Assignment 3: Physical Output

Jaedwin Montal and Panagiota Fytopoulou

Link to portfolio site:

https://panagiotafytopoulo.wixsite.com/mysite/project-03

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Jaedwin Montal and Panagiota Fytopoulou
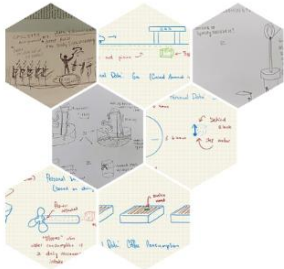
water plant vs. coffee zombie

This project aims to visualize data physically. The user's intake of coffee and water is recorded and displayed via this plant vs. zombie garden. It uses two rack and pinion systems, along with two stepper motors and two Arduinos. The data would ideally be fed into the system by measuring the water/coffee level

the design

The initial phase of this project was to nail down a design that fits within the scope of the project, as well as aim to be out of the box thinking. Jae and I came up with different sketches that we elaborated on. We discussed the advantages/disadvantages of our sketches and how feasible they truly are given the time and resources at hand.

We decided on a mix of two ideas: the flower and the zombie hand, as they both can be made with similar mechanics and they both take in liquids as input dataset.
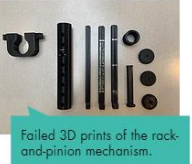
the squid

The project was broken up into different segments, which are:
- building a functioning rack and pinion mechanism for the flower and zombie hand
- creating a blooming mechanism for the flower
- putting it all together

After building/3D-printing a rack and pinion mechanism, we decided to go with a wooden box as the body of the project as we would be able to screw the mechanism to the side of the box for more stability.

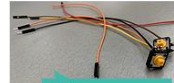Failed 3D prints of the rack-and-pinion mechanism.

The two main aspects of this project are the zombie hand and flower. The zombie hand was made out of polymer clay and the flower was made out of paper. We attempted to create the flower along with its blooming mechanism out of a different material such as cardboard or poster paper, however due to the nature of the blooming mechanism, it failed so we stuck to the original idea.
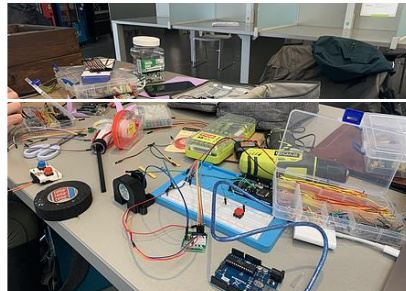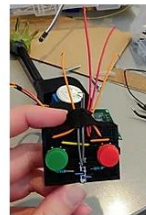
The original idea included a real-time data stream, however we wanted to focus on the output more than the input and decided to go with simple push-buttons as input method for this data visualization. The wooden box has 4 button-sized holes drilled in that were supposed to fit the buttons with their sodered wires in, making the complicated wiring invisible. This however failed and due to time restraints, we switched to mini-breadboards, hidden simply by cardboard.
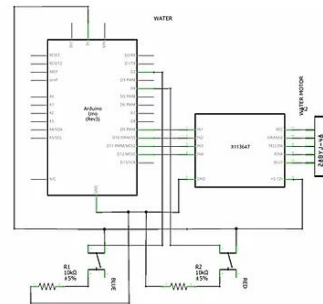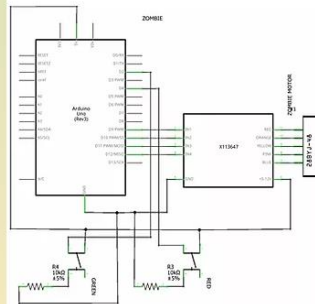

Failed attempts to make flower out of poster paper.

Failed attempts to soder push-buttons.

Putting it all together was easier than expected, because we had planned the project and all its details all parts fit like a glove.

circuit schematic

the final product

References:

- https://www.pinclipart.com/pindetail/bhhxiT_ghoul-clipart-zombie-plants-vs-zombies-2-rally/

- https://www.youtube.com/watch?v=avrdDZD7qEQ

- https://www.seeedstudio.com/blog/2019/03/04/driving-a-28byj-48-stepper-motor-with-a-uln2003-driver-board-and-arduino/

- https://www.instructables.com/id/Ever-Blooming-Mechanical-Tulip/

GitHub Repo

Source Code .zip