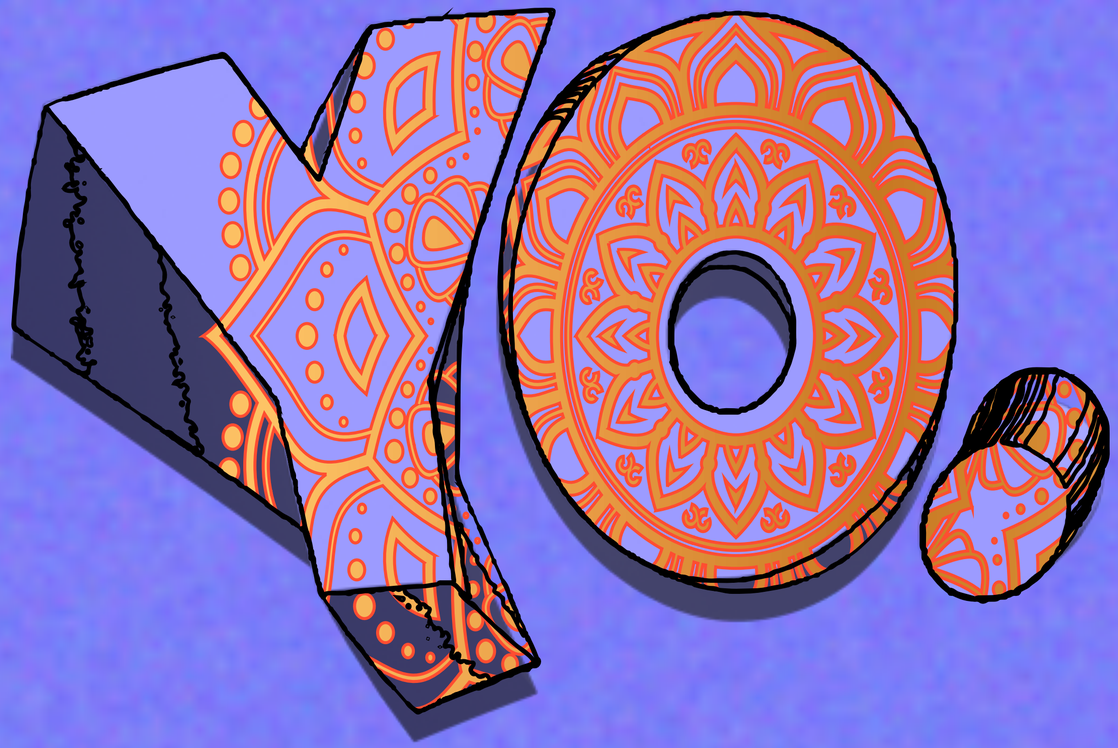


I'M AN INDUSTRIAL DESIGNER, INTERACTIVE EXPERIENCE DESIGNER, CREATIVE CODER, ARTIST, CREATIVE TECHNOLOGIST,

CURRICULUM VITAE

WORK EXPERIENCE

Elves
Mechanical Design Lead
March 2022- August 2022

Remedy
Industrial Design Lead
June 2021 - May 2022

USC Center For Advanced Manufacturing
Manufacturing/Fabrication Intern
May 2021 - August 2021

USC Iovine and Young Academy
Makerspace/Design Technician
November 2020 - May 2021

EDUCATION

University of California, Berkeley
Master of Design
December 2024

University of Southern California
B.S. Mechanical Engineering - Design Emphasis
Minor in Theater
Magna Cum Laude
May 2022

TABLE SAFARI

Table Safari is a early-childhood development toy that bridges 2D perspectives with 3D space. Table Safari improves spatial visualization skills by highlighting the visual-spatial correlation between 3-dimensional building blocks and 2-dimensional views.

Table Safari encourages children who are disproportionately underdeveloped in spatial skills to develop such skills early, encouraging them to retain interest in related STEAM fields in the future.

Roles: Ideation, Sketching, Prototyping, User Exploration, Form Exploration, Digital Game Design and Development, CMF Considerations

Team Members: Ashwan Kadam, Shikha Shah, Shirley Zhang, Yani Mai, Susie Jin

USER RESEARCH

"I wish there was a more enjoyable way to engage my children's developing abstract cognitive skills."
– Nancy (Mother)

"I like building stuff (toy/game like Star Wars Lego)"
– Sasha (7-Year-Old)

"I don't worry that much about their social and motor (physical) skills."
– Aly (Mother)

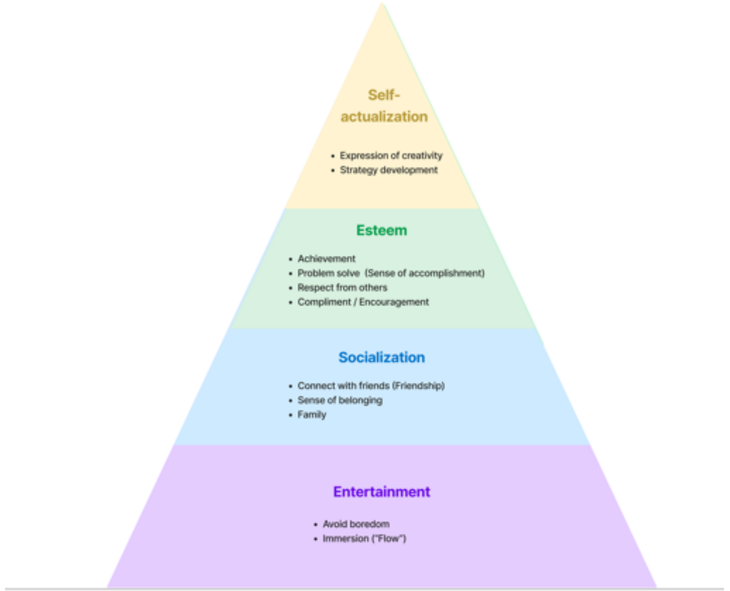
"I feel stressed when the game is too challenging… I like this one because I could solve it (with fun)"
– Orin (7-Year-Old)

Takeaways from observations

- Enjoy the sense of achievement
- Positive feedback could serve as encouragement
- Excessive constraints results in lost interest

Takeaways from interviews

- Children like games that require imagination and creativity.
- Parents tend to focus on cognitive development from the toys/games.



IDEATION

IDEA 1 〉

Block-E allows children to use their imagination to build complex structures to support spatial awareness development and hand-eye coordination training

IDEA 2 〉

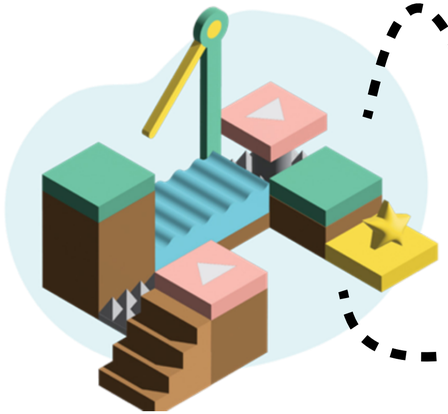
Chowy aims to create an engaging dining experience for children and encourage healthy diets through gameification

IDEA 3 〉

EcoWave provides an interactive experience for children to understand abstract concepts like sustainability

REFINEMENT

After leaning into Block-E, we realized we had two potential paths to follow. Through further discussion with parents, we realized there was a greater interest in IDEA #2 given how such a skill is necessary in STEM roles and can be a form of cognitive development otherwise not readily offered.



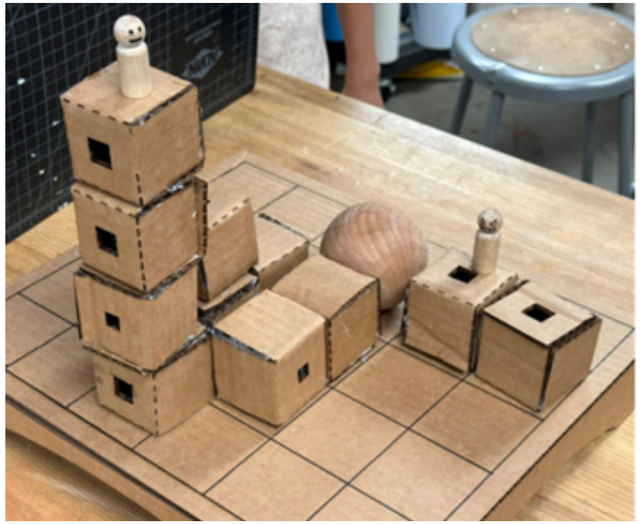
#1
Children place the physical blocks strategically on the game board to save animals in different locations and enjoy the digital gameplay.

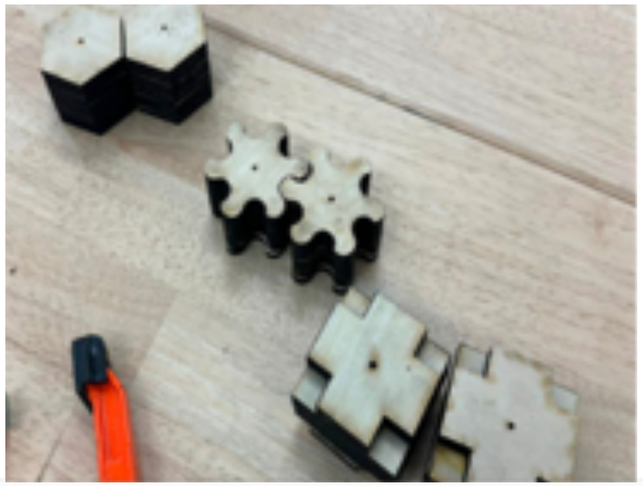
#2
With instructional 2D views, children place the physical blocks strategically on the game board to transform 2D flat images to 3D animal.

Problem
How might we improve Spatial Visualization in young, marginalized children (ages 5–7) through Game-Based-Learning?

