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JABATAN KEJURUTERAAN MEKANIKAL

SESI 1 2023/2024

POLITEKNIK BANTING SELANGOR

RESEARCH OF REVO BASE CONTROL

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This report was submitted to the Mechanical Engineering Department as part of the requirements for the award of the Mechanical Engineering Diploma

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SESI 1 2023/2024

STATEMENT OF AUTHENTICITY AND PROPRIETARY RIGHTS

RESEARCH OF REVO BASE CONTROL

1. We, **ALIF IKHWAN BIN ZAINUL ABIDIN (NO K/P : 021124140279) ,MUHAMMAD SHAHRUL BIN SARIZAN (NO K/P :020224101053) , MUHAMMAD SOLAHUDDIN HASBULLAH BIN MHD SAWALI (NO K/P : 020618100205) , MOHAMMAD HAFIDZ MOHD MAZLAN(NO K/P :001021101447)** is a Mechanical Engineering Diploma student, Polytechnic Banting Selangor, whose address is **Persiaran Ilmu , Jalan Abdul Samad 42700 Banting, Selangor**. (Hereinafter referred to as 'the Polytechnic')

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Last but not least, we hope that the work we do will increase our knowledge base and make us more cooperative and responsible .

Thank You

ABSTRACT

Revo base control is a type of mobile robot that uses mecanum wheels, which are omnidirectional wheels with a series of angled rollers around their circumference. These rollers allow the wheels to move in any direction and rotate around their own axis, providing the robot with a high degree of maneuverability. Mecanum wheel robots can move in any direction without the need to turn or rotate, making them ideal for applications such as material handling, inspection, and surveillance. They can also navigate through tight spaces and over uneven terrain with ease. Mecanum wheel robots are often used in industrial settings, as well as in research and development for autonomous vehicles and robotics. This mechanical product is made based on several element that are commonly used in all types of industries around the world,such as using motors,design,and technology.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Our final project call “ Revo Base Control “ is a type of mobile robot that uses mecanum wheels, which are omnidirectional wheels with a series of angled rollers around their circumference. This unique design allows the robot to move in any direction and rotate around its own axis, giving it exceptional maneuverability. Mecanum wheel robots have been used in various applications such as material handling, inspection, surveillance, and even entertainment.

The design of mecanum wheels was first introduced in 1973 by Bengt Ilon, an engineer from Sweden. Since then, they have been widely used in various fields of robotics due to their unique capabilities. Mecanum wheels consist of a central hub and several rollers around the circumference, each with a different angle. The rollers are arranged in a way that allows the wheel to move in any direction while maintaining stability and control.

Mecanum wheel robots can be operated manually or autonomously, and they can navigate through tight spaces and over uneven terrain with ease. This makes them ideal for a range of applications, including industrial settings where they can be used for material handling and inspection, as well as in research and development for autonomous vehicles and robotics.

Overall, mecanum wheel robots are an innovative and versatile solution for mobile robotic systems, offering a unique combination of maneuverability, stability, and control.

1.2 PROBLEM STATEMENT

Based on our observations and research results, we have identified several problems, one of the problems that arise when using mecanum wheel robots is the complexity of their control system. Due to the omnidirectional movement capability of mecanum wheels, the control system must be able to adjust the speed and direction of each individual wheel in real time, while ensuring the stability and safety of the robot. This requires advanced algorithms and sensors to accurately track the robot's position, orientation and movement in space.

Another challenge is the increased power consumption of mecanum wheel robots compared to other types of mobile robots. The rollers on the mecanum wheels create additional friction, which requires more power to overcome. This can result in a shorter battery life and higher operating costs for the robot.

Furthermore, mecanum wheel robots may not be suitable for certain types of terrain or environments. For example, they may have difficulty navigating over rough or uneven surfaces, or in areas with obstacles that could interfere with the movement of the wheels. In addition, their unique movement capabilities may require additional training and expertise to operate effectively, which can be a challenge for some users.

Overall, while mecanum wheel robots offer unique capabilities and advantages, they also present certain challenges and limitations that need to be addressed in order to fully realize their potential in various applications.

1.3 OBJECTIVE

The objective of this project is to move the object that not over 50kg. for example the Revo base control uses an omnidirectional wheel with a series of angled rollers around its circumference. This unique design allows the robot to move in any direction and rotate around its own axis.

1.4 SCOPE OF PROJECT

- Using inventory to create a revo base control.
- Using mecanum wheel to move object.
- Controlled via mobile phone remotely connected to bluetooth
- Revo base control can move as far as 9 meters by using arduino bluetooth

1.5 IMPORTANCE OF STUDY

Advancement of Technology, engineers and roboticists are responsible for developing new technologies that can improve the quality of life for individuals and society as a whole. Through research and development, they create new products and systems that can increase efficiency, save lives, and solve complex problems.

Job opportunities, as the demand for new technology grows, the demand for engineers and roboticists increases as well. Studying these fields can lead to a variety of job opportunities, including designing and building robots, developing software and hardware systems, and managing engineering projects.
Innovation, engineers and roboticists are some of the most innovative thinkers in the world. They are constantly coming up with new ideas and concepts that can change the way we live our lives.

By studying engineering and robotics, individuals can become part of this creative process and help shape the future.
Problem Solving Skills, engineers and roboticists are trained to solve complex problems through critical thinking, analysis, and creative problem solving. These skills are valuable not only in the field of engineering, but also in other areas of life and work.

Sustainability, engineers and roboticists play a key role in developing sustainable solutions for energy, transportation, and other critical areas. By studying these fields, individuals can contribute to the development of sustainable technologies that can help address some of the most pressing issues facing our planet today

1.6 OPERATIONAL DEFINITIONS/TERMS

Mecanum Wheel, a special type of wheel that has small rollers attached to its circumference at a 45-degree angle. When these wheels rotate in opposite directions, they allow the robot to move in any direction. Holonomic Robot, a robot that can move freely in any direction, rather than being limited to forwards/backwards and left/right movements. Omni-Directional Movement, the ability of a robot to move in any direction, without having to turn or rotate first. Four-Wheel Drive, a drive system where all four wheels of the robot are powered, providing greater traction and maneuverability. Control System, the software and hardware components that allow the operator to control the movement and actions of the mecanum wheel robot. Kinematics, the study of the motion of objects without considering the forces that cause the motion. In the context of mecanum wheel robots, kinematics is used to calculate the movements required to move the robot in a specific direction.

