

WORKING WITH ANALOG/DIGITAL MATERIALS, ARTISTS-IN-RESIDENCE PROGRAM IN ESTONIA

APPLICANT: LEANNA BARWICK, 3174120

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CAREER LAUNCHER:

WORKING WITH ANALOG/ DIGITAL MATERIALS ARTISTS-IN-RESIDENCE PROGRAM IN ESTONIA



1. What is your name?

APPLICATION FORM

2. Are you a current student or recent graduate (2018 or 2019) of the OCAD U Material Art & Design undergraduate program, Digital Futures undergraduate program or Digital Futures graduate program?

- Yes
- No

3. What is your program?

- Material Art & Design undergraduate program
- Digital Futures undergraduate program
- Digital Futures graduate program

4. When did you graduate? If you are a current student, indicate in which year you currently are.

5. What are your phone number and email address?

6. List two references and their email addresses

(No reference letter is required)

7. Do you need a visa to visit Estonia?

(Please check [here](#))

- Yes
- No

8. Are you available to travel for the period of May 16–23, 2020?

- Yes
- No

CONTACT

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Material Art & Design, Faculty of Design
nnimkulrat@faculty.ocadu.ca
416 977 6000 x 274

RESOURCES

ocadu.ca/careerdevelopment

- careerlaunchers.format.com
- Tools & Resources
- Online Portfolios



Leanna Barwick: Letter of Interest

I am a Digital Futures undergraduate student in my second year. My art practice is very much an expression of my whole self; it blends my diverse interests, methods and materials that enable me to explore my creative expression, passion for learning, and curiosity for the natural world, human behaviour and relationships. I often incorporate physical and digital interaction in the things I make. My work intends to create an ephemeral experience for the participant/viewer that is as much sculpted by the moment as much as producing an object or thing with aesthetic values that continues.

One thing I love about being a student at OCADU is working with students in other programs, learning new skills I might not in my own program, sharing my skills, and creating something that's a unique expression of who we are as a team, that I can forward with as an individual as well. In my professional life I am a relationship systems coach, and as a student I get to practice the collaborative skills I train.

I have an interest in learning more about digital crafts practices and material design. My sister has a small farm in Ontario, where she and her partner raise multiple varieties of sheep, process wool. I have some experience helping them with material processing; shearing and harvesting of wool and sheepskin, preparing hides for tanning, and cleaning the wool for milled roving and yarn, as well as some felting crafts.

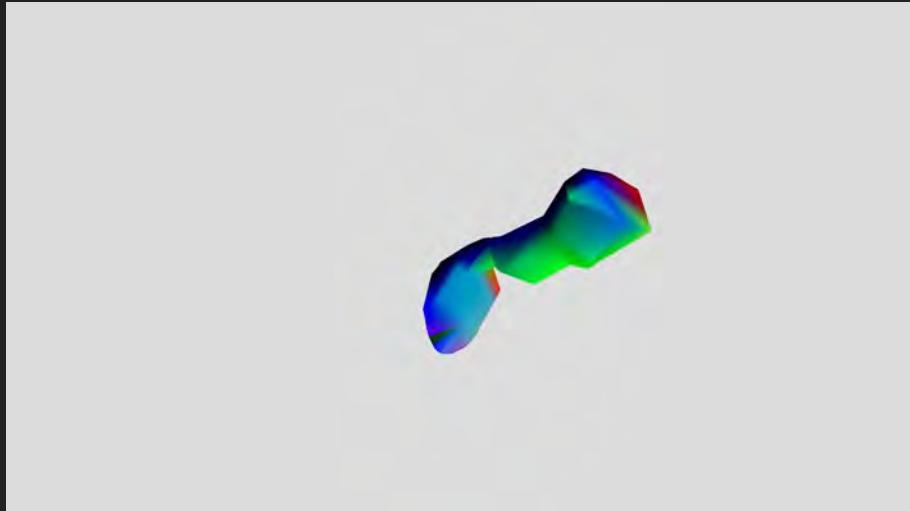


Bad Arm, Leanna Barwick, 2020

Bad Arm Summary

Bad Arm is the story of a disembodied non-normative body part. There is a short written component and a digital component. A visitor to the interactive space is met with the sound of a baby crying and a digital arm. When the arm is clicked on the audio story changes.

Bad Arm is a browser based digital artwork, coded using [p5.js](#), that incorporates audio and user interaction with a 3D object. The manipulatable object is a digital model of a physical casting, made from a mould of the artist's left arm, that has been digitized using photogrammetry software.



[Link to digital interaction:](https://editor.p5js.org/LB/full/PG086HR)
<https://editor.p5js.org/LB/full/PG086HR>

L

[Link to code:](https://editor.p5js.org/LB/full/PG086HRL)
<https://editor.p5js.org/LB/full/PG086HRL>

[Video of interaction:](https://vimeo.com/391043102)
<https://vimeo.com/391043102>

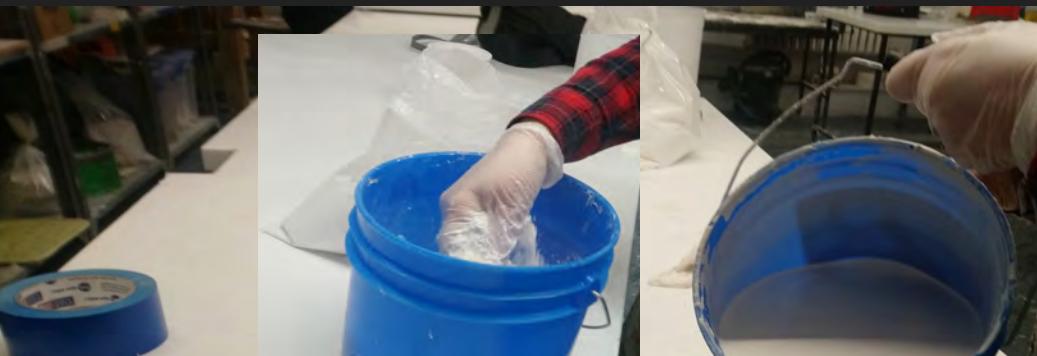
Bad Arm

From the start I was bad. Or so I was told. It's all the little ways. Even those who believed in me called me bad. It's as if I was just naturally born that way and that was just my cross to bear. It didn't matter what I did, 'bad Arm' was the mould I was cast in, it was the role I was born to play. Infancy was difficult. I was stretched so much to exercise and stimulate my lazy muscles that the body cried and cried and the mind, it just got the fuck out.



Various display outputs of the cast arm model from different perspectives. Clockwise from top left: textured with wire frame, x-ray (x2), textured, solid, still image.

Process Images - Physical Fabrication: Mouldmaking Studio



Attempt #2



I made an alginate mould of my left arm and used hydrocal plaster to cast a physical model of it.

I learned that alginate is mixed by adding water to the dry powder, whereas plaster is mixed by adding dry powder to water. Otherwise big clumps will form.



FAIL

Attempt #1

I also learned that agitating alginate with mechanical mixers can increase the setting time (normally approx 8-10 min) by as much as 5 min.



Process Images -
Physical Fabrication:
Revealing the cast arm
from the mould

Process Images -

Physical Fabrication: Fixing Broken Casting

cccrow.com/how-2/fix.html   

HOW TO WORK WITH HYDROCAL AND OTHER MODELING TIPS -

FIXING BROKEN CASTINGS

Hydrocal is great stuff. Its one weak spot is if you drop it- it will break. Fortunately, it is possible to fix broken pieces, often without it even being noticed. At least you can give it a try.

More than one of my original pilot models have been picked up and dropped by careless people who ignore the polite signs on my vendor table: **PLEASE DO NOT HANDLE THE MODELS.** That's all right, I'll fix it. (geert)

If it is a simple break maybe we can get it back together. First, blow off any small chips or dirt that may interfere with rejoining. Then check to see if the parts will go back together. Work on a firm flat surface.

Okay, if it looks like it might work let's give it a try.

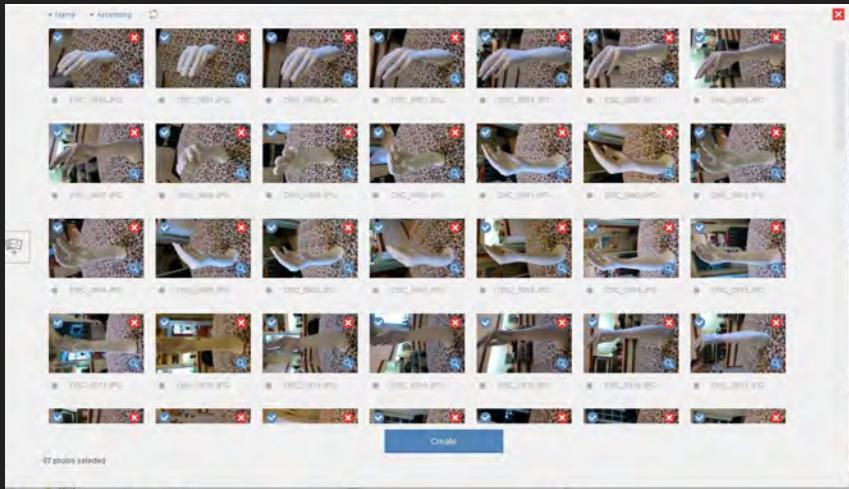
For gluing Hydrocal I recommend and always use Elmer's Carpenter's Wood Glue, the yellow stuff.

It gives a good quick bond. We only need a tiny bit. The trick is to have a good tight joint. Nice and square where two parts come together. Or just free of obstacles as in a break.

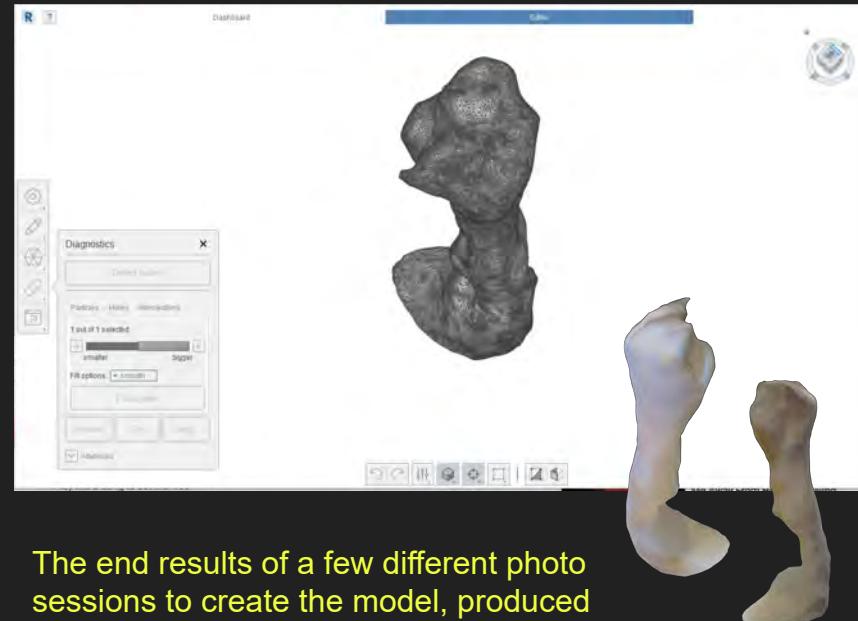
Apply a small bead of glue along one side of the joint. Then quickly push the two sides together. Apply firm pressure. In just a moment the glue will begin to firm up as the moisture is absorbed into the plaster. For that reason we must work



