetical disc- and tic-tac-shaped models revealed aerodynamic anomalies under conventional physics assumptions. These findings suggest the presence of unconventional propulsion or control mechanisms, warranting further investigation. In conclusion, the study highlights the importance of integrating credible UFO flight data into aerospace research. While the majority of sightings align with known technology, the outliers present opportunities for disruptive innovation in materials, propulsion systems, and flight control architecture. The research proposes the need for open, interdisciplinary frameworks to systematically explore unexplained aerial phenomena from an engineering perspective.