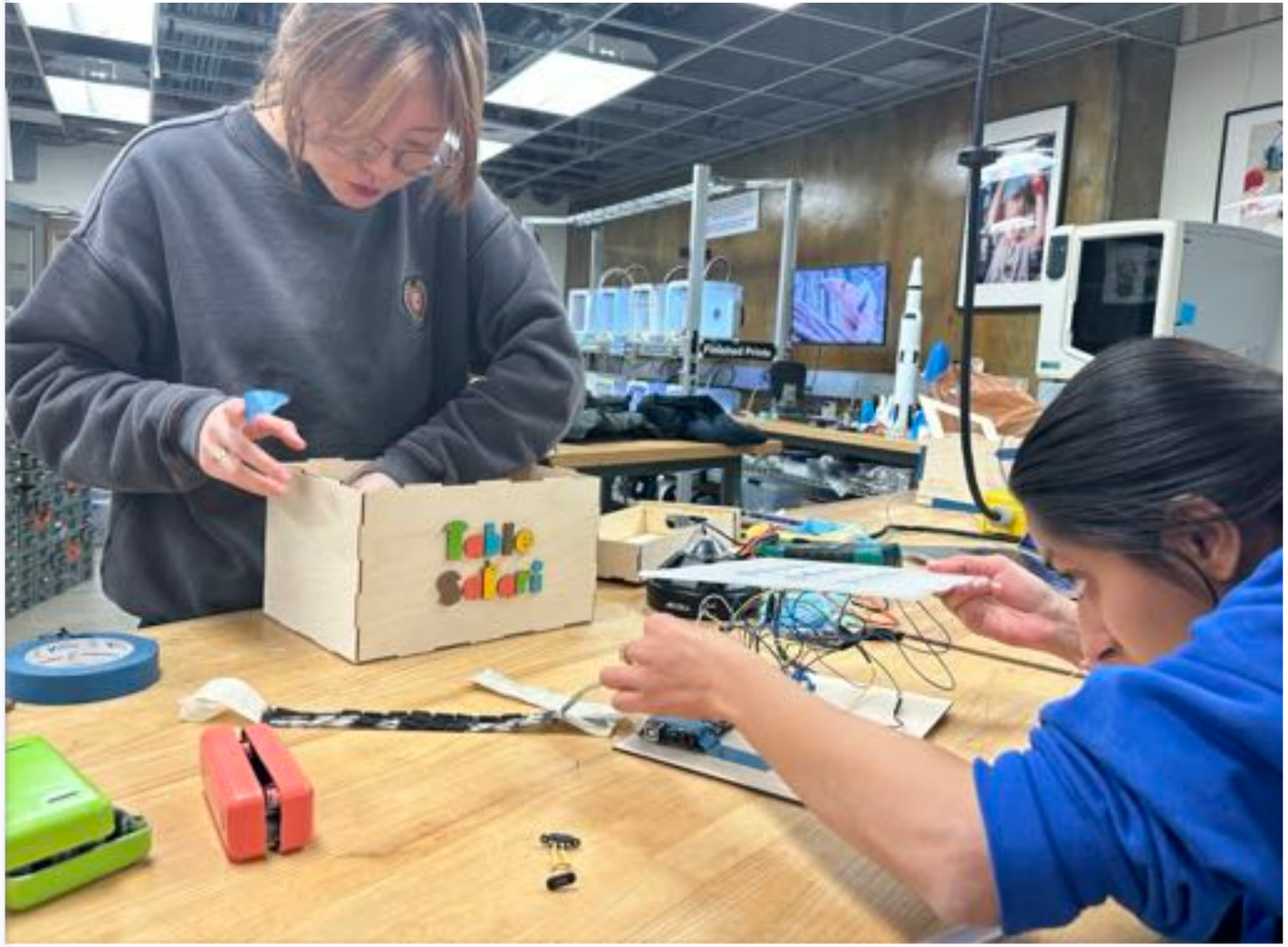
Solution
A gamified experience that encourages children reconstruct 3D animal models with a set of building blocks, following 2D instructional views

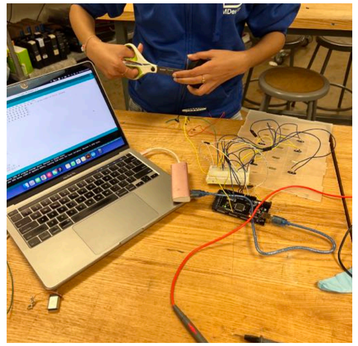
FORM, COLOR, AND MATERIAL PROTOTYPING

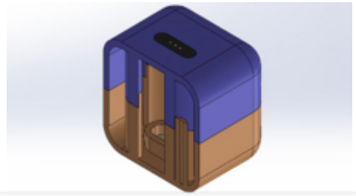


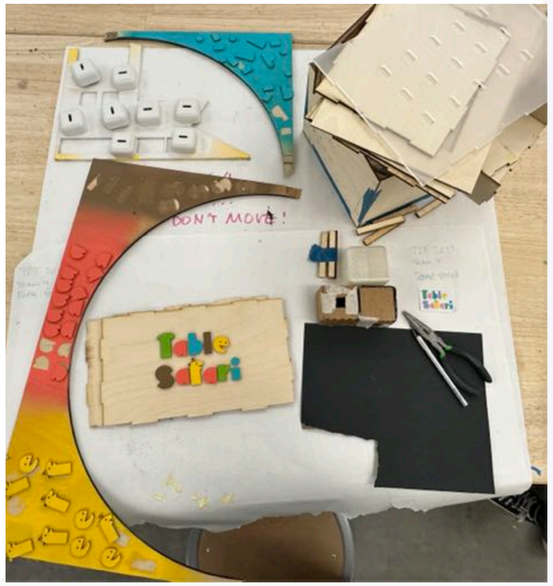


FABRICATION AND ELECTRONICS



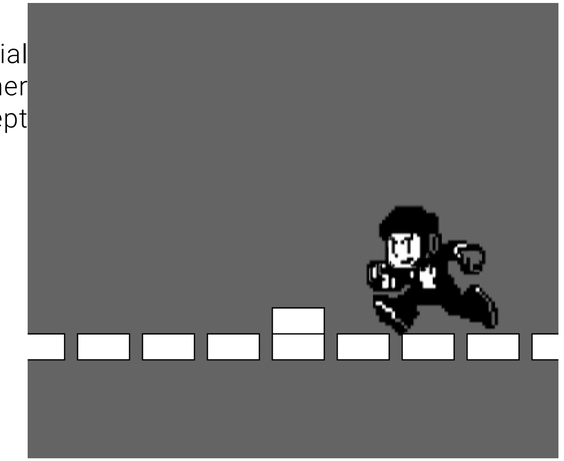




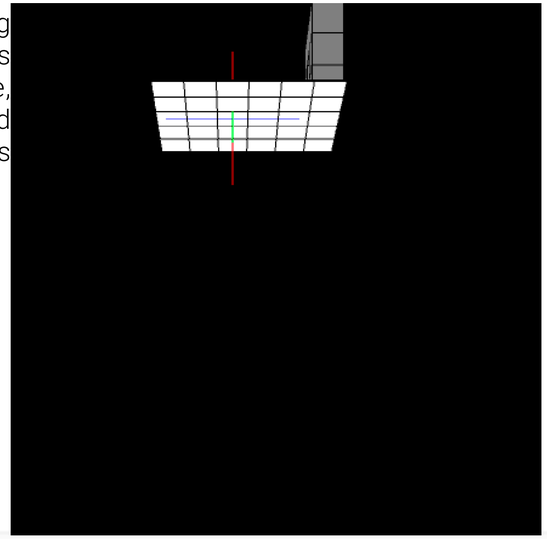


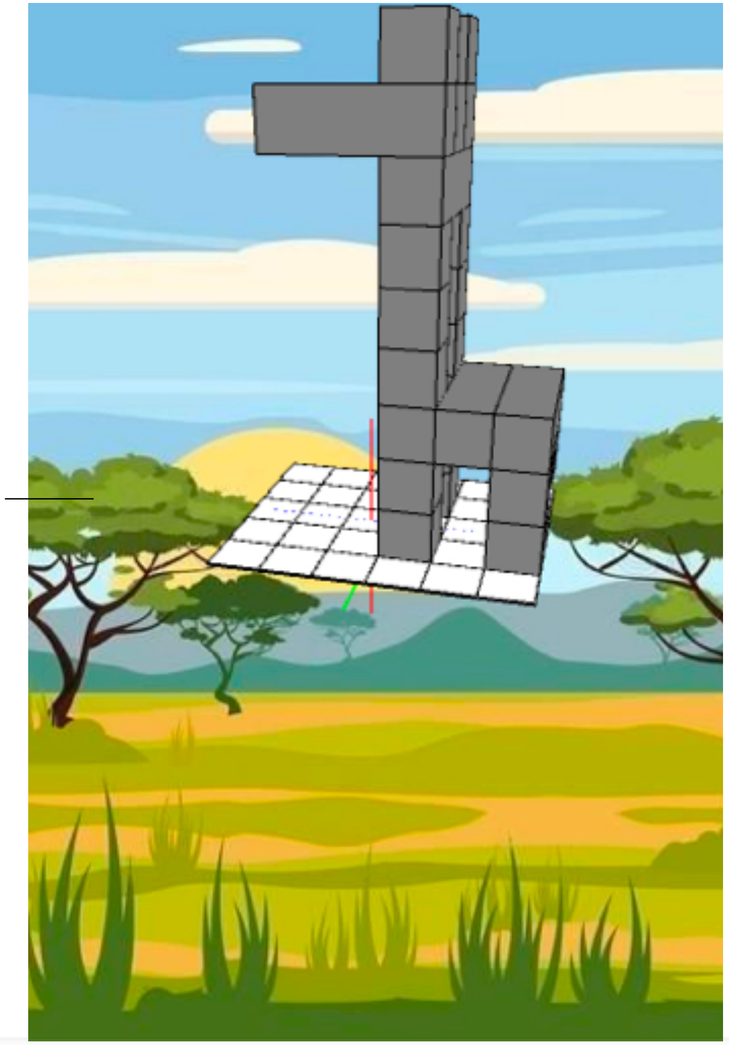
DIGITAL GAME DESIGN

Initial Platformer Concept



Establishing Dimensions Space, Graphics, and Aesthetics



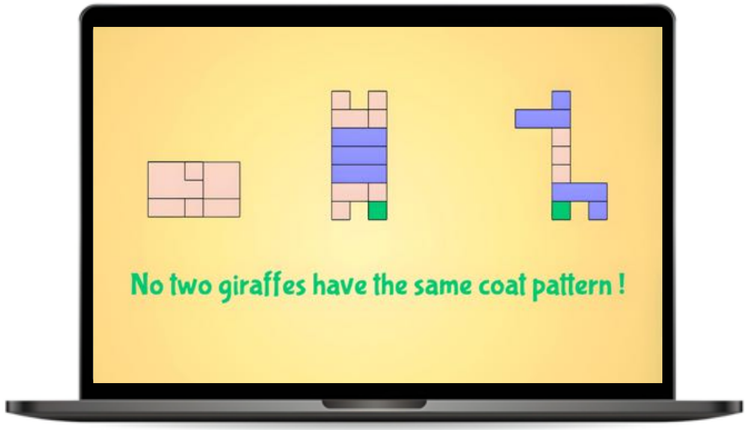


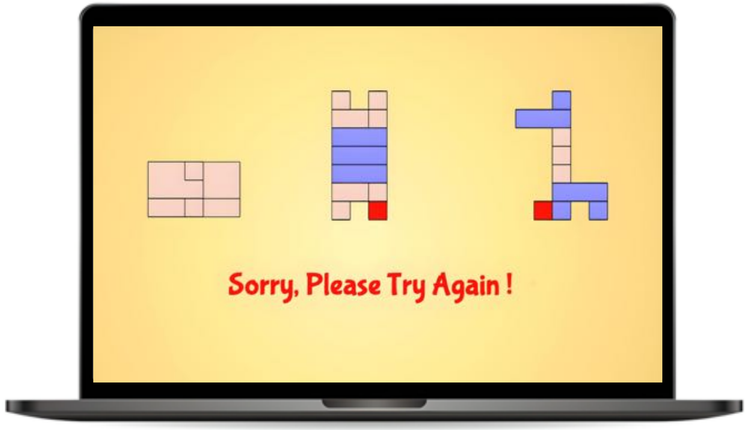
```
void top() {
  camera(0, -1200, 1, 0, 0, 0, 0, 1, 0
  translate(-425, -1, -112.5);
  giraffe();
}

void side() {

  c1= color(150, 150, 253);

  c2= color(245, 213, 203);

  camera(0, 0, 400, 0, 0, 0, 0, 1, 0);
  translate(425, 0, 0);
  giraffe();
}

void iso() {
  camera(200.0, -300, 400.0, 0, 0, 0.0
    0.0, 1.0, 0.0);
  translate(0, 350, 0);
  giraffe();
}

void getSerialData() {
  while (myPort.available() > 0) {
   String myString = myPort.readString
    if (myString != null) {
      String[] serialInArray = split(
      println(serialInArray);
      if (serialInArray.length == NUM_
        blockType = int(serialInArray[
        gridNum = int(serialInArray[1]
        blockFunction = int(serialInAr
        stackNum = int(serialInArray[3
      }
   if(blockFunction==0){
```