Importing jpg images of casting into Autodesk ReCap Photo



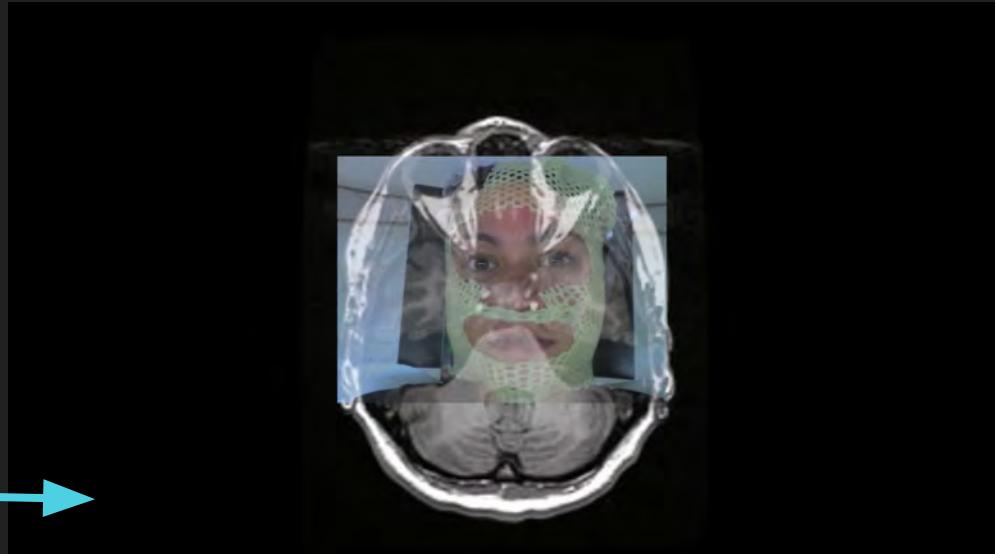
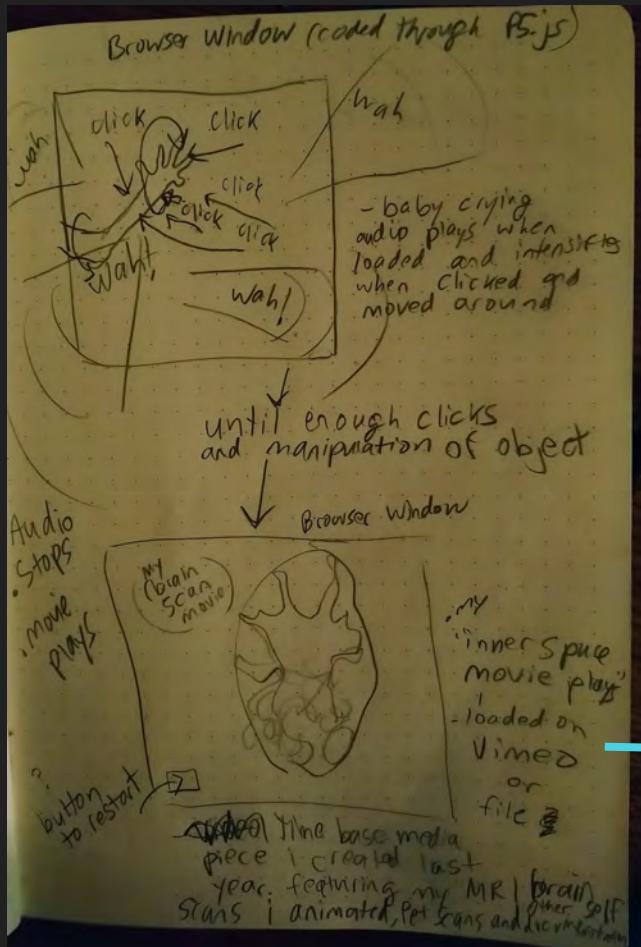
Cleaning up the 3d model of the casting and exporting it as an obj file and png



Process Images - Digital Fabrication: Photogrammetry

The end results of a few different photo sessions to create the model, produced equally non-naturalised visualizations of the arm, but I appreciated the blob and thought it worked with the 'bad arm' (mutant, blob, unhuman, demonized) narrative.

Process Images - Digital Interaction: Initial Conceptualizing, Sketches

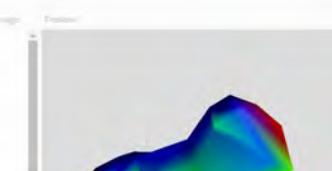


Inner Space Mirror Test, Leanna Barwick, 2019
<https://vimeo.com/317439202>

Process Images Audio & Interaction: P5.js

P5.js has a maximum file upload size of 5mb. I had to experiment with the decimation percentage when exporting the model from ReCap Photo, to get something small enough, which then resulted in a low-poly aesthetic in the 3d model of the cast.

I learned that: preLoad audio and WEBGL don't work together. Audio must be loaded in the setup and executed in the draw loop. The `isLoaded()` function is used to check to see if the audio file is available before the call loop of the audio file.

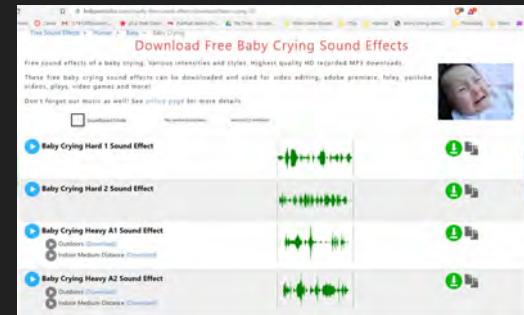
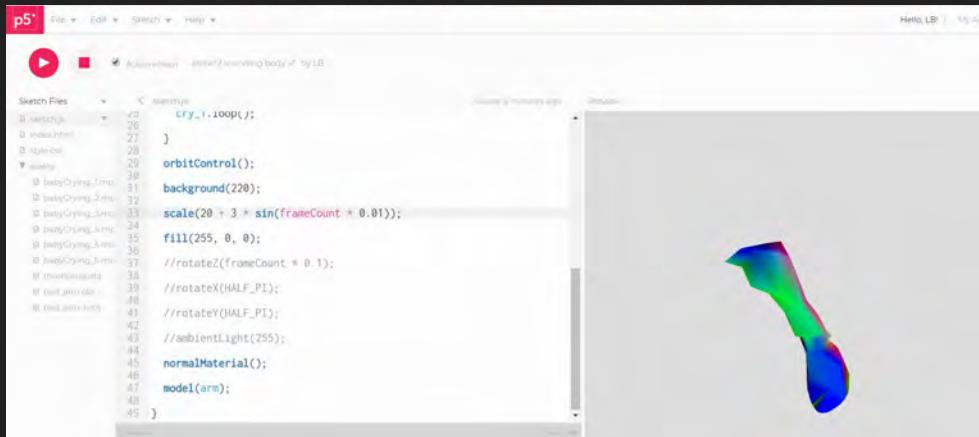


The code defines a 3D model of a baby's arm and plays a sound when it is touched.

```
let arm;
let cry_1;

function setup() {
  createCanvas(600, 600, WEBGL);
  arm = loadModel('assets/bad.arm.obj');
  cry_1 = loadSound('assets/babyCrying_1.mp3');
  cry_1.playMode('untilDone');
}

function draw() {
  if (cry_1.isLoaded()) {
    touchArm();
  }
}
```



Found free sound effects online:
<https://www.fesliyanstudios.com/royalty-free-sound-effects-download/baby-crying-70>

Angry Bees

Leanna Barwick, Tim Chang, Jiaxi Pan
2019

*LOST IN A FOREST FOR WHAT FELT LIKE DAYS, I CAME ACROSS A CLEAR PATH.
A SPARKLE IN THE DISTANCE CAUGHT MY EYE AND A DREAMLIKE MELODY LULLED
ME IN. AS IF UNDER A SPELL, MY BODY WAS PULLED FORWARD. A BUZZING
NOISE FILLED MY EARS AND I SAW THEM. BEES SHOOTING AT ME LIKE LINES OF
ANGRY BULLETS. POWERLESS TO GET OFF THE RIDE, ALL I COULD DO WAS MOVE
MY HEAD TO AVOID BEING HIT, AND SURRENDER TO WHEREVER I MIGHT LAND.*



Project Description

Angry Bees is a game-like VR based experience designed to evoke a mixed emotional sense of anxiety and delight to the player.

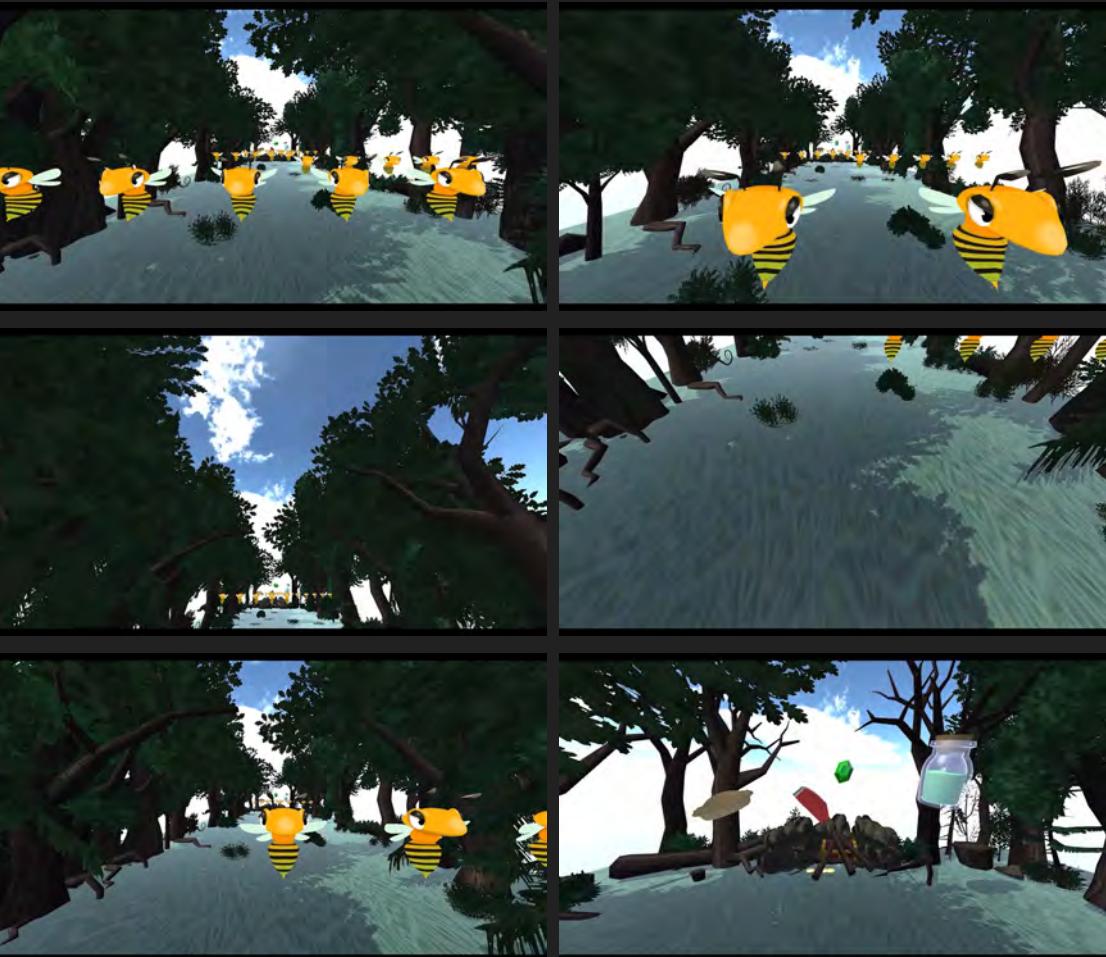
Video of Final Work

Link to video of VR demo (no player): <https://vimeo.com/378884603>

Link to video of VR demo (player 1): <https://vimeo.com/378901038>

Link to video of VR demo (player 2): <https://vimeo.com/378897363>

In *Angry Bees*, the player is propelled along a forest pathway accompanied by a musical soundtrack, while multiple lines of bees fly towards them. Each bee buzz gets louder as they approach the player and fades as they go past. Players can dodge the bees by moving their body. If the player does not dodge and gets hit by a bee, they visually tip backwards and forwards and feel a vibration in their hand controllers.



Video of Final Work

Link to video of VR demo (no player): <https://vimeo.com/378884603>

Link to video of VR demo (player 1): <https://vimeo.com/378901038>

Link to video of VR demo (player 2): <https://vimeo.com/378897363>

Concept

Angry Bees was created using a comic book prompt word, “VIP!”, which reminds us of something whizzing past that provokes anxiety and a need to dodge. For us this manifested thematically as lines of angry bees. The intended “game-feel” is a playful mix of dream and nightmare.



VR Interaction Design

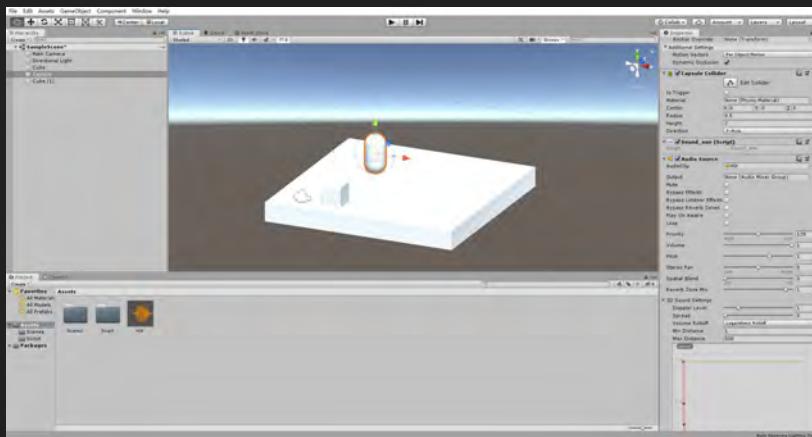
Angry Bees is built using the Unity game engine and prefabricated assets available from the Unity store. It was designed to be played using an Oculus Quest VR headset and hand controllers. When considering the VR interaction design and how to articulate the bee theme as well as the anxious qualities we looked to evoke, we decided to utilize:

- Audio
- Player movement
- Animation
- Haptic feedback
- Visual environment and theme

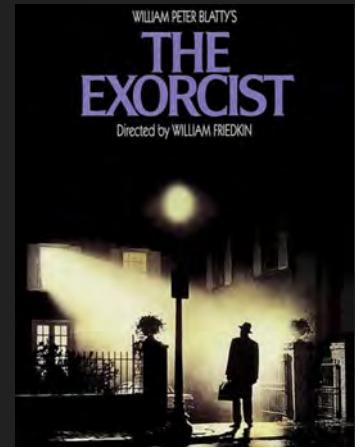


Audio

To give a more realistic depth, each bee object in *Angry Bees* has been assigned 1 of 3 different buzzing noises and uses spatial audio to create a more realistically immersive experience. This helps support the experience we want to emote by exploiting the human instinct and anxiety associated with bee buzzing sounds.

