

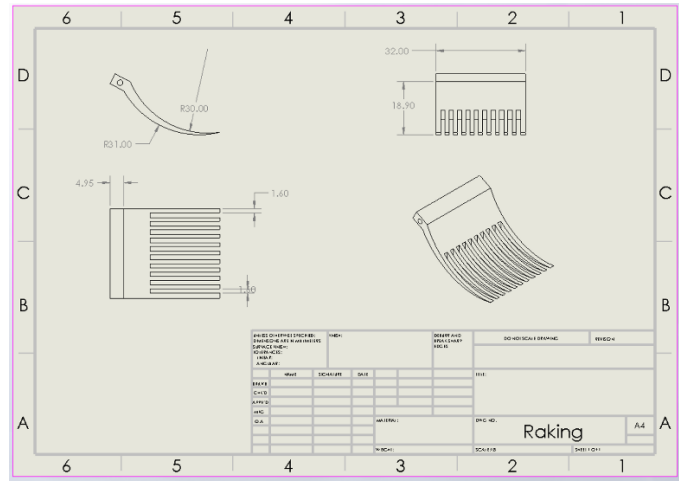
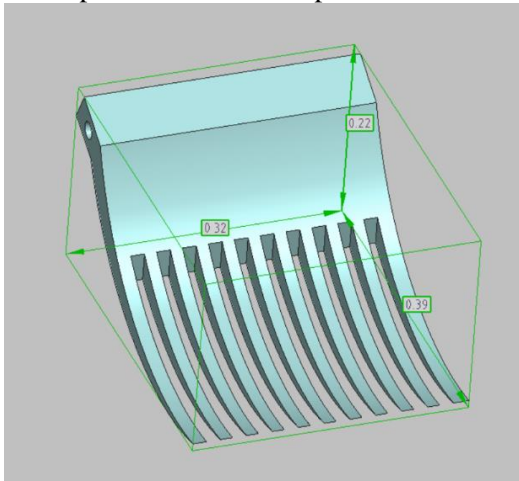
EE4203 – Design Project – Progress Review 1 – Individual Report

Index No	190091K	Name	Barathraj M.
Group	G14	Project Title & Supervisor/s	Intelligent Beach Cleaning Robot Prof. Buddhika Jayasekara
Evaluation Panel	Panel 3		

Individual contribution to the project

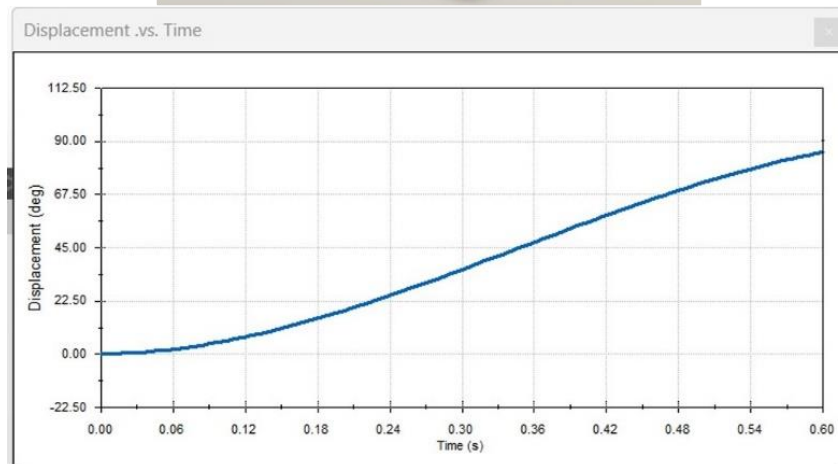
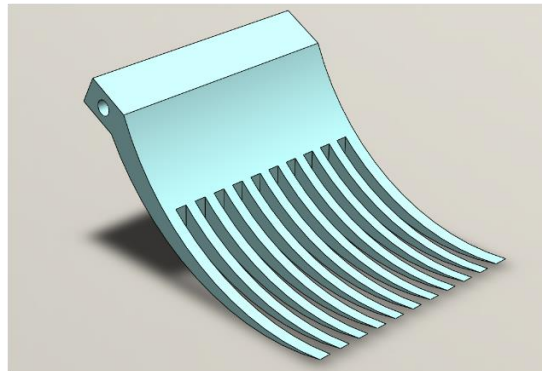
✓ Designed the Raking Mode for the Refuse Collection Mechanism using SolidWorks.

I used SolidWorks to design the raking mode for the refuse collection mechanism. This design involved creating a comprehensive plan for how the mechanism would effectively collect refuse. It included the arrangement and operation of the components that make up the mechanism.



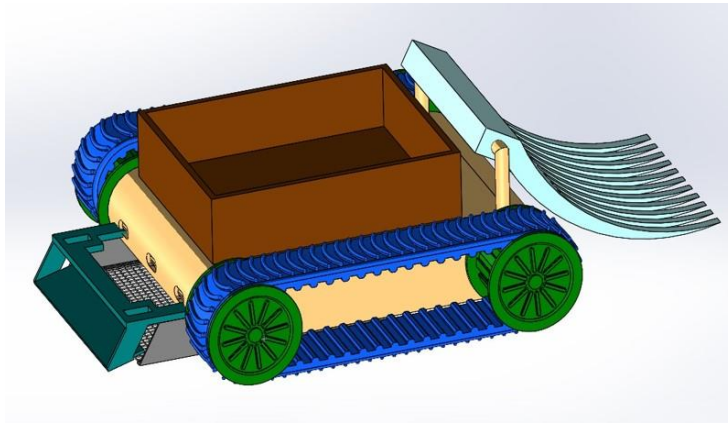
✓ Conducted a Motion Study to Analyze the Designed Mechanism.