The digital game development process was carried out through Arduino and Processing. Arduino was utilized to detect the physical sensing data, which was then sent over to control the graphics developed in Processing.

```
#include <Adafruit_NeoPixel.h>
#ifdef __AVR__
 #include <avr/power.h> // Required for 16 MHz Adafruit Trinket
#endif
// Which pin on the Arduino is connected to the NeoPixels?
#define PIN        6 // On Trinket or Gemma, suggest changing this to

// How many NeoPixels are attached to the Arduino?
#define NUMPIXELS 24 // Popular NeoPixel ring size

// When setting up the NeoPixel library, we tell it how many pixels,
// and which pin to use to send signals. Note that for older NeoPixel
// strips you might need to change the third parameter -- see the
// strandtest example for more information on possible values.
Adafruit_NeoPixel pixels(NUMPIXELS, PIN, NEO_GRB + NEO_KHZ800);
Adafruit_NeoPixel strip = Adafruit_NeoPixel(60, PIN, NEO_GRB + NEO_KH


int analogPin[15] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
int updatedPins[15] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
float R3[15] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
float R2[15] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
float R4[15] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
int row[15] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
int Vin = 5;
float Vout = 0;
float R1 = 39000;
//float R2 = 0;
float buffer = 0;
//float R3 = 0;
//float R4 = 0;
int block = 0;
int q;
int r;
int p=0;
int i = 0;
int j = 0;
int blockfunction = 0; //0 == correct block placed, 1 == wrong block
int blockGrid[15][7];
int giraffeMatrix[15][7];
int match = 0;
void setup(){

  for (i=0;i<15;i++){
    for (j=0;j<7;j++){
      blockGrid[i][j] = 0;
      giraffeMatrix[i][j] = 0;
    }
  }
  giraffeMatrix[12][0] = 3;
  giraffeMatrix[12][1] = 1;
  giraffeMatrix[12][2] = 2;
  giraffeMatrix[12][3] = 2;
  giraffeMatrix[12][4] = 2;
```

FINAL PROTOTYPE



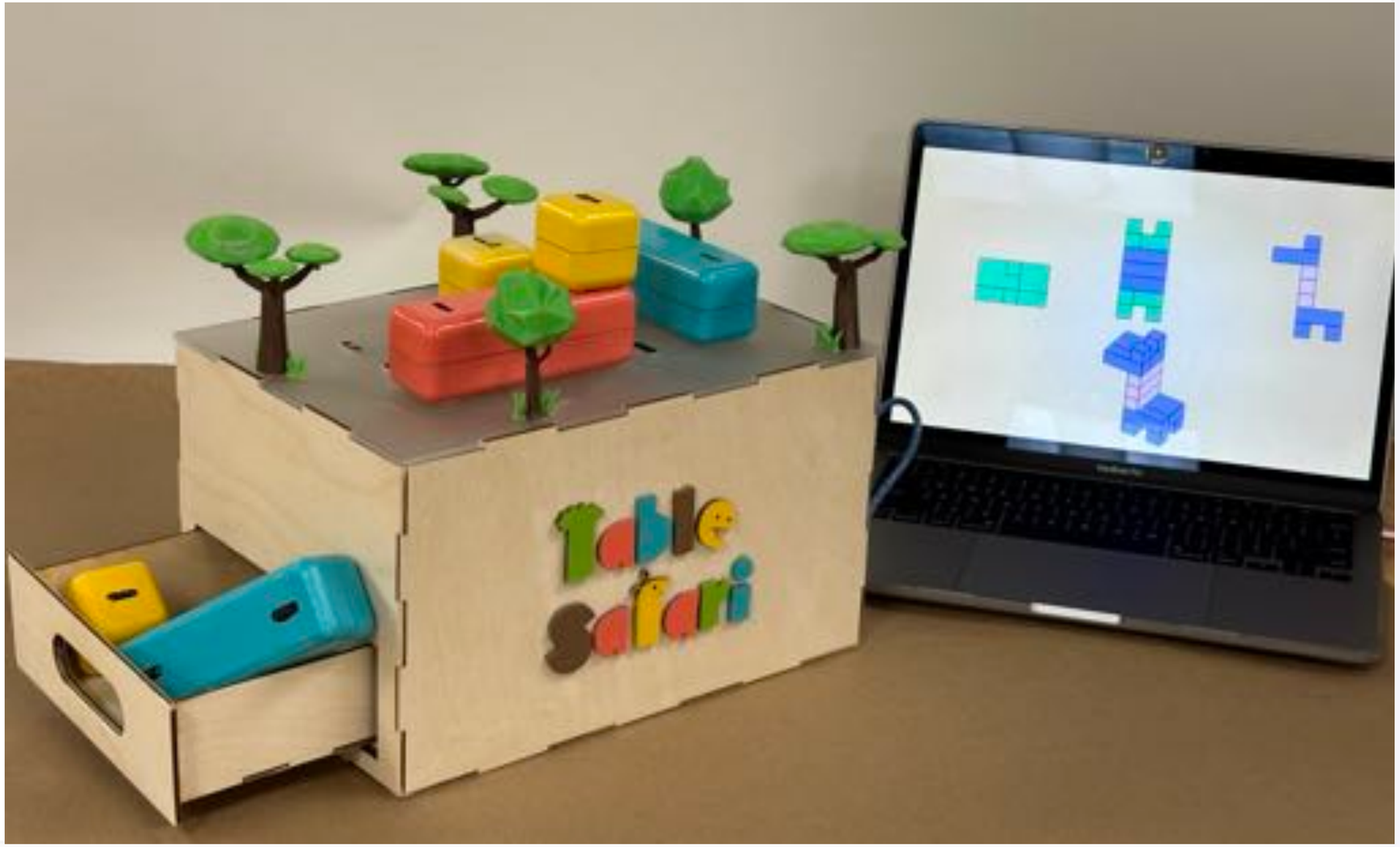


FUTURE WORK

In a future iteration, we would further develop the digital gameplay by adapting it into an iOS application.

In June 2023, Table Safari was selected as an Honorable Mention in the Student Category for San Francisco Design Week. You can view our recipient page below: https://sfdesignweek.org/awards/table-safari/

We believe that the full launch of this product will result in a greater retention rate of young students in STEM-oriented fields, particularly for marginalized groups, such as BIPOC and female-identifying students, who are more likely to leave STEM because they are disproportionately impacted by a lack of spatial visualization education.



INTER(FACE)

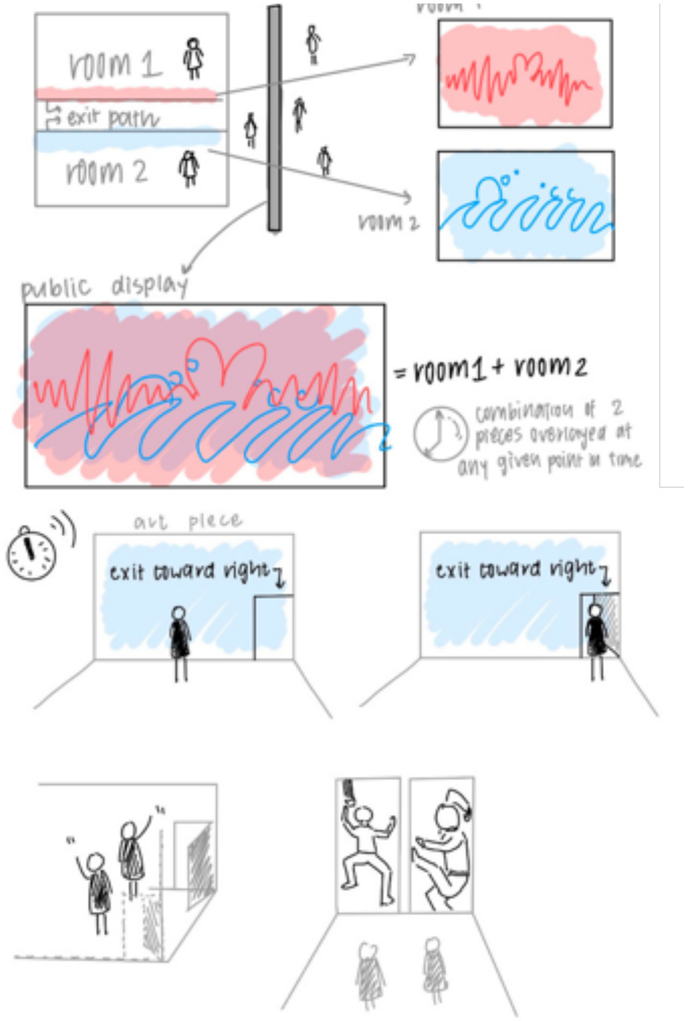
Inter(Face) is intended to be a ludic approach to thinking through our relationships with devices, networks, and each other. Based on the writings of New Media thinkers Alexander Galloway and Wendy Hui Kyong Chun, (Inter)Face highlights our partial perspectives in network technologies, the work of translation that we do with our machines to become legible in those networks, and the vulnerable position we all put ourselves in by being part of network protocols.
Inter(Face) launched as an installation on December 7th, 2022 to a select audience.

Roles: Ideation, Digital and Physical Aesthetic Exploration, Visual Language Development, Creative Coding, Hardware Design, Fabrication, Form Exploration, User Interaction, Spatial Design, CMF Development, Narrative Development

Team Members: Ashwan Kadam,

USER EXPERIENCE

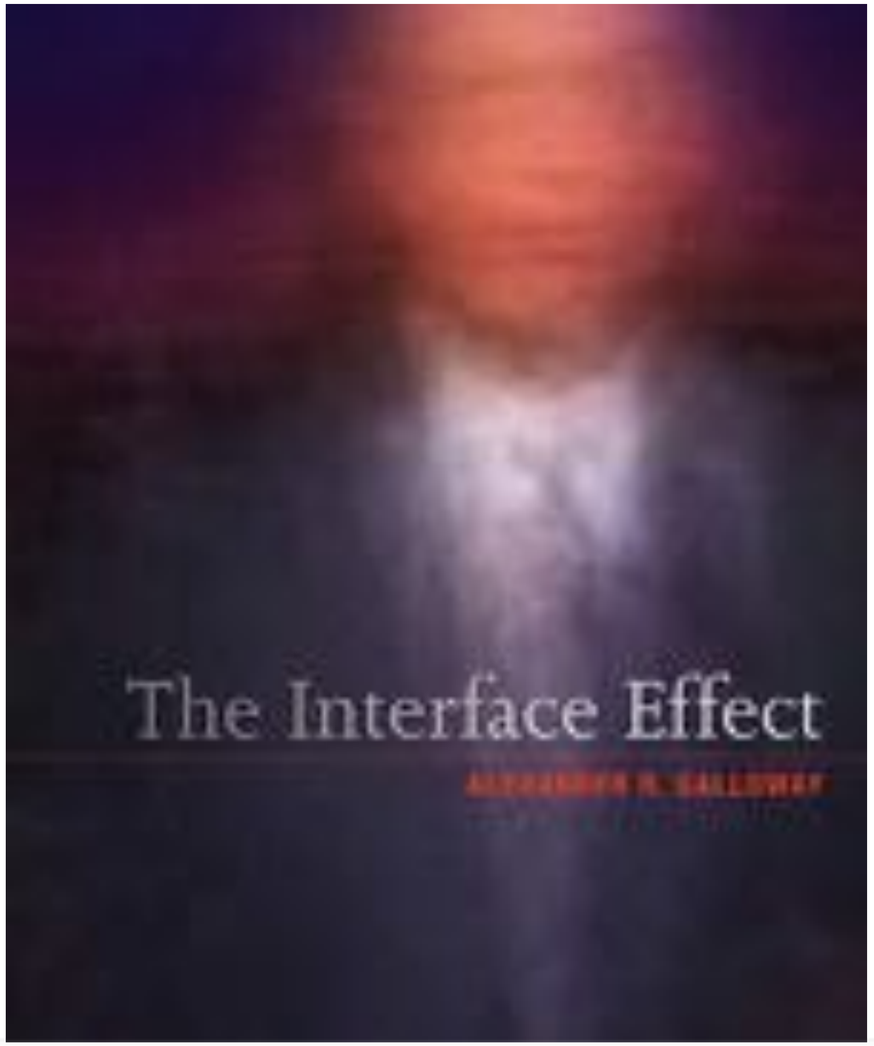
Inter(Face) is two black-box booths designed for playful experimentation through object interaction. Users create images by contorting their bodies to engage with unconventional inputs. Afterwards, users view snapshots from each booth. Upon leaving the booths, users see a projection of their collaborative artwork in a public gallery. Users can only discern their individual contributions.