1.7 SUMMARY

With the help of this chapter, we were able to demonstrate each, pinpoint the issue statement, and make the project's goal crystal apparent. Also, we explicitly constructed the project's scope above. The project summary is a succinct document that gives an overview of the research topic, examines its intellectual qualities, and explores its wider implications. Each of these parts must exist and must have a clear definition. One of the most crucial elements of the proposal is the project overview. With that stated, in the topic of literature review that follows, we will also talk about the article reviews of each and every component that we employed in our project.

CHAPTER 2

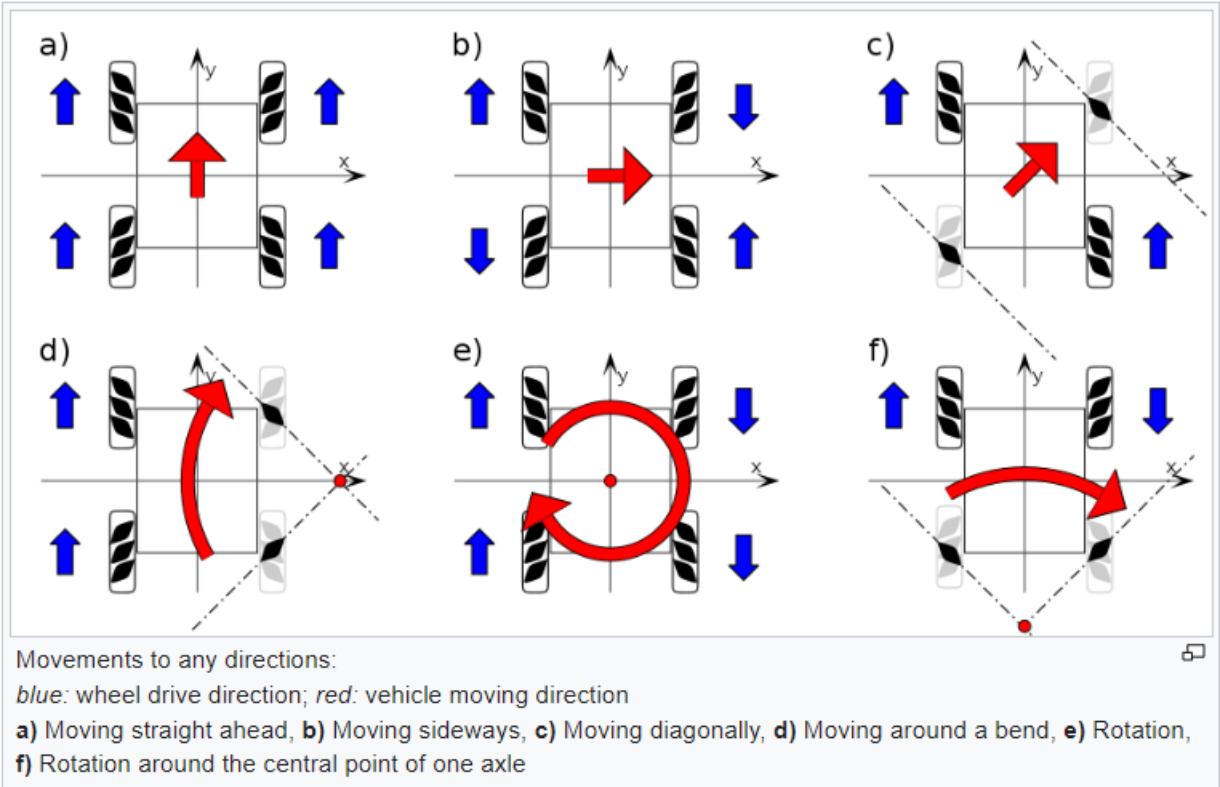
LITERATURE REVIEW/RESEARCH

2.1 PREVIOUS STUDIES / REVIEWS / INVESTIGATIONS

Mecanum wheels, also known as swedish wheels or ilon wheels, are a type of omnidirectional wheels that allow a vehicle to move in any direction without changing its orientation. For previos studies on mecanum wheels, here are some relevant areas of research and studies that have been conducted. Firstly, kinematics and dynamics of vehicles equipped with mecanum wheels. These studies aim to understand the wheels motion characteristics, such as the relationships between wheel velocities and vehicle velocities, as well as the forces and moments involved during movement.

Next is control systems. Research has been conducted to develop control systems for vehicles with mecanum wheels. These studies focus on designing algorithms and control strategies to achieve precise and efficient control of the vehicles motion, including trajectory tracking, obstacle avoidance, and stability control. After that is autonomous navigation. Mecanum wheels are often used in autonomous vehicles due to their omnidirectional capabilities. Research in this area focuses on developing navigation algorithms and sensor fusion techniques to enable autonomous vehicles to navigate complex enviroments using mecanum wheels.

Other than that is robotic manipulation. Mecanum wheels are employed in robotic manipulator platforms. Studies have investigated the design and control of robotic arms equipped with mecanum wheels to enable precise manipulation task in various applicatons, such as industrial automation and human robot interaction. Lastly is mobile robotics applications. Mecanum wheels find applications in various fields, such as logistics, agriculture, healthcare, and search and rescue. Research has explored the use of mecanum wheels in these applications, studying their effectiveness, efficiency, and adaptability to specific tasks and environments.



Figures 1.0: Mecanum wheel movement

The mecanum wheel is a form of tireless wheel, with a series of rubberized external rollers obliquely attached to the whole circumference of its rim. These rollers typically each have an axis of rotation at 45° to the wheel plane and at 45° to the axle line. Each mecanum wheel is an independent non-steering drive wheel with its own powertrain, and when spinning generates a propelling force perpendicular to the roller axle, which can be vectored into a longitudinal and a transverse component in relation to the vehicle.