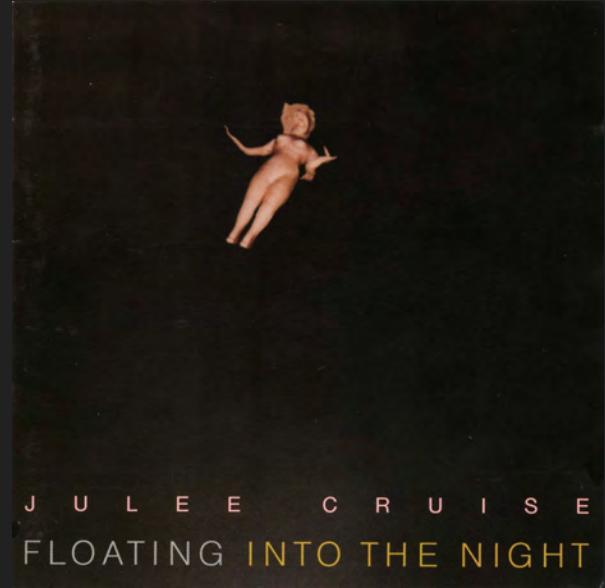


This sound design technique (subliminal stimuli) was notably used in the psychological horror film *The Exorcist* (William Friedkin 1973).



Audio

There is a dreamy musical soundtrack (Julee Cruise, Rockin' Back Inside My Heart, 1990) to intentionally contrast the bee nightmare, and help create a tension between the calming environmental atmosphere and the bee object assault action. Julee Cruise is the partner of film director David Lynch, who has also featured the artist's music (and this song), in the TV series Twin Peaks (ep14 "Lonely Souls", 1990). The song in that circumstance also created a similar tension between resonance and dissonance.

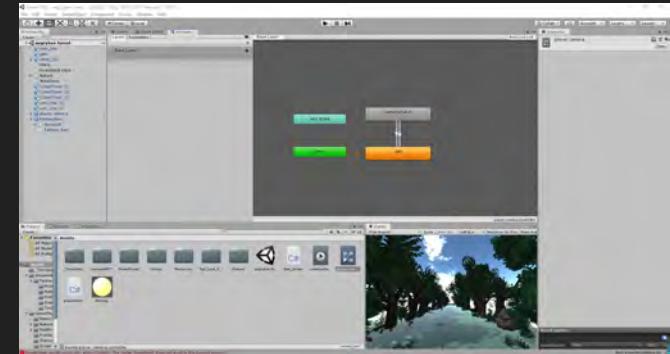


Animation

Whenever a bee collides into the player, an animation created in the Unity game engine, plays, what appears in the VR viewer, as the camera shaking from the force, which gives the sense of being “hit” by the bees.

Haptic Feedback

When a bee collides into the player the left and right hand controls vibrate for a few seconds, to embellish the impact of being hit by bees.

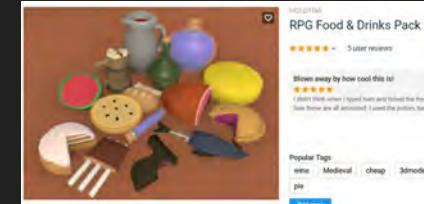
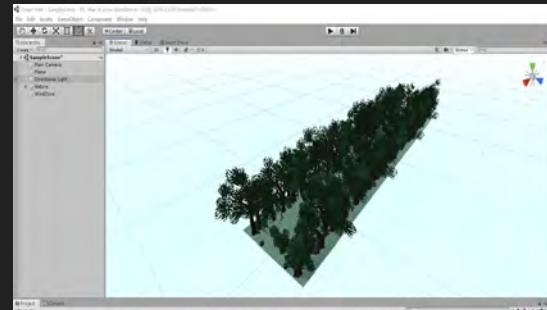


Player Movement

The player is “floating” along the path of angry bees pelting towards them and cannot control this forward motion. Movement has been restricted to reinforce the sense of powerlessness. The player still has some control, and can use their body to try to avoid being hit by the bees.

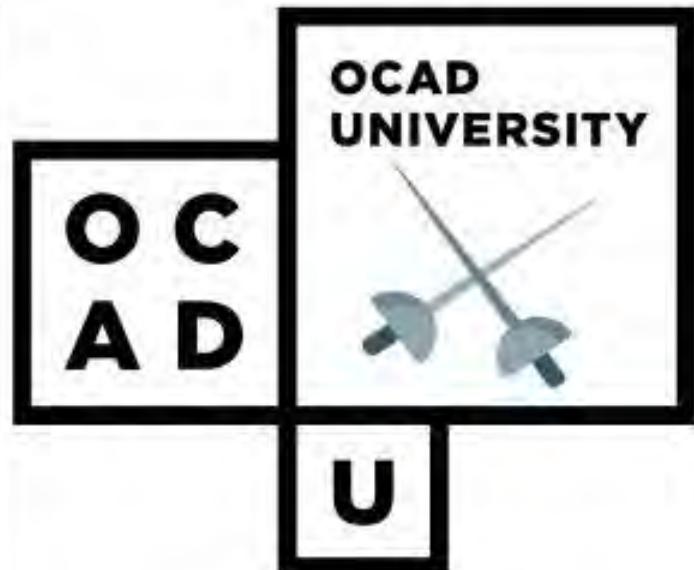
Environment & Prefabs - Assets from Unity store:

- A bee prefab was used and multiplied in numerous rows along the path the player moves
- A forest scenery builder that fit thematically with the bees was used. Visual wind effects heighten the player's movement
- “Loot” is placed in the scene and rotates/floats in mid air



Fencing Club

Leanna Barwick, Sam Kingston, Jaixi Pan
2019



FENCING CLUB



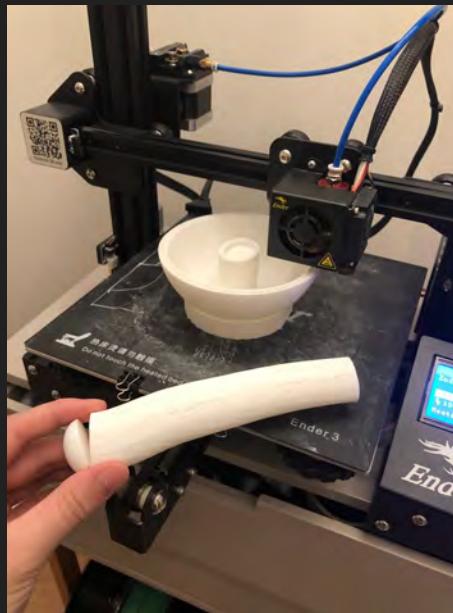
Project Description

Inspired by the content of “Fencing” an instructional book on the sport, *Fencing Club* is a 1-3 player online game, developed using [p5.js](#) (a JavaScript library for creative coding) and [PubNub](#) (a real-time communication infrastructure using messaging channels). The game hardware interface (fencing foil handle) is designed using 3D modeling and fabrication. Mobile devices physically connect to the foil handles and digitally connect to the messaging channel in order to play the game. Players practice fencing technique, competing to improve speed, accuracy and sword handling skills.

3D Fabrication

Phones are used to replicate fencing foils. Optional “foil handle” phone holder accessory can be fabricated using the downloadable 3D printing file.

<https://github.com/Leanna-B/fencing-club/tree/master/fencing-club-foil-handle-phone-holder>



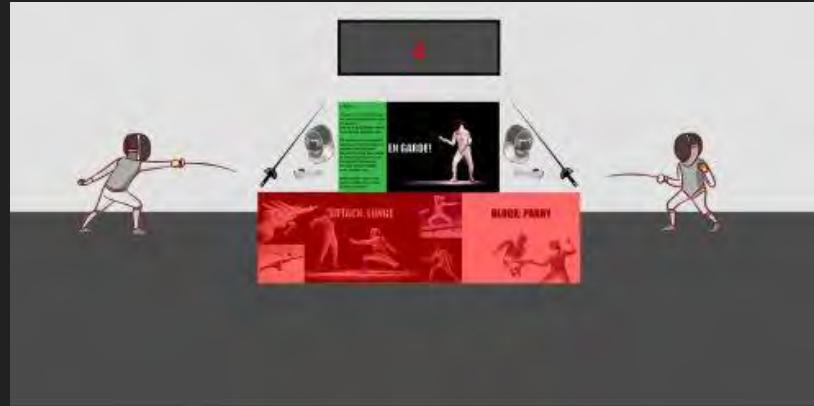
Instruction

Players start and learn fencing moves on the [welcome page](#); en garde (accesses phone's gyroscope, score is based on how the phone is angled in stillness), lunge (accesses phone's accelerometer, score is based on how fast the phone is thrust outwards), and parry (accesses phone's accelerometer, score is based on how fast the phone is withdrawn towards the body).



Gameplay

Entering the game area, a ten second countdown starts. When the timer completes, one fencing movement appears in green (the other two in red), a new four second timer starts, and players perform the green highlighted movement, receiving a real-time score based on their performance. This repeats in a succession of five rounds of randomly selected movements, after which the game is over, and the winner is displayed, based on who has the highest total score.



Link to mobile phone fencing foil demo:
<https://vimeo.com/363362608>



Links to Fencing Club Code

<https://github.com/Leanna-B/fencing-club>

Fencing Club Welcome Page (Please note links on page are no longer active, for code please see github repository)

<https://fencing-club-welcome.glitch.me/>

Bathroom Break(out)

Leanna Barwick, Marcella Driver-Moliner, Frank Lin,
Tae Nim, Rachel South
2019

Bathroom Break(out) Process Book

Escape Room

April 2019



Content

Artist Statement

Story Line

Material

Sensors

Electronics

Circuit diagram

Arduino code

Fabrication

Final Work

Artist Statement

Bathroom Break (Out) is an escape room that uses electronic and analog puzzles and clues to emphasise the importance of communication.

Story Line for Bathroom Break (Out)

Dear OCAD University Students,

We here at Imagination Corp (IC) welcome you to the new required research study at OCAD University!

Thanks to a recent initiative from the Province of Ontario to encourage private sponsorship in public universities, IC has made a generous donation to OCADU, and are pleased to announce OCADU will now be a host partner for IC pop-up research labs. IC labs offer cutting edge advancements to human data mining and sales.

Going forward, students like you will have the opportunity to acquire life, team and leadership skills, while also being part of something larger, and paying forward to the OCADU community.

Students will be observed within an interactive site-based scenario, and studied on their ability to work collaboratively through solving puzzles that reward them with their freedom from the test. Don't be surprised if you find yourself lucky enough to step into one of these innovative and immersive experiences!

→ *view next page*

The IC vision maximizes the full potential of each student, recognizing them as an untapped income stream for B2B research data sales. Profits generated will ensure that universities can continue to increase their capital holdings, expand business groups, and create more management positions without sacrificing executive salaries. The data will be bought and used by corporate and public education institutions to better understand best practices when it comes to return on investment in students, and the next generation of the creative workforce. “From the cradle to the desk”.

Thanks to the mandatory help from students like you, the cutting edge research that we generate together from these tests will revolutionize how Canadian educational institutions approach their funding and business models.

IC is putting the fun in FUNding! Student's voices matter!

We listened to feedback and understand that students want a “gamefeel” and immersive experience. In response to this need, our labs are now designed with user experience in mind, and modeled after escape rooms

We here at IC are looking forward to our partnership, as together, we bridge the gap between students as passive participants in the system, to every student being a possible research income stream and really mattering!

Materials

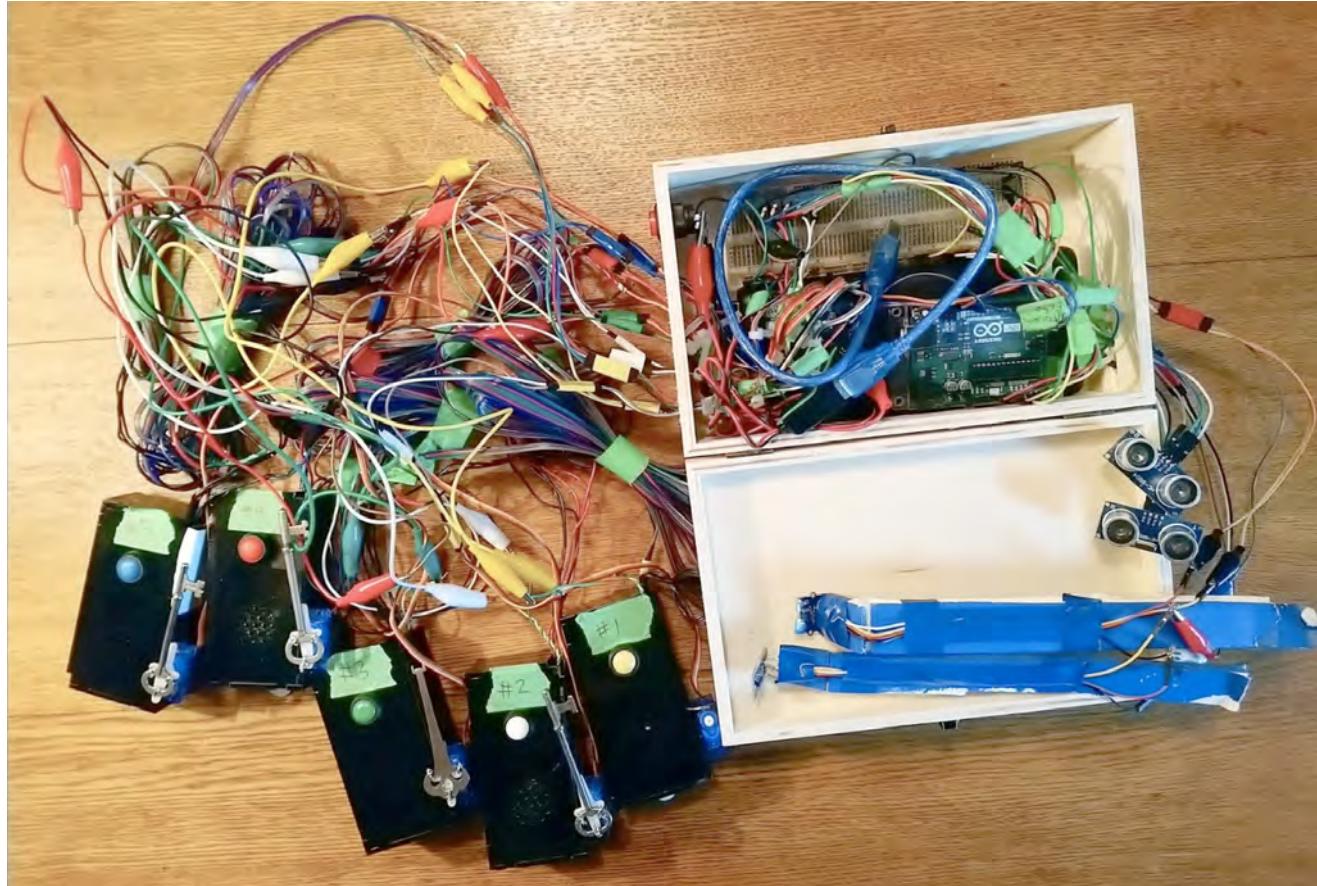
Sensors: Ultrasonic sensor, button sensor, and temperature sensor.