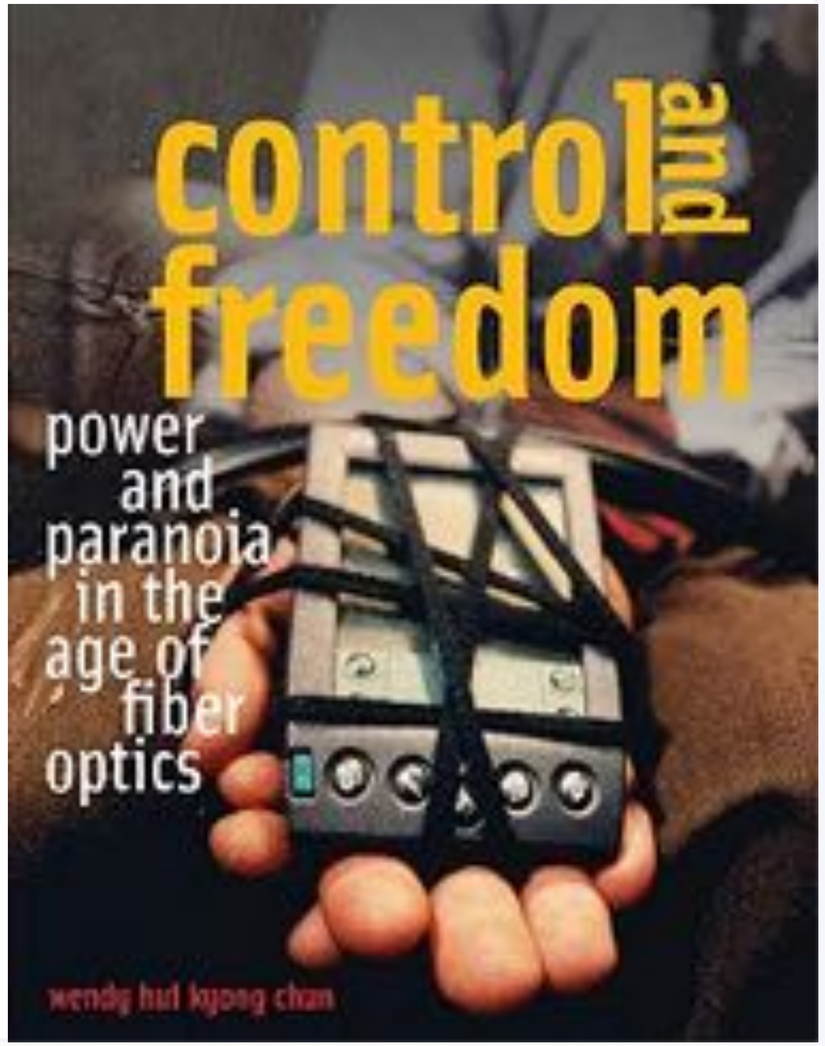


BACKGROUND

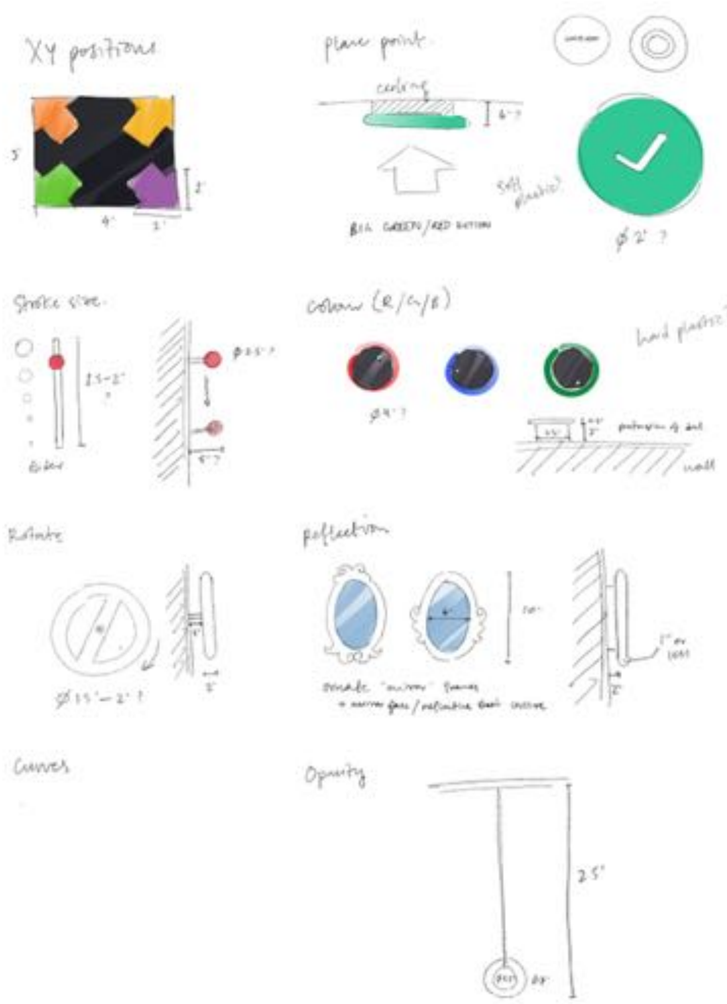
This project focuses Alexander Galloway's "Interface Effect" and Wndy Hui Kyon Chun's exploration of how the two-way vulnerability of digital networks can act as a form of social and political connection

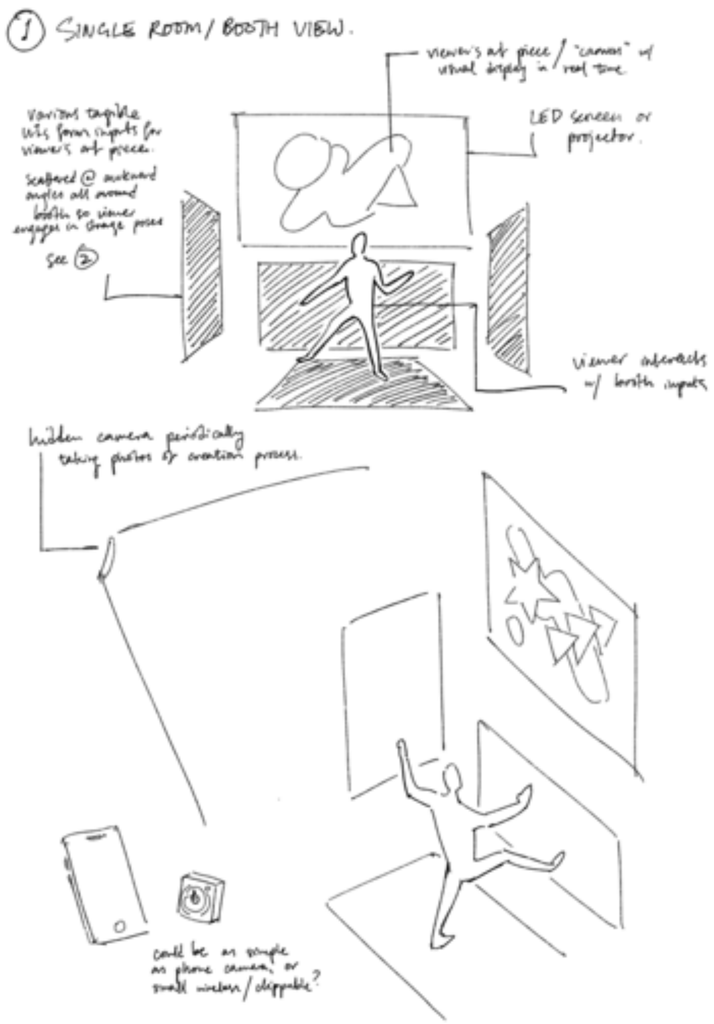
Aesthetic experiences offer unique ways to engage with networks, and this project aims to provide an aesthetic that helps users explore Galloway's Interface Effect and Chun's "wonderful creepiness," fostering empathetic vulnerability.

