Lab Weeks Report

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Disclaimer:

The report was written daily by the end of the day. Energy and motivation to sit and write varied from day to day, so each day is written in different levels of energy. I felt it was the best way of reporting, giving it a human touch, making it less professional, but more human with some mistakes etc. Especially while having this subject of Artificial Creatures, I felt it was a great theme to plan the report writing this way. I chose to explain my contributions shorter and let the images speak to themselves instead with added text to clarify what is going on in the picture. I have attached links for videos that should lead you to my Dropbox folder and I will link relevant videos along the way to clarify exactly what I was working with.

Dropbox link for all videos of the process and EXPO:

https://www.dropbox.com/scl/fo/mnyhy43d6fjct8v9ytkky/AH40xCKKBcPiEFgkqMXefVU?rlkey=e85feie7lh6v4w3u30b4eov0k&st=6yq8vodr&dl=0

10.06.25 – Kickoff and Meeting the Team

Own Contributions:

To start off with, NS chose to strike on the first day, making my trip to Zoetermeer from Haarlem impossible, unless I wanted to spend 3.5 hours one way on travel. I had to meet the team online. I am not a big fan of hybrid, and I did feel it was very difficult to get to know my team properly and come with input. But I managed, thanks to my welcoming team as well!

First brainstorm session I came up with the following ideas:

1. AI-Robot that is like a creature for the desk, so a desktop pet.
2. Gaming Robot - which has a big screen which roams around the campus and you can play against it. Specifically like Tetris or other arcade games.
3. Little Sketcher – Looking at when some people don't feel good enough to sketch, you could place a drawing robot on the paper and ask it to draw what you are thinking of.
4. Beer pong Buddy – A Buddy that will always make you win beer pong

Group Contributions:

The rest of the group also came up with very cool ideas and we landed on an interactive plant. First, we thought of the Super Mario Piranha plant that could like snap at you if you get close or pet it too hard. We moved towards a Sunflower, maybe with a face even. We will try to add Sunflower nature towards it. So, the flower bulb will tilt when dark, and when light it will face the sun or the people.

Own reflections and points of discussion with my team:

- Which interactions should we cover
- Does it make sounds
- How is it built
- What materials

Materials used: None yet.

Tools used: None yet.

Tutorials or Inspiration:

https://www.youtube.com/watch?v=ikMVfzW2rtI

https://www.youtube.com/watch?v=A3wpNoZmb7Y

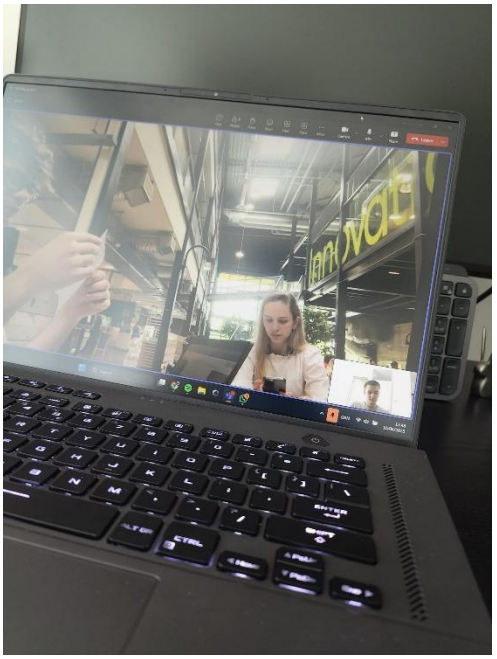
https://www.youtube.com/watch?v=dW_wWJIgoJI&t=13s

https://www.youtube.com/watch?v=5KxzI7kZFfo

https://www.youtube.com/shorts/X3Sw3pMChCs

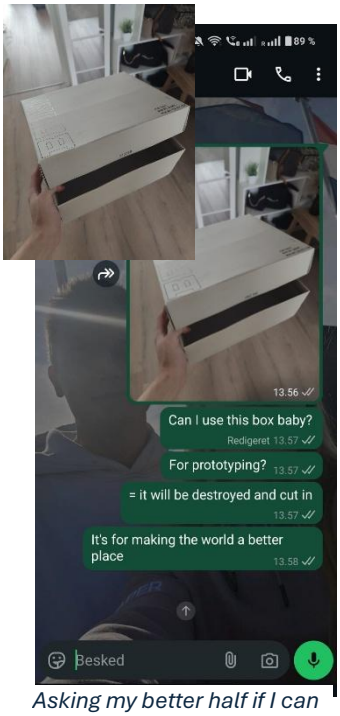
Pics & Videos:

Cleaningup my old toolbox and finding all small things I never got to use from for example IKEA furniture



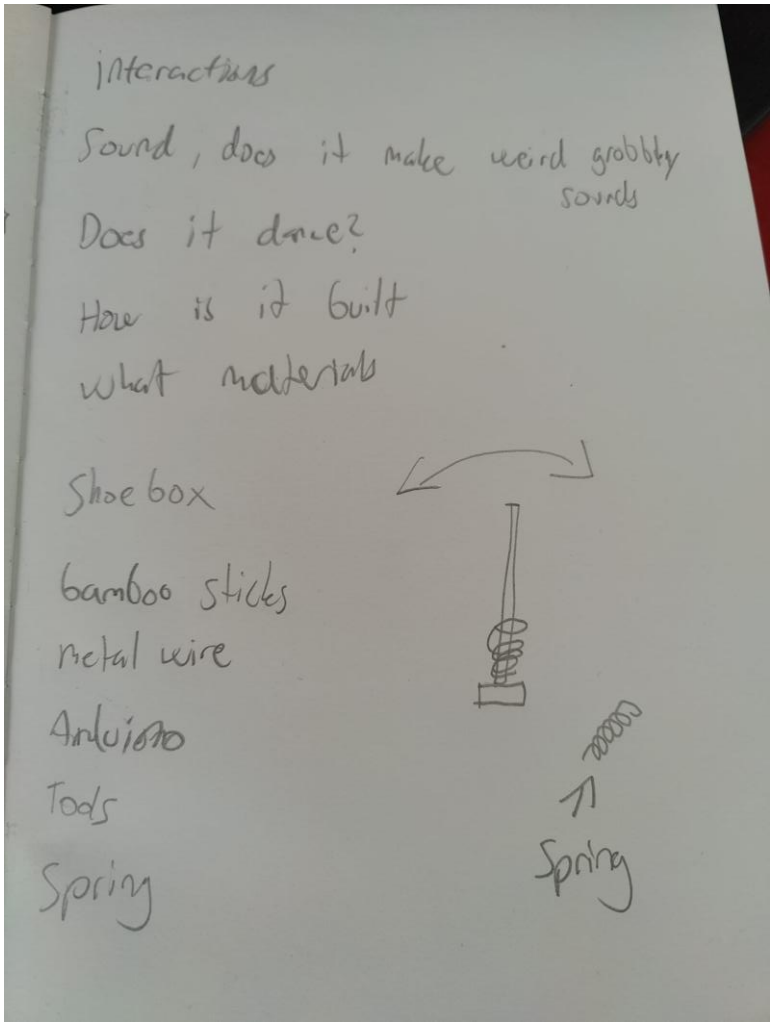
Meeting my team for the first time.

Weird tools and material for prototyping, you never know what you can use

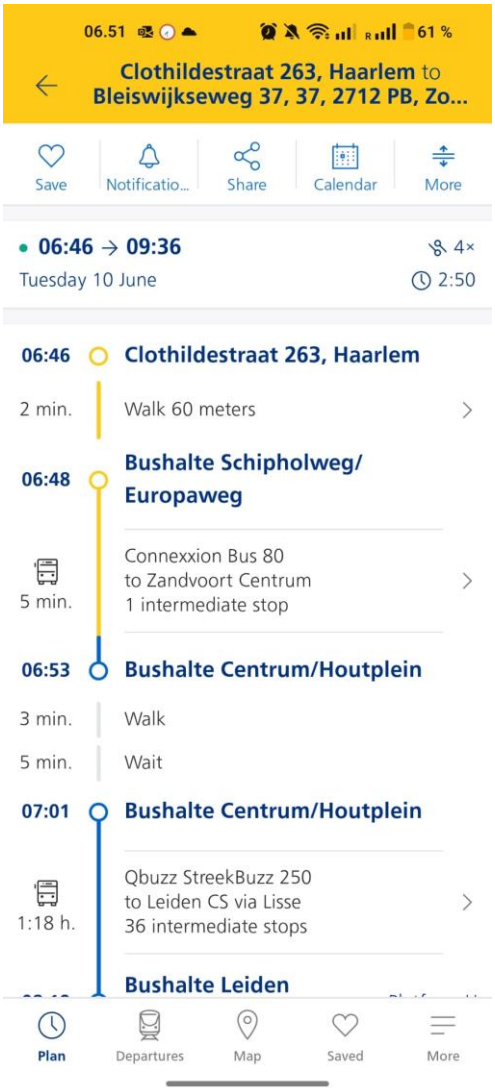


Asking my better half if I can use her old shoebox

Box is packed and ready for a new day of prototyping



Problemsolving how to make the flower bend to multiple sides. I came up with the idea to use a spring to make it bouncable in multiple directions



3 hours of traveltime.. Knowing this country it wont be `only` three hours

11.06.25 – Initial Prototyping

Own Contributions: I started thinking of how the leaves of our flower could contract end retract, hiding the flower in a way, so when there is no sun, the flower bulb gets hidden by leaves from the stem. I started sketching possible solutions first and then went into the cardboard. I worked around three triangles of cardboard, imitating the leaves. I created a frame of metal wire and try working some strings on both sides of the leaves to be able to move the flowers accordingly, both to close the flower, but also to open it again. Here I struggled a lot, I needed some fishing strings for flexibility and lightness but could only create with normal string, which became impossible to work with. However, I learned how to make the flower leaves fit better, so by the end of the day I created a new metal frame, which we then attached leaves in the material (foam) we want the leaves to be in, which is also softer than cardboard.

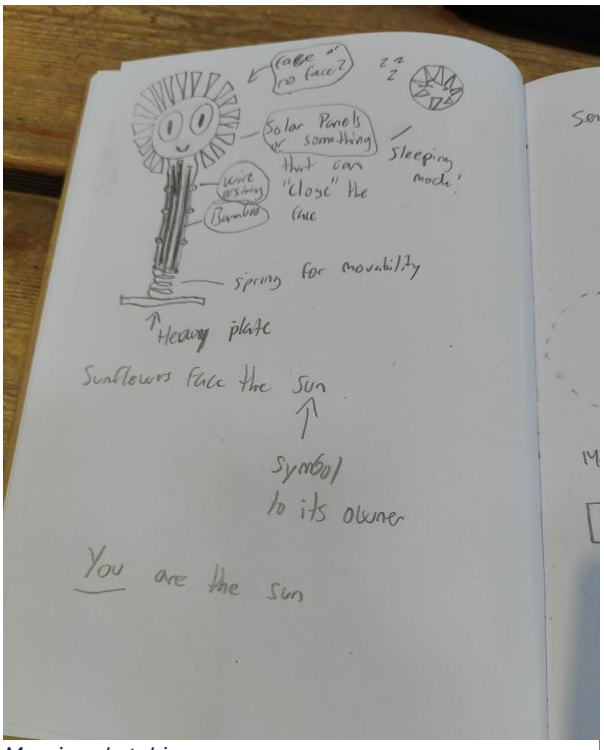
Group Contributions: My group worked hard on each part of the plant as well. We solved the stem issue, and the pretty-team created the flower itself. The stem was created with spiraled plastic tube, some fishingstring and an Arduino with a servo that can pull the string in specific direction, however more is yet to be discovered tomorrow.

Materials used: cardboard, paper, metalwire, plantwire, glue, string,

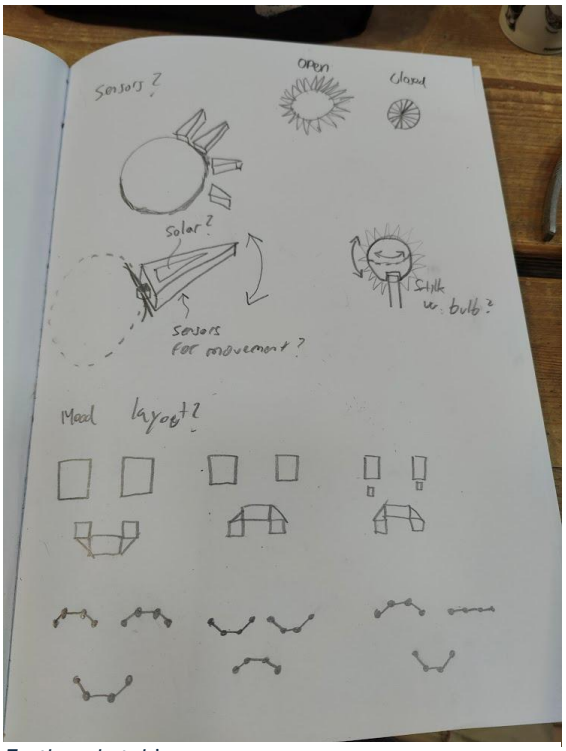
Tools used: scissors, pliers

Tutorials Seen: None

Pics & Videos: feast yourself

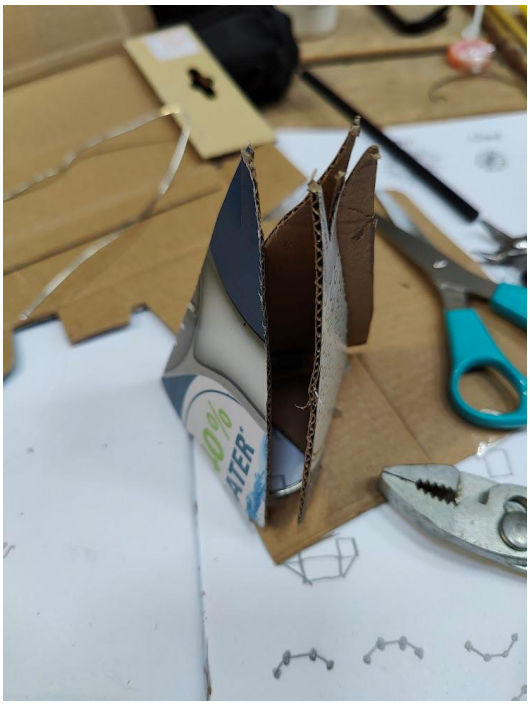


Morning sketching



Further sketching

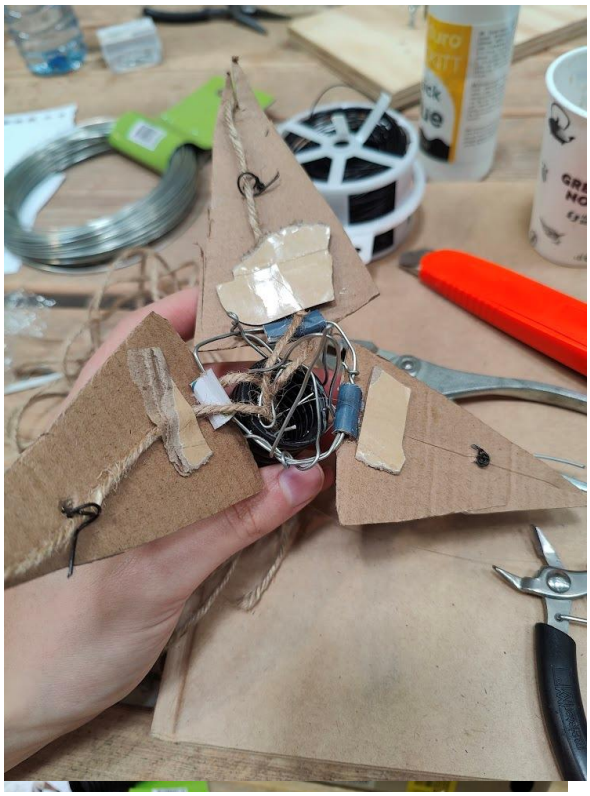
Cutting first pieces of cardboard



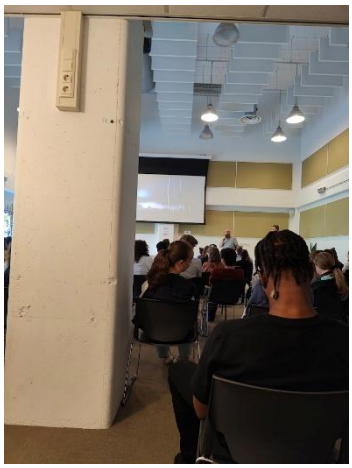
All three cardboard pieces together

Metalwire frame for the cardboard to be able to flip up and down

All strings attached for full movement. It is getting a bit messy now, since iterations are happening on the spot, and it is very wobbly and unsturdy.

