Introduction

This document is the follow-up to the client and user feedback received during the last meeting. It goes over how to implement the feedback and incorporate it into the prototype 3. We documented the prototype and its execution. We also outlined user feedback and took into account a variety of factors when iterating our future prototype. Finally, we refined the test plan created in the last deliverable, incorporating our user feedback and client feedback to create future tests that will enhance the quality of the final implementation for Design Day.

Feedback

Client Feedback

The client provided the following feedback: “It looks good, I look forward to seeing it”

Implementation of Client Feedback

We don’t need to improve on our design, and instead focus on improving what we currently have.

User Feedback Table

The feedback was obtained by surveying the team's grandparents.

| **User Feedback** | **Implementation** |
| --- | --- |
| A potential user expressed the attachment to the cart was flimsy and that it would be difficult to attach every time it would be used | The attachment to the cart from the robot could be magnets or buckle attachment. |
| A potential user expressed that in the final video presentation, the music played behind the dancing of the robot should be synchronized. | For the final video, the music will be played during the whole video and will be synchronized with the robot dancing at the end. |
| A potential user expressed that they would like the robot to act on command or be more interactive. | During the video editing stage of the prototype, we will place a bigger emphasis on displaying the robot responding to user physical input. |

Prototyping and Test Plan

Cart Attachment

What: The attachment of the cart to the Robomaster

Why: Need to improve attachment speed, especially how it is tied around with knots

When: March 16th

Documentation: Brainstorming - magnets, karabiner, buckle or a stronger piece of cord.

Coding

What: Compile all the coding files from DJI into separate images.

Why: To make it easier to document, as well as for use on the final design day presentation.

When: 2 hours / March 9th

Documentation: The fields were placed in the shared Google Drive folder amongst the team.

Video Editing

What: Complete final video editing

Why: For final presentation and to be shown to government officials

When: 3 hours / March 20th

Documentation: Collected all the clips that will be used in the video and decided on a video editing software.

Manifesto

What: Write a manifesto from the perspective of the robot expressing its disapproval for being used to teach students about using it for war

Why: This is one of the final deliverables required by the client.

When: 3 hours / March 20th

Documentation: Brainstorming

Conveyance of message

What: Asking the client for feedback

Why: Allows us to identify areas for improvement

When: 20 minutes / February 11th

Length of travel of delivery

What: Attached the wagon to the robomaster and had it travel in a straight line

Why: To identify if the robomaster is able to travel from point A to B with the food on board

When: 5 minutes / March 2nd

Documentation:

* Moved the attachment location of the ribbon from bottom to the midpoint
* Changed what material the connector is made of

Lights

What: Program in DJI Education hub, the robomaster to lights

Why: To see if the lights are visible, able to turn on and change colour.

When: 10 minutes / March 2nd

Documentation:

* The lights are separately programed
* Made it blink along with changing the colour

Handling the weight of the pizza.

What: Add weight to the wagon and test how much the robomater is able to pull.

Why: To identify if the robomaster will be able to pull food, pills and other objects

When: 20 minutes / March 2nd

Documentation:

* Prototype of wagon design
  + Made of plastic plant cart
  + Punctured a small hole to screw in a hook
  + To make more personably
    - Attached googly eyes with hot glue
    - Attached pipe cleaner arm and mouth
* Weight: 776 grams
  + Can carry it easily

Audio output from the robot.

What: Robomaster plays sound ques. Different sounds for different situations

Why: To see if it can it can play audio

When: 20 minutes / march 2nd

Documentation:

* Can play piano notes
* The custom audio not available

Setting the speed of the robot.

What: Change the speed of the robomaster

Why: Ensure the robomaster does not move too fast causing items from the wagon to spill out.

When: 5 minutes / march 2nd

Documentation:

* Robomaster Was originally set at 2-3 m/s was to fast
* Set speed to 0.25 m/s

Detecting people / objects

What: Be able to detect people and objects in front of it.

Why: Once detected the robomaster will be able to avoid collisions.

When: March 9th

Documentation:

* Will be finished in prototype 2

Film Video

What: Be able to film video through robomaster.

Why: Be able to add a POV shot in the video

When: March 2nd

Documentation:

* Only hold five photos
* SD mini chip
* DJI Education hub programed

Prototype 3 Plan

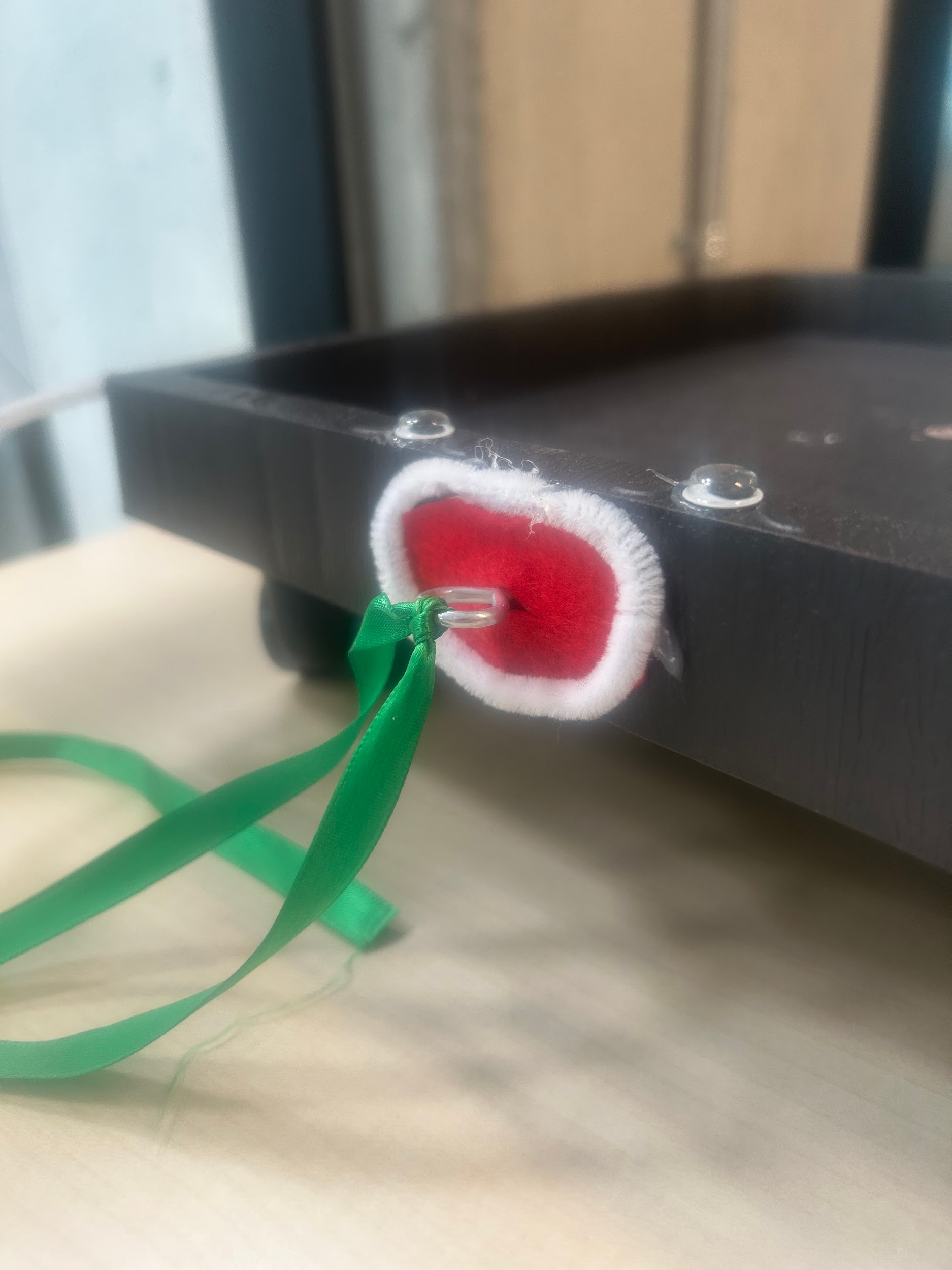
| Number | Objective | Test Method | Usage of Results | Stopping Criteria | Test Duration  (date) |
| --- | --- | --- | --- | --- | --- |
| 1 | Conveyance of message. | Survey before and after client meeting. | To iterate the message of the video. | Satisfaction from the client  (complete) | 10 minutes / March 3rd. |
| 2 | Length of travel of delivery. | Can the robot travel 10m without the pizza falling off. | To determine whether this section of our user needs is met. | Once it Moves 10 m  (complete) | 10 minutes / March 1st. |
| 3 | Handling the weight of the pizza. | A repeat of test 2, as well as whether the robot can still travel 10m with it. | To determine whether the food delivery objective of our project is met. | Be able to handle 500 g  (complete) | 10 minutes / March 1st. |
| 4 | Audio output from the robot. | Can the robot output custom audio. | To be used for interaction in all objectives for the robot. | Be able idea though audio | 10 minutes / March 1st. |
| 5 | Setting the speed of the robot. | Can the robot travel at 28 km/h. | To be used when delivering food to the customer. | Can travel at 0.5m/s  (complete) | 10 minutes / March 1st. |
| 6 | Turning on/off of the lights. | Can the robots light’s be programmed in a way that they turn on and off/ | To be used to add a level of interactivity to the robot. | Be able to control lights and light colour  (complete) | 10 minutes / March 1st. |
| 7 | Recreation of the cart attachment | Can the cart attachment be recreated in < 1 minute. | To be used to make the final design day presentation more coherent. | Once the attachment can be recreated in under 1 minute, by testing. | 10 minutes / March 16th. |