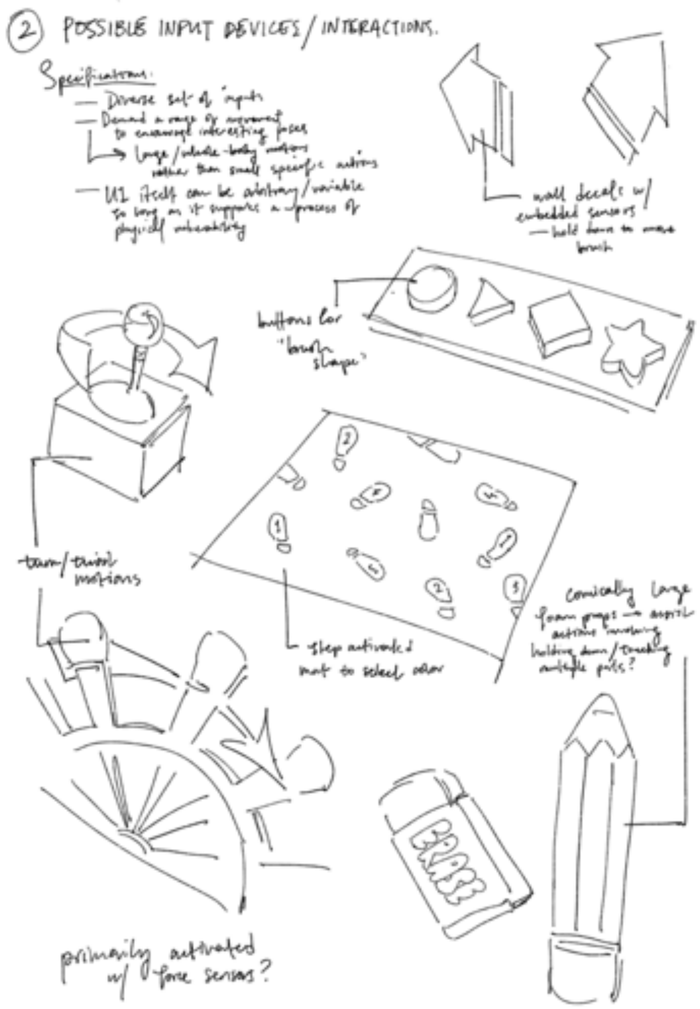




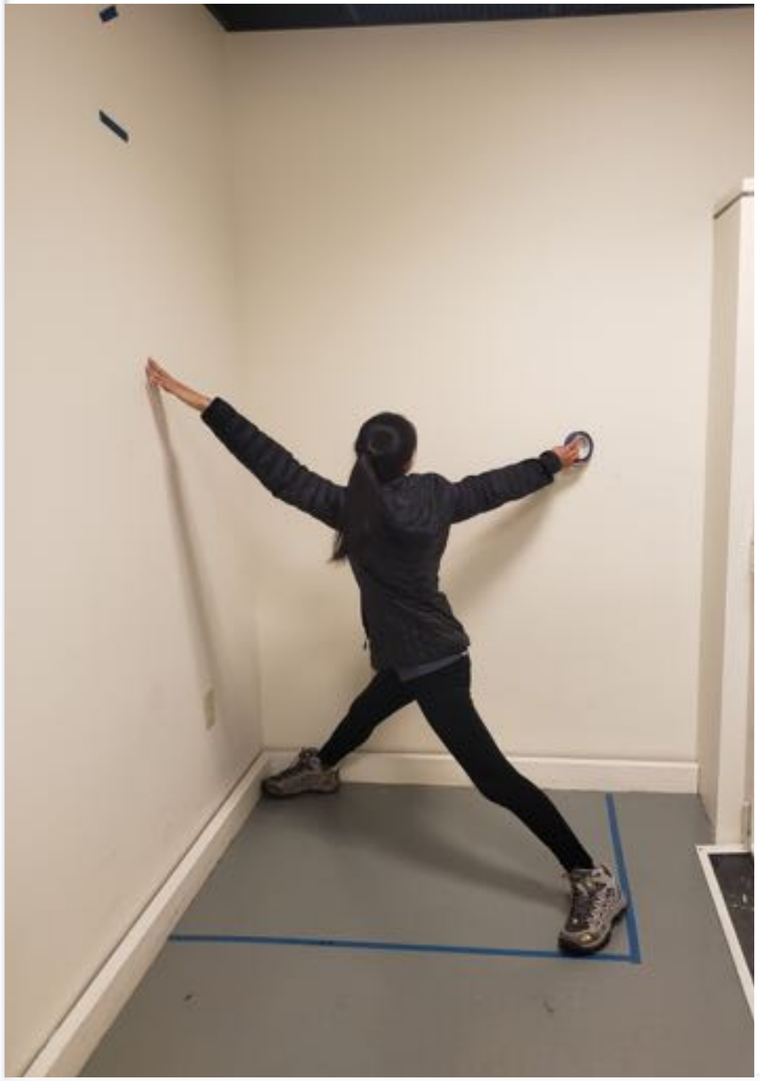
CONCEPT SKETCHES

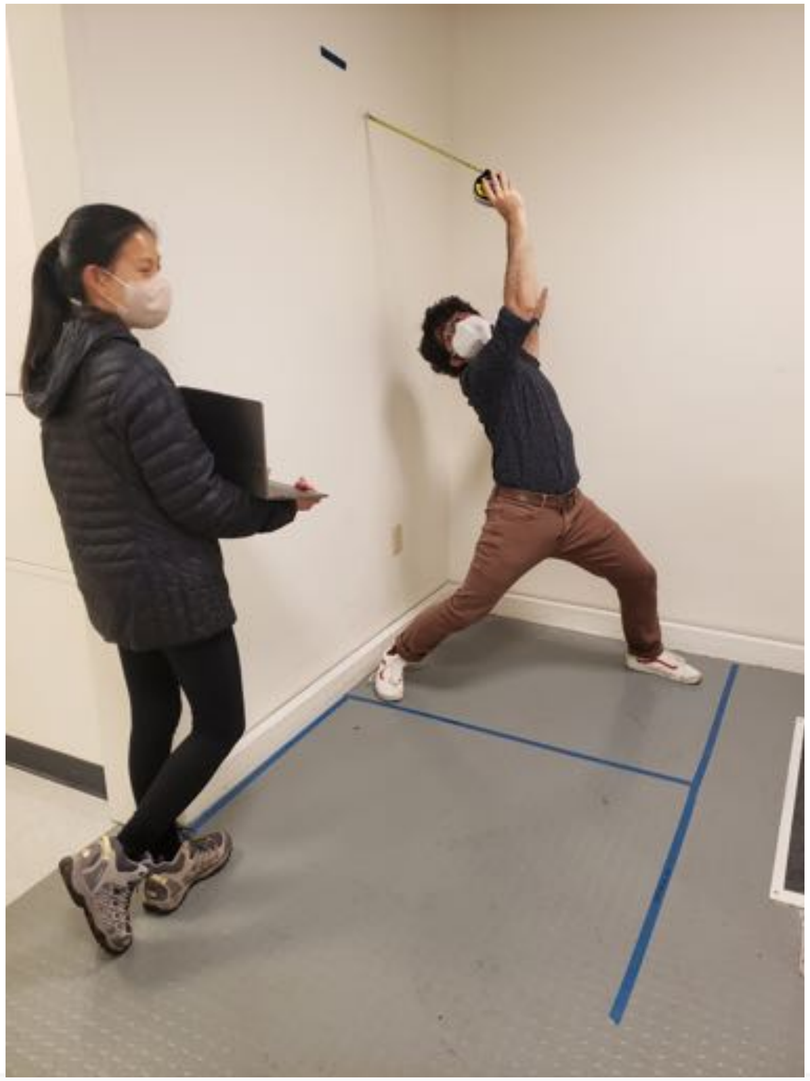




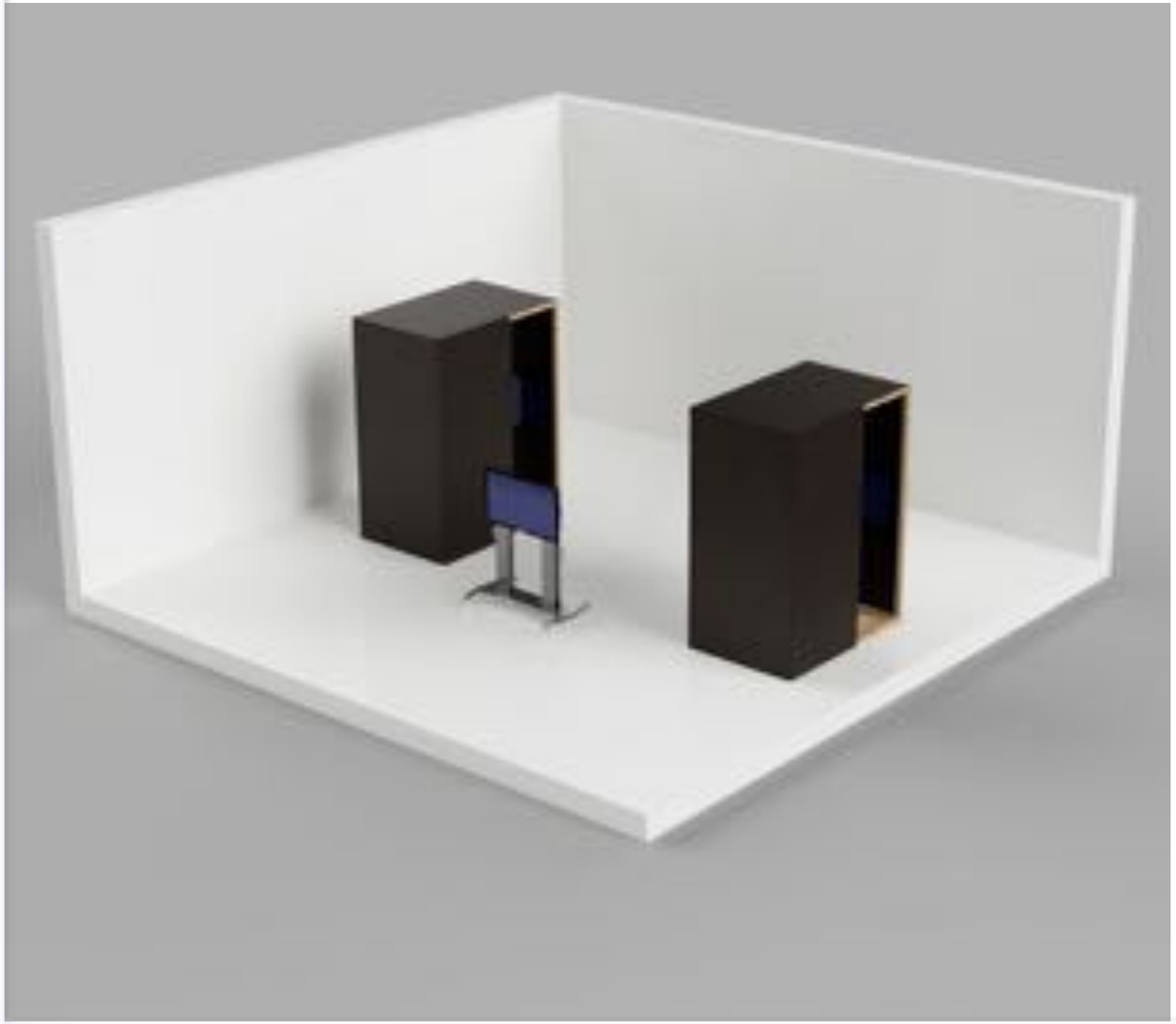


SPATIAL DESIGN





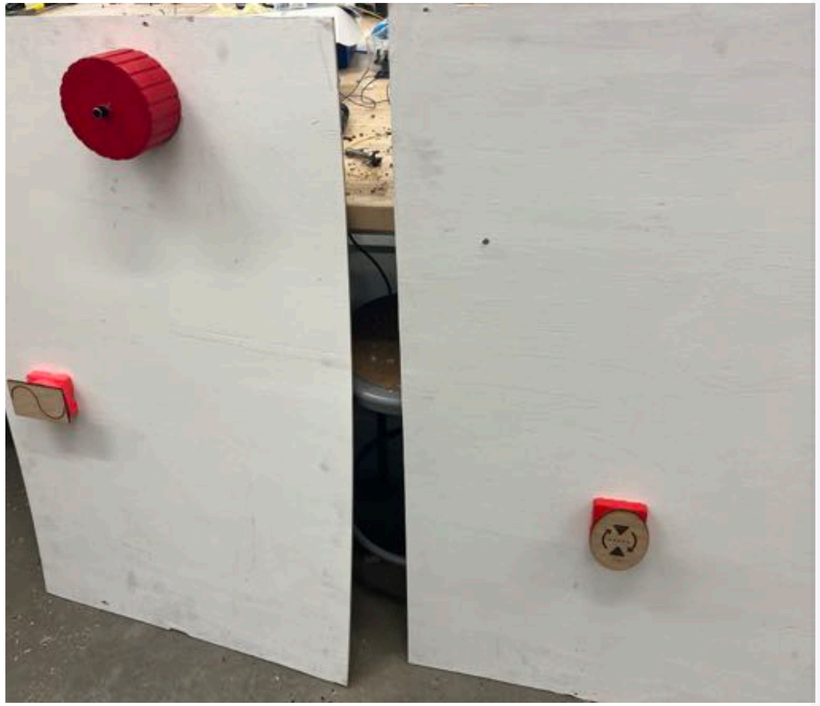
CAD MOCKUP

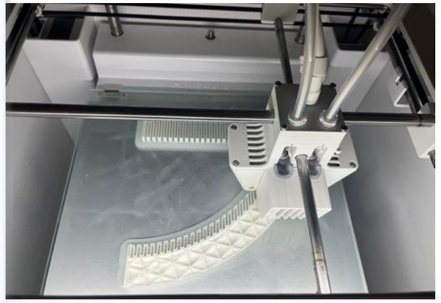


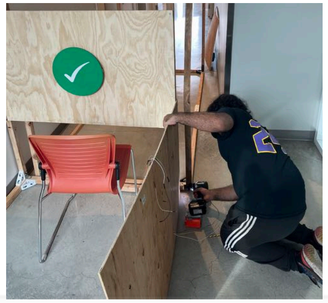
BOOTH FABRICATION

The fabrication of the booths involved prepping, cutting, and joining a host of stock lumber, utilizing 3D printed brackets to mount lumber together. Tools utilized included Table Saws, Chop Saws, and Various Power Tools.