The typical mecanum design is the four-wheel configuration as demonstrated by one of the URANUS omni-directional mobile robot or a wheelchair with mecanum wheels, with an alternating with left and right handed rollers whose axles at the top of the wheel are parallel to the diagonal of the vehicle frame (and hence perpendicular to the diagonal when at where the buttom of the wheel contacts the ground). In such a way, each wheel will generate a thrust roughly parallel to the corresponding frame diagonal. By varying the rotational speed and direction of each wheel, the summation of the force vectors from each of the

wheels will create both linear motions and/or rotations of the vehicle, allowing it to maneuver around with minimal need for space. For example:

- Running all four wheels in the same direction at the same speed will result in a forward/backward movement, as the longitudinal force vectors add up but the transverse vectors cancel each other out.
- Running (all at the same speed) both wheels on one side in one direction while the other side in the opposite direction, will result in a stationary rotation of the vehicle, as the transverse vectors cancel out but the longitudinal vectors couple to generate a torque around the central vertical axis of the vehicle.
- Running (all at the same speed) the diagonal wheels in one direction while the other diagonal in the opposite direction will result in a sideways movement, as the transverse vectors add up but the longitudinal vectors cancel out.

A mix of differential wheel motions will allow for vehicle motion in almost any direction with any rotation.

2.2 SUMMARY

In this chapter we can see about previous studies for the mecanum wheel robot and we can also see how the mecanum wheel works and the use of the mecanum wheel. the research done is kinematics and dynamics, control systems, autonomous navigation, robotic manipulation, and finally is mobile robotics applications.Once we have finished learning about this mecanum wheel and know how it works, we can finally continue to make our project.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 STUDY / PROJECT DESIGN