Electronics: lots of wires (over 400 feet of wire), neopixel RGB LEDs, arduino, breadboard, locks (servo motors), Battery Pack, Servo Driver, and Resistors

Used materials in the bathroom: Toilet, stalls and hand dryer.

Fabricated material: Puzzle to conclude the escape room, button boxes, posters, box for all electronics, lab coat, storyline hand out.

Everything together



Sensors

Ultrasonic sensor

Button

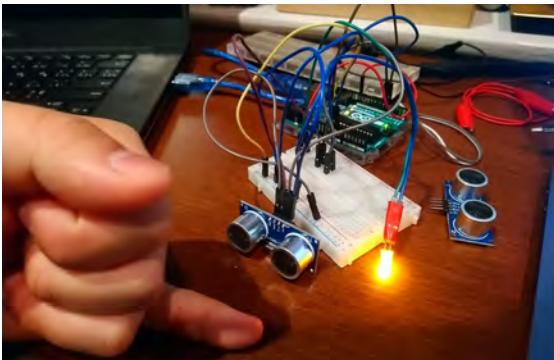
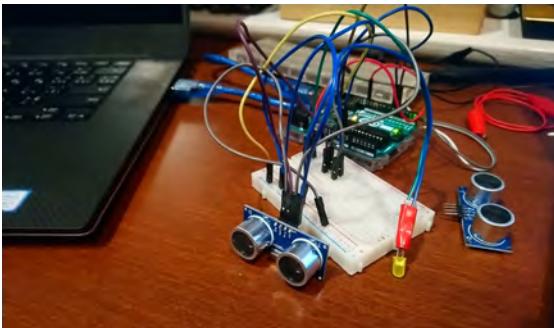
Temperature Sensor

Ultrasonic sensor

This sensor was used for our first puzzle of the toilets flushing. Both toilets needed to be flushed at the same time in order for it to trigger the code. The ultrasonic sensor measure distance with noise bouncing off of objects.

Process Picture & Video

Video Of First Try



Video Of Second Try

<https://vimeo.com/328222857>

Video Of Third Try

<https://vimeo.com/328302389>

Final look!



During Simulation



Button Sensor

This part is essential to the room. It allows people to enter the code they have received from the light. And if the code is right, the locks (servos) will open.

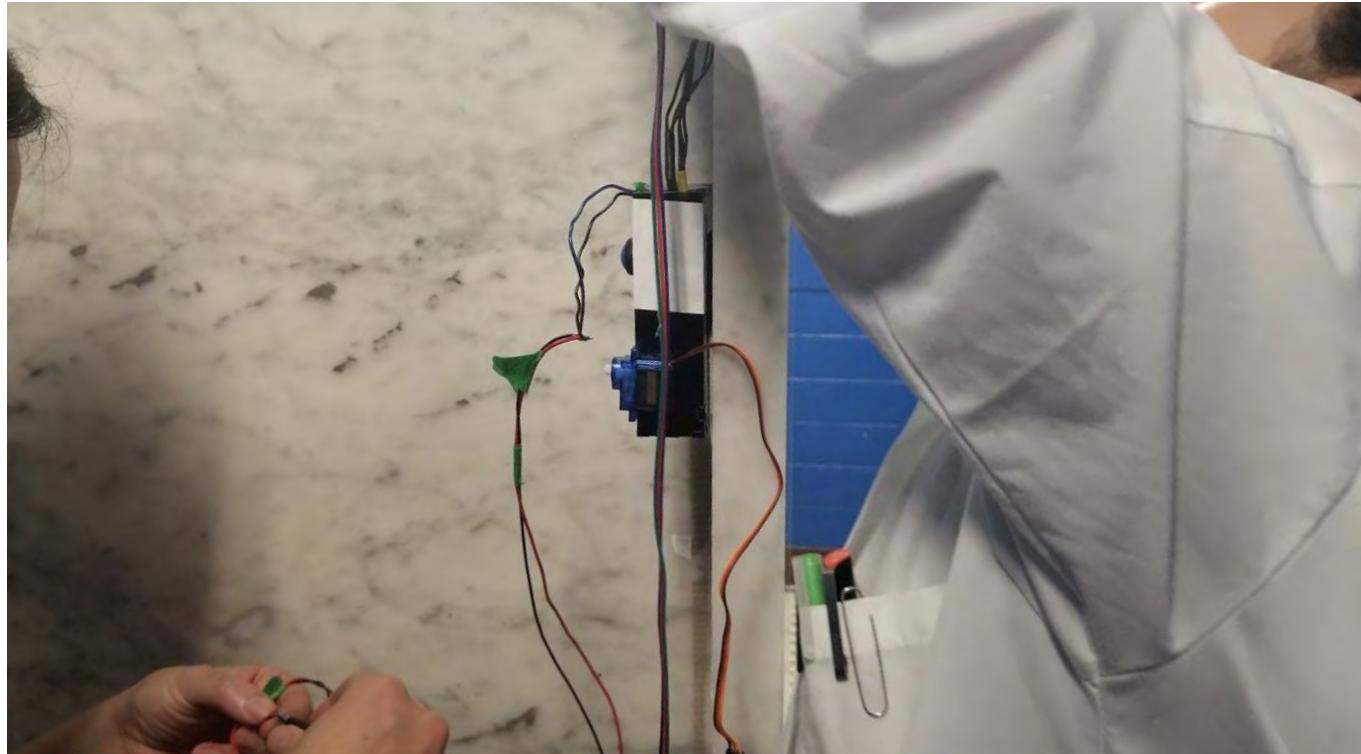
Button Test Video Link:

<https://vimeo.com/328293353>

Code for the part

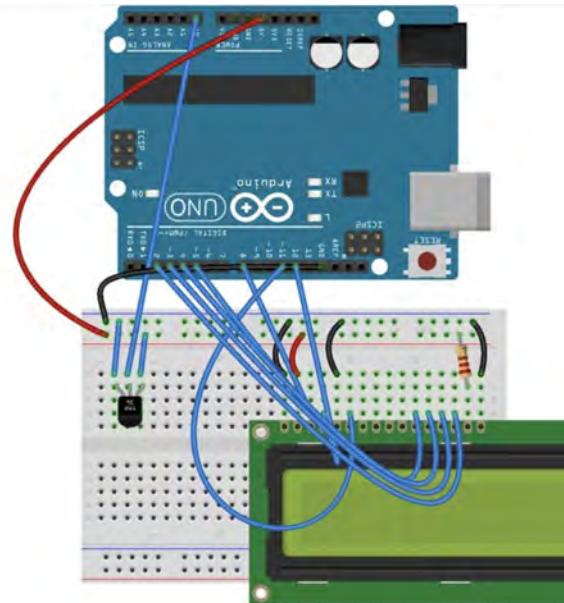
<https://pastebin.com/raw/X4M5nzY0>





Grove (Heat) Sensor

This sensor is for our second puzzle. It reads the heat emitted from the hand dryers and triggers the second light code. Both hand dryers need to reach the same temperature in order for the light code to activate.



Heat Sensor



Used Materials in the Bathrooms

Toilet, stalls and hand dryers



Electronics

400 feet of wire

Neopixel RGB LEDs

Arduino

Breadboard

Locks (servos)