ARTIFACT FABRICATION

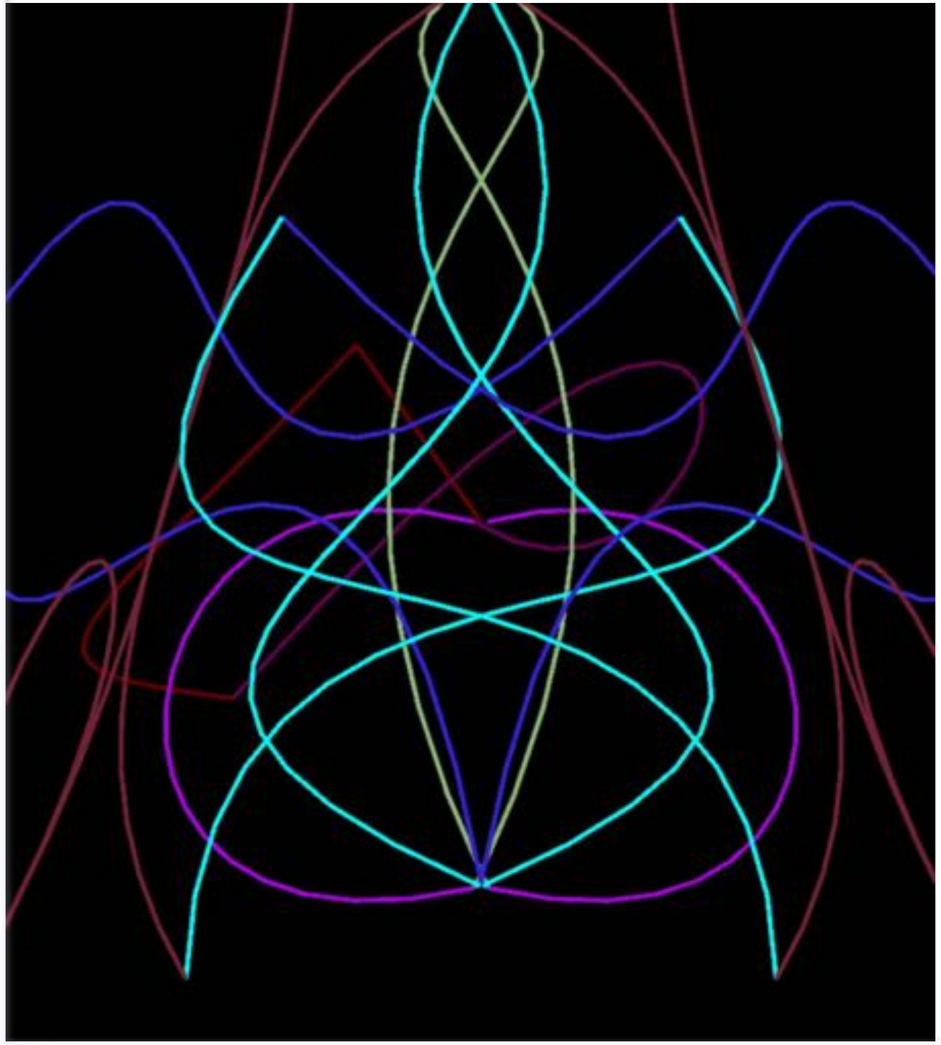


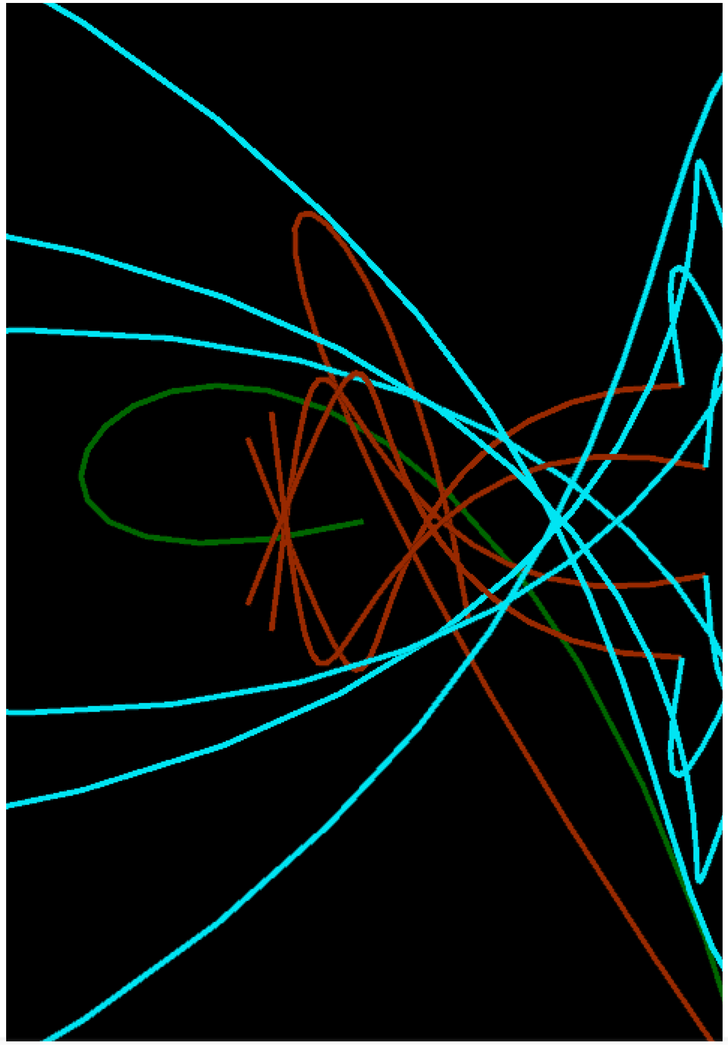




The various artifacts, including large wheels, giant push buttons, and step pads, were designed in Autodesk Fusion 360 and Adobe Illustrator. Fabrication processes included 3D printing, laser cutting, and spray painting.

CREATIVE CODING

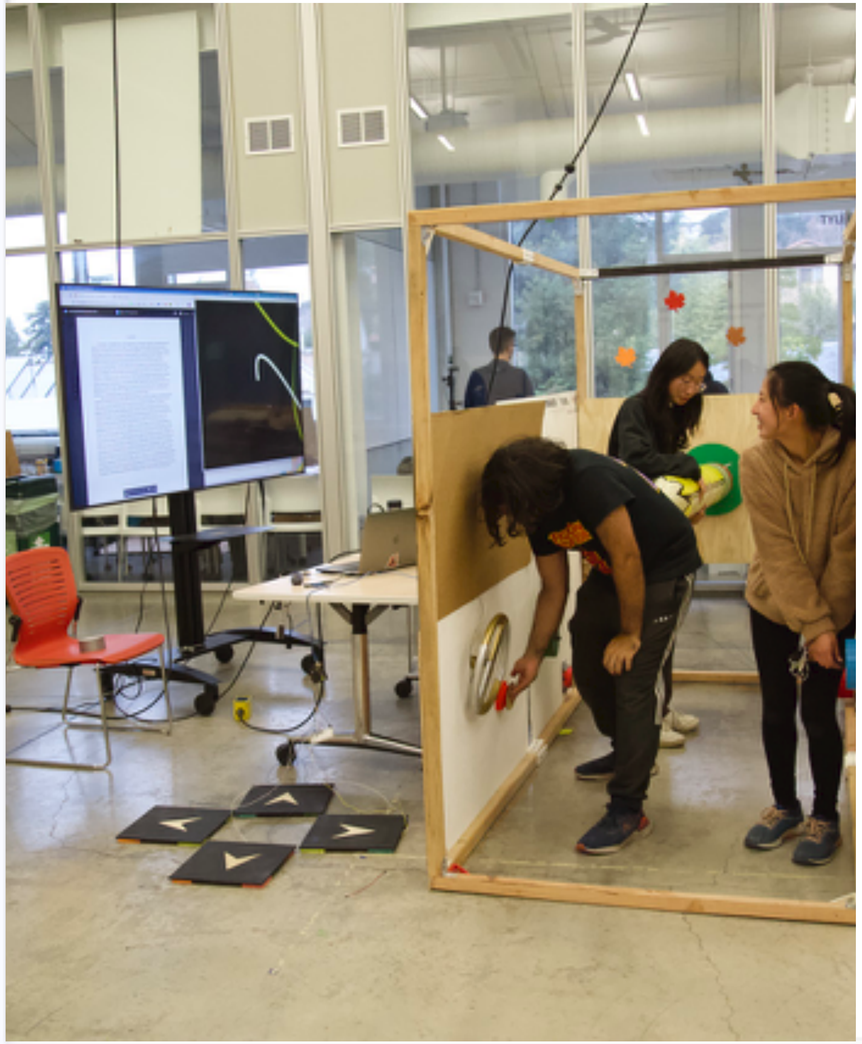


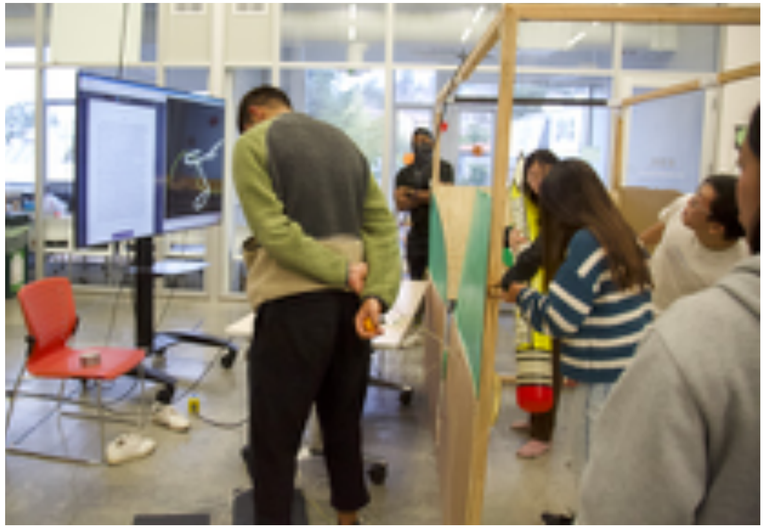


Final_Installation_Code_V11

```
if (key=='j') {

  if (counter==0) {
    art[layerCount].smooth();
    art[layerCount].beginDraw();
    art[layerCount].translate(500, 500);
    art[layerCount].noFill();
    art[layerCount].stroke(rVal, gVal, bVal);
    art[layerCount].strokeWeight(strokeSize);
    art[layerCount].rotate(rotVal);
    art[layerCount].beginShape();
    art[layerCount].vertex(oldPtX, oldPtY);
    art[layerCount].bezierVertex(cntrlPts[0], cntrlPts[1], cntrlPts[2], cntrlPts[3], newPtX, newPtY);
    art[layerCount].endShape();

    if (reflectCount==1){
      art[layerCount].beginShape();
    art[layerCount].vertex(-oldPtX, oldPtY);
    art[layerCount].bezierVertex(-cntrlPts[0], cntrlPts[1], -cntrlPts[2], cntrlPts[3], -newPtX, newPtY);
    art[layerCount].endShape();

    }

      if (reflectCount==2){
      art[layerCount].beginShape();
    art[layerCount].vertex(oldPtX, -oldPtY);
    art[layerCount].bezierVertex(cntrlPts[0], -cntrlPts[1], cntrlPts[2], -cntrlPts[3], newPtX, -newPtY);
    art[layerCount].endShape();

    }


    if (reflectCount==3){ //wont need this once button is connected, just for demo rn
      art[layerCount].beginShape();
    art[layerCount].vertex(-oldPtX, -oldPtY);
    art[layerCount].bezierVertex(-cntrlPts[0], -cntrlPts[1], -cntrlPts[2], -cntrlPts[3], -newPtX, -newPtY);
    art[layerCount].endShape();

    }

    art[layerCount].endDraw();
    oldPtX=newPtX;
    oldPtY=newPtY;
    counter++;
  }
}
if (key=='f') {
  counter=0;
```

INSTALLATION





DESIGN@LARGE

As part of a summer educational experience, I spent seven weeks as a Design and STEAM Instructor with iDTech Camps. Specifically, I taught at Arizona State University, San Francisco State University, and Stanford University, teaching children (ages 7 to 17) about various fields of design through week-long courses. Specifically, I taught Robotics Design, Astronautical Design, and 3D Modeling and Computer Graphics for 3D Printing (in Blender).