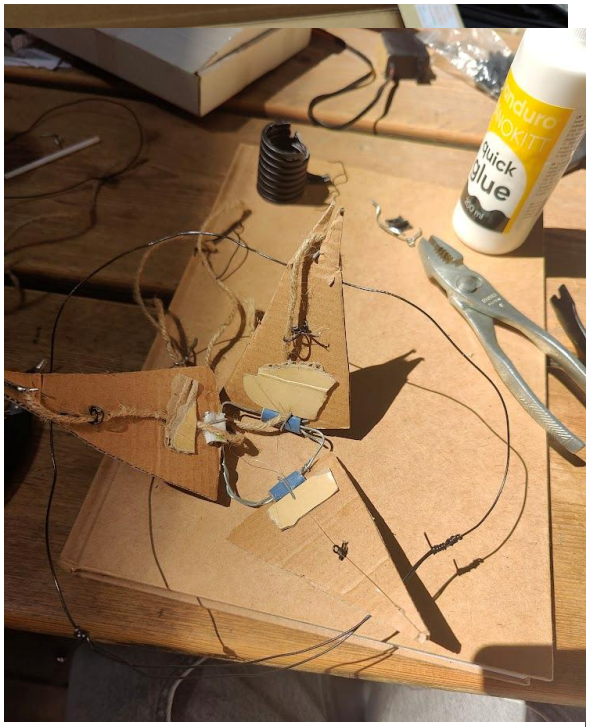


Prototype really becoming messy. All I had to do, was to create and find out how the leaves could go up and down



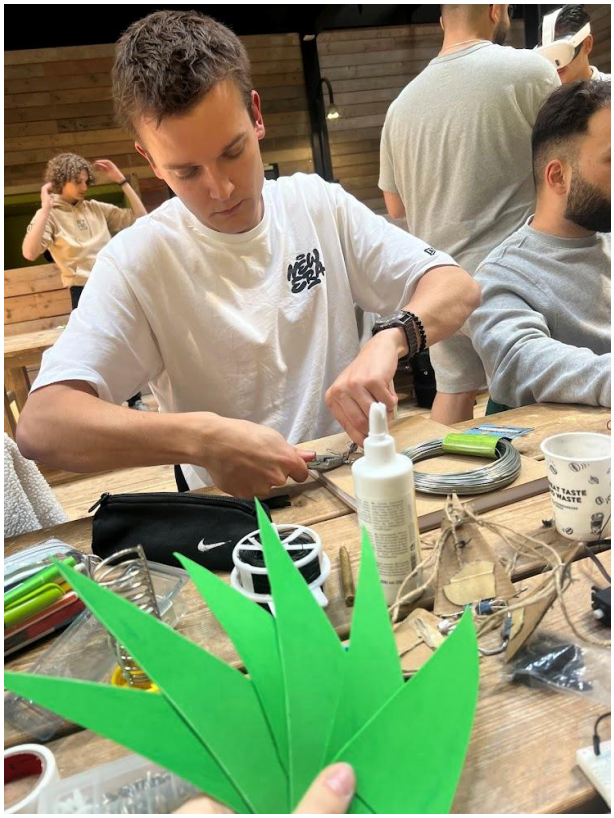
Cool presentation about sounds and surfaces

Lunch break



Prototype was cleaned up and I had to find out how to secure the leaves from falling downwards, I used wire, so it was bad, the leaves were held up, but they not possible to pull up anymore

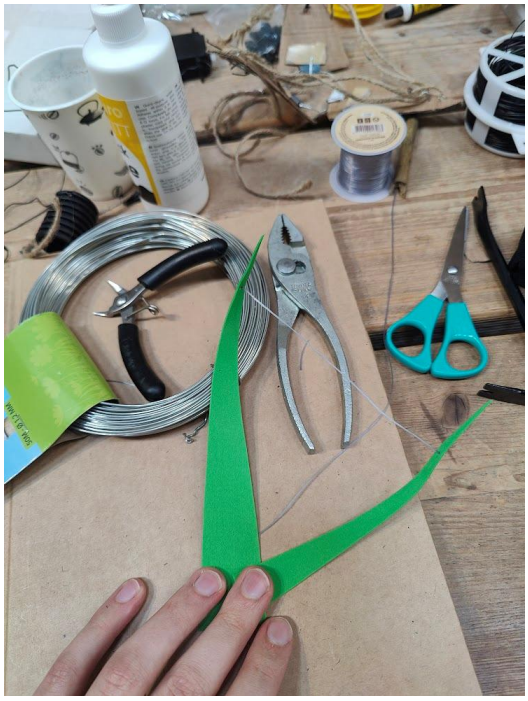
String was added instead of wire between each leaves, but the string was too soft



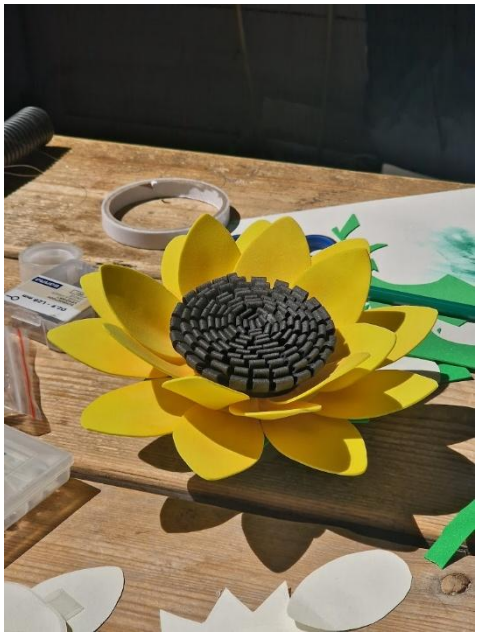
Time to resaddle. I started creating a metalwire frame, sturdy and clean for the leaves instead of working with cardboard

This was the main gist of the idea and then we add elastics on the end of the leaves to make it possible to pull in and out

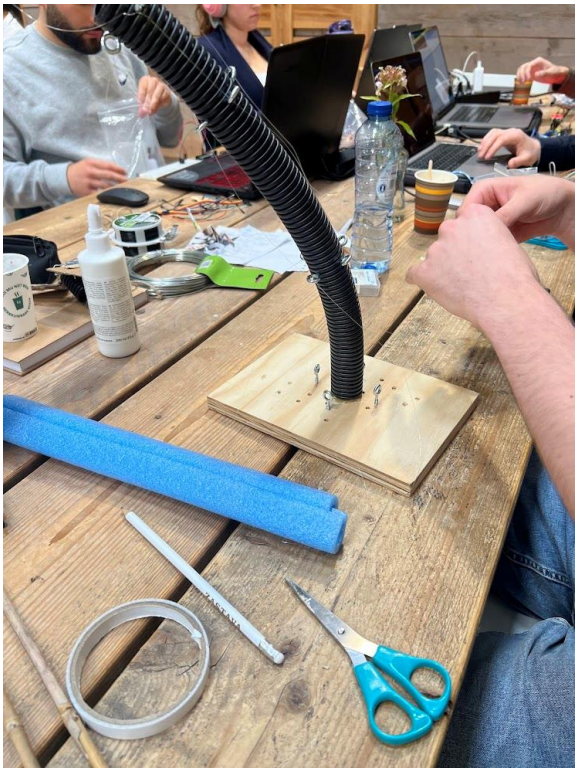
This is how it looks



This is the idea we started sketching out, but we leave this for tomorrow. Stay tuned!



Flower made by the pretty team (Sacha & Anastasia)



Stem made out of PVC with spirals. Strings attached on the side for flexibility and movement (Wout)

12.06.25 – Functions & Functions

Own Contributions:

I started off the day sketching ways of closing the leaves in a pretty but good way. Please have a look at the images below. It took some time to figure out how to make this, and once it was made in the paper prototype I quickly made of the rough sunflower plant, I found out how the fishingstring reacts differently with friction on paper than on the foam. I quickly solved the issue with cutting pieces of a plastic straw that I had from my lollipop I was eating, guess you can really use everything for prototyping, it is pretty funny, and so cheap.

It worked very well with the plastic tubes, but now a new issue appeared. It only closes, but what if we want full control and be able to open it? Well here comes the rest of the day. I had to play around with which point of the ´leave´ it was pulling from, without twisting the leave in an awkward way. I worked a lot around with this and managed to create a clever mechanism that will require one or two servos, depending on what will happen when this mechanism is added to the actual prototype. The servo pulls one string that connects all the leaves, then it either retracts and pulls back the leaves or open the leaves.

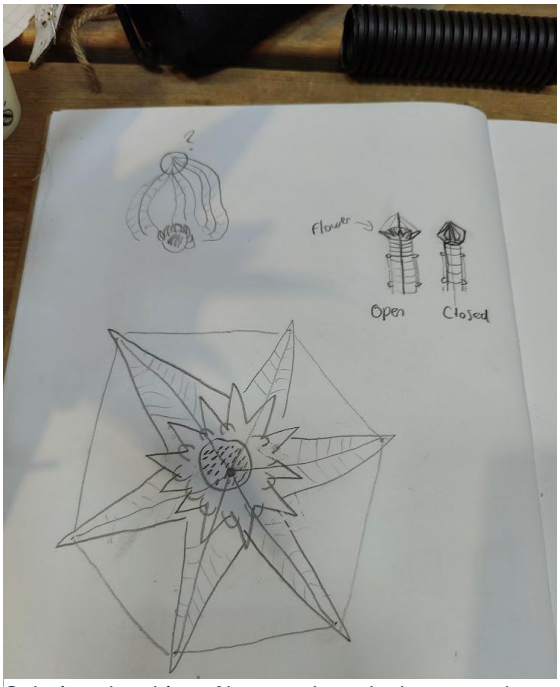
Group Contributions: The group worked further with the stem and functions thereof. I worked in close collaboration with the pretty team to see how to implement the mechanism in a clever and subtle way. It worked very well for the contraction design, but we will see with the pull-back once added. A very productive day in general!

Materials used: Cardboard, tape, glue, fishingstring, stapler, foam, paper

Tools used: pencil occasionally for sketching

Tutorials Seen: None

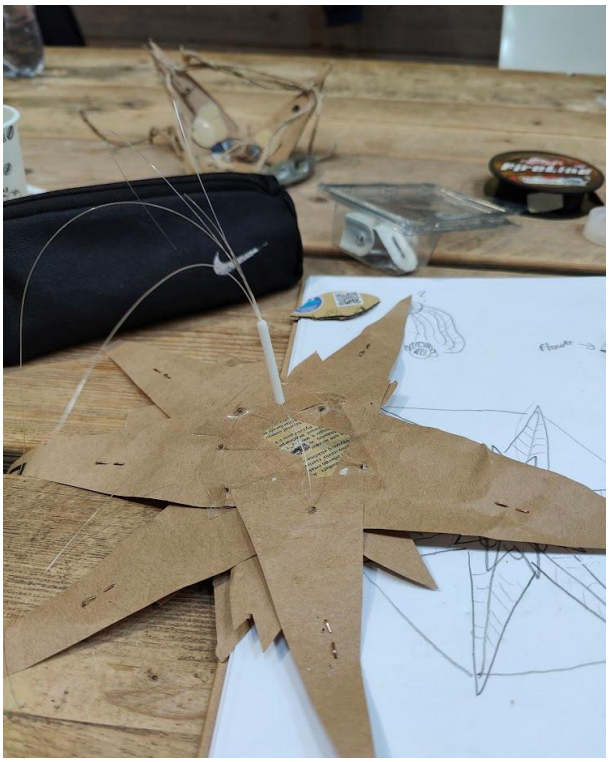
Pics & Videos: Have a look!



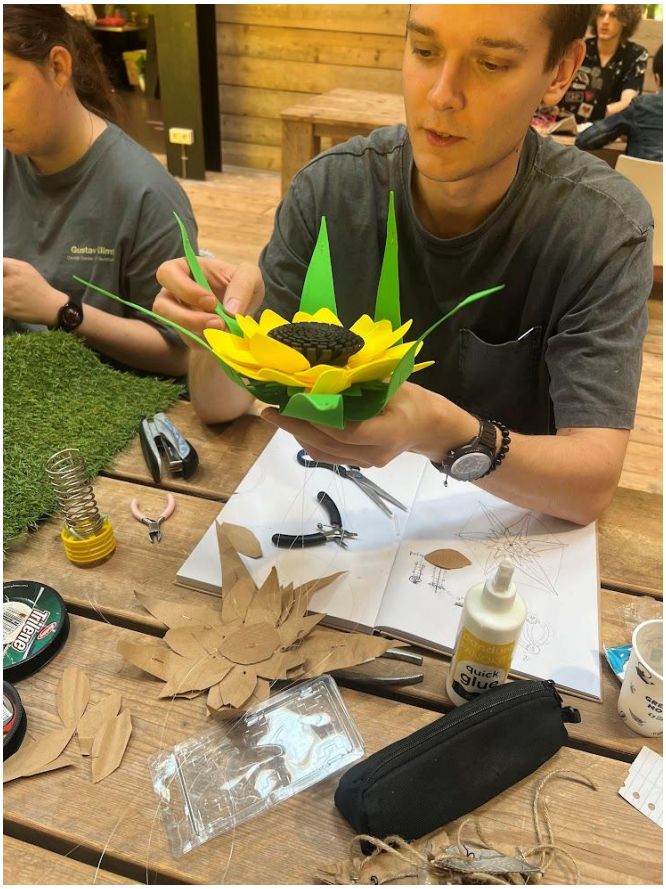
Solution sketching of how to close the leaves and make it ´hug´ the flowerhead

Sunflower prototype to test mechanism of string contraction and retraction

Ready to be tested!

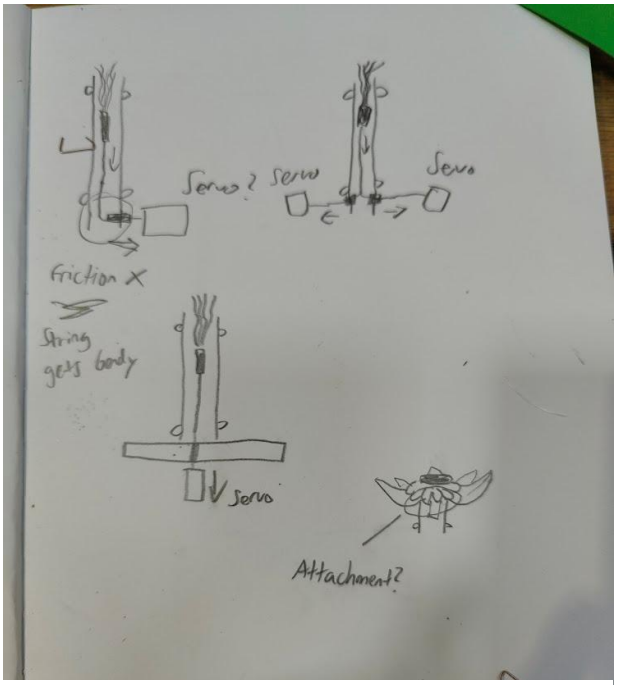


String attaached to make the leaves close onto the flower. I connected all the strings with the lollipop plastic to connect it for easier control.



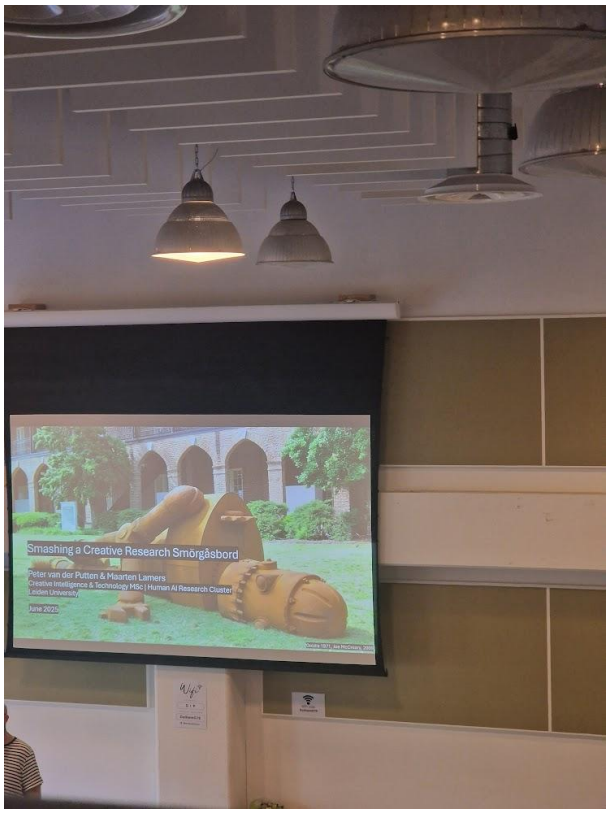
Now adding it onto the real thing. Scary stuff but managed pretty well despite my clumsy hands

But how do we open it again after closing?



Back to the drawing board figuring out how to attach the whole mechanism with the rest of the stem. A solution was not chosen yet, since I still need to figure out how to contract and retract the leaves in an easy way

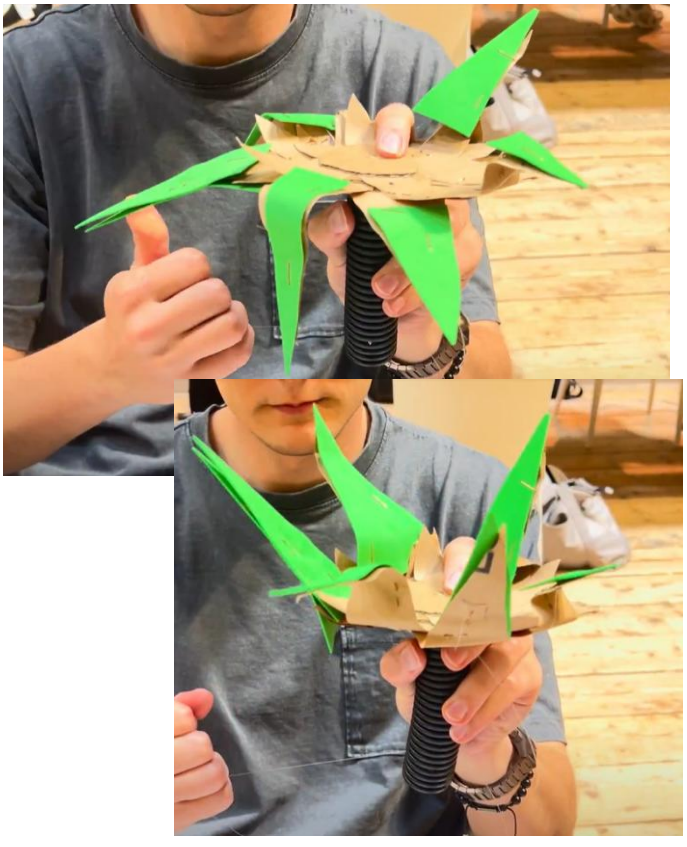
Plastic tube inserts (from my lollipop) instead of holes to make the string worker smoother. Really fucking clever in my opinion, proud of this one.