Battery Pack

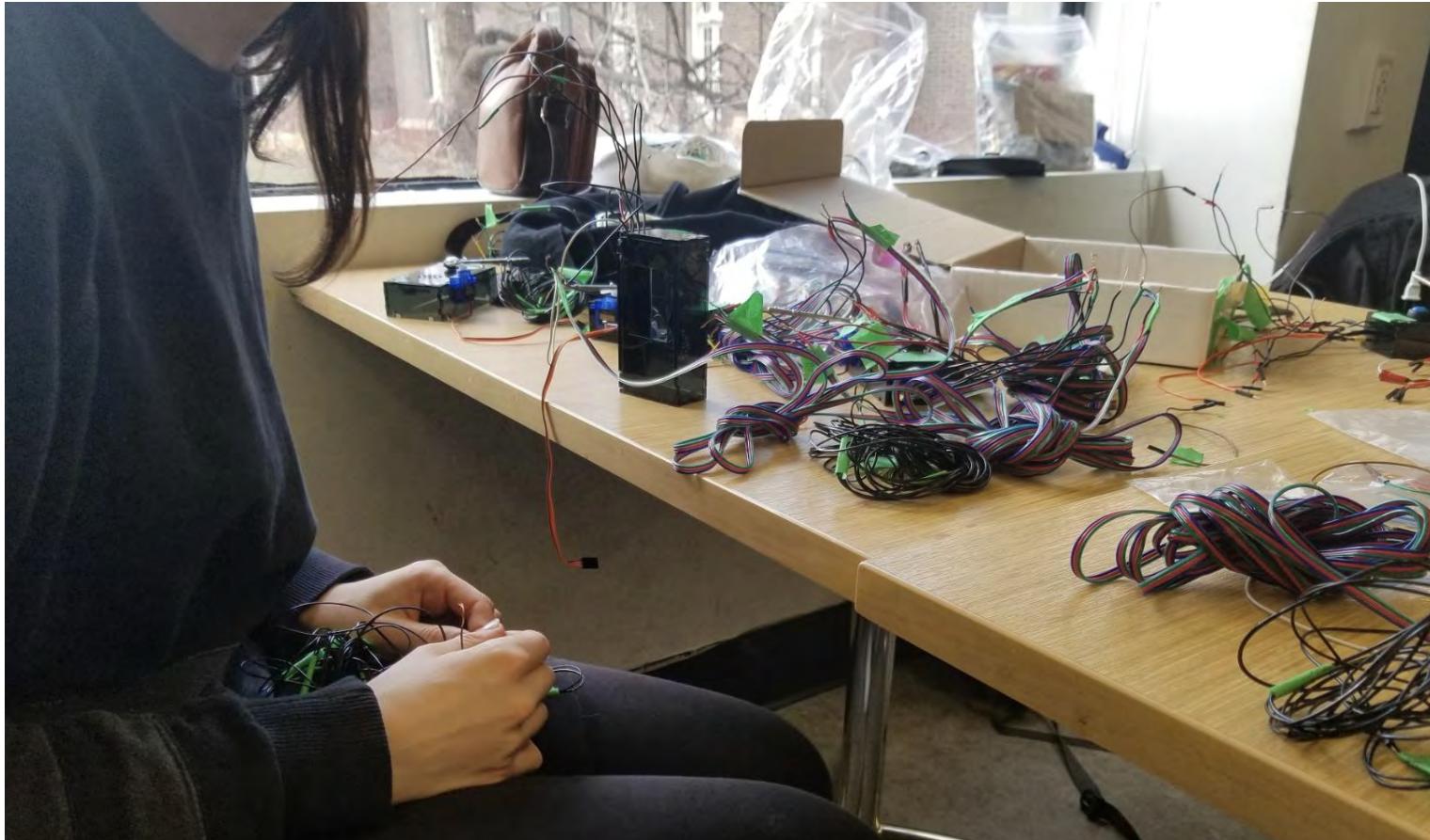
Servo Driver

Resistors

Circuit Diagram

Arduino Code

400 feet of Wires



Measuring wires

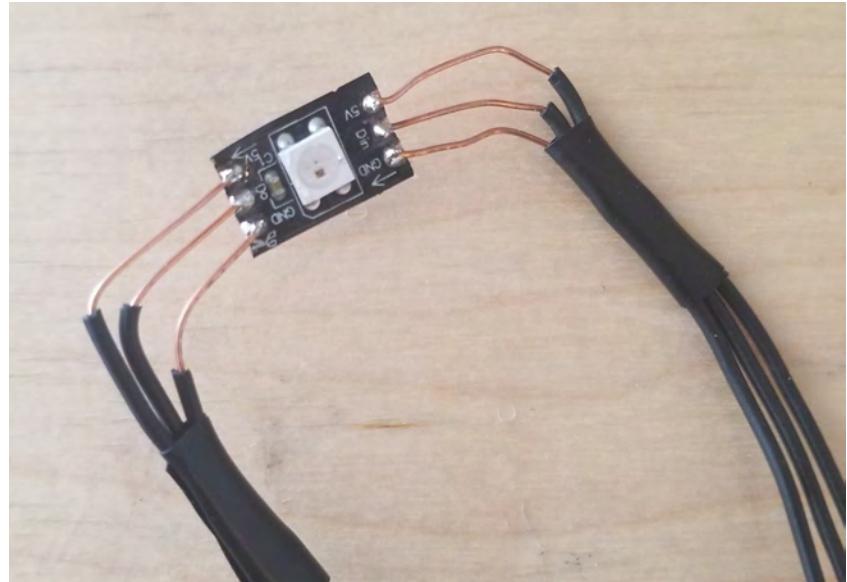


LED's

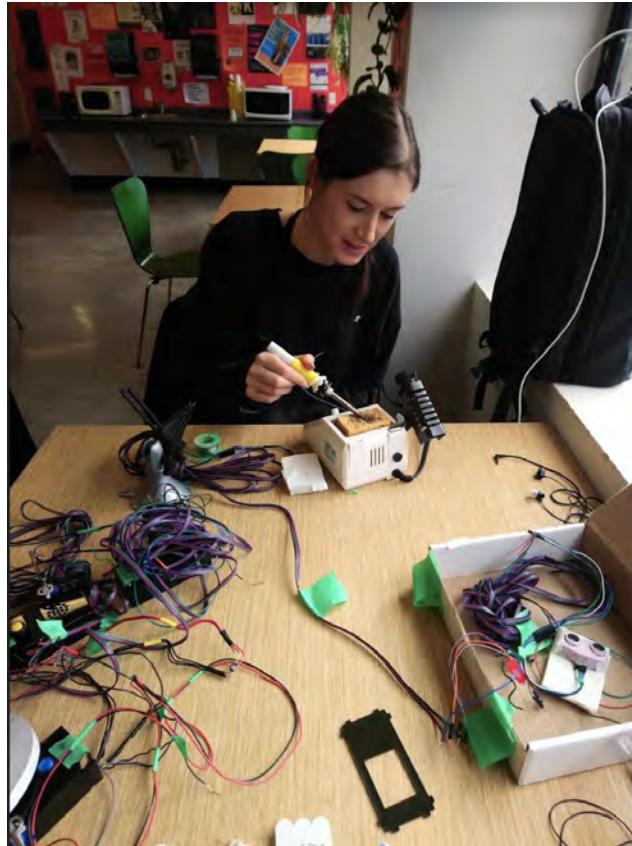
Neopixel Digital RGB:

To separate the neopixel strand that we were using, we cut the strip between the lights. We soldered wires connecting the ground pins to one another, the voltage pins to one another, and the Do to Din together on each neopixel.

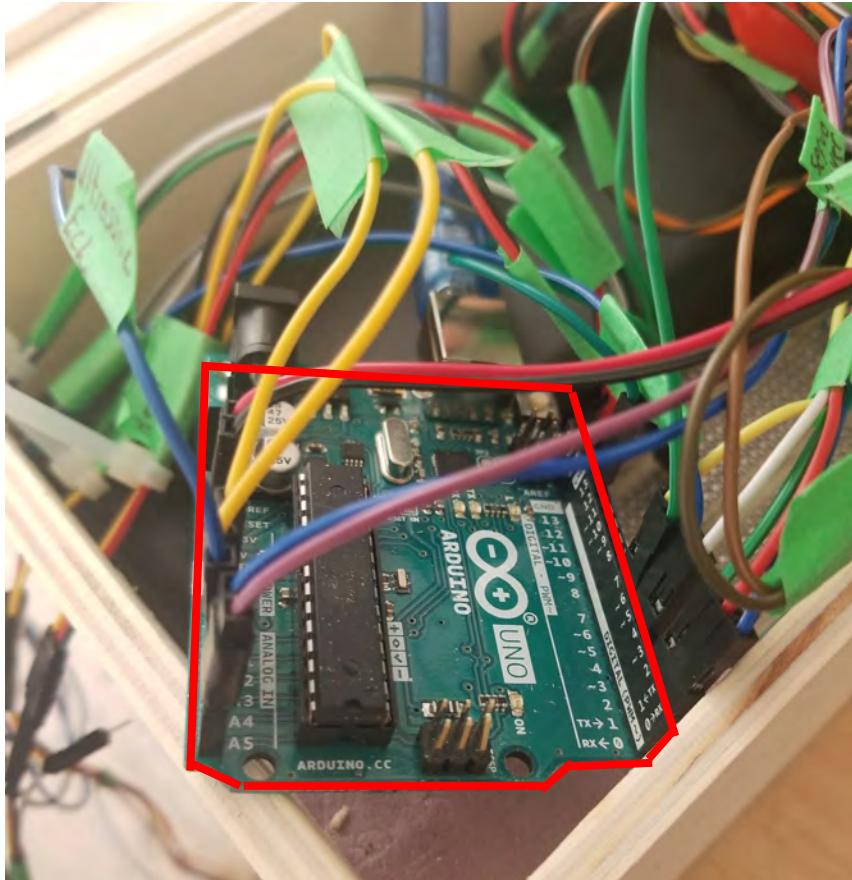
Initially, we tried to use RGB light, but since each of them has to use 3 pins, we decided to change our plan to use Neopixel, a method that requires only one output pin.



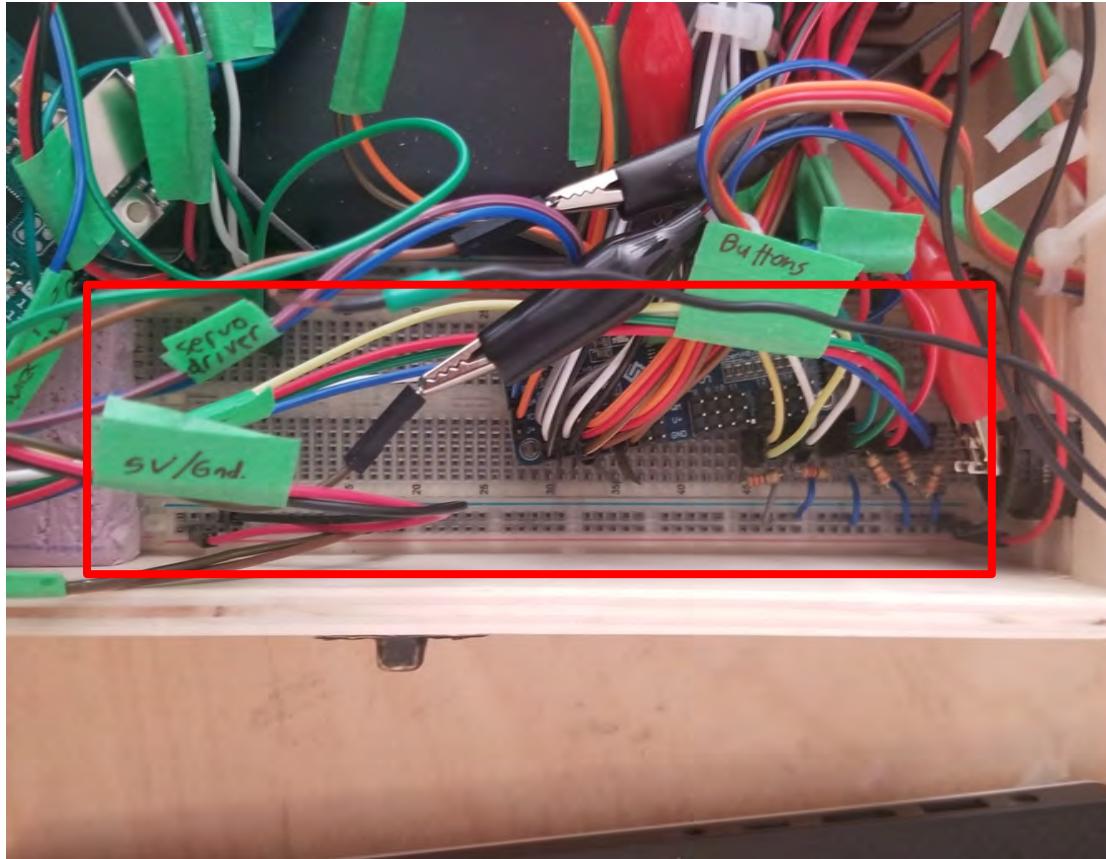
Before and Soldering LED's



Arduino

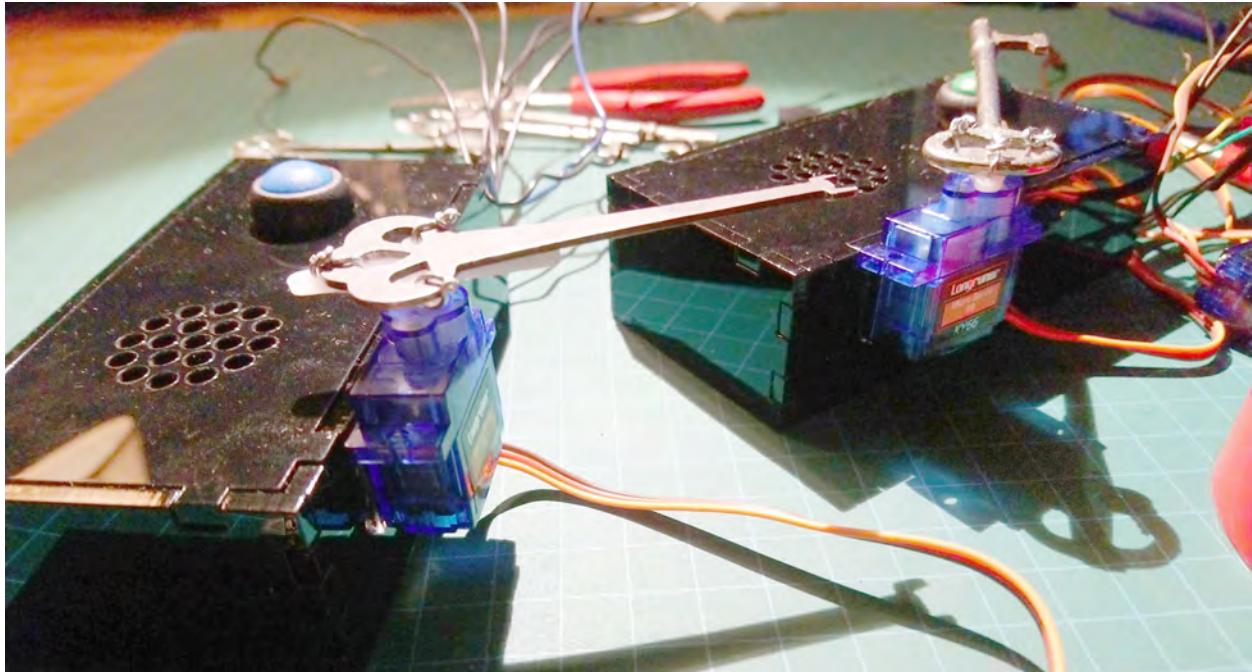


Bread Board



Locks (Servo Motor)

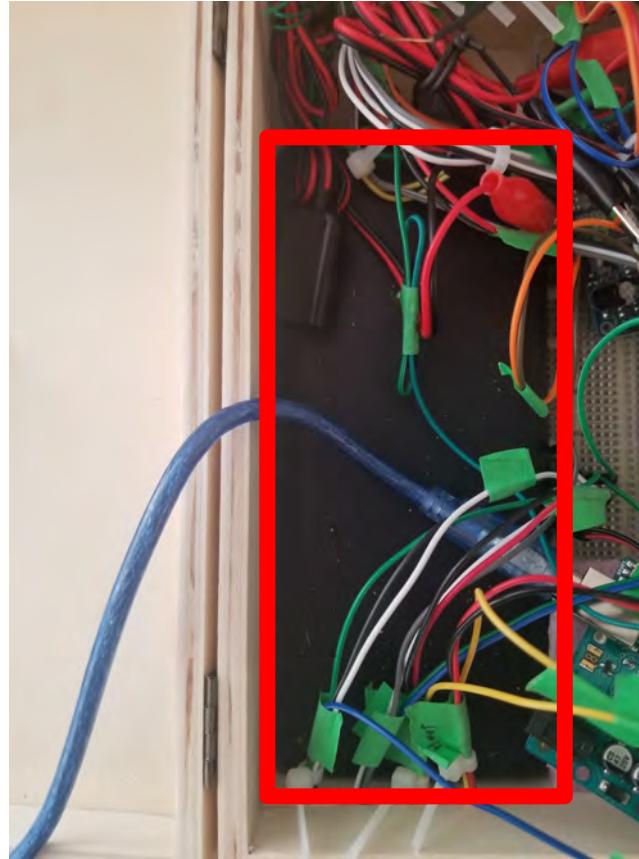
Instead of using solenoid locks, we used a Servo Motor to represent the lock and unlock of the door.