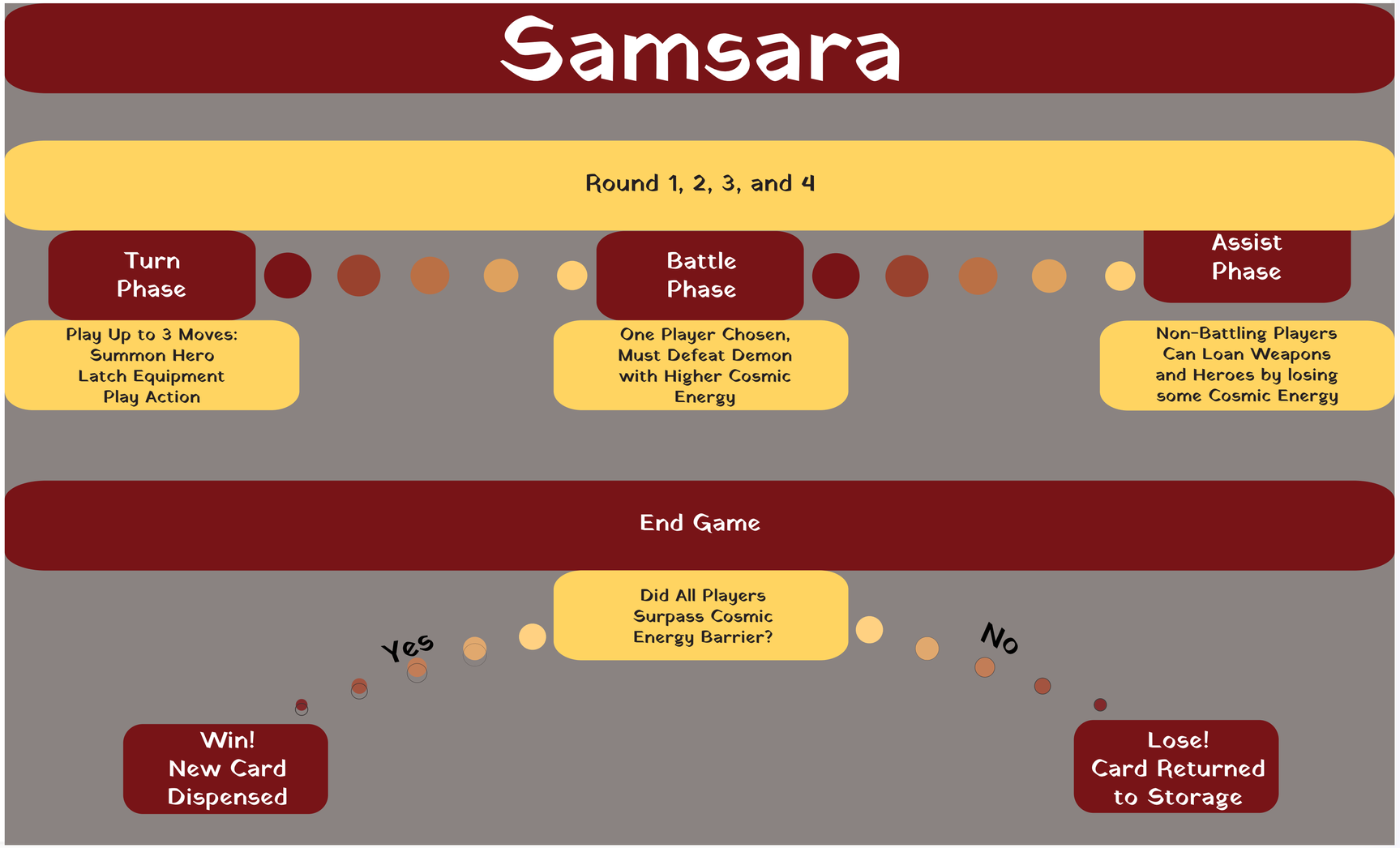
A large focus of my work was on developing a balance between form and function in a designed artifact, which I incentivized routinely through my curriculum structuring

SAMSARA

Samsara is a tangible, personified gaming experience that utilizes Indofuturist narratives and immersive gaming techniques to generate positive representation and community building among Indian children. Samsara is a digital-physical trading card game that invokes themes of post-colonial restorative justice, positive self-perception, Hinduism, and Indian history. The goal of this project is to combat the internalized racism that exists within our community by addressing a lack of positive representation within the toy and game industry. The hope is that an Indian child who plays this game can look in the mirror and be proud of who they are.

GAMEPLAY DESIGN

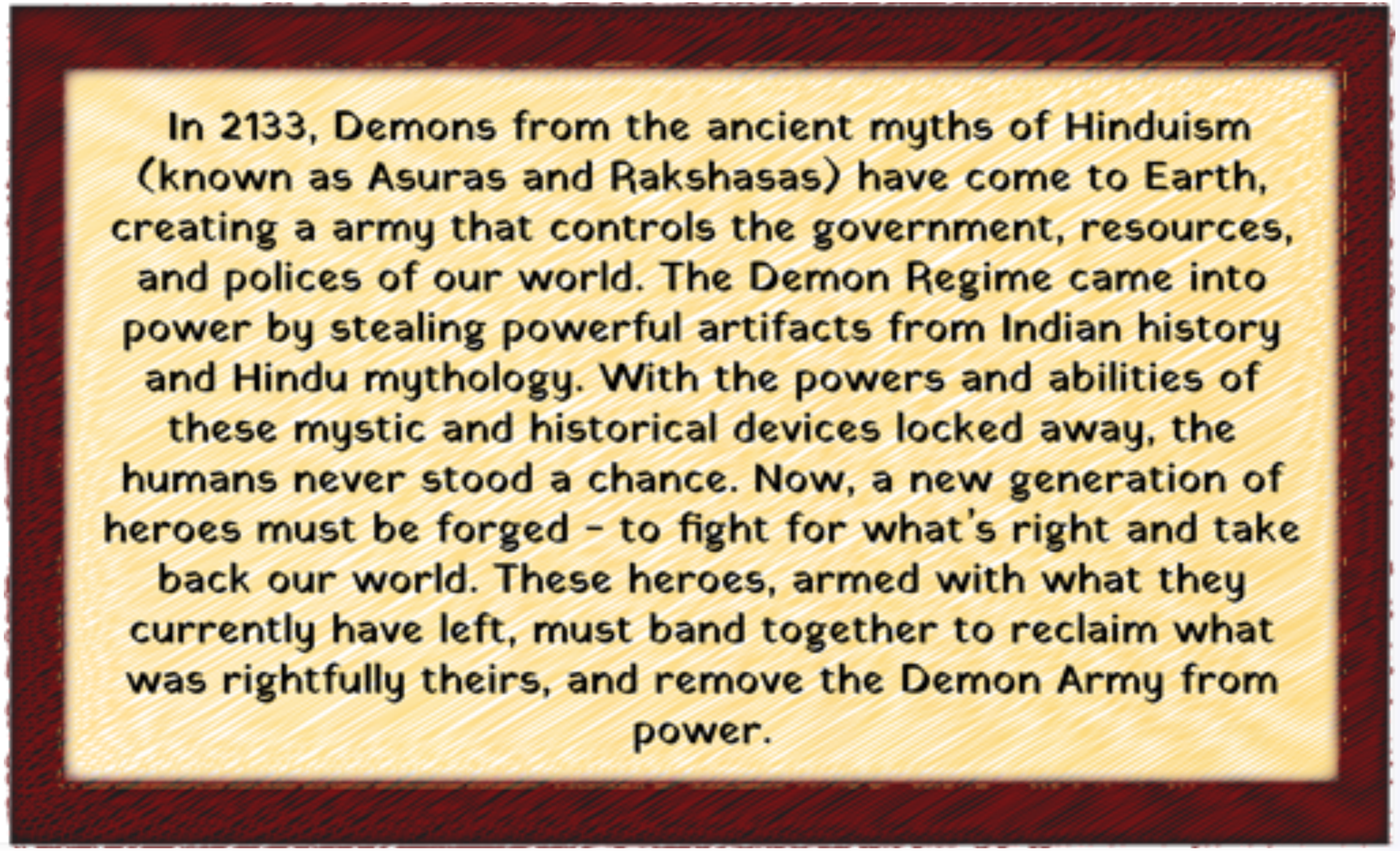
Samsara is a four-round, co-op game. The game stuctures around two-to-four players, who each can perform up to three actions per stage. The goal is to raise the in-game power metric of their Heroes, known as Cosmic Energy, to as high as possible. After each player has completed their turn, one Hero will be selected to battle the Demon, a set of four characters who grow more powerful with each progressive stage. The selected Hero must have greater Cosmic Energy than the Demon to defeat it, and if they do not, other players can perform specific actions to assist. At the end of the game, if all Heroes pass a threshold Cosmic Energy level, the players win. If even one does not, all players lose.



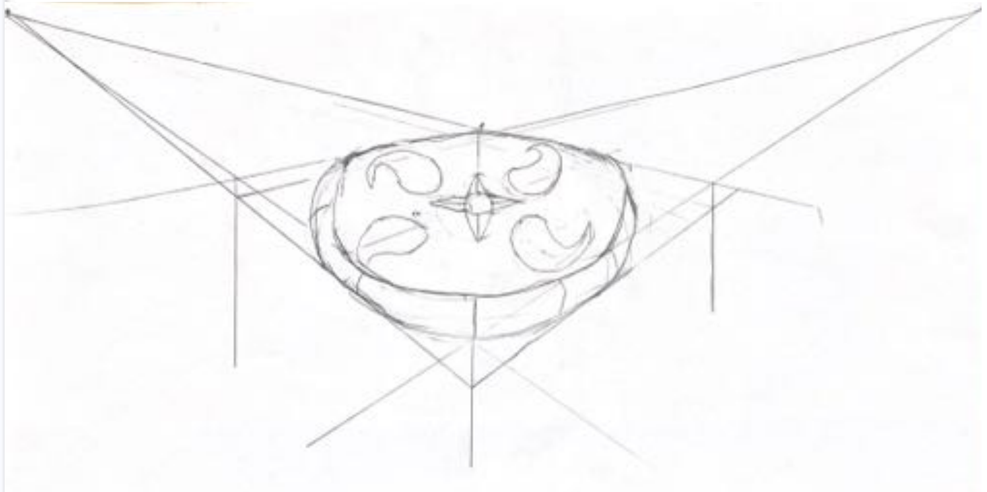
NARRATIVE DESIGN

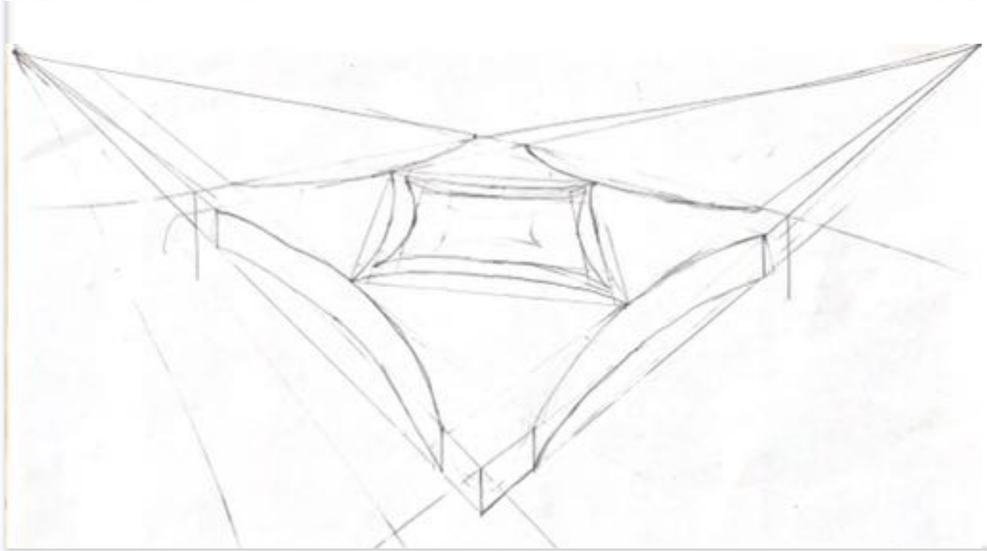
Samsara centers around a band of freedom fighters - followers of mythological figures, descendants of ancient warriors, and modern-day technological masters - taking on an oppresive totalitarian government in a futuristic, dystopian society.