I conducted a detailed motion study to thoroughly assess the functionality and efficiency of the designed raking refuse collection mechanism. This study involved allowing for a comprehensive analysis of how the mechanism performs in real-world conditions.



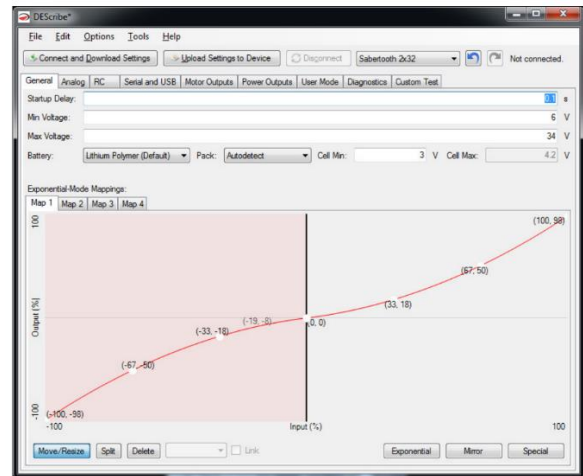
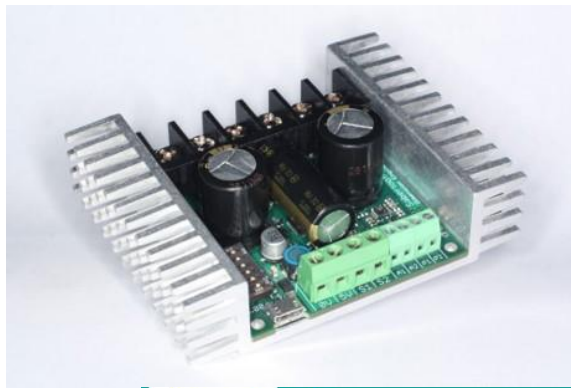
✓ Assembled the Overall Design for the Beach Cleaning Robot.

Following the mechanism design and analysis, I moved on to assembling the overall design for the beach cleaning robot. This involved integrating various components and systems to create a fully operational robot capable of efficiently cleaning beaches.



✓ Tested the Mobile Tracking Robot, Including Its Components such as the Motor Driver.

To ensure the effectiveness of the project, I thoroughly tested the mobile tracking robot, paying particular attention to its components such as the motor driver, which was essential for its mobility and navigation.



```
1 #include <Sabertooth.h>
2
3 Sabertooth ST(128, Serial); // Replace 128 with your Sabertooth address and Serial with your chosen hardware serial port
4
5 int motor1Pin = 2; // Connect S1 to digital pin 2
6
7 void setup() {
8   // No need to call ST.begin() as we've already provided the necessary constructor arguments
9 }
10
11 pinMode(motor1Pin, OUTPUT);
12 Serial.begin(9600); // Initialize serial communication for debugging (optional)
13
14 void loop() {
15   // Control motor 1 (S1) to move forward at a fixed speed
16   digitalWrite(motor1Pin, HIGH); // Set motor 1 to move forward
17   ST.motor(1, 127); // Control the motor at a speed of 127
18
19   // a delay here to run the motor for a specific duration
20   delay(2000); // Run the motor for 2 seconds
21
22   // Stop the motor
23   digitalWrite(motor1Pin, LOW);
24   ST.motor(1, 0);
25 }
26
27
```

✓ **Performed an Analysis and Selection of Hardware Components for the Entire Project.**

The next critical phase involved an in-depth analysis and selection of hardware components for the entire project. I carefully chose the right hardware to ensure the reliability and durability of the beach cleaning robot and its mechanisms.

✓ **Conducted a Literature Review by Studying Relevant Conference Papers.**

I conducted a comprehensive literature review by studying relevant conference papers. This step was crucial to gather insights, best practices, and knowledge from existing research in the field of robotics and refuse collection mechanisms.

✓ **Created a Budget Estimation List and a Timeline Plan for the Project.**

To keep the project on track and within budget, I created a budget estimation list and a timeline plan. This provided a clear roadmap for the project's execution, outlining the financial requirements and milestones to be achieved within specific timeframes.

Peer contribution and personality clashes

Mahiliny J. - 190378X

She trained a YOLOv5s model to detect the plastics on the image. Also obtained an available labeled dataset from Roboflow website for the garbage. And trained a model for that dataset. Trained with different types of garbage image dataset to decide which dataset gives the highest accuracy. By changing the parameters got the accuracy about 88%.

Yathunanthanasarma B. - 190722A

He contributed to a part of literature review at the problem and research gap level and then to focus on the sieving shaker mechanism for garbage collection. Then, he sketched the sample design for refuse collection mechanisms. Designed the sieving shaker mechanism using SolidWorks software. Performed the analysis and motion study of the mechanism and added suitable component parameters to check.

Together, we conducted the testing of the mobile tracking robot in the laboratory with a specific focus on its components including the motor driver (Sabertooth) which plays a vital role in enabling its mobility and navigation.

Issues

- Unavailability of components and financial issues can impact on the budget.
- The motor driver available for the mobile tracking robot was not functioning correctly which had prevented us from testing the tracker's navigation.