Battery Pack

Anker PowerCore 26800 Portable Charger,
26800mAh External Battery with Dual Input
Port and Double-Speed Recharging

We needed to supply the power to the arduino
without connecting it to the computer. It
supplies 5V; therefore gives of enough power
to the system without being overpowering. It
has three USB ports for the convenience.



Servo Driver

Model Number: PCA 9685 Servo Driver helps to provide extra PWM slots, which are more option to have a analog output.

Since we have to use 5 Servo motors, we did not get to have enough output to connect the servo Motor.

We were thinking of using two arduinos, but it was not an option.

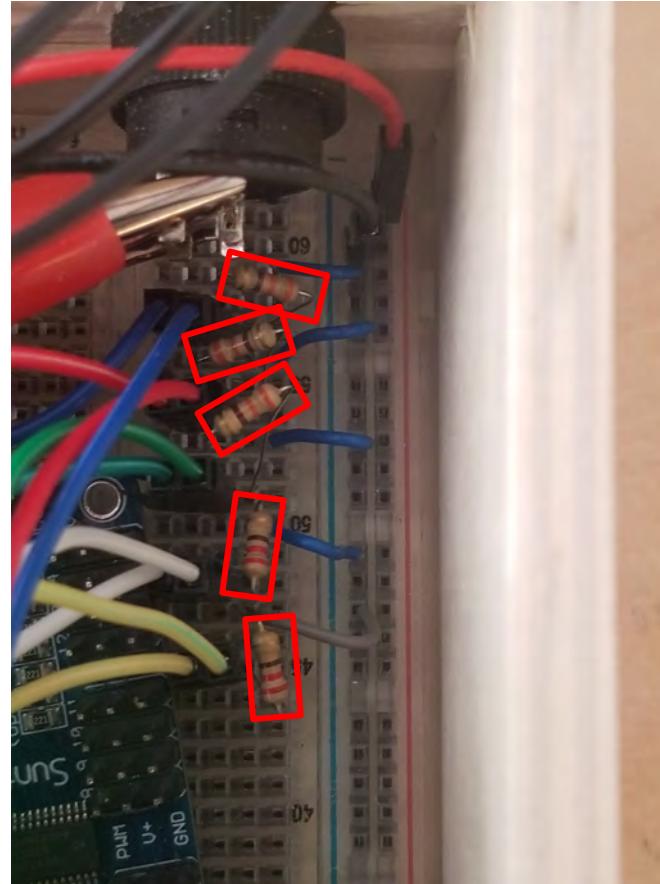
Therefore, we finalize our decision to use Servo Drivers to have extra spaces to connect Servo Motor.



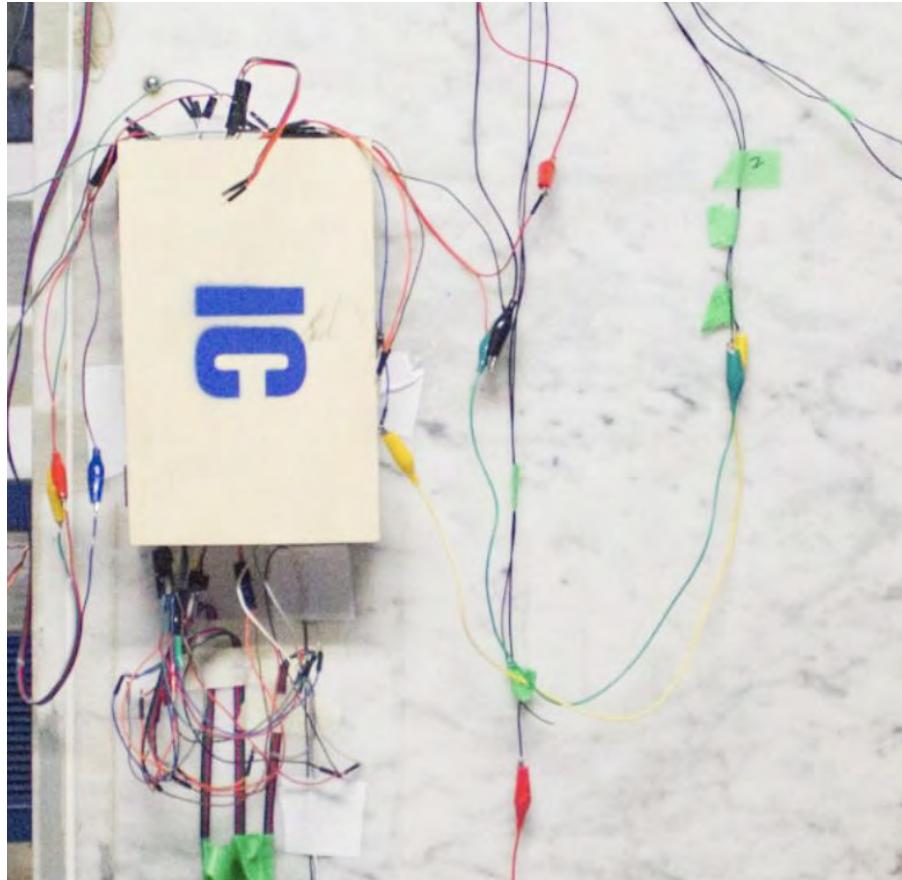
Resistor

We used 300 ohm resistors for button sensor.

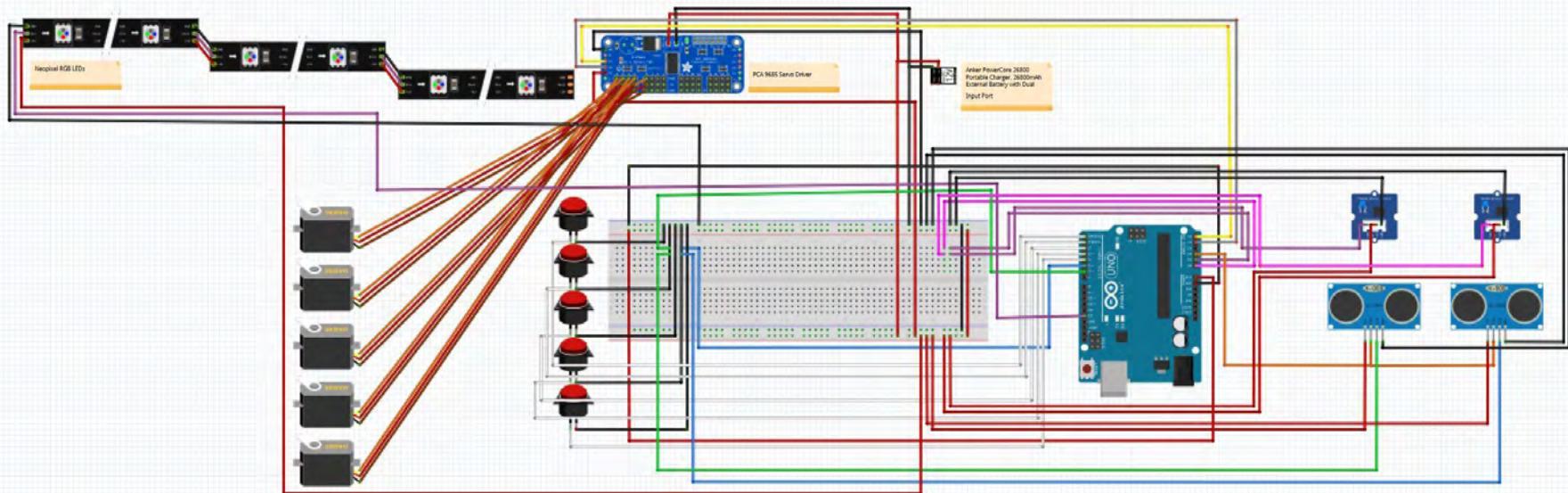
Since the button sensor required precise amount of resistance. By adding the components, resistors, we tried to reduce the current by a precise amount.



It all fits in here!



Circuit Diagram



Arduino Code

[https://github.com/Leanna-B/bathroombreakout/
blob/master/bathroombreakout_final](https://github.com/Leanna-B/bathroombreakout/blob/master/bathroombreakout_final)

Fabrication

Posters

Puzzle

Light, button & lock boxes

Main electronic box

Heat sensor holder

Branding

Posters

Slightly altered OCAD University posters.

By using the poster that we can easily see in OCAD University, we are going to change a contents of the poster, in order to give a hint to escape the room.

Each players will be lock in five stall of the washroom. In order to escape from the washroom, players have to work as a team to solve puzzles to open stalls.

Since they won't get specific instruction, the poster will give them hints to directing them to do certain action to escape from the stalls and washroom.

The poster will be in each stalls and outside of the stalls.

By using the poster from OCAD U, we tried not to make hints too obvious.

Posters



Posters

We need enthusiastic, friendly, upper-year undergrad flusher!

Will you be going into second-, third-, fourth-, or upper-year in September 2019?

OCAD U

STUDENT MENTOR PROGRAM

Sign up and learn more about OCAD U services and programs. Get involved. Be part of our community and help us welcome and assist new undergraduate students with their transition to OCAD U!

Become a Flush Mentor!

 ocadu.ca/mentorprogram

BUTTON THERAPY FOR STRESS AT OCAD U

Join an art therapy group facilitated by an art therapy student at the Health and Wellness Centre designed to enhance coping skills and reduce stress through your studies at OCAD U.



Sign up at the Heath and Wellness Centre or by email: arttherapycadu@gmail.com or hwc.ocadu.ca

Date: Fridays, January 18th – March 29th
Time: 1:30pm – 3:30pm
Location: Health and Wellness Centre
230 Richmond St. W.
Level 6, Meeting room
Contact: buttontherapycadu@gmail.com

PRESS IN HERE

REMEMBER FOLKS
FLUSH, YOUR FECES ARE
NON RECYCLABLES





Posters



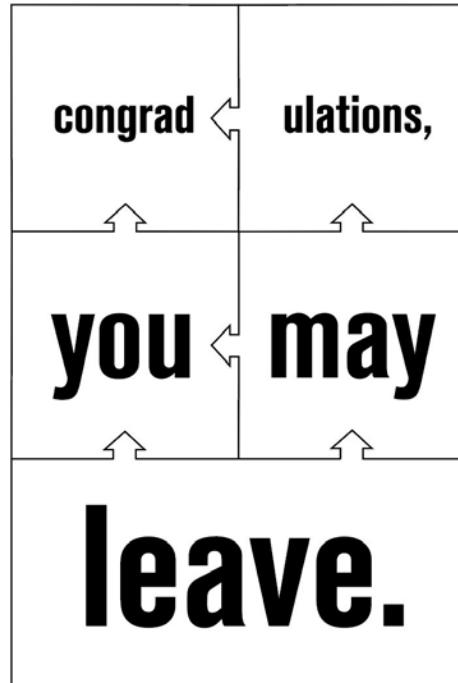
Last but not least



The 3rd puzzle

In every stall there is a puzzle piece.
Once they have all escaped their stall
they need to assemble it.

First Design

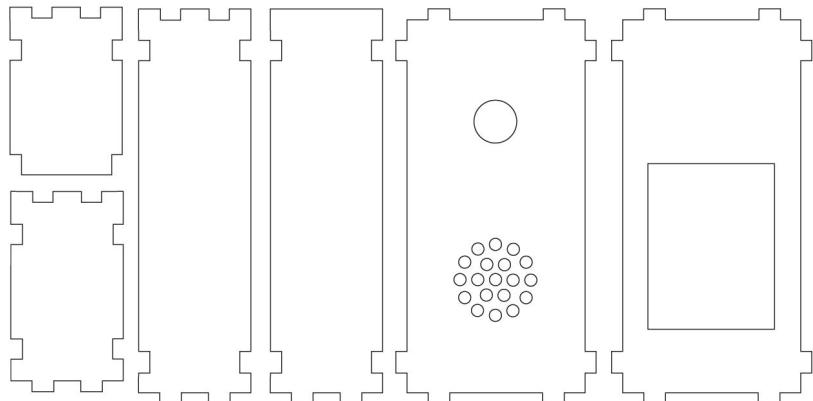


Second Design

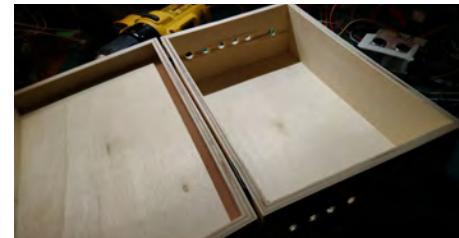
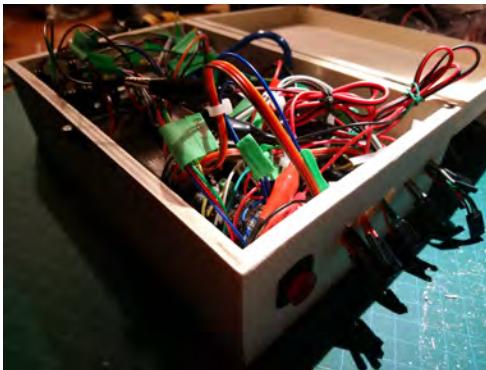
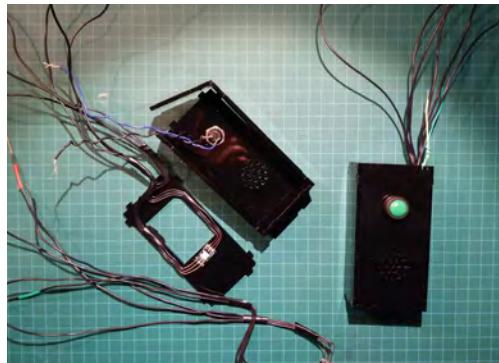
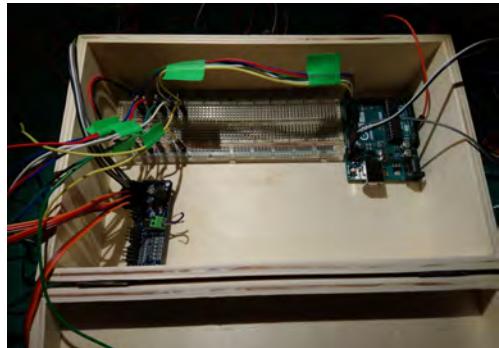


Light, Button & Lock

This is the light, button and lock box. It is made of acrylic and was lazer cut.