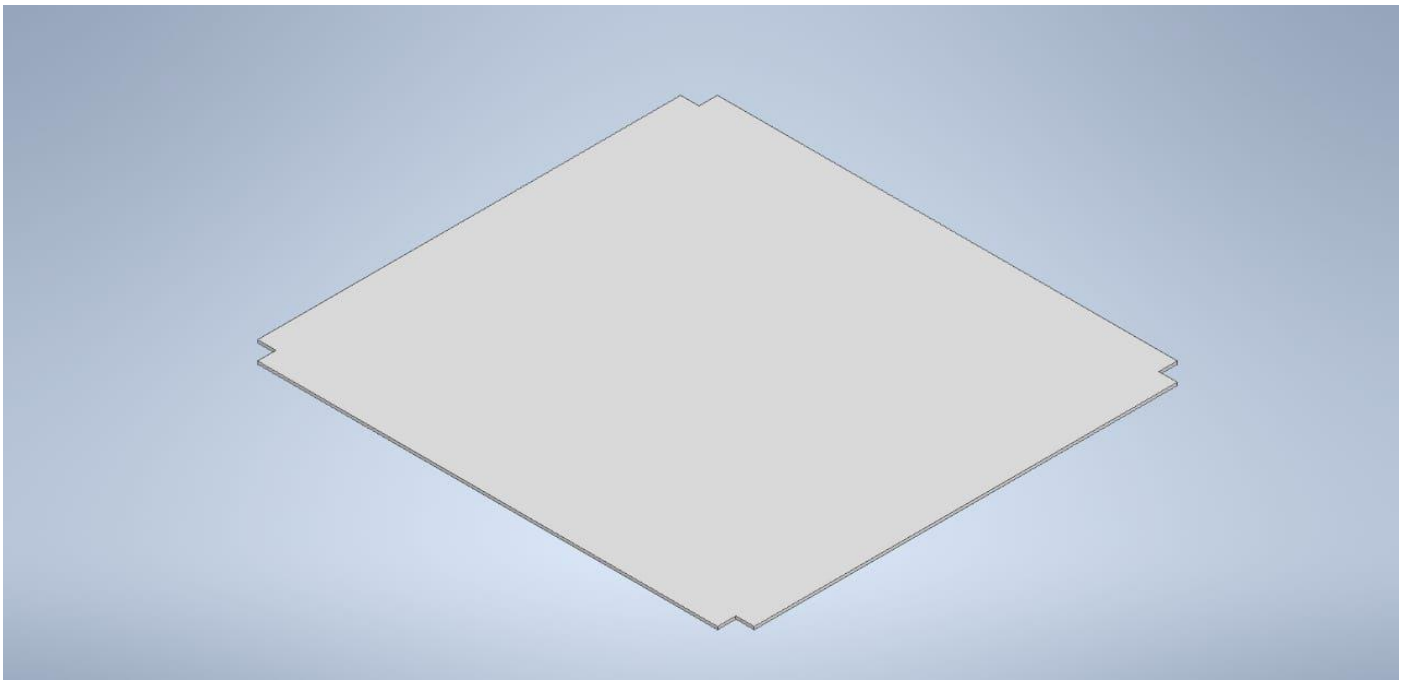


Figure 2.0 : Aluminium plate

Figure 3.0: Aluminium profile

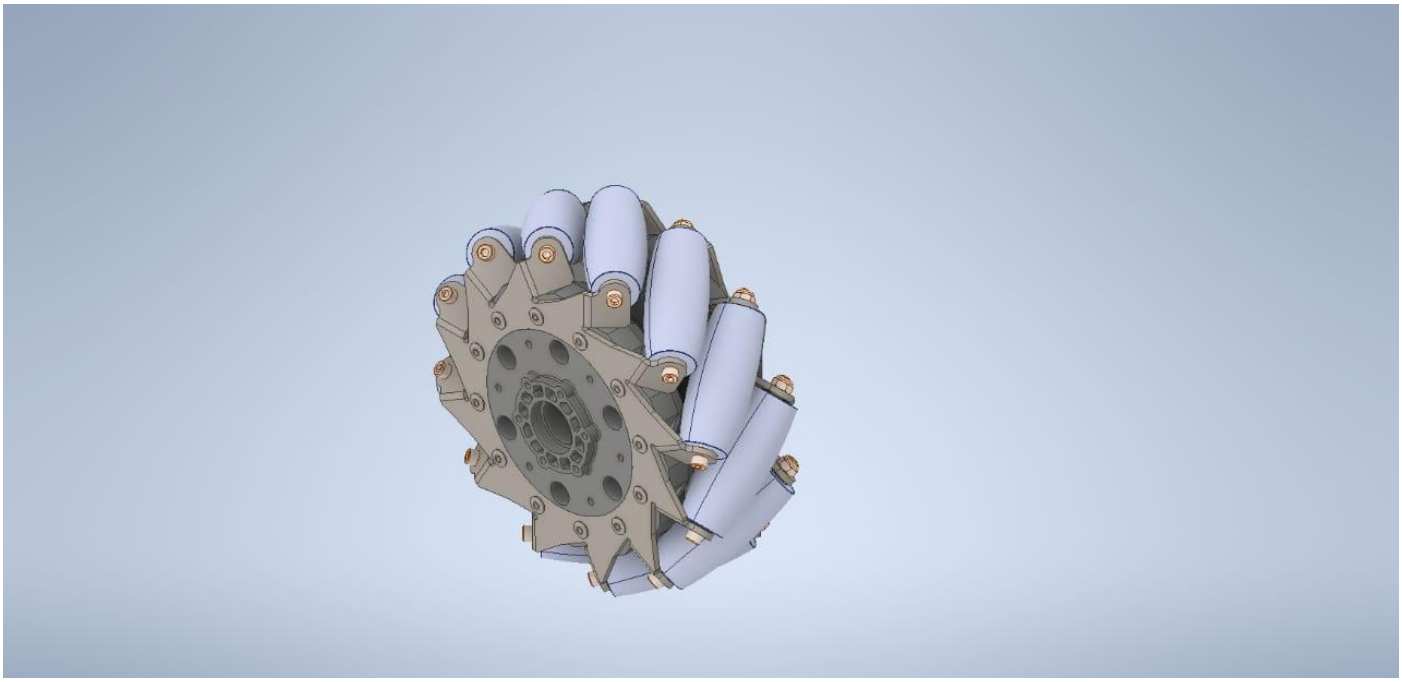


Figure 4.0: Mecanum wheel

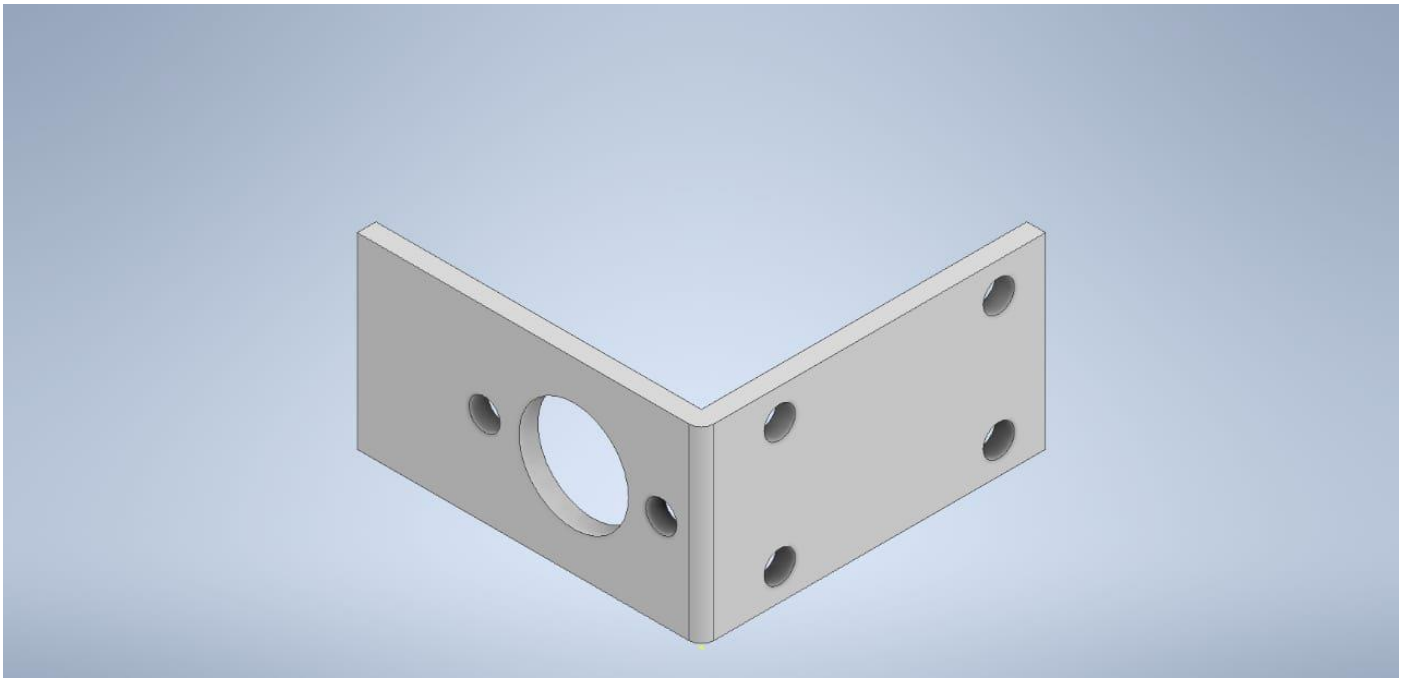


Figure 5.0: Bracket

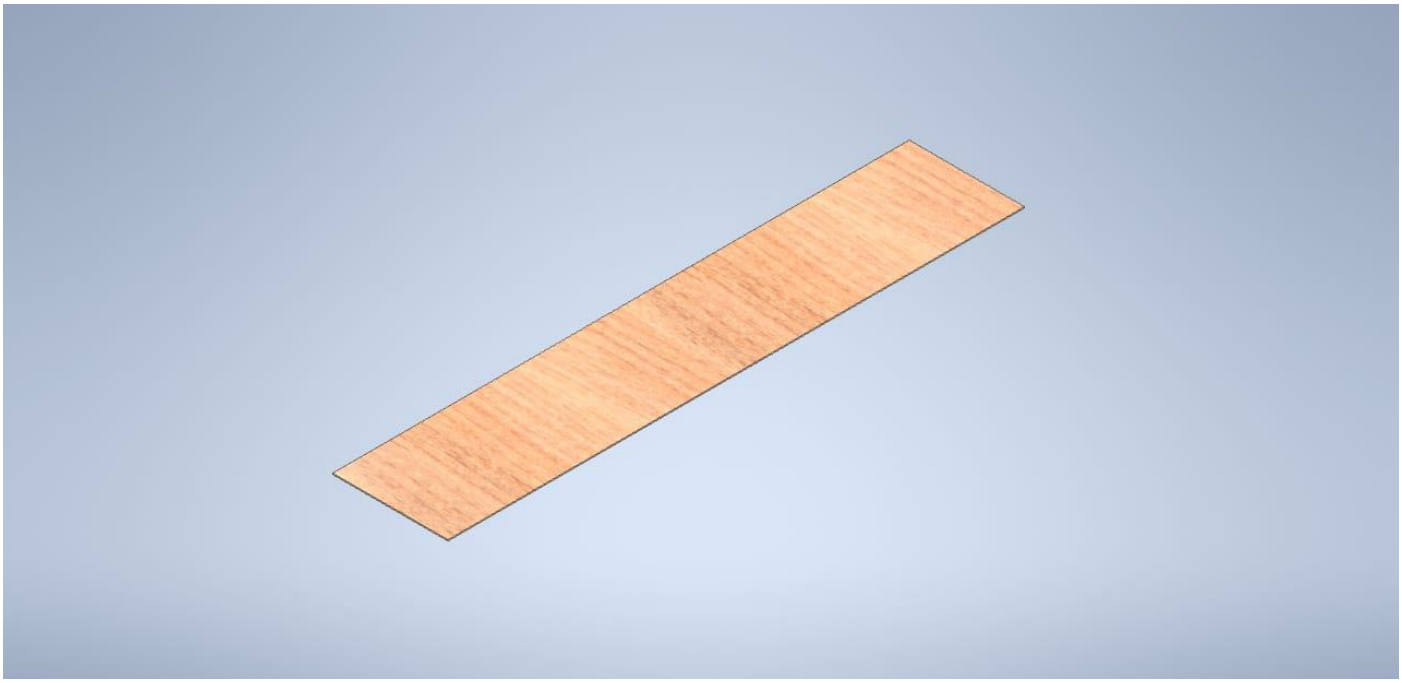


Figure 6.0: Plywood

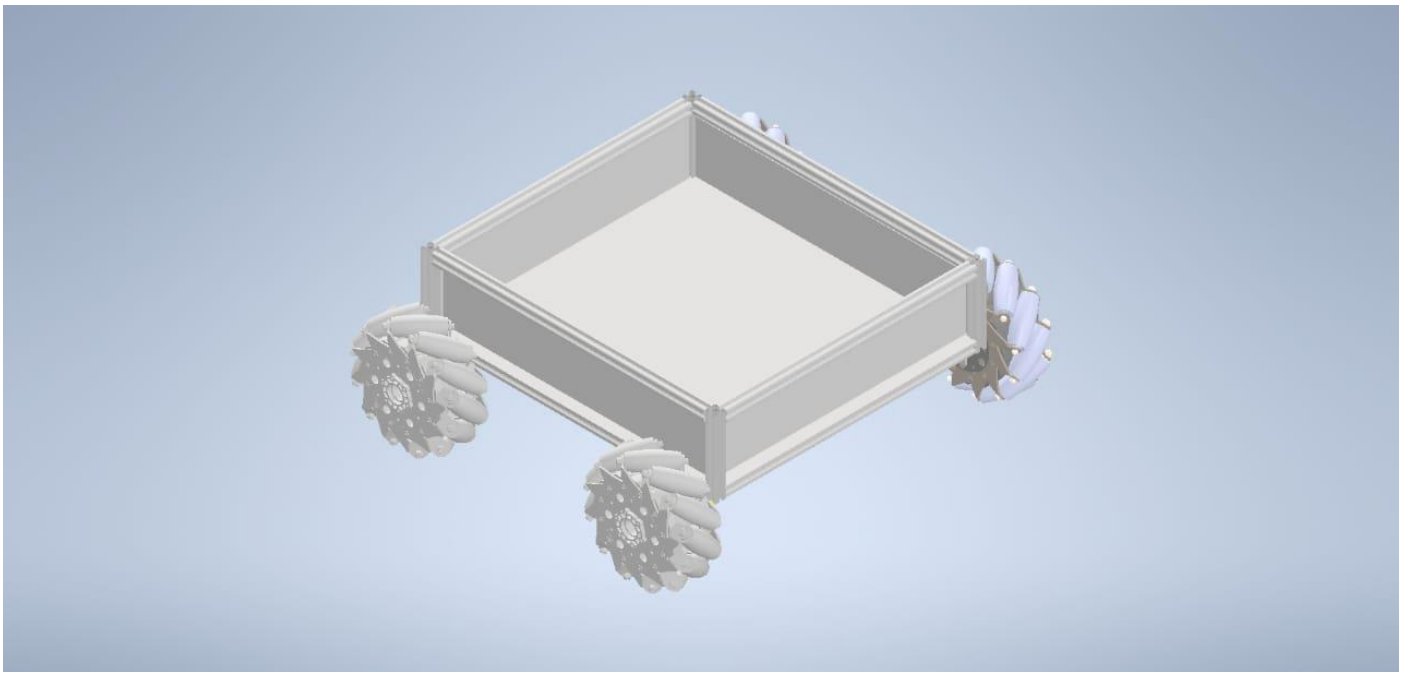


Figure 7.0: Revo base control

3.2.1 PROCUDERES PROJECT PRODUCTION TECHNIQUES METHOD

1. cut aluminium into a size of 55cm x 60cm for base
2. cut aluminium profile into size 50cm 4pcs , 46cm 4pcs and 10cm 4pcs
3. measure and cut playwood into a size 50cm x 10cm 2pcs and size 46cm x 10cm 2 pcs
4. make a holes diameter 5mm at bracket to fit the motor
5. make a screw holes using drilling machine to tie the bracket to the aluminium profile
6. tighten the motor to the bracket using the fasteners clip
7. make a body frame with aluminum profile
8. install the aluminum base into the aluminum profile frame
9. spray the plywood and cover using black color
10. install the plywood that has been cut for the 4 wall sections of the aluminum profile frame
11. connecting wires to other electronic parts such as arduino mega, driver,battery compartment and bluetooth
12. Attach the electronic parts to the middle of the aluminum base using a hot glue gun
13. connect the wire from the driver to the motors
14. cover the electronic part using a cover that has been sprayed black
15. do the final test on the revo base control

3.2.2 MATERIAL AND EQUIPMENT

Figure 8.0: DC motor

Providing direct current (DC) voltage to power a device is the function of a DC power supply.The term "bench power supply" is frequently used to refer to DC power supplies because theyare frequently used on an engineer's or technician's bench for numerous power tests. A DC power supply can also accept an input of a DC voltage with typical values of 5V, 12V, 24V, or48V. It is also possible to generate the output voltage, which ranges from less than a volt to more than 1000 volts DC. An input source for a DC power management subsystem can be a battery or harvested energy (solar cells, fuel cells, etc.), which gets its electricity from other sources. The management of DC power.