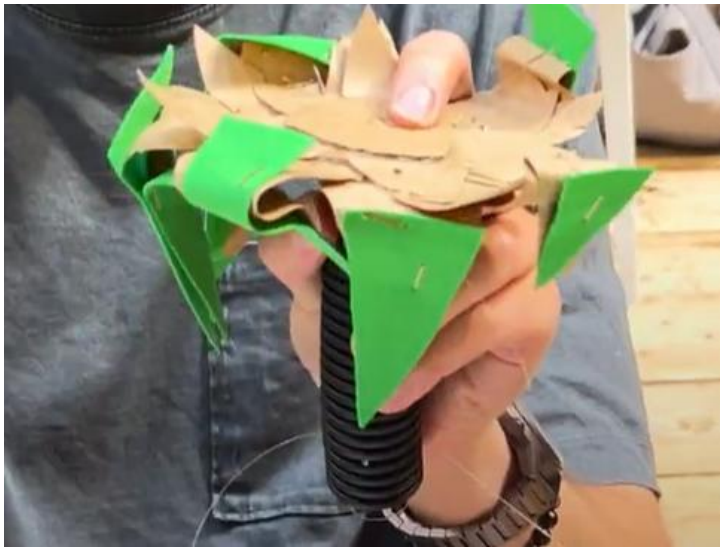


Damn cool guest lecture. Really cool dudes and interesting!

A retract and pullback mechanism split in two. One pulls and closes the leaves, one pulls and opens the leaves

Attaching the foam material to the test prototype, to understand the material I am working with better.





It retracts! Now it only has to be applied for the real prototype to see how it works. I also added the plastic that corresponds to the stilk of the flower, I pulled one of each mechanisms out of each side

Honorable mentions by my fellow groupmembers. Really functions well with the weighted string to make the servo contra pull, which makes it easier for it as well

Time to think of specific decoration. Stay tuned!! (Pretty team: Sacha & Alicia)

Relevant video folder:
https://www.dropbox.com/scl/fo/uatdn2e8fdwin94csquxa/AN6zms2FwcHXIoBccEciqNU?rlkey=9u47yjdzifw202bj0l9jso2op&st=1j7kc2jy&dl=0

Specific videos of the progress of this day:

Paper prototype video:
https://www.dropbox.com/scl/fi/33zp7onz20edhwwilaa26/Paper-Prototype.mp4?rlkey=fu6v7f8ov9k64xxk8w00wv7je&st=kwjg8x27&dl=0

Opening attached video:

https://www.dropbox.com/scl/fi/1hyp0rilctljkx7vg7b7j/Opening-Attached.MOV?rlkey=487xmfzqk2n65vw0w546cdpa7&st=pm397sk1&dl=0

Opening and closing:

https://www.dropbox.com/scl/fi/1azn65rz7t7yeor2bx9be/Opening-Closing.mp4?rlkey=ih1bvtify8qmpxrzikp12p8zd&st=3m9wsoui&dl=0

13.06.25 – Sounds & Arduino

Own Contributions: Waking up to another day of NS strike. I worked from home another day, however with a plan already from the beginning, to create sounds for our little plant.

I first asked some questions before heading into this new realm. What kind of sound should the plant have, why etc. I chose more artificial R2D2 inspired mechanical sound, since it gives that contrast to a living creature that a sunflower is. I made two different sounds, well technically one, but it is played in a different way depending on if proximity or light sensor is triggered. I wanted a more random, radical, quick and lower notes if you get too close, since sunflowers don't like being touched, especially the flowerhead. However, what a sunflower does like, is sun. So, the happy sounds in the synth was created with more random but longer distances (or technically delays) between each note. This gives it a moody and a happy character. Sounds are very efficient, and I love diving into sounds, so naturally I took this role for discovering it, and so I certainly did. I have zero Arduino experience, other than from the workshops, but it really went better than expected.

Group Contributions: The group started working further and ideating on LDRs for servo pulling the stem, when shining light on the plant leaves.

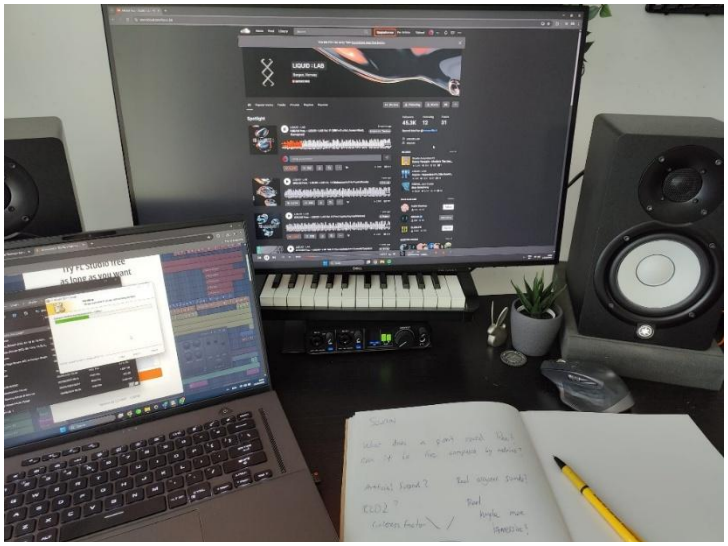
Materials used: Arduino kit. Sketching paper

Tools used: FL Studio, Arduino IDE, Serum, ChatGPT

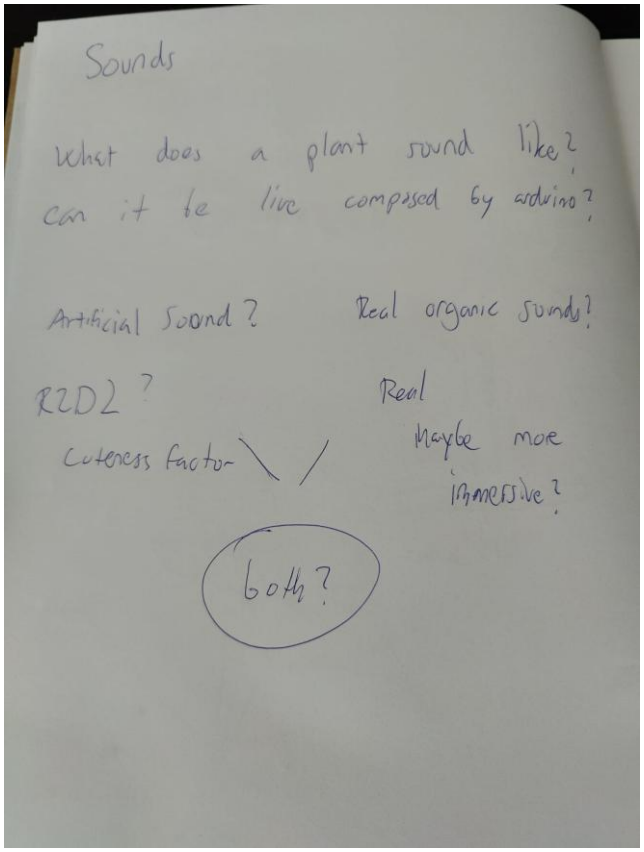
Tutorials Seen: https://www.youtube.com/watch?v=FjkmHp5LcQk

ChatGPT Chats: https://chatgpt.com/share/68517bc4-5e0c-8013-bc15-4fef9bc22227

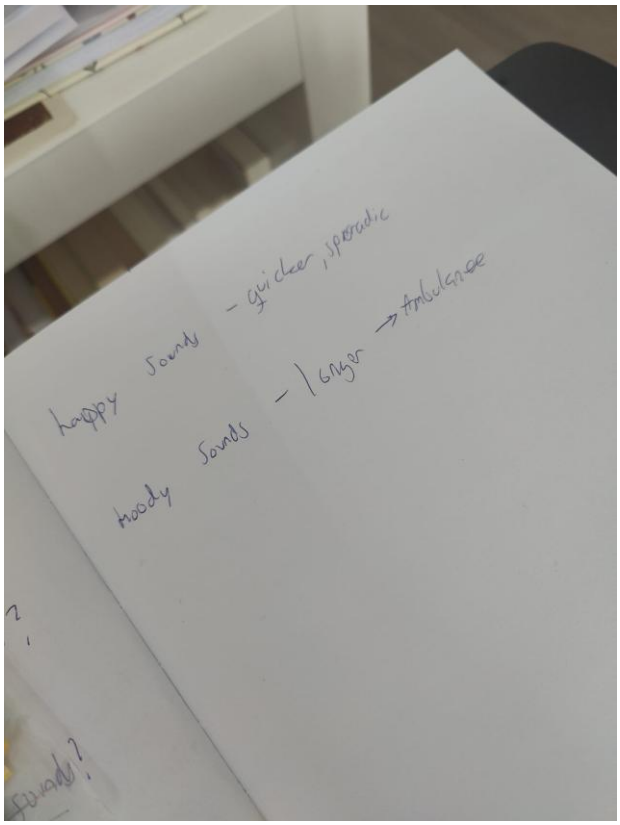
Pics & Videos:



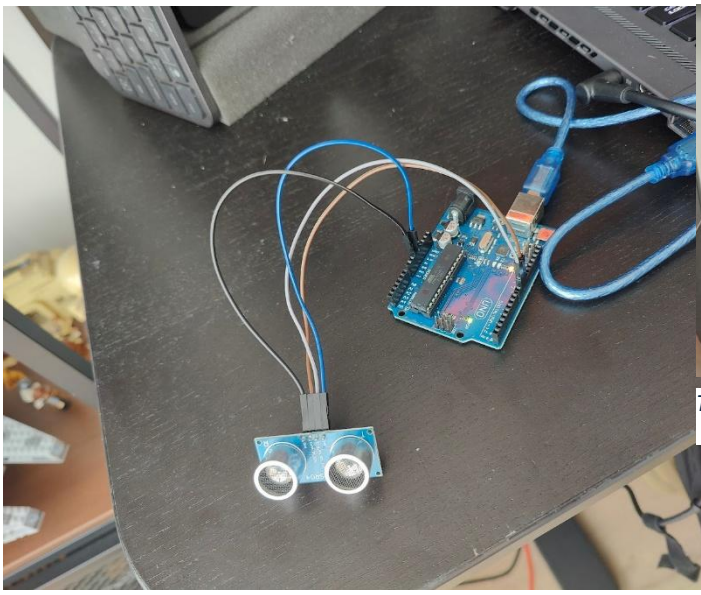
Another day at the home office due to strikes, this time lets dive into music and sounds!!



What sounds should our little character have?

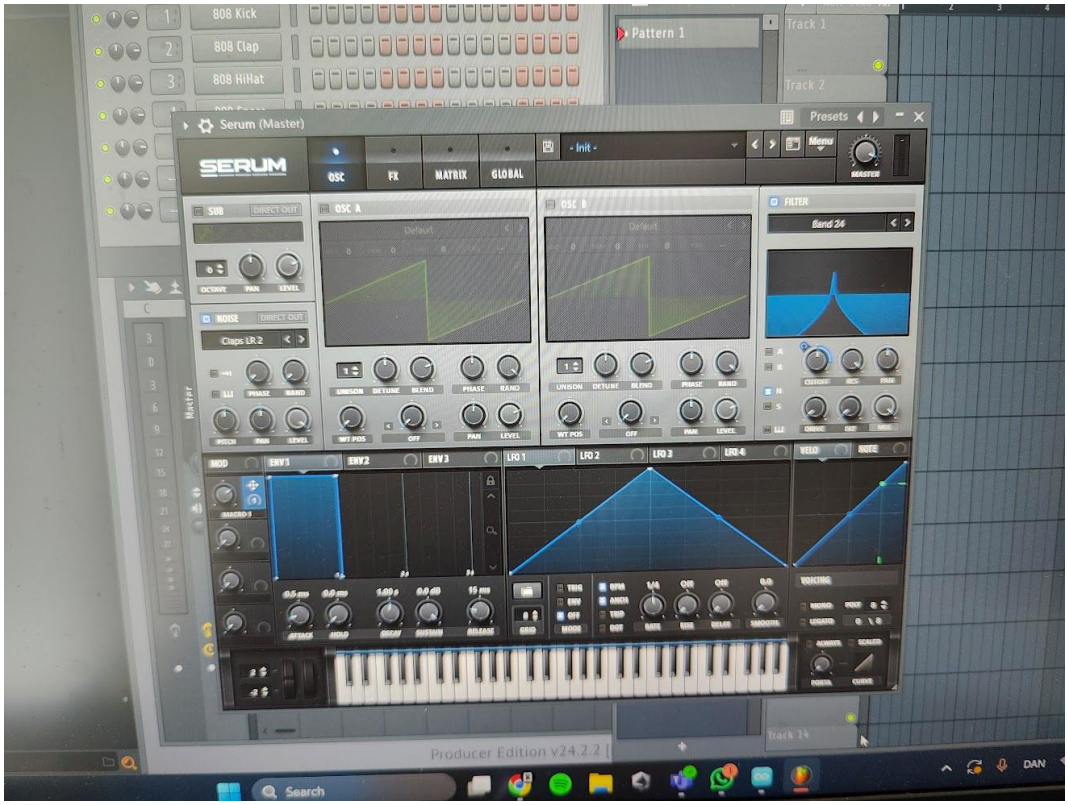


What is a happy and moody sound?

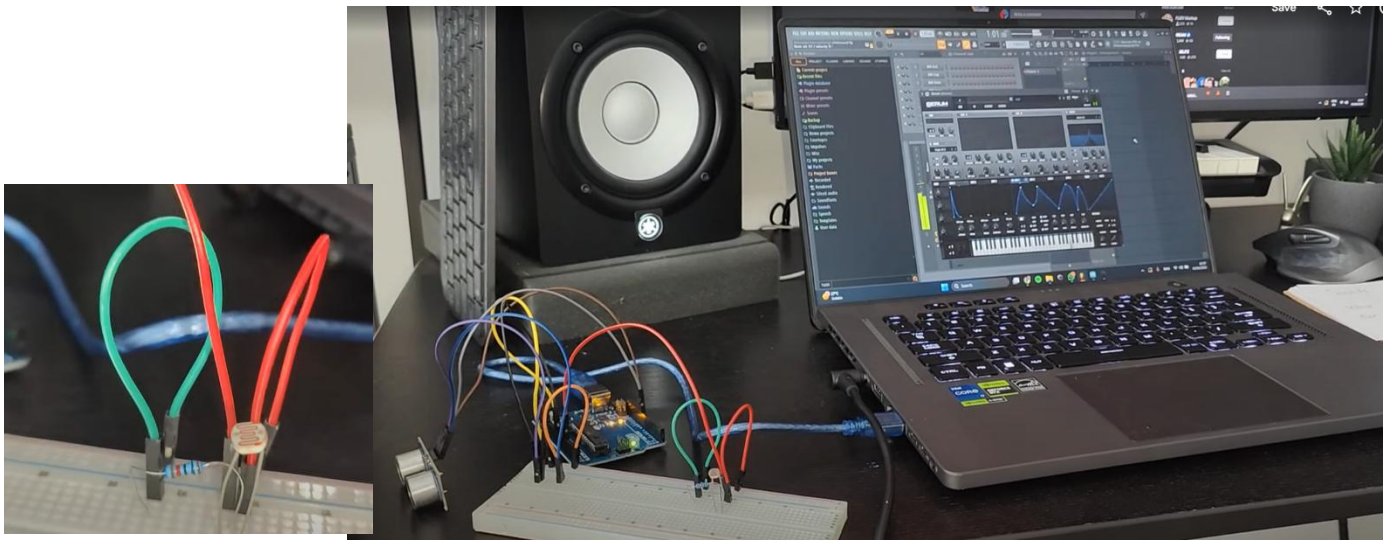


Proximity sensor with arduino, I did not even know I could connect it directly to it! It worked very well and I quickly got it set up

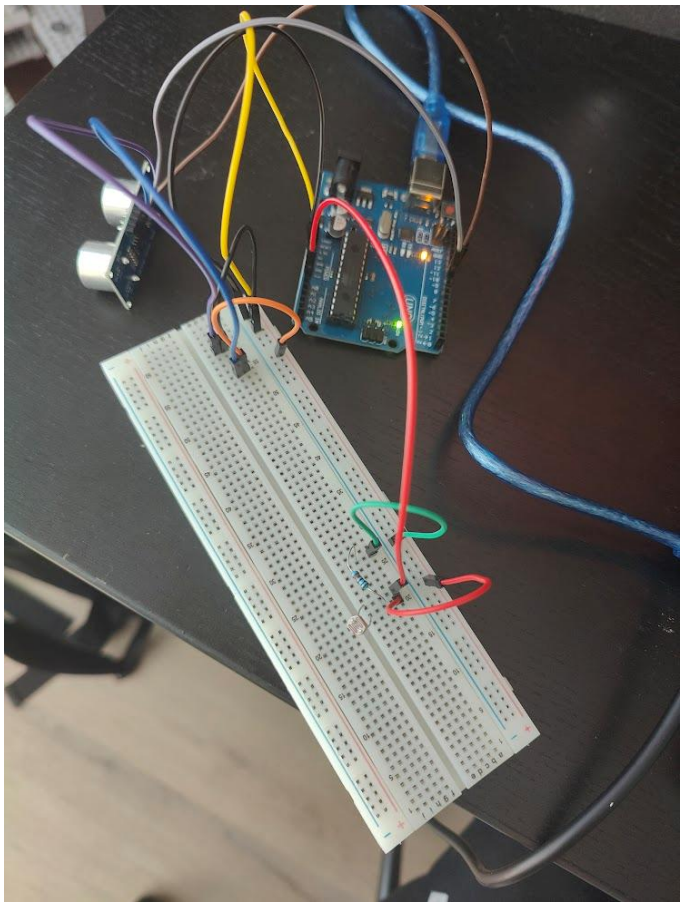
Testing together with the music software FL Studio. There is SOUND