Main Electronic Box



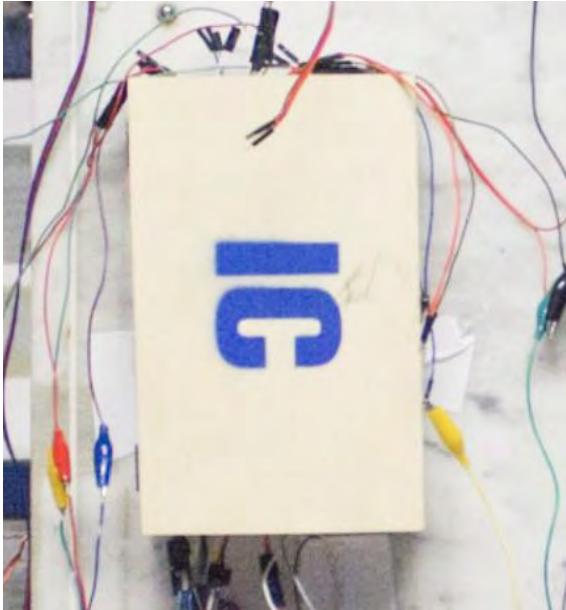
Heat Sensor Holder

We attached the heat sensor to a piece of foamcore to stabilize it.



Branding

We spray painted the main electronic box, lab coat and made a letterhead to further emphasize the plot.



Imagination Corporation LTD Saturday April 6, 2019
100 Yonge St, Suite 2500
Toronto, ON, Canada M5R 1L4

IC

Dear OCAD University Students,

We here at Imagination Corp (IC) welcome you to the new required research study at OCAD University!

Thanks to a recent initiative from the Province of Ontario to encourage private sponsorship in public universities, IC has made a generous donation to OCADU, and are pleased to announce OCADU will now be a host partner for IC pop-up research labs. IC labs offer cutting edge advancements to human data mining and sales.

Going forward, students like you will have the opportunity to acquire life, team and leadership skills, while also being part of something larger, and paying forward to the OCADU community.

Students will be observed within an interactive site-based scenario, and studied on their ability to work collaboratively through solving puzzles that reward them with their freedom from the test. Don't be surprised if you find yourself lucky enough to step into one of these innovative and immersive experiences!

The IC vision maximizes the full potential of each student, recognizing them as an unapplied income stream for B2B research data sales. Profits generated will ensure that universities can continue to increase their capital holdings, expand business groups, and create more management positions without sacrificing executive salaries. The data will be bought and used by corporate and public education institutions to better understand best practices when it comes to return on investment in students, and the next generation of the creative workforce, "From the cradle to the desk".

Thanks to the mandatory help from students like you, the cutting edge research that we generate together from these tests will revolutionize how Canadian educational institutions approach their funding and business models.

IC is putting the fun in FUNding! Student's voices matter!

We listened to feedback and understand that students want a "gamified" and immersive experience. In response to this need, our labs are now designed with user experience in mind, and modeled after escape rooms.

We here at IC are looking forward to our partnership, as together, we bridge the gap between students as passive participants in the system, to every student being a possible research income stream and really mattering!

Final Work

The following link is to the unwired live action escape room.

<https://www.youtube.com/watch?v=JILhWDKeTeo>

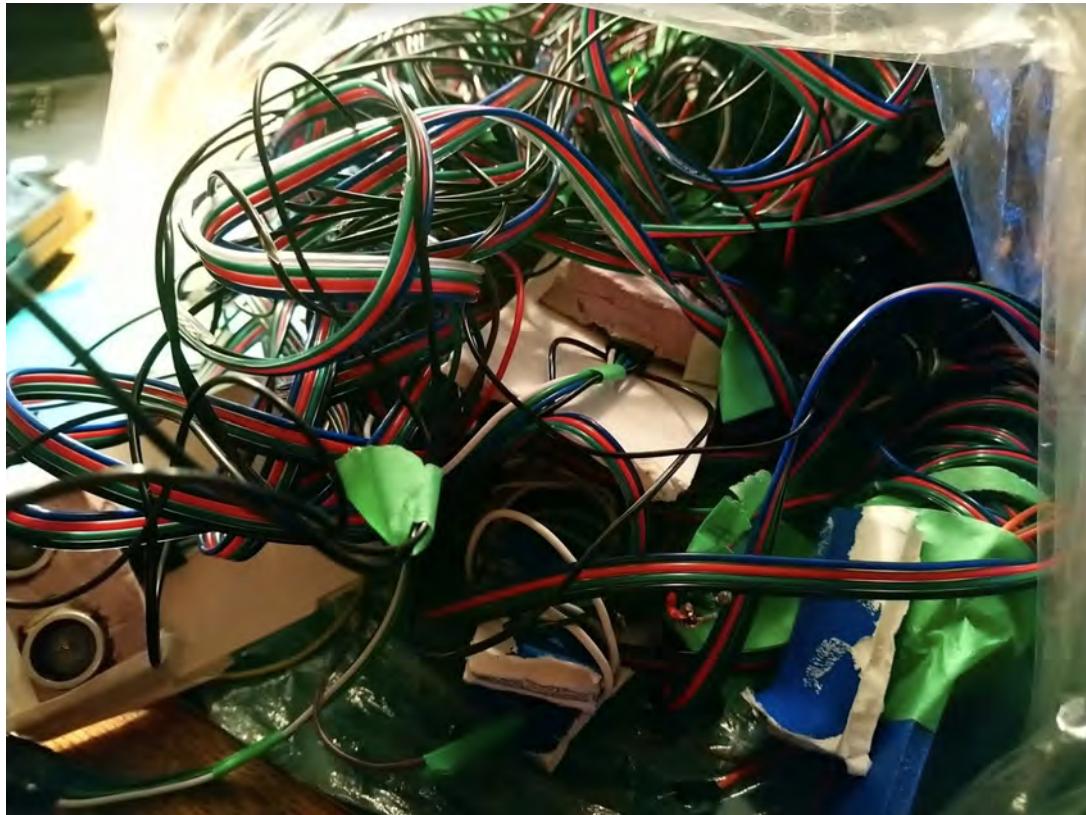
Welcome to the bathroom Break(out)



Break(out) of the bathroom invaded by wires



Break(out) of the bathroom invaded by wires



Cute!



Rustic for Robots



Leanna Barwick
January-21-2019
Light & Material Exploration
Physical Computing 2002-001

Rustic for Robots is a mobile electronic simulated campfire that functions as a home decor and ambient lighting piece.

Do androids dream of electric campfires? **Rustic for Robots** offers "steampunk" aesthetic applied to fire, in a handmade scaled down portable LED lamp unit. The piece appeals to the nostalgia of simpler times past, and presents a minimalist and naturalistic ambience which is generated from the warm glow of a wood burning fire, and complemented by the "no bells no whistles" functionality of vintage electronic hardware. The device is both battery and USB powered, accented with a retro knife switch, that allows it to be powered on and off without interacting with the technical aspects, and offers the physical gratification of flipping the switch. The lamp shade is composed of individually carved birch and maple stylized wood logs, that have been charred to visually recreate the nuances of fire burning, and assembled piece by piece to build a "teepee" style campfire. The shade can be removed to access the light bulbs if they need to be changed, and is situated on top of a box-like base, which portrays a ground-like appearance and is enclosed by a birch bark veneer. This base serves as a chassis that houses and hides the technical components, and can also be opened to easily access the electrical parts if necessary. The campfire lamp offers two different modes for the flame movement, tame and roaring, which can be changed by connecting the lamp via its USB input to the computer interface.

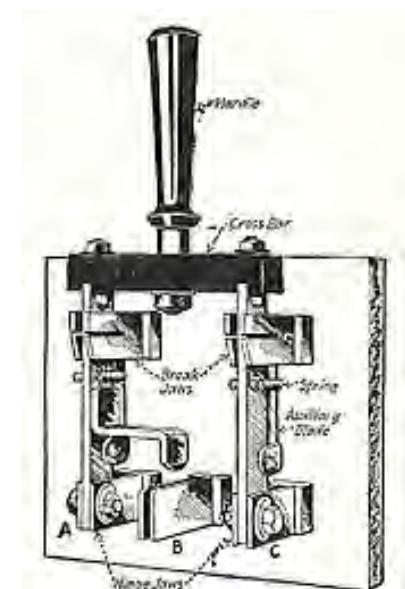


FIG. 117.—A field discharge switch. (A and C connect to field-winding terminals and B connects to one end of the field discharge resistance.)

Materials & Parts

Electronics

Arduino Uno Rev3
Half size breadboard
Jumper wire (m-m) x 10
Jumper wire (m-f) x 12
220K - 1/4W 5% resistor x 6
9v battery snap and jack
9v battery
LED red 10mm
LED yellow 10mm
LED orange 10mm
LED Red 3mm
LED yellow 3mm
LED orange 3mm
Knife switch (double pole)

Materials

Birch wood
Birch bark
Maple wood
River stones
Wax paper
XPS (Extruded polystyrene) Rigid Foam Board Insulation Sheathing 1"
XPS (Extruded polystyrene) Rigid Foam Board Insulation Sheathing 1/2"
Foamcore board 1/4"
Model landscaping scenery - coarse ballast black
Model landscaping scenery - coarse ballast dirt and soil
Model landscaping scenery - fine turf dark green
Model landscaping scenery - fine turf black
Wood glue
White glue

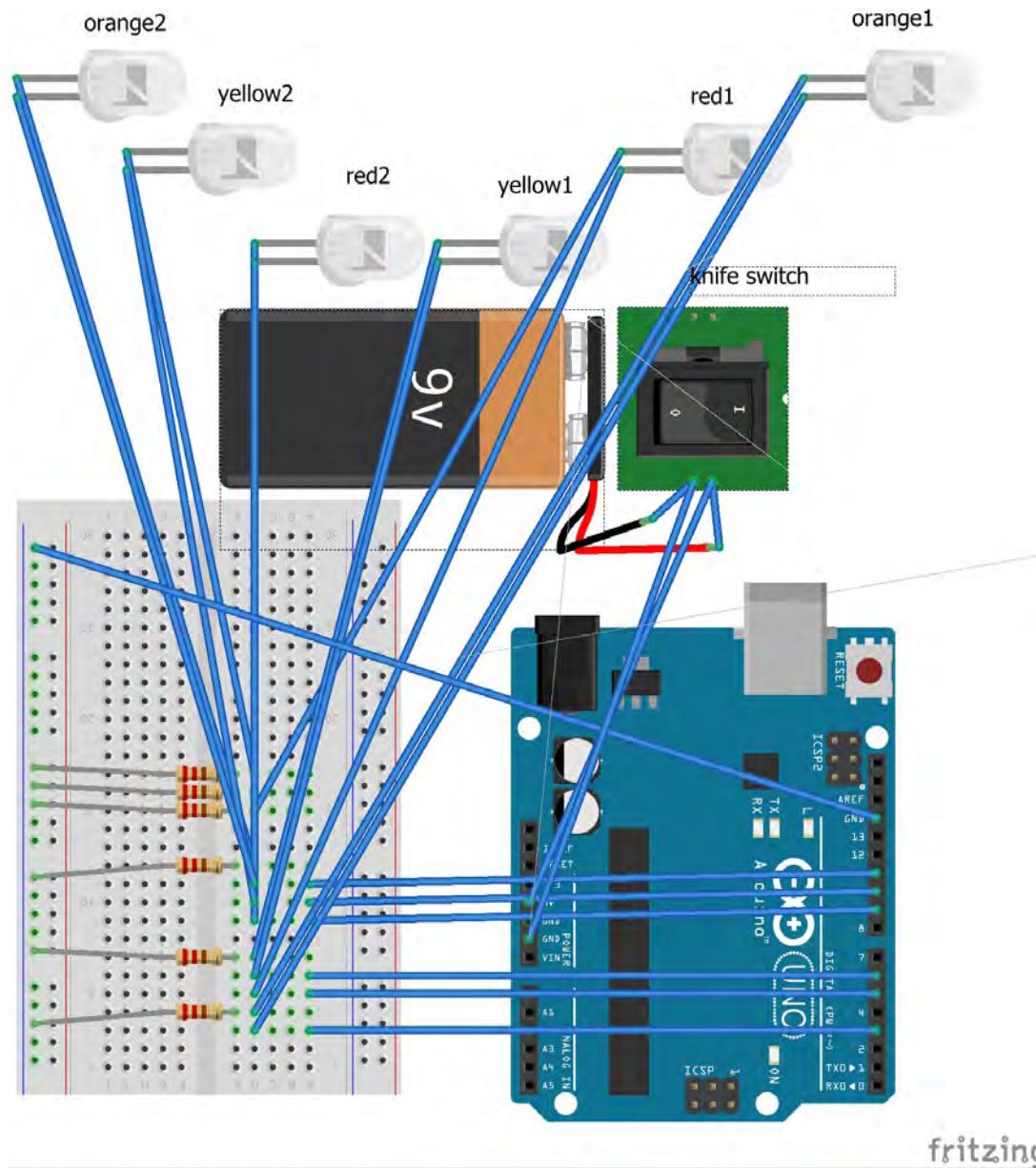


How the Rustic for Robots campfire lamp works:

The piece uses an Arduino Uno Rev3 microcontroller. It connects 6 LEDs to the PWM (Pulse Width Modulation) pins (3, 5, 6, 9, 10, 11) on the arduino. This is done to achieve the flickering effect to better replicate the movement of fire, because those pins are analogue outputs and can achieve a variance of dimness which the digital pins, because of their "off or on" usability, cannot. The arduino is running a code which uses the random function, for the fading and the delay. There are two different coding loops (tame and roaring), one loop can be selected to run by commenting out the other loop. The LEDs used were chosen to replicate the warmth of fire, with the red LEDs closer to the bottom, orange LEDs more in the middle, and yellow LEDs closer to the top, much like fire visually appears to the eye. Blue lights were experimented with but chosen to be excluded because the blue color dominated more than how it is perceived when looking at real fire. The LEDs are a mix in size and diffusion to offer more variance true to how fire moves and projects. The power is connected to an externally accessible switch, so that can be controlled by physically flipping the switch, without the need to open up the light base. The choice of wax paper was added to the shade as an inexpensive and affective way to soften/diffuse the light and also add depth to the light, and minimize the flashing "christmas light" look.



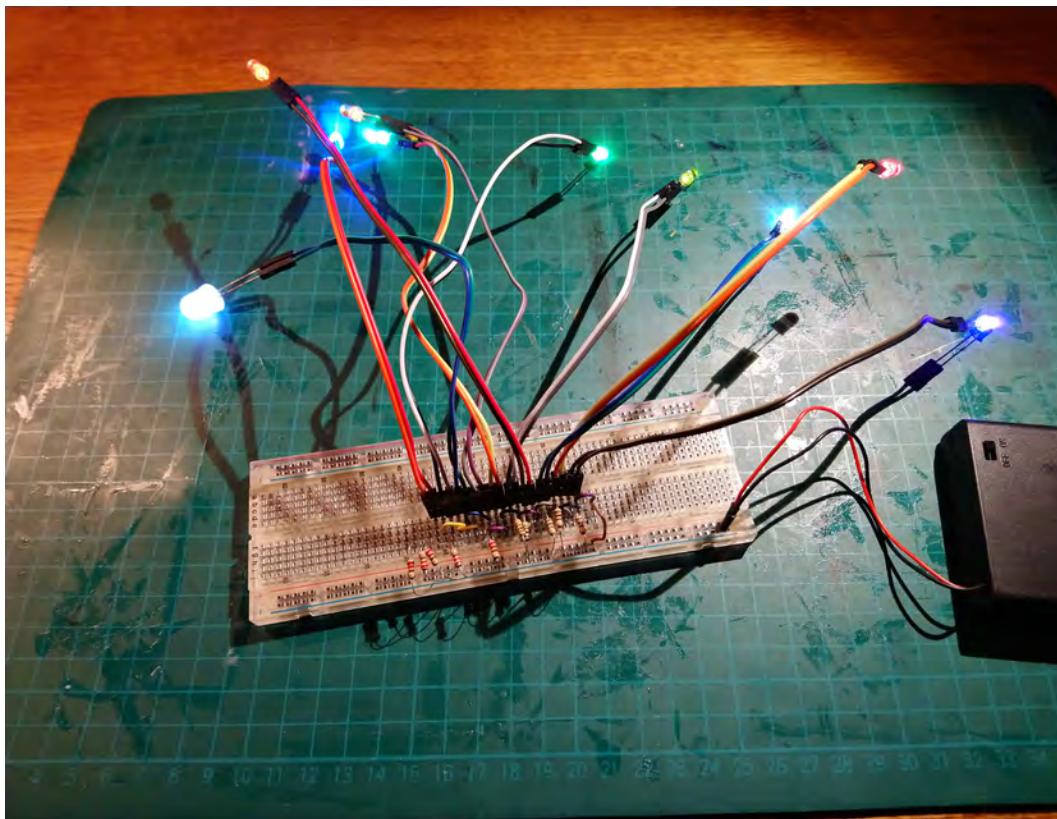
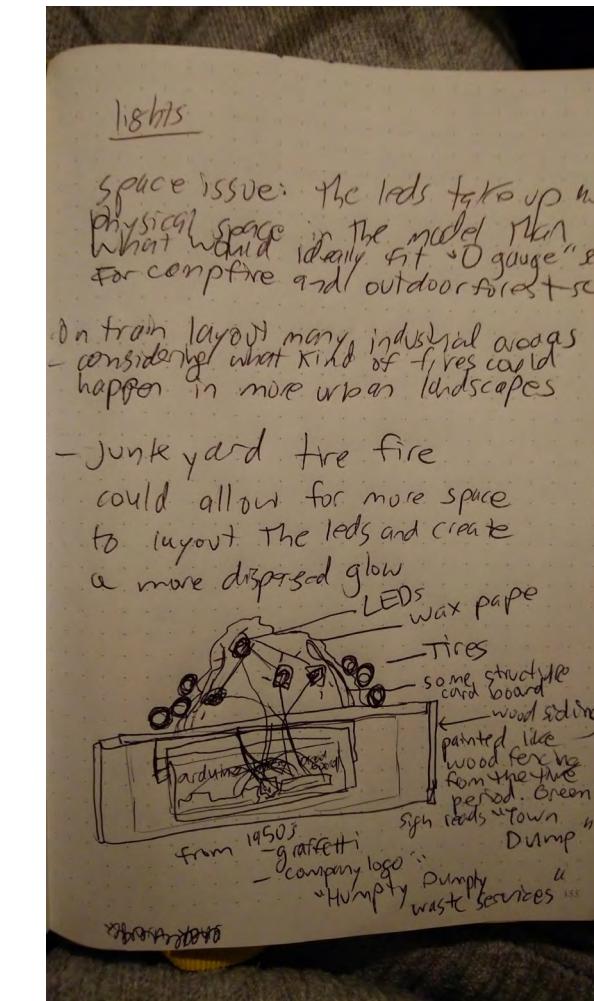
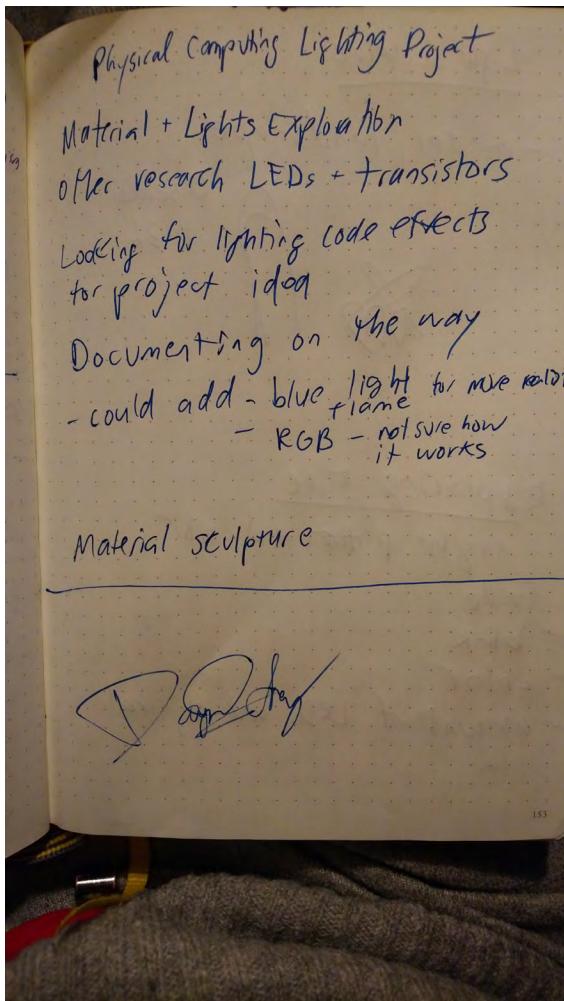
Circuit Diagram



Code

<https://gist.github.com/Leanna-B/c5d4ed273af4375a0931eee772f486d9>

Planning Process



LED (Light) Exploration

Color, Wavelength

Red, 625

Orange, 604

Yellow, 590

Blue, 467

Cyan, 505

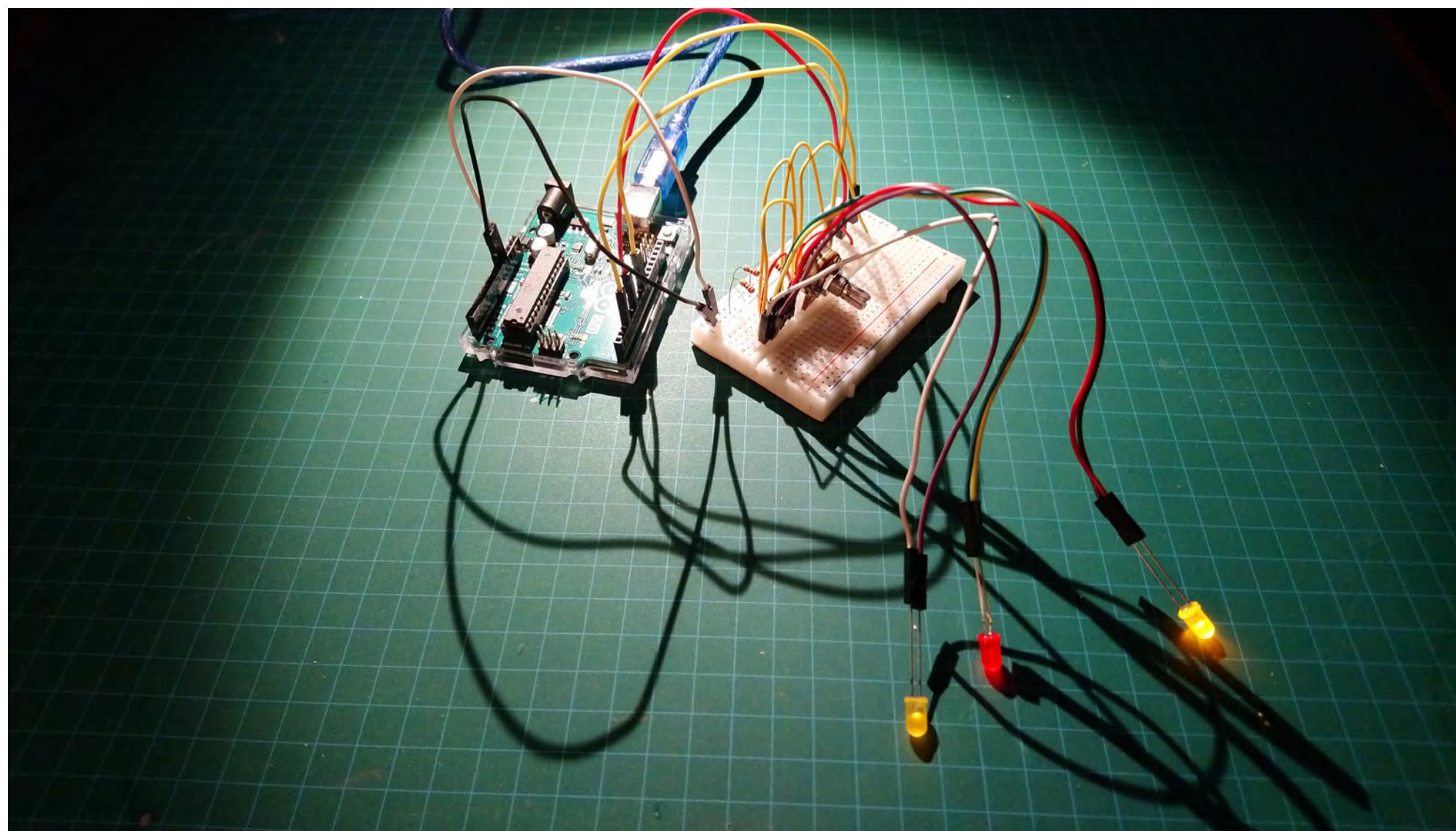
Green, 520

Purplish, mixed

White, mixed

Big blue, 470

Connecting the LEDs to the Arduino via a breadboard, attaching a potentiometer to have a physical control, and running the Arduino "fade" example sketch.





Video link to Final Work:

<https://drive.google.com/file/d/1245pSzkbQ611S1WoRMfEu1-N0v-JP4iVT/view?usp=sharing>

Video link to Test with Blue LED:

https://drive.google.com/file/d/1re5AAIqo1L3K9tjUc2qNCDfR-jIfC_BC4/view?usp=sharing

Thank you for your consideration,

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416-841-6172