*Table 2: Table of prototyping and test planning.*

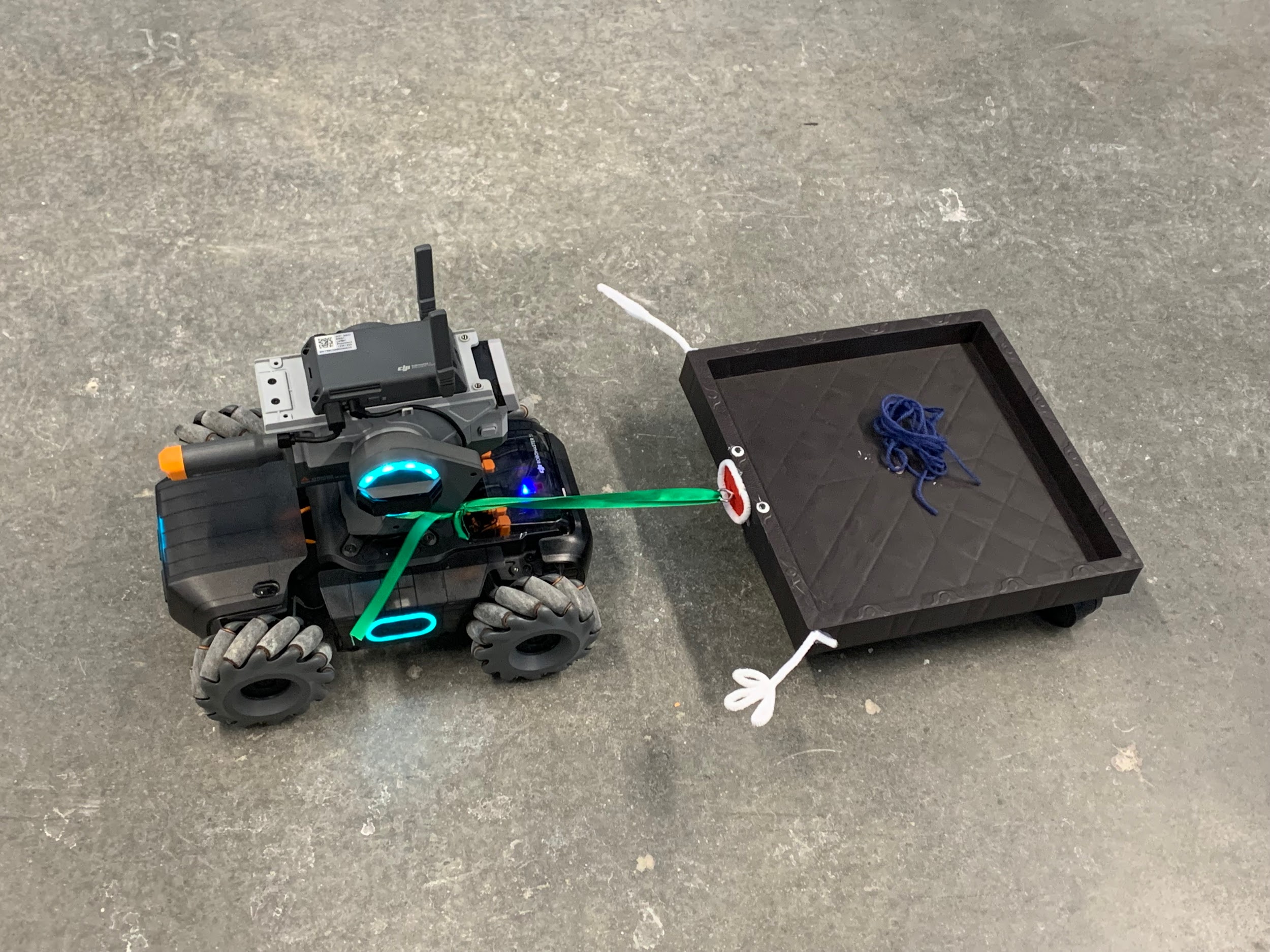
| Number | Type (what) | Objective (why) | Fidelity | When To realise |
| --- | --- | --- | --- | --- |
| 1 | Comprehensive | Overall message | High | March 3rd. |
| 2 | Focus | Movement of Wheels | Low | March 1st. |
| 3 | Comprehensive | Weight Bearing | Medium | March 1st. |
| 4 | Focus | Audio Sound | Low | March 1st. |
| 5 | Focus | Movement of Wheels (engine) | Low | March 1st. |
| 6 | Focus | Light brightness | Low | March 1st. |
| 7 | Focus | Attachment Speed | Medium | March 20th. |

*Table 4: Further expansion of prototyping tasks.*

Images



*Image 1: A picture of the attachment to the cart, using the ribbon*



*Image 2: A picture of the RoboMaster S1 attached to the cart, using the ribbon*

Conclusion

In Conclusion, for the next prototype we need to adjust the cart attachment method. To do this we need to add a buckle to improve the strength of the attachment. Furthermore, we plan to edit the video and refine our conveyance of message, by taking the user feedback obtained in earlier deliverables and synchronizing music to enhance the quality of the final implementation. Finally, we plan to edit the video in a way that displays the interactive nature of the robot – by prioritizing showing the robot interacting and reacting to user input. Overall, by implementing our user feedback and continuing to refine our prototype, we will meet the goals outlined in our test plan table and finish our final implementation for Design Day.