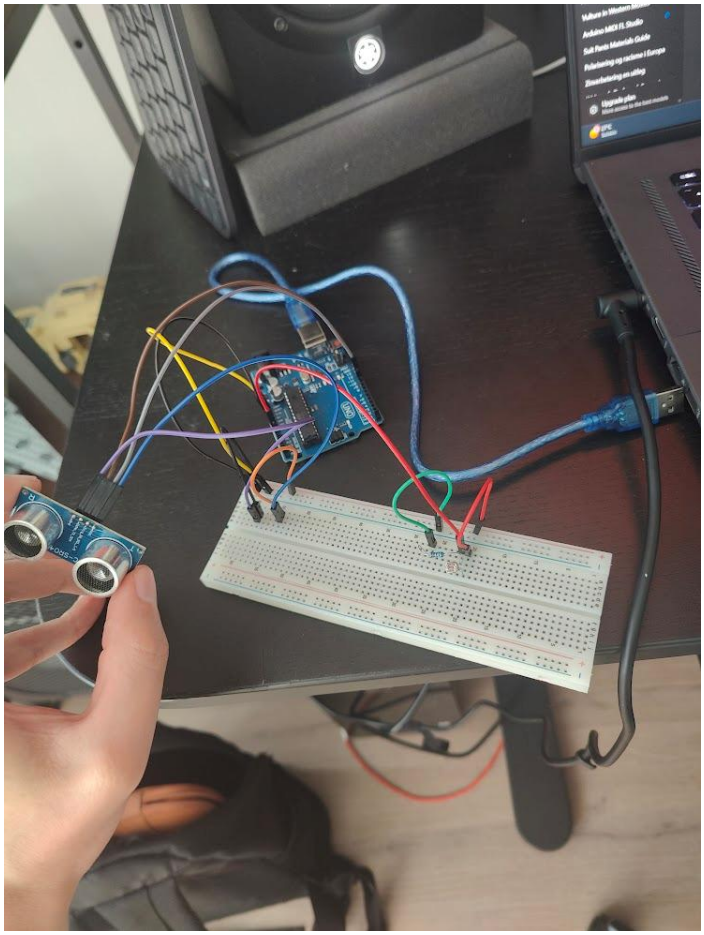


Sound design in progress



Now proximity (ultrasonic) together with light sensor





But it doesnt just work on its own. Here is the applicable code for it for Arduino IDE

plantsounds.ino

```ino
const int trigPin = 9;
const int echoPin = 10;
const int lightPin = A0;

void setup() {
  Serial.begin(9600);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
}

void sendNoteOn(byte note, byte velocity) {
  Serial.write(0x90 | 0x00); // MIDI Channel 1
  delay(2);
  Serial.write(note);
  delay(2);
  Serial.write(velocity);
  delay(2);
}

void sendNoteOff(byte note) {
  Serial.write(0x80 | 0x00); // MIDI Channel 1
  delay(2);
  Serial.write(note);
  delay(2);
  Serial.write(0);
  delay(2);
}

void loop() {
  // Measure distance (proximity)
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  long duration = pulseIn(echoPin, HIGH);
  int distance = duration * 0.034 / 2;

  // Read light
  int lightValue = analogRead(lightPin);

  // === Angry Mode (Proximity) ===
  if (distance > 0 && distance <= 20) {
    byte baseNote = 60; // C4
    byte pitchRange = map(distance, 1, 20, 12, 2); // wider range closer
    byte note = baseNote + random(-pitchRange, pitchRange + 1);
    byte velocity = random(115, 127); // aggressive
    int noteLength = map(distance, 1, 20, 60, 180);  // short
    int restLength = map(distance, 1, 20, 20, 80);   // quick

    sendNoteOn(note, velocity);
    delay(noteLength);
    sendNoteOff(note);
    delay(restLength);
  }

  // === Happy Mode (Light Sensor - Continuous) ===
  else if (lightValue > 900) {
    byte arpeggio[] = {72, 76, 79, 83, 86, 88, 91};  // C5–G6
    int arpCount = sizeof(arpeggio) / sizeof(arpeggio[0]);

    byte note = arpeggio[random(0, arpCount)];
    byte velocity = random(70, 95); // softer
    int noteLength = random(200, 400);  // longer notes
    int restLength = random(100, 300);  // slow/gentle pace

    sendNoteOn(note, velocity);
    delay(noteLength);
    sendNoteOff(note);
    delay(restLength);
  }
```

Yaaaay, code! But how will this be connected with the plant itself? I don't know yet, find out below

Relevant video folder:
https://www.dropbox.com/scl/fo/5m7zgxpd2ko48yggw7gaj/AKCGoKMd7x9mPFtP32vGREk?rlkey=fa2tg26zxksqn1foz07vfy5j8&st=rmzbpwsm&dl=0

Specific videos of the progress of this day:

First sounds:

https://www.dropbox.com/scl/fi/5j99fiixz6kj1m46md6vi/First-Sounds.mp4?rlkey=dkezvv79tzncbd530rlbl2cqx&st=gew7nsbu&dl=0

Sound designed video:

https://www.dropbox.com/scl/fi/vijar9ppo56hozec6rsdw/Sound-is-designed.mp4?rlkey=nyx0svxtz9kx9aochks2i4nwk&st=0voq90hk&dl=0

Sound is designed extended:

https://www.dropbox.com/scl/fi/a2j9hfvod9wf7z9i4o0by/Sound-is-designed-1.mp4?rlkey=vpltgnlrihylpeu7brkiyy48z&st=kmva1qti&dl=0

Echosensor & LDR together:

https://www.dropbox.com/scl/fi/8jmibmzx55n33qyw7u7f5/Echosensor-and-LDR-together.mp4?rlkey=nqi51he17q5gbzkmrvxjfqcw6&st=2b2hyei7&dl=0

Sound changes the closer you get:

https://www.dropbox.com/scl/fi/ubxmxasmhroe8i593lbkj/Proximity-Changes.mp4?rlkey=qejc56ln5e6p34apl9uoadu1k&st=bgme15sk&dl=0

17.06.25 – Another Work From Home Day...

Own Contributions: So today was another strike, leaving me no other choice than to work from home once again. I quickly started sketching on where to add these sensors from the sound prototyping, I did the last day. I wanted to see how the whole prototype would look when adding the sensors, so the proximity and the LDR to an actual plant. Given I was working from home, I did not have any access to the prototype we made, so I took my own plant and started attaching wires to it (no plant was harmed). I had to check out how to extend the circuit and connect all the sensors without having them close to the breadboard, so I did solder without soldering. Which was scary in my opinion, since I did not know if it would work or not. I saw some tutorials online and checked with ChatGPT for possibilities to do soldering, only using the Dupont wires and male and females. Turns out it was possible! I added the proximity sensor with extended wiring to the top to imitate the flowerhead and then the LDR are below it and are meant to be integrated in the leaves of the plant.

And I started thinking on how to make the laptop invisible in our installation/exhibit. I started prototyping and drawing a bit and will finish this part tomorrow, when I will be working at the campus, together with my group again.

Group Contributions: The group started soldering together the LDRs that will be necessary for the installation/exhibit of the flower and the flower stem was tried to be attached to the stem of the plant for testing of stem movement. A joystick has been added that has LED response depending on which side you turn the stick.

Materials used: Arduino-kit, Cardboard Box, Real Plant

Tools used: YouTube, ChatGPT, FL Studio, Speakers, Laptop

Tutorials Seen:
https://www.youtube.com/watch?v=ghx6S4lh4lg&t=1**s**

https://www.youtube.com/watch?v=DMRd2kwoHeU

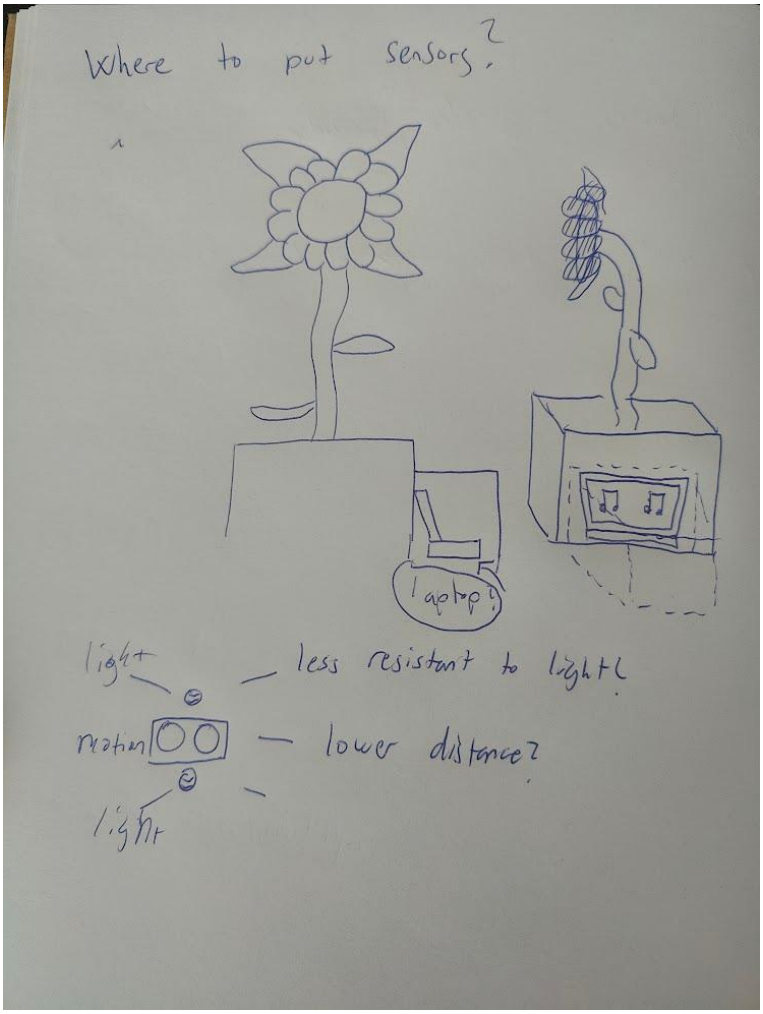
ChatGPT chats:

https://chatgpt.com/share/68517b31-f0ac-8013-bdd6-7f39c245fc9b

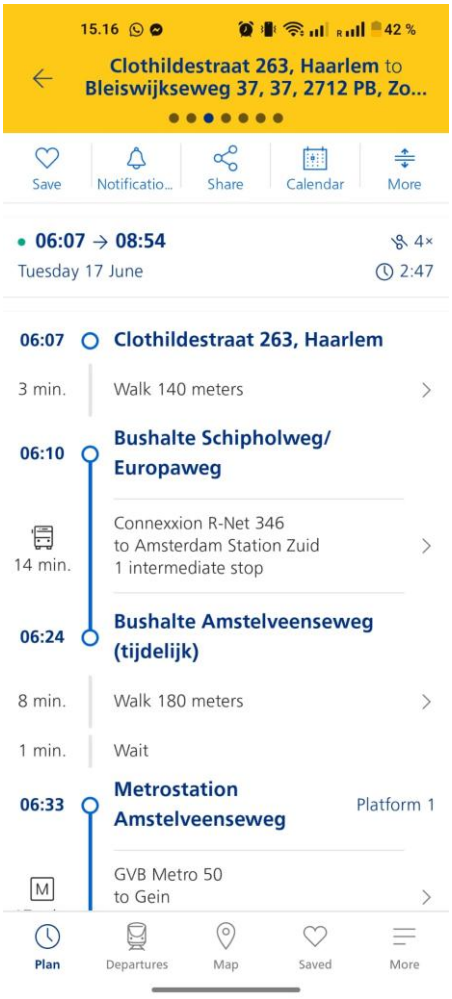
https://chatgpt.com/share/68517b93-60c4-8013-b505-e7ae406c83a8

https://chatgpt.com/share/68517bab-e4d0-8013-a3a7-c2205c07dad4

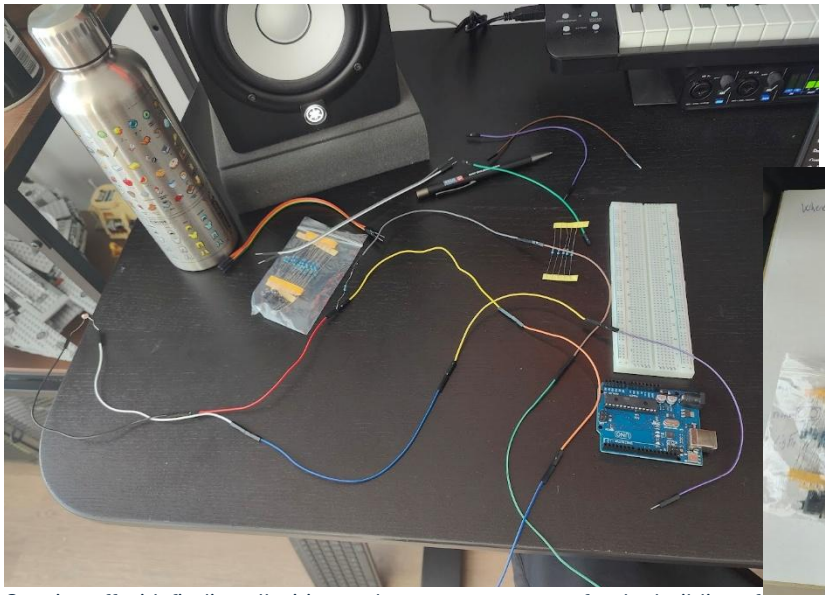
Pics & Videos:

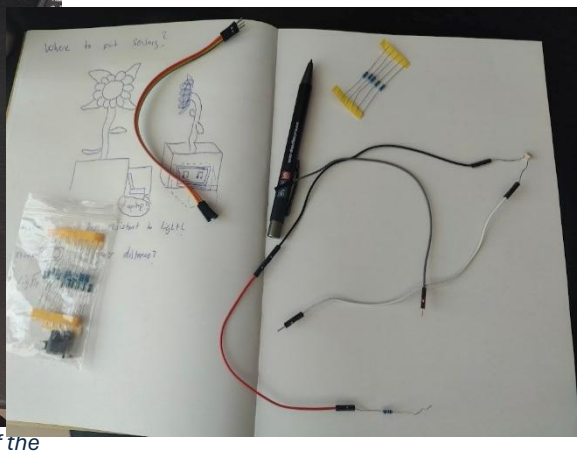


Initial sketches of how the plant will look and the installation will be solved with my laptop that needs to be there for the sound to function

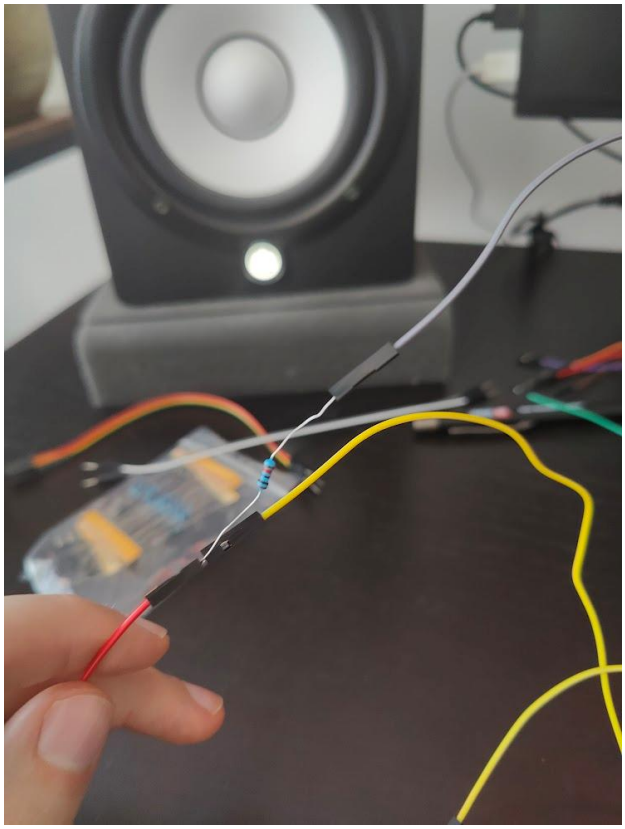


Only frustrations looking at this timetable



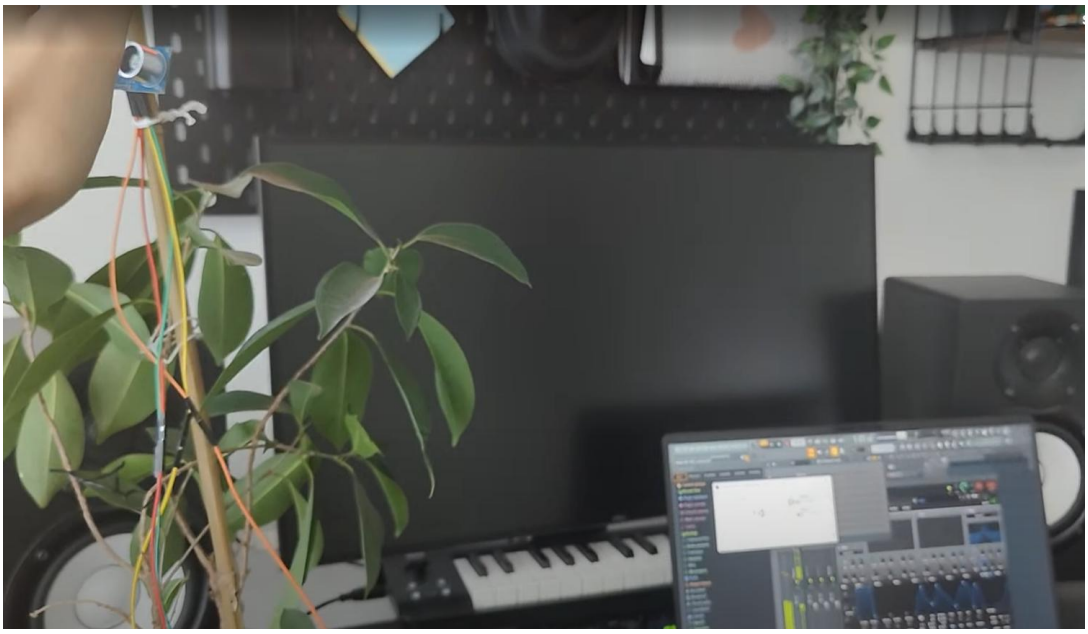


Starting off with finding all wiring and sensors necessary for the building of the prototyping.