Figure 9.0: Arduino mega

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Mega 2560 board is compatible with most shields designed for the Uno and the former boards Duemilanove or Diecimila.

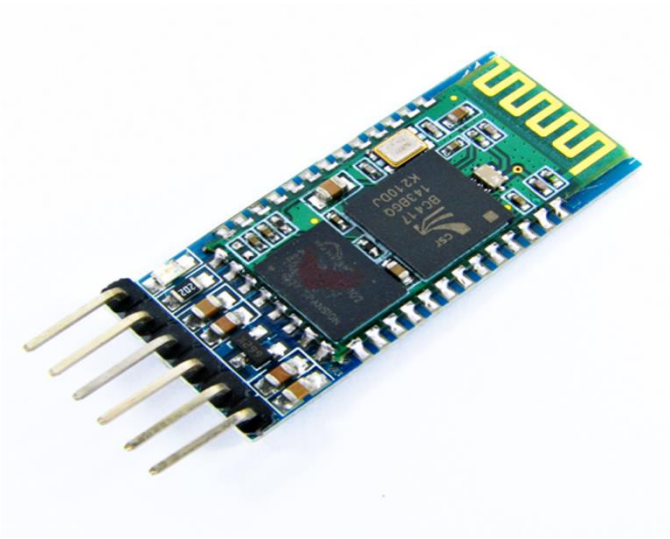


Figure 10.0: HC-05 Bluetooth Module

The HC-05 is a class 2 Bluetooth module designed for transparent wireless serial communication. It is pre-configured as a slave Bluetooth device. Once it is paired to a master Bluetooth device such as PC, smart phones and tablet, its operation becomes transparent to the user. All data received through the serial input is immediately transmitted over the air. When the module receives wireless data, it is sent out through the serial interface exactly at it is received. No user code specific to the Bluetooth module is needed at all in the user microcontroller program.The HC-05 will work with supply voltage of 3.6VDC to 6VDC, however, the logic level of RXD pin is 3.3V and is not 5V tolerant. A Logic Level Converter is recommended to protect the sensor if connect it to a 5V device (e.g Arduino Uno and Mega). The power to the HC-05 will cut off if the "EN" pin is pulled to logic 0.

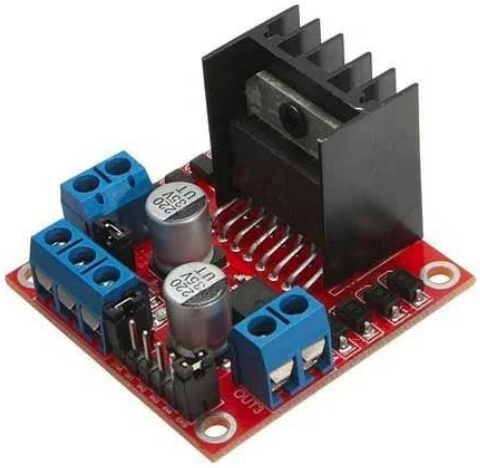


Figure 11.0: L298N Motor Driver Module

L298N module is a high voltage, high current dual full-bridge motor driver module for controlling DC motor and stepper motor. It can control both the speed and rotation direction of two DC motors. This module consists of an L298 dual-channel H-Bridge motor driver IC. This module uses two techniques for the control speed and rotation direction of the DC motors. These are PWM – For controlling the speed and H-Bridge – For controlling rotation direction. These modules can control two DC motor or one stepper motor at the same time.

Figure 12.0: Mecanum wheel

The mecanum wheel is a form of tireless wheel, with a series of rubberized external rollers obliquely attached to the whole circumference of its rim. These rollers typically each have an axis of rotation at 45° to the wheel plane and at 45° to the axle line. Each Mecanum wheel is an independent non-steering drive wheel with its own powertrain, and when spinning generates a propelling force perpendicular to the roller axle, which can be vectored into a longitudinal and a transverse component in relation to the vehicle.

Figure 13.0: Aluminium profile

Aluminium is a silvery-white metal, the 13 element in the periodic table. One surprising fact about aluminium is that it's the most widespread metal on Earth, making up more than 8% of the Earth's core mass. It's also the third most common chemical element on our planet after oxygen and silicon. At the same time, because it easily binds with other elements, pure aluminium does not occur in nature. This is the reason that people learned about it relatively recently. Formally aluminium was produced for the first time in 1824 and it took people another fifty years to learn to produce it on an industrial scale. The most common form of aluminium found in nature is aluminium sulphates. These are minerals that combine two sulphuric acids: one based on an alkaline metal (lithium, sodium, potassium rubidium or caesium) and one based on a metal from the third group of the periodic table, primarily aluminium. Aluminium sulphates are used to this day to clean water, for cooking, in medicine, in cosmetology, in the chemical industry and in other sectors. By the way, aluminium got its name from aluminium sulphates which in Latin were called alumen.

Figure 14.0: Aluminium plate

Aluminium is known for its low density, making aluminium plates much lighter compared to other metals such as steel. This property is beneficial in applications where weight reduction is desired, such as aerospace, automotive, and marine industries. Aluminium has a natural oxide layer that protects it from corrosion. This inherent corrosion resistance makes aluminium plates suitable for outdoor applications or enviroments where exposure to moisture, chemicals, or harsh weather condition is expected.

Figure 15.0: Plywood

Plywood is a material manufactured from thin layers or "plies" of wood veneer that are glued together with adjacent layers having their wood grain rotated up to 90 degrees to one another. It is an engineered wood from the family of manufactured boards which include medium-density fibreboard (MDF), oriented strand board (OSB) and particle board (chipboard). All plywoods bind resin and wood fibre sheets (cellulose cells are long, strong and thin) to form a composite material. This alternation of the grain is called cross-graining and has several important benefits: it reduces the tendency of wood to split when nailed at the edges; it reduces expansion and shrinkage, providing improved dimensional stability; and it makes the strength of the panel consistent across all directions. There is usually an odd number of plies, so that the sheet is balanced—this reduces warping. Because plywood is bonded with grains running against one another and with an odd number of composite parts, it has high stiffness perpendicular to the grain direction of the surface ply.