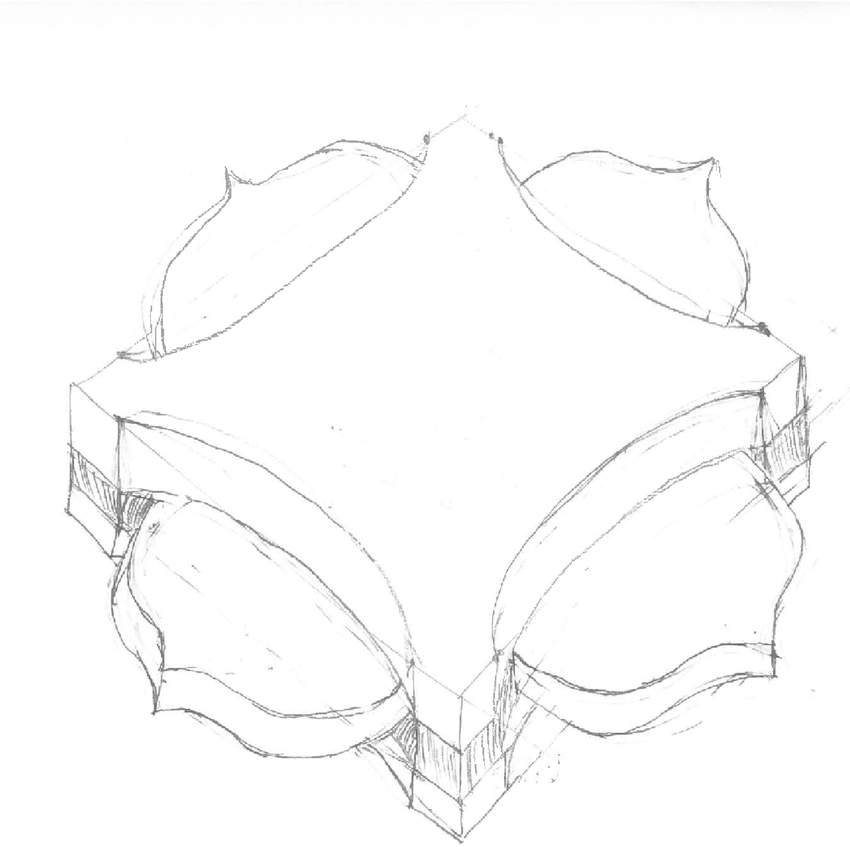
Samsara builds its narrative on the plots and themes of Restorative Justice, existing Hindu epics, and Indian history



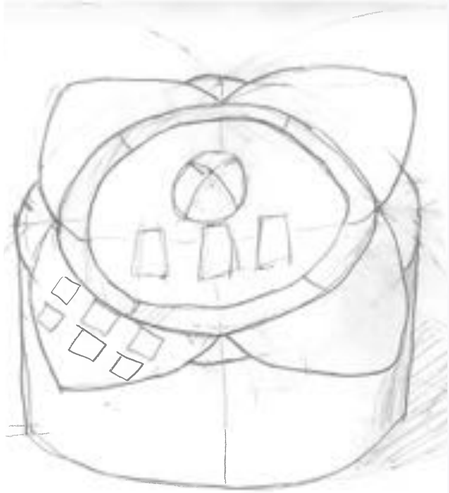
FORM DEVELOPMENT



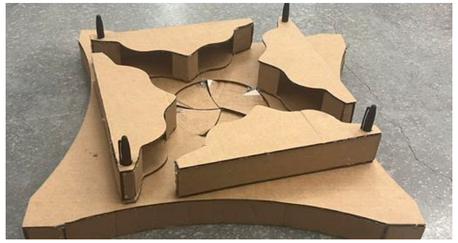


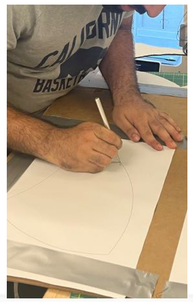


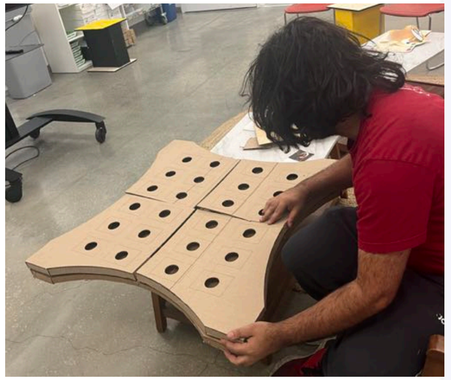
Form experimentation included various circular, star, hexagonal, and rectilinear shapes that were inspired from Indian art practices and Hinduism. Additionally, detailings such a corner and edge styling, surface deviations, and symbolic inlays were explored. It was through multiple rounds of user feedback on criteria such as cultural relevance, intuitive use, ergonomics, and sense of personification that the final form



FORM DEVELOPMENT







Cardboard prototyping was used to visualize the form language experience, and problems. Parameters included scale, aethetics, ergonomics, and intuitiveness.

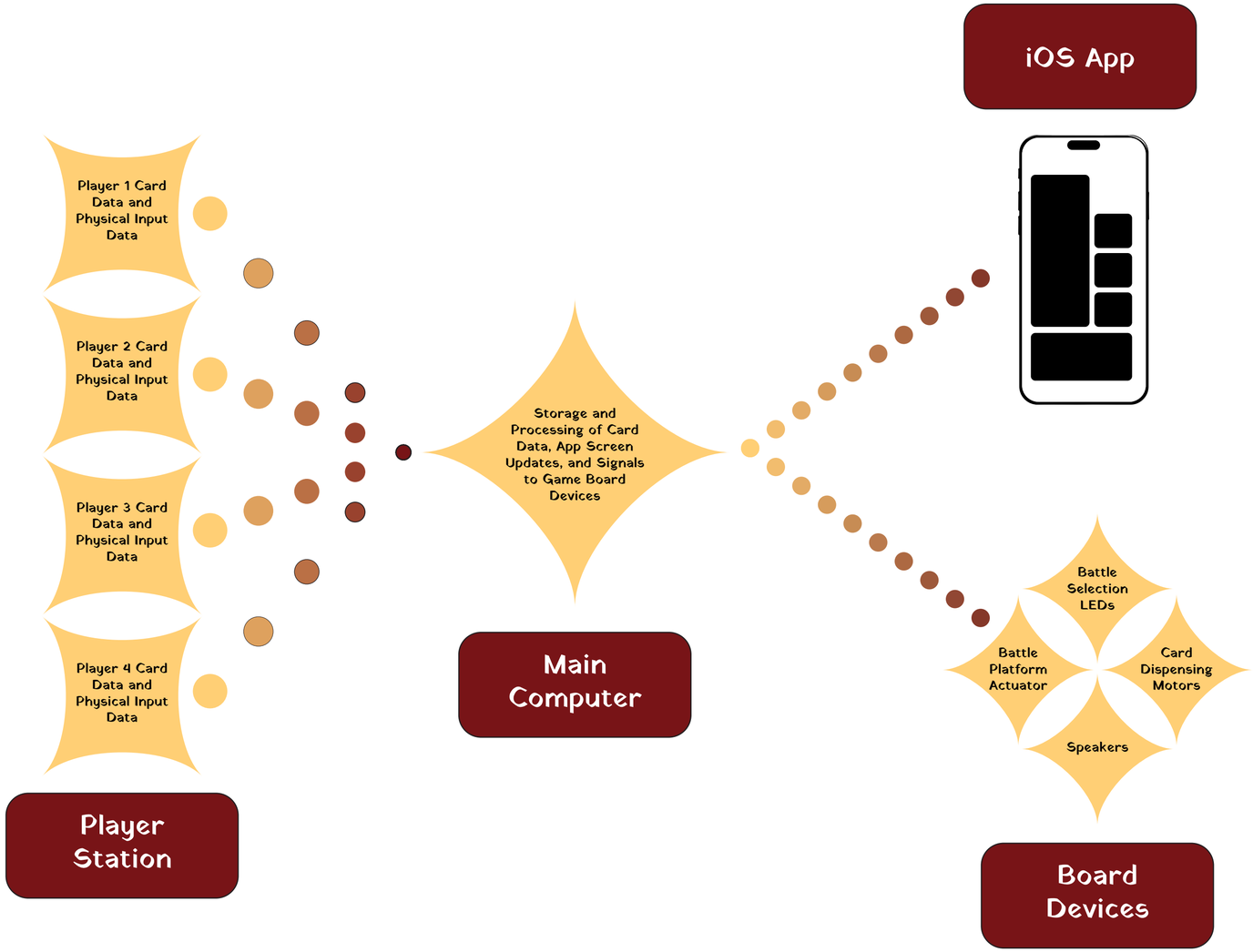
COLOR AND MATERIAL

Regarding materiality, an emphasis was placed on cost-effectiveness, user experience, material interactions, and cultural norms. Plywood with a mahogany stain and blue acrylic inlays were chosen for the game board, to act as interaction guides and as references to the woodworking and jewel history of India

For color, a wide analysis of color palettes was performed across various Indian craft practices, including blockprinting, jewelery-making, and weaving. This color pallete emphasizes the warm tone values of Indian craftwork, while also remaining accessible through visual contrast of hue and brightness.

HARDWARE/SOFTWARE

This technology behind this design, including a host of physical computing systems and a paired iOS application, were chosen to accomplish personification, as a means of creating a sense of immersion.
When a player sets a card above an RFID sensor player, the information related to that card is sent to the “main computer,” a central microcontroller that aggregates and analyzes the actions of the players and sends out appropriate commands as a response.



When a change occurs to the prior state of the player station the main computer alerts the paired Blynk iOS app to update the relevant graphics. This application includes a page for each player, where they can find all their relevant on-field card information. This display does not influence the game in any way, to emphasize the tangibility of the gameplay. The main computer also sends commands to various electromechanical devices located within the game board, such as speakers and motors.

FINAL PROTOTYPE