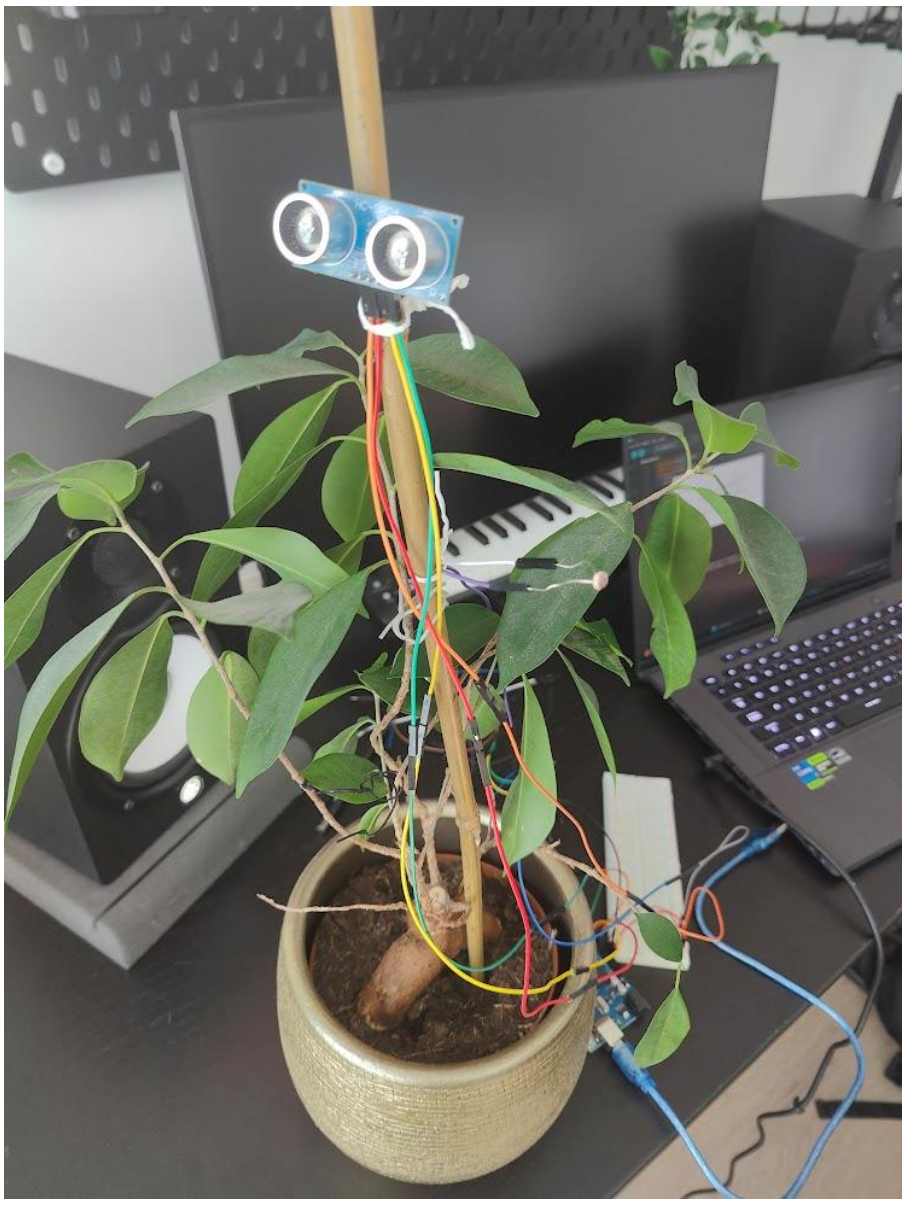


Sketchy wiring and soldering without soldering iron. At first I did not want to do it, and my team member Wout recommended me not to, due to his experience with destroying his Arduinos.

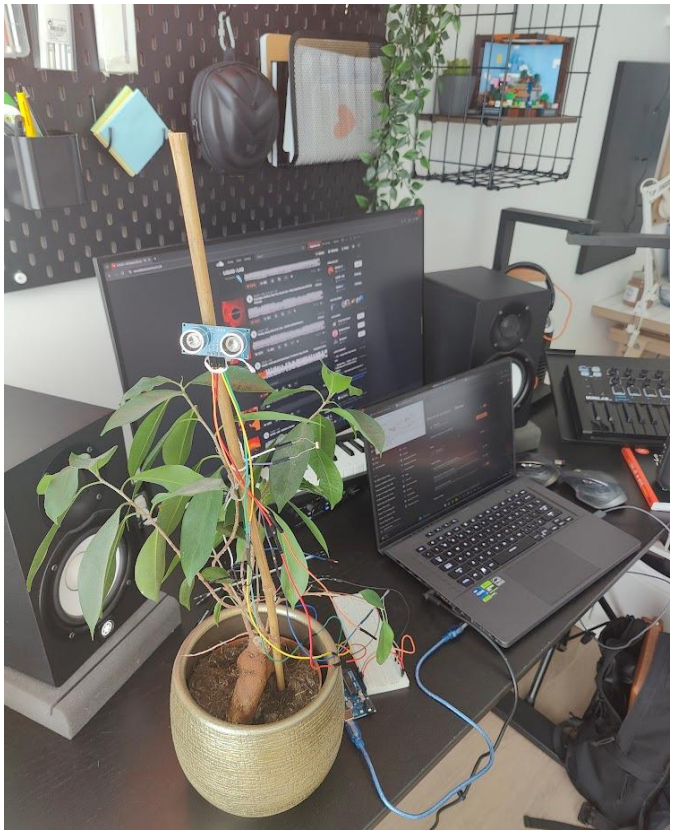
Proximity Sensor has been installed successfully with extension of the circuit, to imitate how it will look on our plant! Exciting stuff!



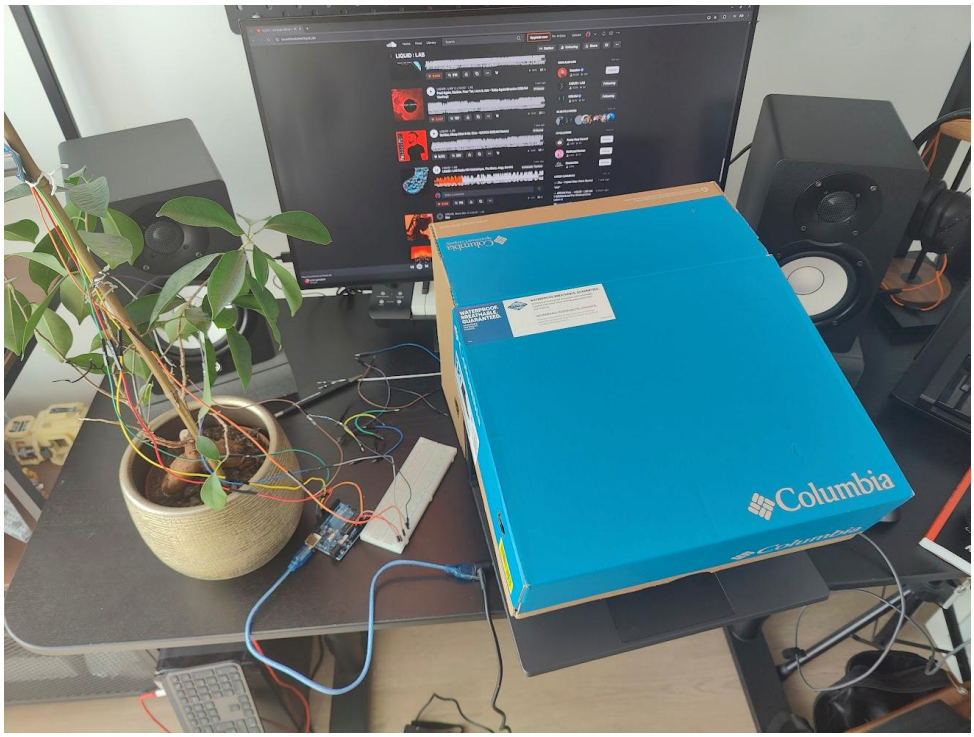
Works perfectly!



Now an LDR has been added on the side. Lets see if it works?

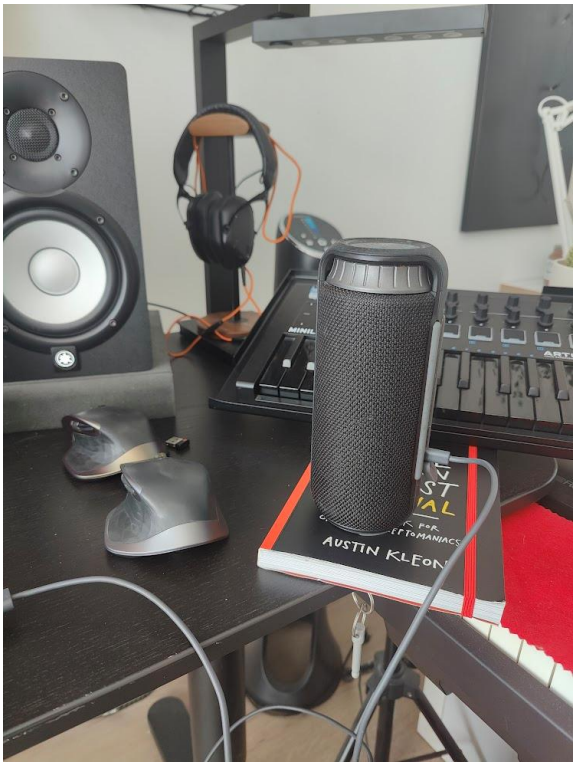


Pure mess and tons of screens, just how I like it

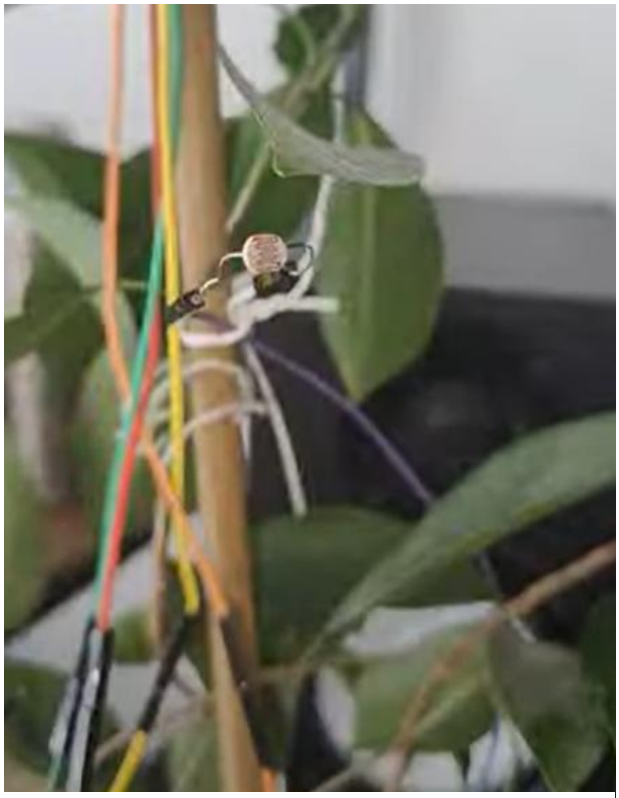


Potential cover box for the laptop not to be seen

Proximity or Ultrasonic sensor works well together with the LDR in the new circuit!

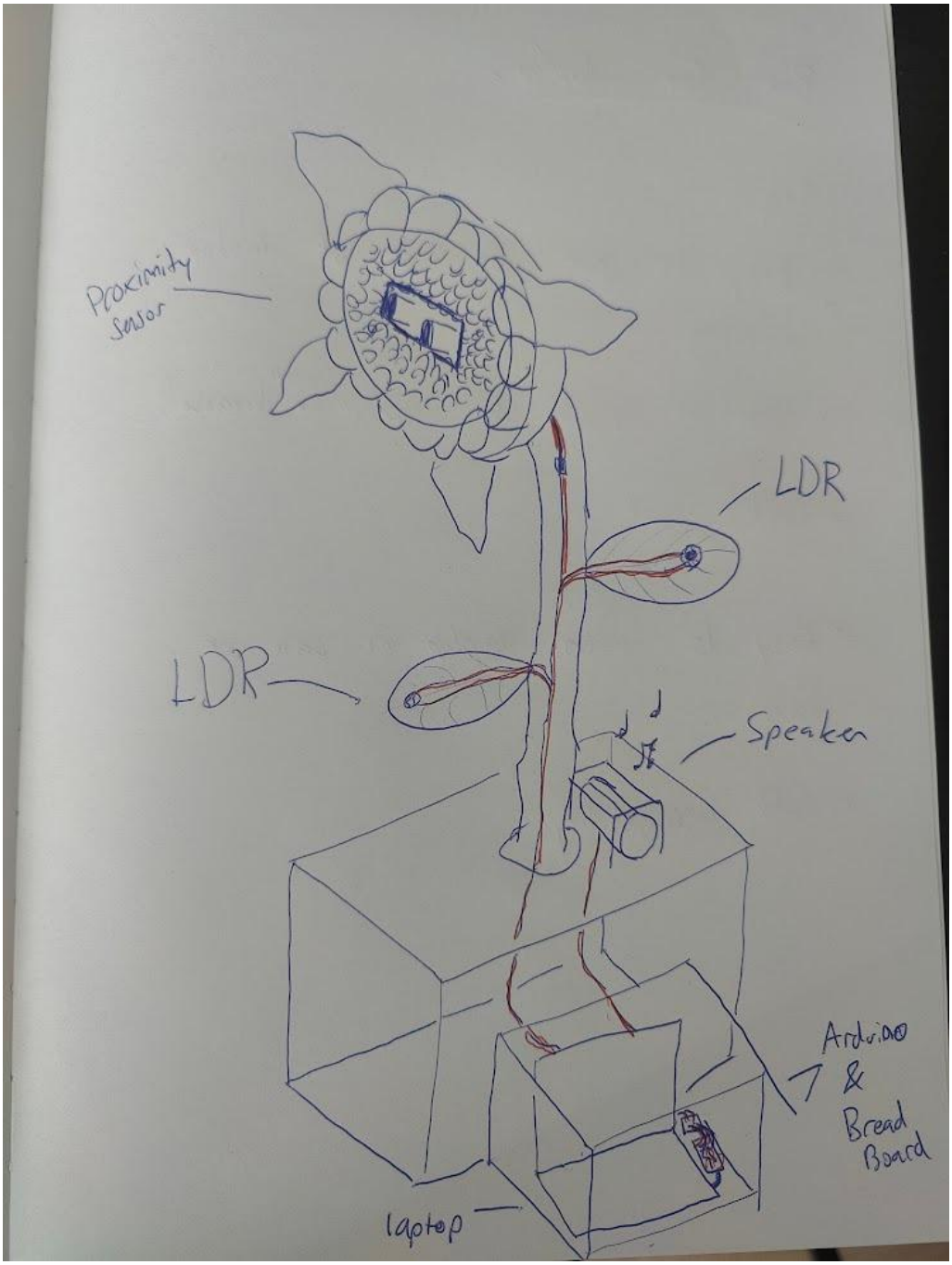


Speakers from the laptop are now covered by cardboard making the sound muffled. So why not combine more hardware together. This Bluetooth speaker will be placed closer to the plant to imit sound making it come more directly from the plant.

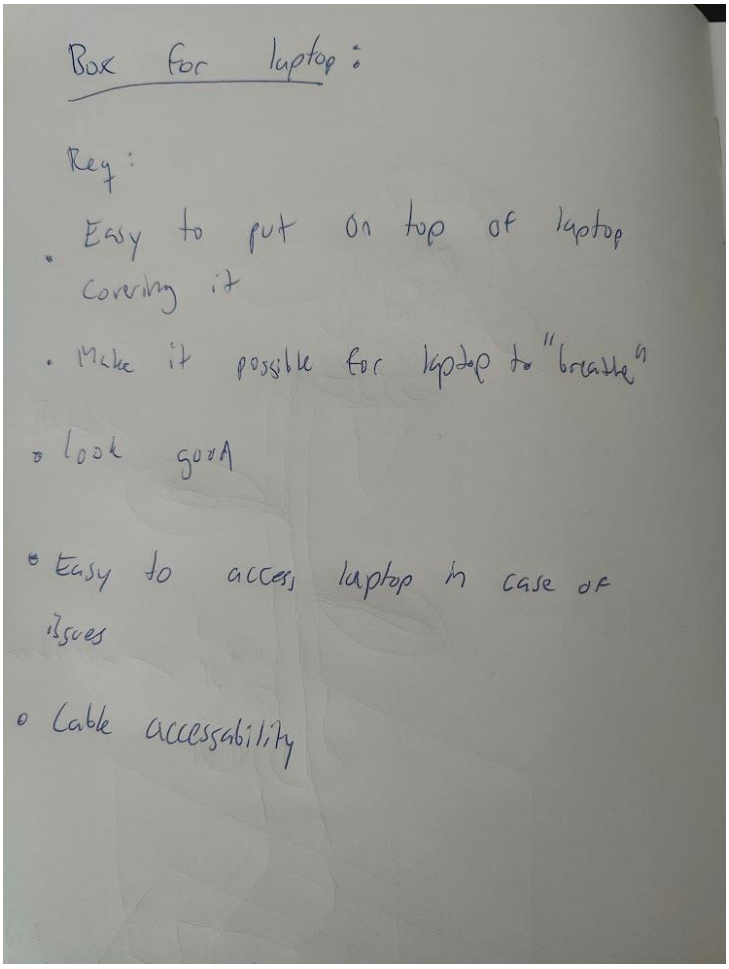


Light is registered perfectly from the LDR and sound is emitting. However due to the loose soldering way I made it, sometimes the loose connections did give some trouble and register when nothing was to be registered. But it works!