Figure 16.0: Jumper wire

A jumper wire is an electric wire that connects remote electric circuits used for printed circuit boards. By attaching a jumper wire on the circuit, it can be short-circuited and short-cut (jump) to the electric circuit.

Figure 17.0: Multicore cable

A multicore cable is a type of electrical cable that combines multiple signals or power feeds into a single jacketed cable.The term is normally only used in relation to a cable that has more cores than commonly encountered.Not all cables with multiple insulated conductors are called multicore cables –
the core in multicore refers to the number of usable connections made, not the number of conductors or wires.

Figure 18.0: Battery rechargeable

- SKU: 00664R
- Weight(grams): 200
- Dimension: 6 cm (Length) x 4 cm (Width) x 2 cm (Height)
- Type: 6800 mAh
- Voltage: 3.7V
- Technology: Lithium-Ion
- Size: 18650

3.2.3 DATA ANALYSIS METHOD

Statistical analysis refers to the process of collecting, reviewing, and interpreting data using statistical methods to gain insights, draw conclusions, and make decisions.This process involves various steps like data collection, organization, analysis,interpretation, and presentation. Statistical analysis helps in detecting patterns,relationships, and trends in data, making predictions, and testing hypotheses. It is widelyused in research, business, finance, healthcare, and other fields where data driven decisions are important.

The results are back from your online surveys. Now it’s time to tap the power of survey data analysis to make sense of the results and present them in ways that are easy to understand and act on. After you’ve collected statistical survey results and have a data analysis plan, it’s time to begin the process of calculating survey results you got back. Here’s how our survey research scientists make sense of quantitative data (versus qualitative data). They structure their reporting around survey responses that will answer research questions. Even for the experts, it can be hard to parse the insights in raw data.

In order to reach your survey goals, you’ll want to start with relying on the survey methodology suggested by our experts. Then once you have results, you can effectively analyze them using all the data analysis tools available to you including statistical analysis, data analytics, and charts and graphs that capture your survey metrics.

3.3 SUMMARY

This chapter focuses on the project design, procuders project, material/equipment and data analysis method. The research design and method chosen for the study have been mentioned. It also includes the questionnaire instrument and the functions of each section. The chapter three of final year projects usually explains the 'research methodology', as traditionally called, under various categories and research tools. Mentioning tools, I mean the instruments for data collection or gathering, research techniques, research population, instrument for data analysis and the likes.

CHAPTER 4 : RESEARCH FINDINGS AND DISCUSSION

4.1 DATA ANALYSIS AND STATISTIC

Mecanum wheels exhibit particular kinematic behaviour as a result of their construction. To investigate the connection between wheel velocities and the resulting robot motion, undertake a kinematic analysis. In order to understand how the movements of the wheels influence the system as a whole, this study requires monitoring and examining the wheel speeds, distances travelled, and orientations.

Trajectory Analysis: You may determine a robot's trajectory by gathering information over time on the position and orientation of a mecanum wheel-driven robot. Calculating displacement, velocity, and acceleration as well as looking for any deviations or anomalies in the motion are all possible components of this study. Regression analysis is one statistical technique that may be used to estimate and forecast the robot's trajectory based on the inputs from the wheels.

Evaluation of the Control System: Mecanum wheel-driven robots frequently use sophisticated control systems to accomplish desired motions. You may gauge the effectiveness of the control system by compiling data on the control inputs and matching wheel outputs. You may analyse the link between the control signals and the resultant wheel movements with the use of statistical techniques like system identification, allowing you to improve the control algorithms

Efficiency analysis: Measuring how much power or energy mecanum wheels use while doing different jobs can provide light on how effective they are. The use of statistical analysis can reveal patterns or trends in power utilisation, enabling you to compare various wheel designs for efficiency or to optimise the system's energy usage.

4.2 DISCUSSION

Mecanum wheels have a circumference covered in a row of inclined rollers. The wheels may travel in different directions with the help of these rollers since they can adjust the rotational speed and direction of each individual wheel. The robot can move translationally, spin, and strafe sideways by manipulating the rotation of the wheels in various combinatons.

The capacity to move laterally, which makes mecanum wheel robots very manoeuvrable, is one of their main features. As a result of their main features. As a result of their ease of movement in all directioans, including sideways and diagonally, they are useful for tasks like accessing small places, accurate placement, and item handling.

Mobile mecanum wheel robots are utilised extensively in fields including industrial automation, logistics, surveillance, and research. They can be used in setting like warehouse, industries, or even search and rescue missions where accurate and quick motions are required.

It's crucial to remember that mecanum wheels do have certain drawbacks. They often have less grip than conventional wheels, which might restrict their effectiveness on some situations like soft ground or rugged terrain. Mecanum wheel robots may also be more difficult to construct and maintain than simpler wheel combinations because to their sophisticated wheel design and added control needs.

4.3 SUMMARY

This chapter examines the study's quantitative findings as well as the questionnaire's construction, outcomes, and analysis of the qualitative data. To highlight parallels and contrasts between this study and other studies and literature, the findings are also presented in the context of prior research findings and relevant literature, when appropriate. Chapter 3 provided a thorough explanation of the study technique. The conclusion of our research and what we believe to be the greatest solution to the research issue posed and mentioned in chapter one of the research project.

CHAPTER 5 : CONCLUSION AND SUGGESTION

5.1 CONCLUSION

In conclusion, we already give made a recommendation regarding our project,and we also have primary goal for our project, which is Revo Base Control and how it must funtion.We have already met all of our objectives thanks to your suggestions and recommendations.Suggestion of our project,Revo Base Control,such as the objective of Revo Base Control,the size and weight of our product,the accuracy,durability and cost estimate fo Revo Base Control.Our project also worked effectively and met our goal for how this Revo Base Control should operate such as how it move,how far can go and how much weight can be accommodated. purpose : the purpose of revo base control was created to know the function of the robot will help and facilitate the work of moving goods will be easier

5.2 SUGGESTION AND RECAMMENDATION

Purpose : the purpose of revo base control was created to know the function of the robot will help and facilitate the work of moving goods will be easier

size and weight : object size and weight revo base control should be designed to handle object weight and size
without affecting its efficiency

Accuracy: The Revo base control should be installed with precision speed to ensure durability and consistency during the lifting process.

Durability: Revo site controls should be designed to withstand the constant wear and tear of industrial use or repeated use in recreational activities

Ease of maintenance: Build a revo base control that is easy to maintain and repair in case of damage.

Cost : When making a decision, the cost of the revo base control should be considered. Before making a final selection, consider your budget and pricing comparisons.

5.3 LIMITATION OF THE STUDY

Certainly! There are a number of obstacles preventing our study on mechanum tyres from being as effective as we would like. The requirement for varied tools, resources, and access to numerous information sources is the main cause of these difficulties.

One key obstacle we face is the need for particular tools and resources in order to carry out our research efficiently. To conduct thorough studies, we require mecannum tyres themselves, testing tools, prototypes, and specialised tools. However, getting these resources is challenging because of things like their price, restricted accessibility in our research environment, or limited availability. This lack of availability or scarcity restricts our ability to conduct experiments, collect empirical data, and make precise measurements, which ultimately compromises the validity and dependability of our study.

5.4 REFFERENCE

https://en.wikipedia.org/wiki/Mecanum_wheel

https://www.researchgate.net/publication/336146675_Design_and_Analysis_of_a_New_Type_of_Mecanum_Wheel_International_Journal_of_Mechanical_and_Production_Engineering_IJMPE_pp_47

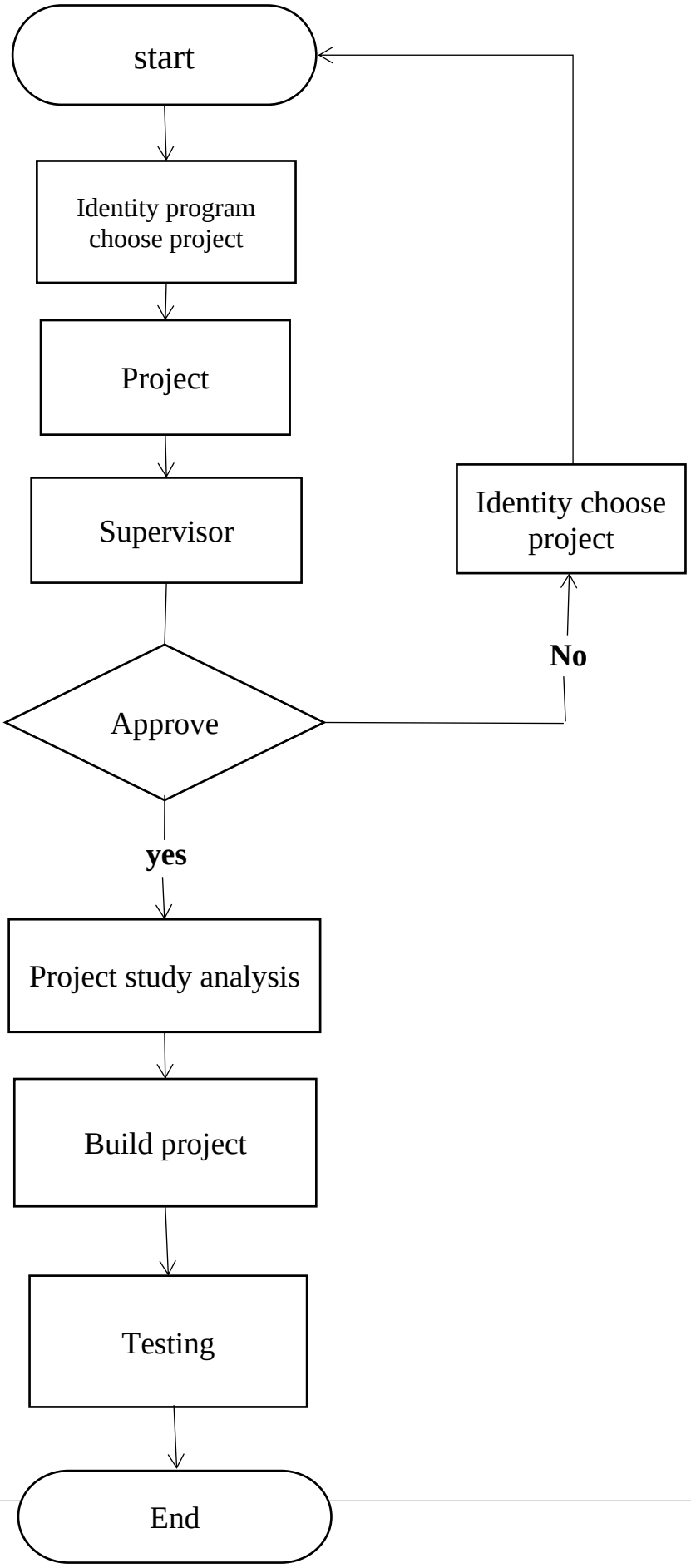
https://www.mdpi.com/1424-8220/20/1/75

https://www.generationrobots.com/media/Mecanum-wheel-application.pdf

https://www.dubizzle.com/blog/cars/differences-run-flat-normal-tyres/

https://www.item24.com/en-de/mb-building-kit-system/aluminium-profiles-and-accessories/

FLOW CHART OF PROJECT



GANTT CHART
Project 1

Description	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Division of project group member 1														
To select the scope of the project title														
To examine the pros and cons of each chosen title														
For the selection of the actual project title to choose between the three														
To carry out research on the actual project title														
To carry out research on the application and method of remote control technology														

Build project prototaip														
Attend the 5th semester project exhibition														
Prepare final report and slide presentation														

Project 2

Description	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Do the framework for the project														
Fill in isolms and do the framework for the project														
Find and understand information about the equipment														

Make a final judgement about the selection of tools														
Find tools and project materials in the workshop.														
Starting project work such as making base and punching holes.														
The process of installing screws in the base														
Connect the frame part on the top plate														
Make and connect the Arduino circuit														
Make arduirno coding														
Change the body part of the project with aluminium profile														

Make a poster for the aeromech program.														
Connect the Arduino to the body project														
Prepare project for aeromech program														
Enter the aeromech program at the polytechnic (wing B)														