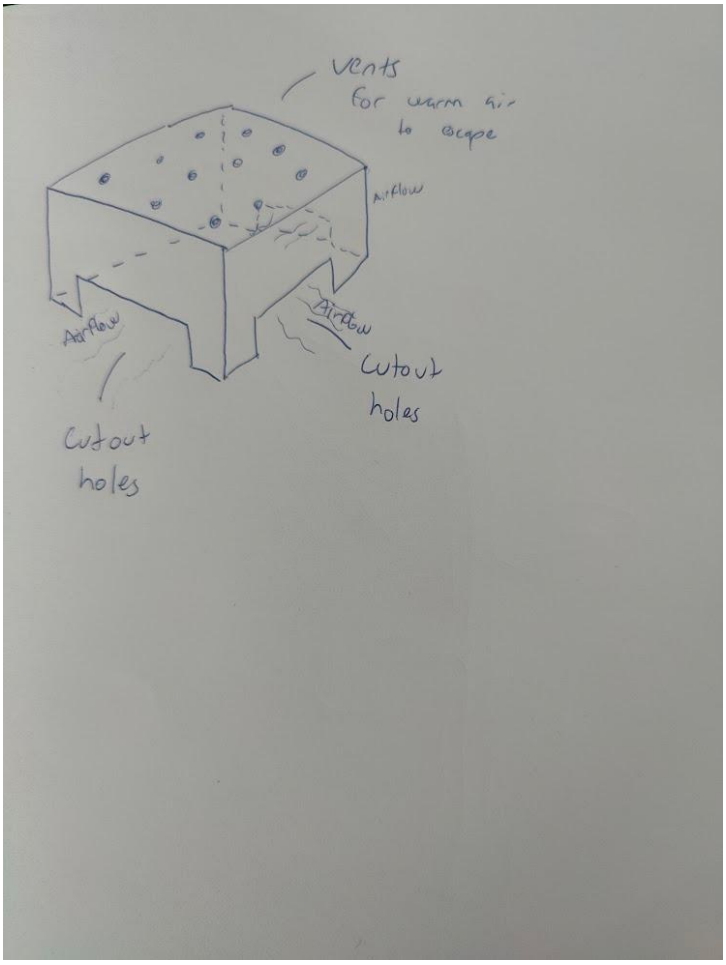
Full setup with speakers now. And it all works!



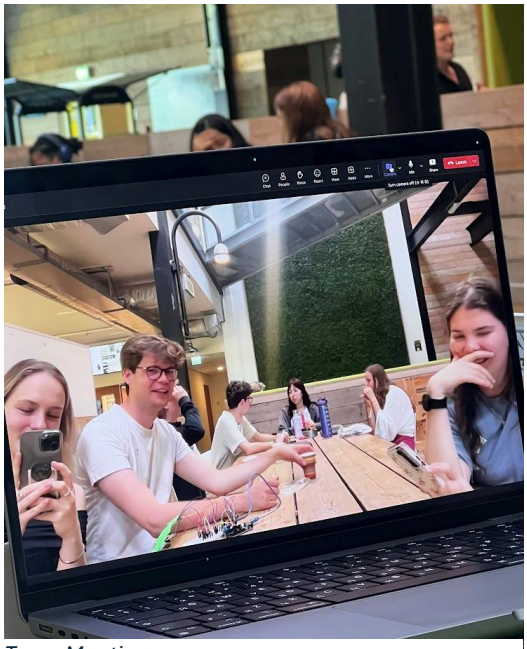
This is how the wiring should run in our real exhibit plant. Proximity goes in the flowerhead. The LDRs go In the leaves for people who shine their flashlight onto the leaves will create photosynthesis (figuratively speaking) and the flower will react happily upon LDR activations. And more angrily when people try to touch the head of the flower. The laptop will be in the bottom, together with the setup of the Arduino and breadboard. Let us see if this will be possible or what changes are ahead!



Requirements for the box that hides the laptop

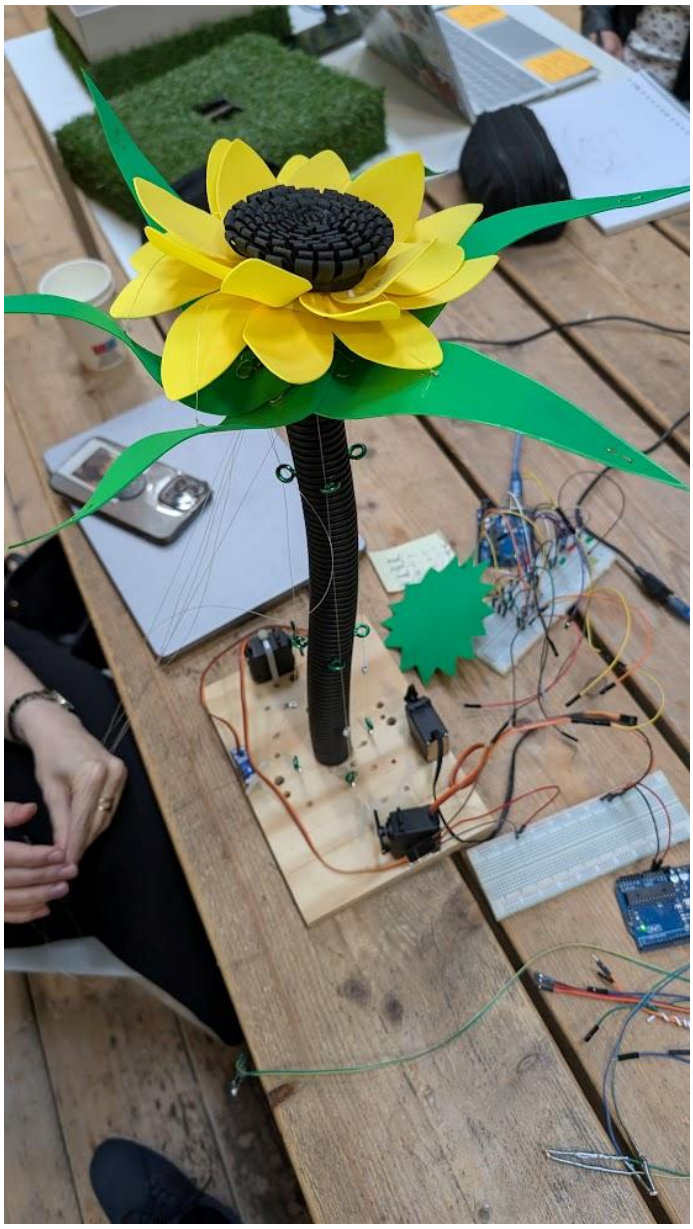


Initial box sketches, will be iterated and created physically tomorrow.

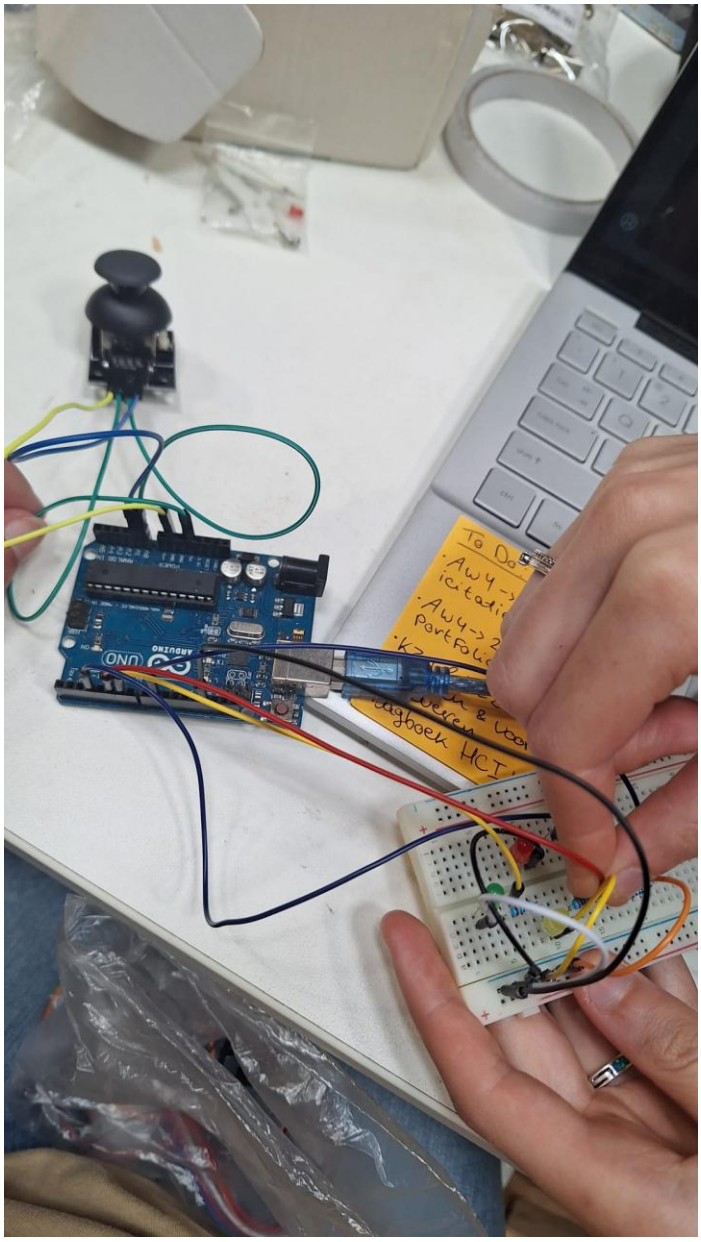


Team Meeting

LDR sensors have been soldered



Flower head attach testing to the stem now.



Joystick prototyping

Relevant video folder:
https://www.dropbox.com/scl/fo/5m7zgxpd2ko48yggw7gaj/AKCGoKMd7x9mPFtP32vGREk?rlkey=fa2tg26zxksqn1foz07vfy5j8&st=rmzbpwsm&dl=0

Specific videos of the progress of this day:

Iteration with sensor placement:

https://www.dropbox.com/scl/fi/tqh2sjolofebmb5n1ipzq/Iteration-with-sensor-placement.mp4?rlkey=q1tsai7jxvlb692i6i09dxosm&st=hydwobk9&dl=0

18.06.25 – Does the sound work with the plant?

Own Contributions: In short, yes! So today I started off thinking of conditions. We have a servo that pulls a string which is attached to the leaves of the plant in the head. It is supposed to retract if a person comes to close. I combined the proximity to trigger the servo, once a person gets withing 8 cm. Then the plant will close to protect itself. I soldered for the first time today as well. The plant will have leaves that you can shine a light on and imitate photosynthesis. When the LDR is activated on the plant-leaves of the stem, it will activate a happy sound in the music software. Pictures are made for this, and I can confirm, so far, all interactions work, and all conditions works as well. We drilled a hole with a foam-pistol to make it possible to attach the proximity (ultrasonic Sensor) sensor to the flowerhead easily and to make the cables go through the stem of the plant.

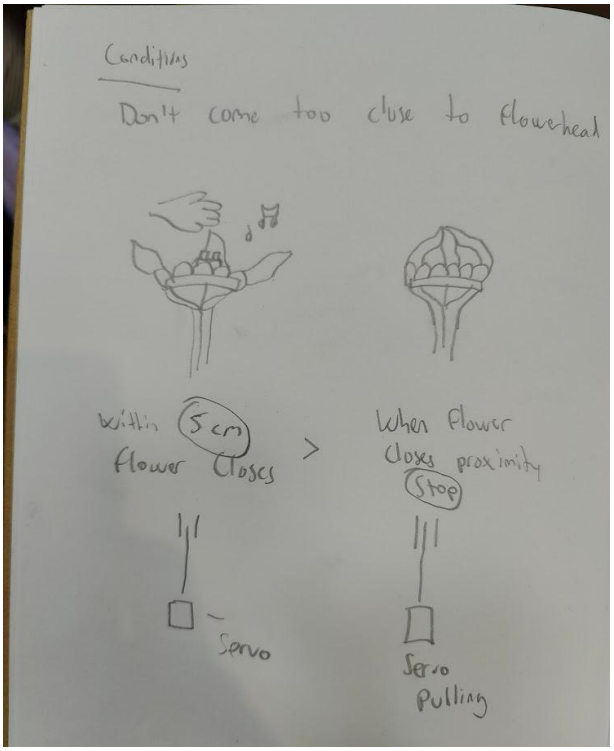
Group Contributions: The group worked further on the stem coding calculations, to make the servo respond when the top of the leaves in the flowerhead are exposed to light.

Materials used: Foam,

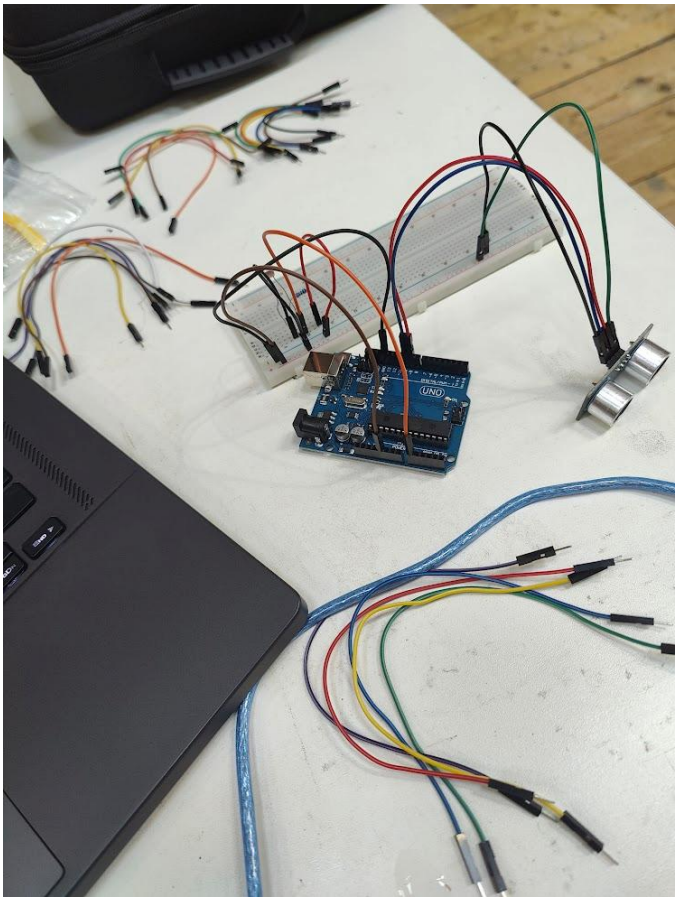
Tools used: Arduino Starter-kit, ChatGPT, Soldering Iron, Foam Cutter to cut through foam seamlessly. Proximity sensor, LDRs.

Tutorials Seen: None, however I did use the tutorial from the day before to understand soldering.

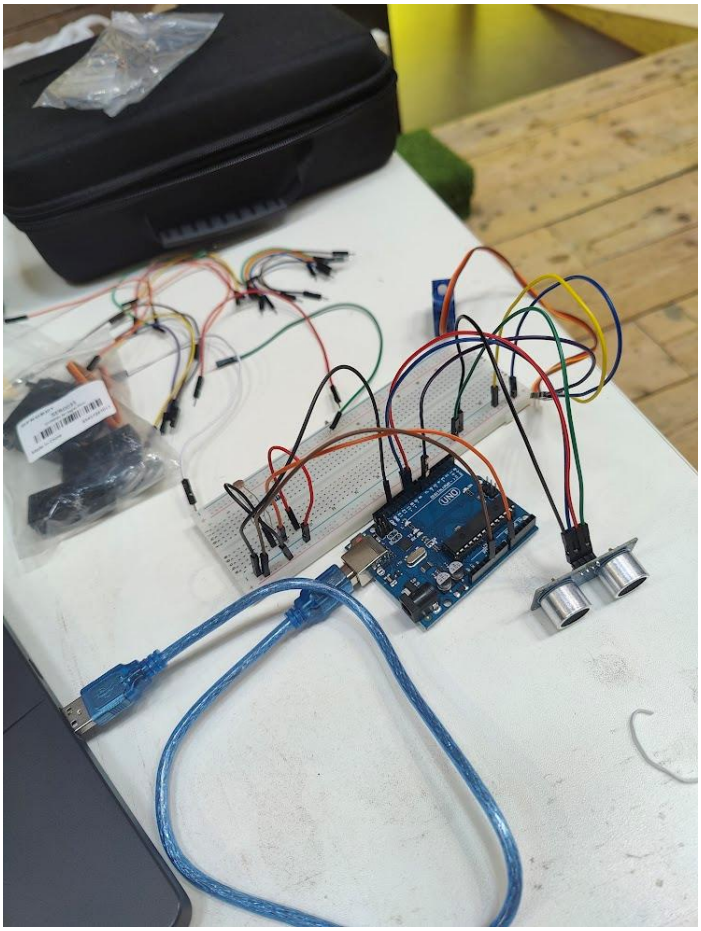
Pics & Videos:



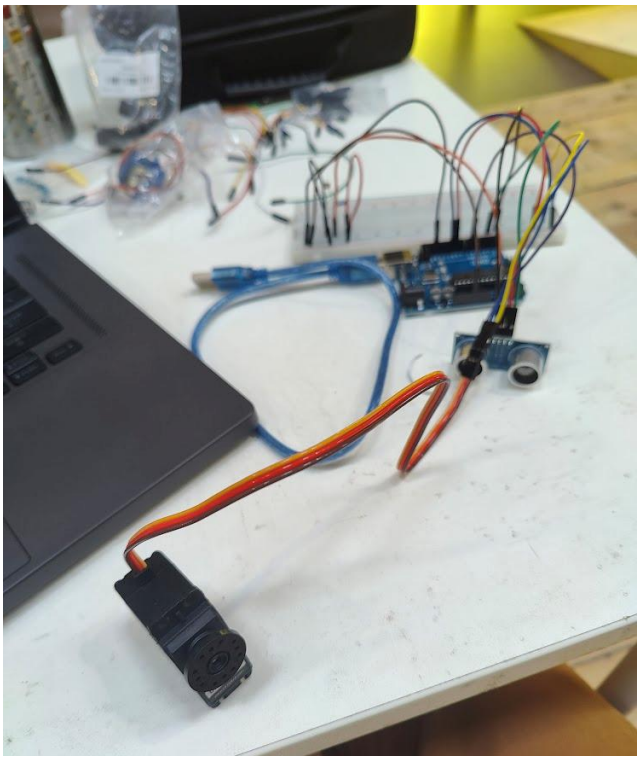
Initial sketching of the conditions. Helps me out to have it clearly in pictures of what is going to happen.



Starting off coding and Arduino Setup.



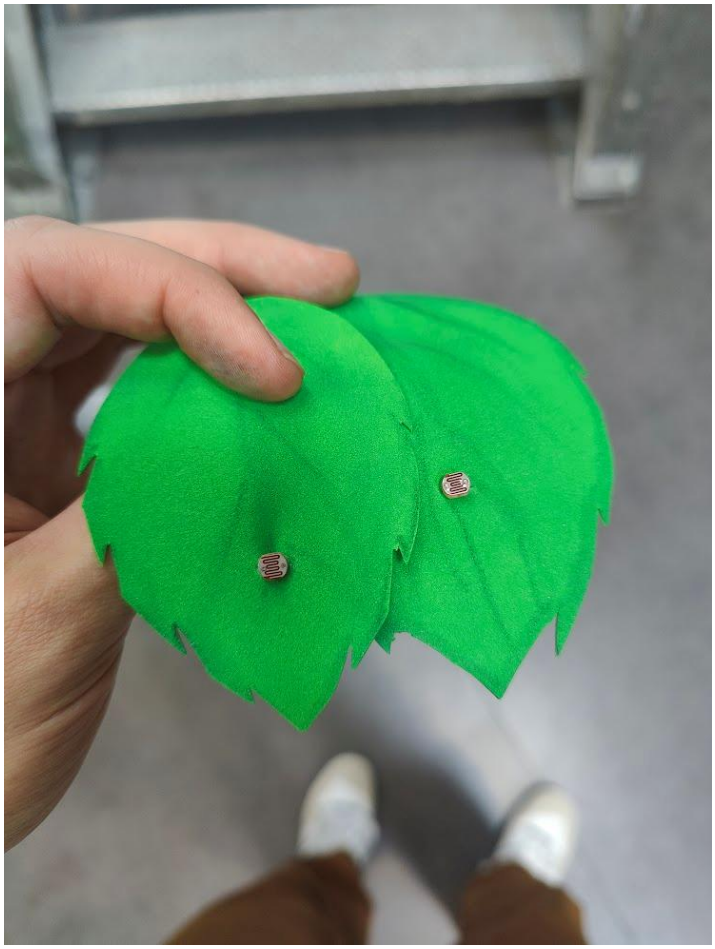
Setup with the sound interaction



Connecting the servo to the setup. Creating a condition that if proximity is activated close to 8 cm or below, it will trigger the servo to start pulling the flowerhead.

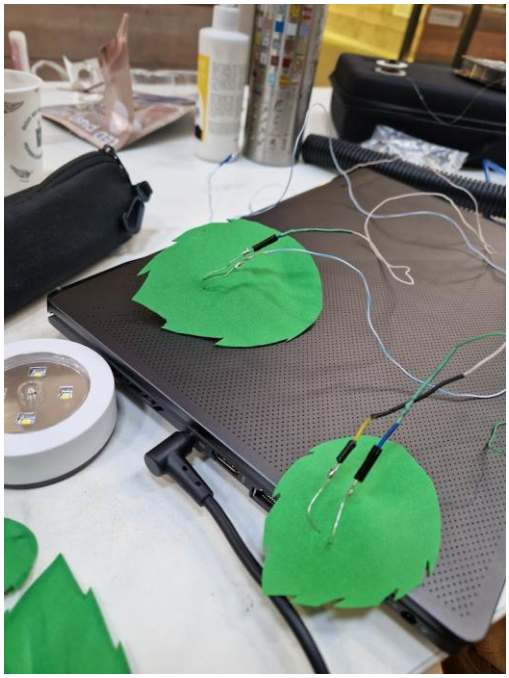
How the wire is supposed to exit the stem and be pulled by the servo. Made a cool solution with the hole so the tension and stress will be less on the wire.

First attachment of the proximity sensor, trying out.

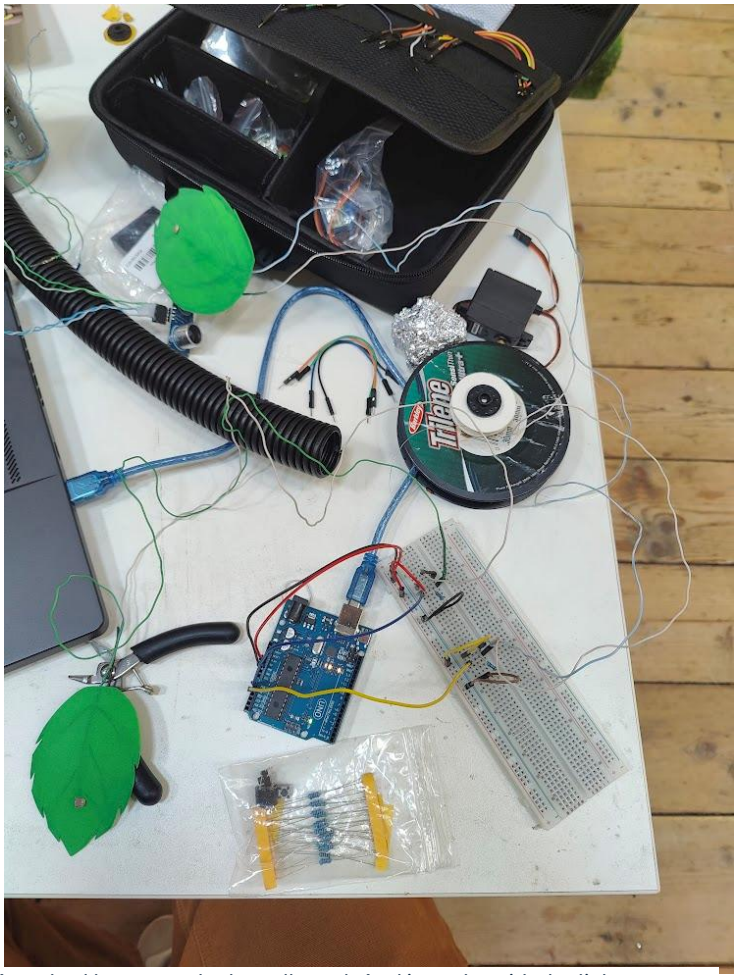


LDRs attached too the stemleaves

First time soldering. Went better than expected!

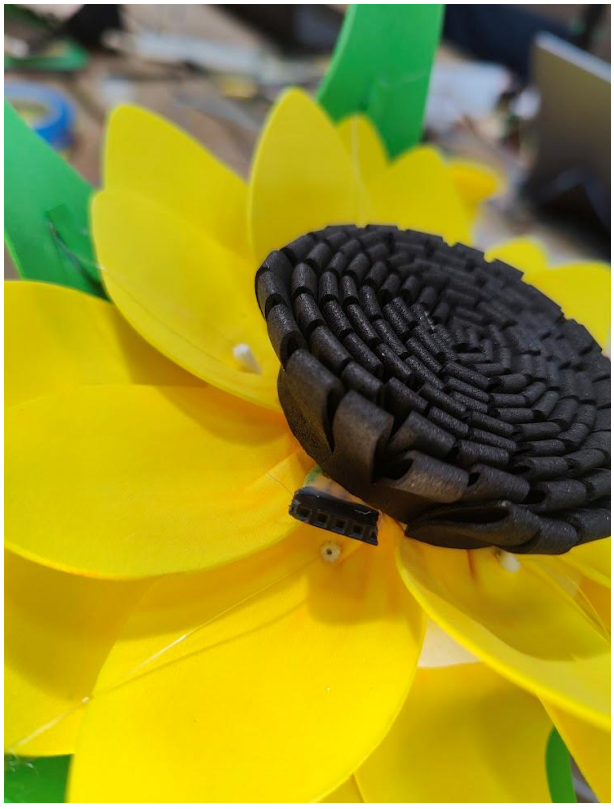


Attached LDRs to leaves.

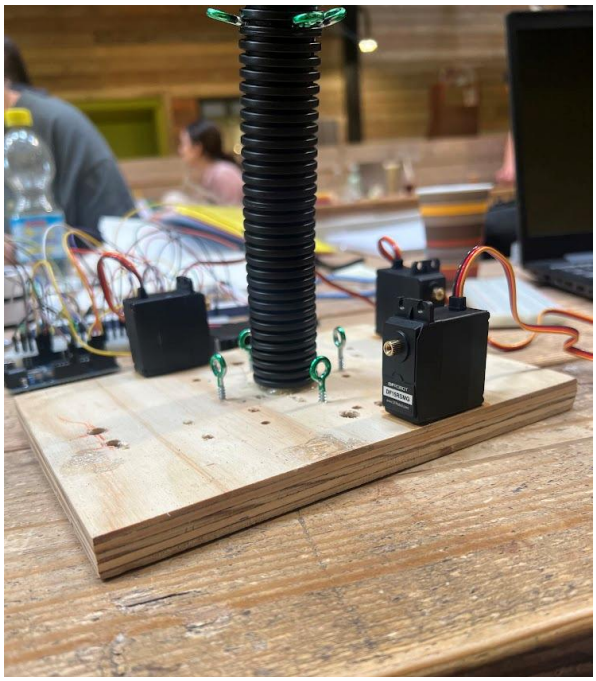


Attached leaves to the breadboard. And it works with the lightsensors

Foam Cutter discovering



Wires are attached to the flowerhead



The other part of the team is working on putting servos together to pull the stem and talk together with LDRs to register light and make the stem move towards it.

Relevant video folder:
https://www.dropbox.com/scl/fo/uatdn2e8fdwin94csquxa/AN6zms2FwcHXIoBccEciqNU?rlkey=9u47yjdzifw202bj0l9jso2op&st=pscg7a6o&dl=0

Specific videos of the progress of this day:

Servo pulling and closing flowerhead test:

https://www.dropbox.com/scl/fi/uag39detbg5fs4ypikgv4/Servo-pulling-the-closing-of-the-flowerhead.MOV?rlkey=99nyeh7dcb7tqnga8vc5wwjo9&st=cszissec&dl=0

Condition works theoretically:

https://www.dropbox.com/scl/fi/f6vzjn7ckyfyyoprk2hde/When-hand-is-too-close-to-flowerhead-the-servo-pulls-and-closes-the-flower-mechanism.mp4?rlkey=hx7t6931r93lvexztl47yu4lb&st=uwov8bgm&dl=0

19.06.25 – Assembly and Wire frustrations

Own Contributions: Today we had to assemble the flowerhead with the stem. However, first we needed to redo the leaves of the sunflower, since we decided to scrap the open and closing mechanism. I figured out that it would require more exploring and tinkering figuring out how the flowerhead can open itself as well with another servo. I did manage make the code that made the servo pull the flower head leaves to close it, but nothing to open it up again. We decided to focus on finishing an MVP, and sadly sacrifices are made when working on deadlines. It was fun to explore though, so I do not think it was wasted time, let alone more time was needed to perfect it. The sound is working perfectly though, both the LDRs and the proximity sensor as well. I created a sun together with Sacha for people to have in their hand to act as the sun and trigger the plant in the LDRs.

Group Contributions: Collectively we attached the stem to the flower and included all wiring through the stem. That was certainly not easy, since the wiring goes through the side of the stem and not just through the stem itself. It was fun combining all the elements we had created separately in the end. Cool little group moment.

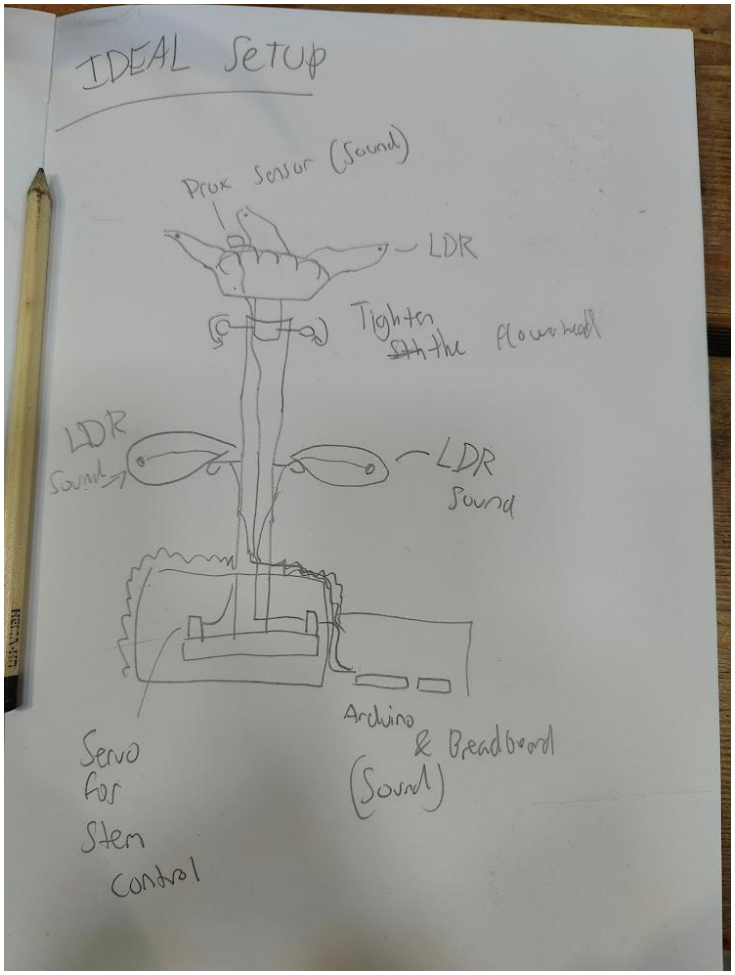
The servo stem group (Wout and Anastasia) is still working on calibrating the necessary pulls needed when the LDRs are triggered in the flowerhead.

Materials used: Foam, metalwire, glue, Arduino-kit

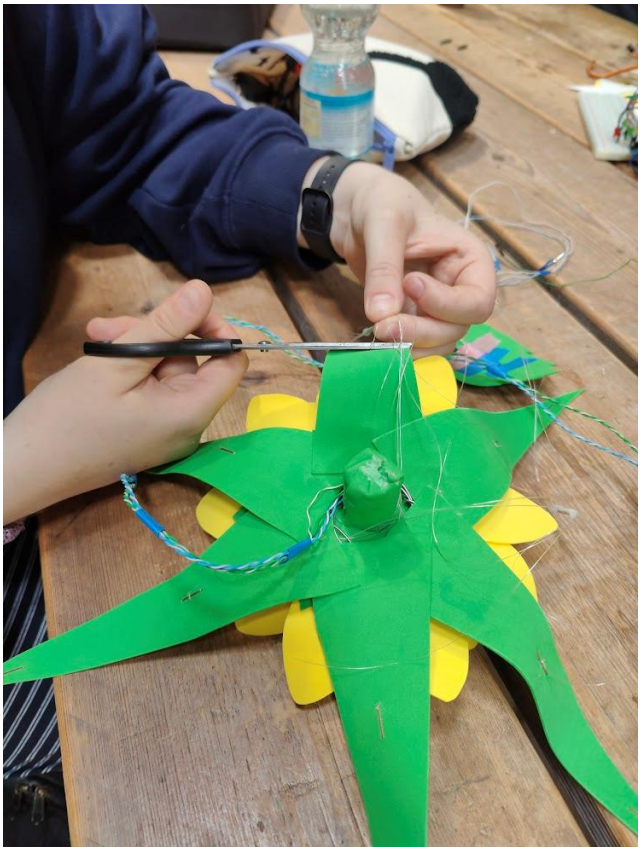
Tools used: FL Studio, Serum (synth), Arduino IDE

Tutorials Seen: None

Pics & Videos:



As always my morning sketch of what I expect to have by the end of the day

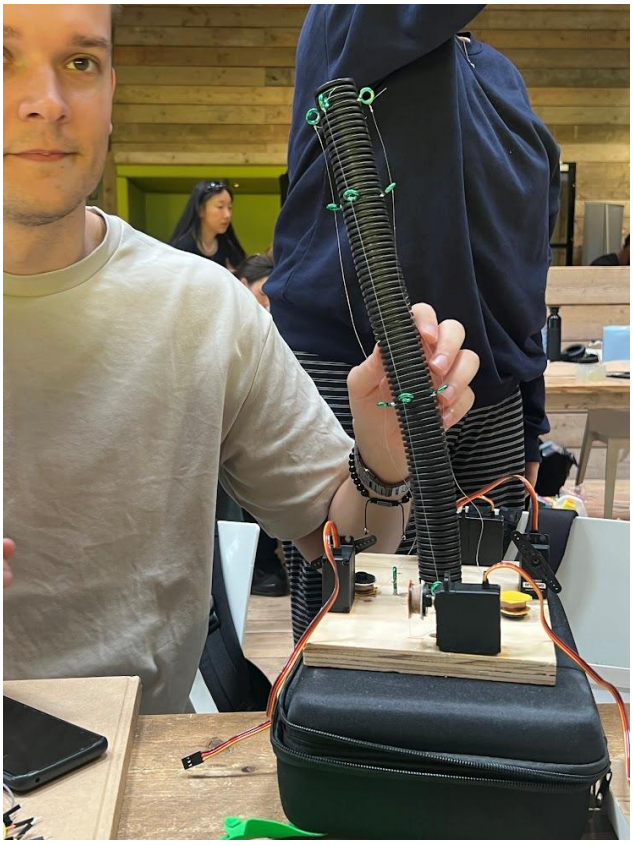


Collectively deciding to scrap the open and closing mechanism of the flower.

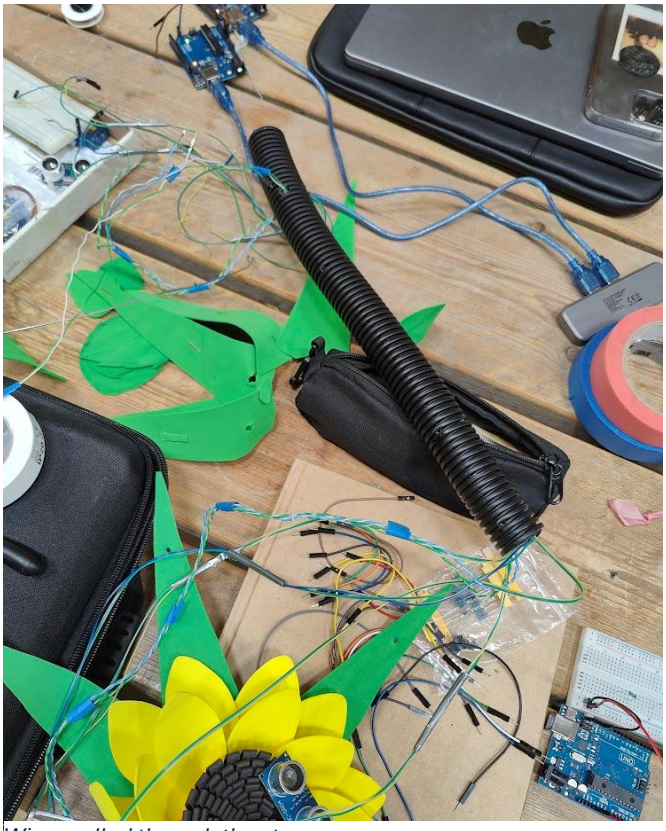
New bottom part of the flower is in the making. This time with improved frame to not let the leave fall due to the weight of the LDRs

Proximity added to the sunflower head

All the amazing wiring that has to go through the stem

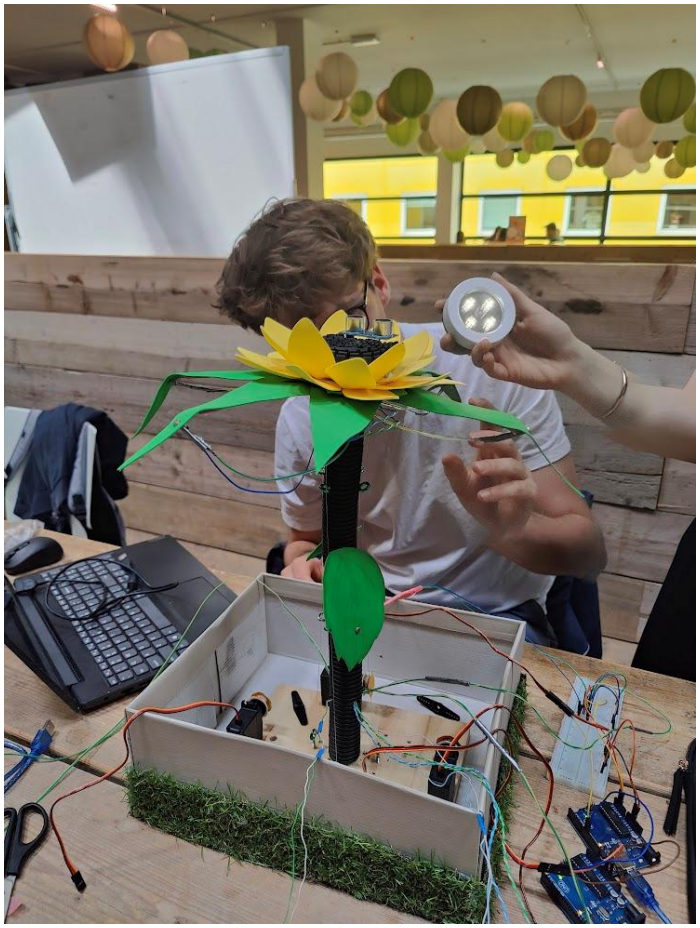


An amused Alex ready to cut holes in the stem for the wiring.



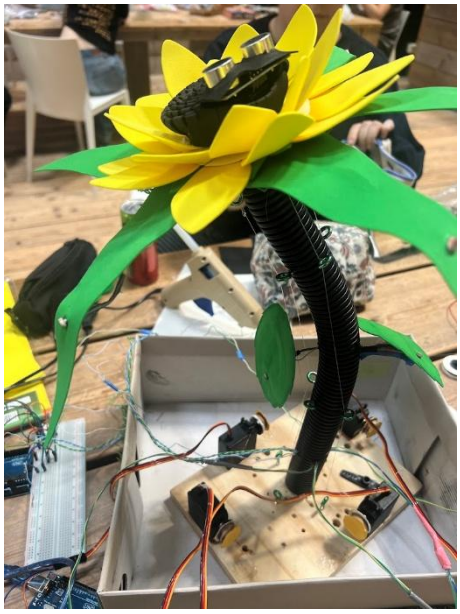
Wires pulled through the stem

Collectively connecting all the parts. An "Avengers, assemble" kind of moment

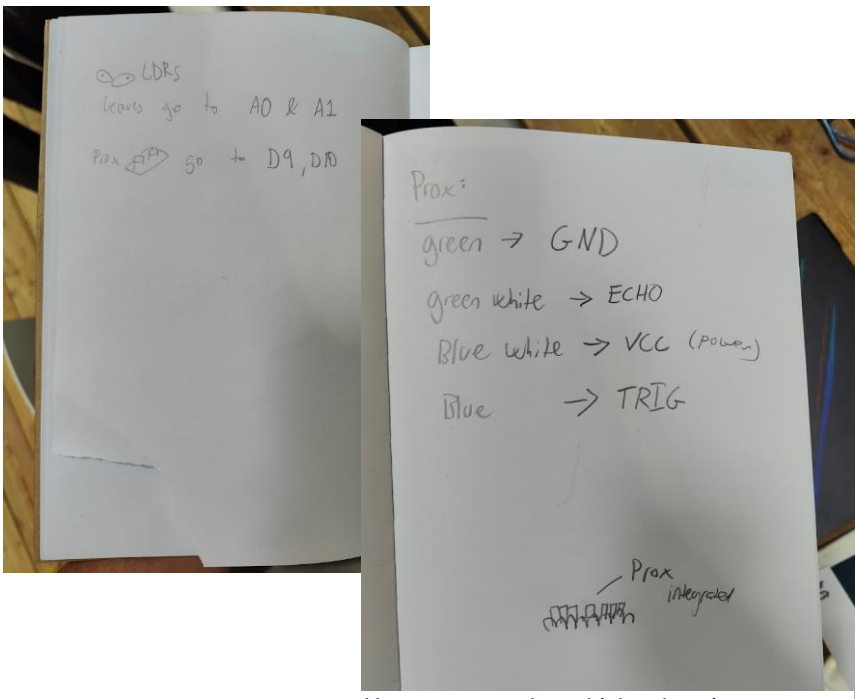


Calibrating and making sure all the wires are not damaged during the assembling. Everything works!

Sun that the guests for the EXPO can shine on our plant with.



Wiring and attached a piece of foam to hide the Ultrasonic sensor a bit more for aesthetics



Notes to remember which color wire goes to which place

Finished Sunflower ready for the EXPO tomorrow (will it work?)

20.06.25 – Final tweaking & EXPO

Own Contributions: The day is here. I started testing out the sounds, calibrating with our new space for the proximity and LDRs registration. It all worked thankfully. I came up with the idea to create an “island” that the plant was on, surrounded by small pads with flowers and a skyline as a background (also to hide the wiring, but still make them accessible to show to people who might be interested in seeing the whole work behind it).

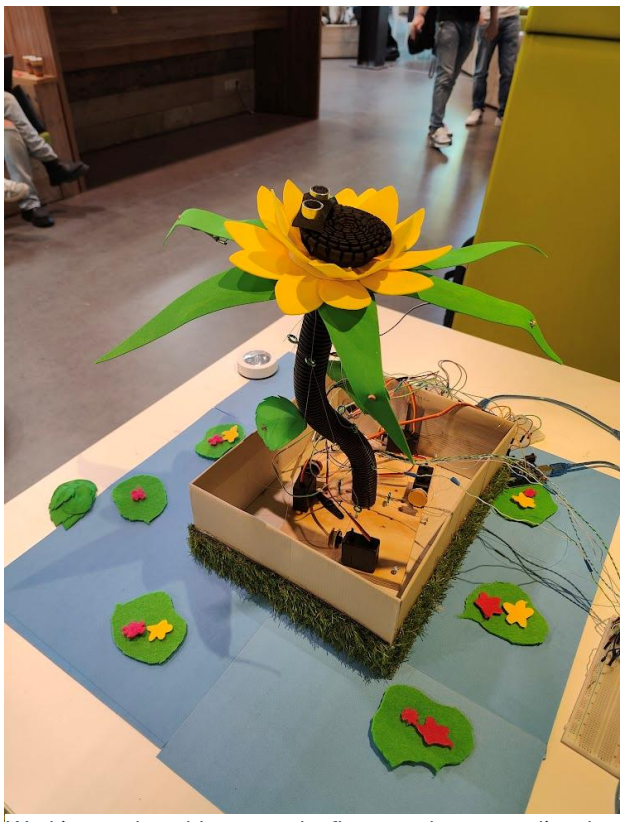
Group Contributions: Wout was unhappy with our initial space, so we moved from the small dark room to one of the acoustically treated booths, which turns out was perfect for our installation. We discussed how the onboarding process should be and started working towards it. A little catch was that overnight the stem had been exposed to stress due to the weight of the flowerhead, so the stem-team (Wout & Anastasia) had to work on fixing this. At the same time the rest of us worked on perfecting the space.

Materials used: blood, sweat & tears, foam, paper, Arduino-kit, cardboard

Tools used: FL Studio, Arduino IDE, Bluetooth Speakers

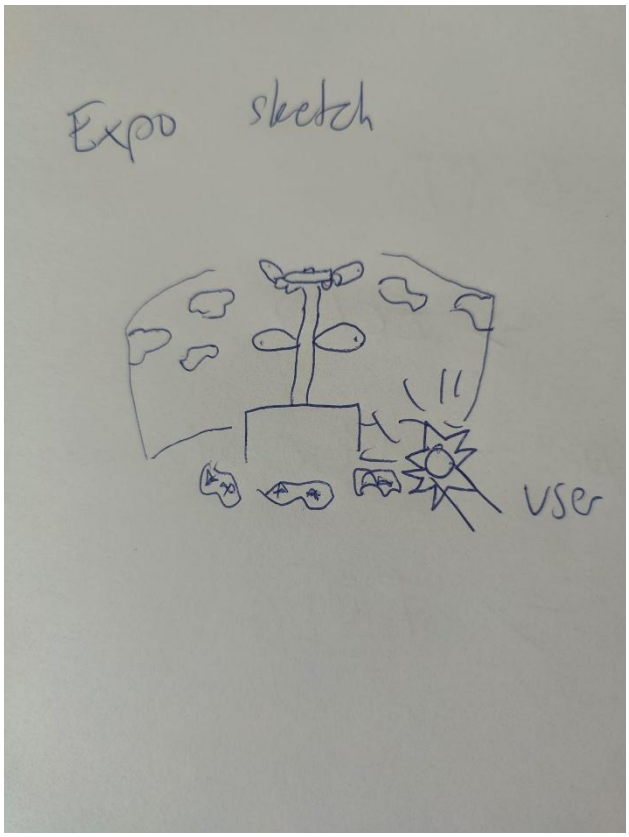
Tutorials Seen: None

Pics & Videos:



Working on the table setup, the flowerpads surrounding the flower for added atmosphere.

Our final product, ready for the EXPO



Video folder with all recorded participants:
https://www.dropbox.com/scl/fo/1mippk6exdlall0rb4kgq/AJyvt13c5BNdPny41b_ZXQI?rlkey=wt12s1b9m0rrenvay93rtxaxo&st=x6v9gitu&dl=0

Product

The interactive artificial creature **Plantitude** is a Sunflower which has been given creature features. It has a mood and reacts upon it when either having a positive or negative interaction with a human being. The sound attribute is an addition and symbol of a voice that we usually connect with something living, or a creature. It does not only have a positive but also negative response which makes it more of a character than a one-time interaction.

By combining the things, a flower likes and does not like, and creating a voice for it, it becomes a creature, given it is now able to express itself. The flower head is a sensitive area and upon researching, sunflowers specifically do not like being touched there, so adding a mechanism that will keep the user/tester from touching the head, the creature has successfully communicated that it doesn't like it. It does like doing photosynthesis however, so it will reward the user with happy sounds and the user will keep helping the plant creating photosynthesis.

The user should feel with the plant and understand what it likes and doesn't like. By shining a light onto its top leaves, it will adjust its position. Which is also related to sunflower ´s nature, which always will face the sun and in our exhibit the participant is the sun.

- Sounds: The **ultrasonic** sensor is connected to the flowerhead via wiring through the stem to the Arduino. The Arduino then transfers data into the laptop that has two software's: midiLOOP and hairless midi which translates the data from Arduino to midi notes that are transferred into the music software and plays the specific synth sound that was designed for this flower. The closer the hand of the user gets to the flowerhead (Ultrasonic sensor) the more aggressive and angrier the sound gets.

  2 LDRs are added in the stem leaves which emit a happier sound compared to the proximity sound. When the LDRs register bright light, they will create random and live synth sounds, nothing is prerecorded.

- Movement: The **4 servos** in the bottom of the stem are pulling wires that are attached to the stem of the flower head itself. By shining a light on either of the **4 LDRs** the plant will move via the servos towards the LDR which has the highest values.

Reactions from EXPO:

The sounds of the flower were exposed and presented first and some users responded by laughing and amaze, while others started to see if they could play live sounds as an instrument almost, which was possible to an extent. When discovering that the flower could move towards the light as well, they were eager to have the plant move around as much as possible while making it create sounds.

Showcase Video:

https://www.dropbox.com/scl/fi/lqp9ooh855j5zvz077hsx/AC1-Showcase-Video.mp4?rlkey=mj7dwcciugwnzc1jcs5khk1r9&st=iayc2qdf&dl=0

Personal Reflection:

Are you content with your result? And why? Does it achieve what you expected?

Short answer yes. The Sunflower stands as a symbol of how well our group dynamic worked and how all our individual ideas got realized or at least they got tested to a point. I enjoyed making the opening and closing mechanisms and really thinking into how to make it work mechanically as well, and despite the feature being scratched I don't feel like having wasted time, since I know it would be possible, if we had more time. And I like that part of these two weeks. You could be working on something you might have thought was going to be added, but suddenly they get scratched, but replaced by even better ideas.

Reflect on the process that you have gone through and compare your individual work / effort to that of the group.

Since I was more challenged due to my geological location of my home, living in Haarlem, I had to find out how to add to the group despite not being there physically. This way it restricted me on some stuff but opened new ways of trying to assist and ideate on other things. I can almost say that it was because of the strikes by NS that sound was added. I suddenly was by myself at home, and since I am a music producer, I thought it was perfect to combine my knowledge of sound and music with things I had much less experience or barely any experience with Arduino and coding. And now looking back and seeing how people reacted to the sound, it was such an important addition to the overall interaction and character of the plant.

The group in general worked flawlessly. We listened to each other and let each other tinker, ideate and add and scrap whatever had to be. I really enjoyed working with my group and it made the two weeks feel a lot easier and more fun and experimenting.

What did you learn? Describe important learning moments.

The fact that I could use sensor data from Arduino to play sounds and music. This was a big moment for me since I do live DJ-sets, and it really sparked some ideas for the future of how I want to approach playing my music live

From the EXPO itself I learned how sounds create an immediate reaction in people and how easy it is for people to connect with sounds. It does not need to have specific language, but how we interpret sounds and in which dynamics they are sent out in, we connect with it and understand what a happy sound is and what an angry sound is.

And lastly, I found out how important it is to go directly to the materials and start creating and not sit for too long discussing, since the iterations happen way faster while building.

Were you motivated? Were your expectations met? Did you have a good time? Did you achieve personal growth? Why? Why not?

Thanks to my group I was really looking forward to every day because I knew we were going to spend time together, ideate, laugh, struggle all of it.

I really taught myself a lot of things from coding and Arduino to hardware knowledge such as Sensors and Servos. My team also pushed me into trying soldering for example, which I somehow naturally was good at, and was quiet fun as well. I am a big fan of doing stuff with my hands, like building LEGOs etc, so this course and the lab weeks in general has been a lot of fun, since I got to do and just explore, exactly how I like to approach design. Explore first, then create and ideate and lastly create boundaries & restrictions, **all in that specific order.**