„Wunderkammer 4.0 / Cabinets of wonder“ Schloss Friedenstein Gotha

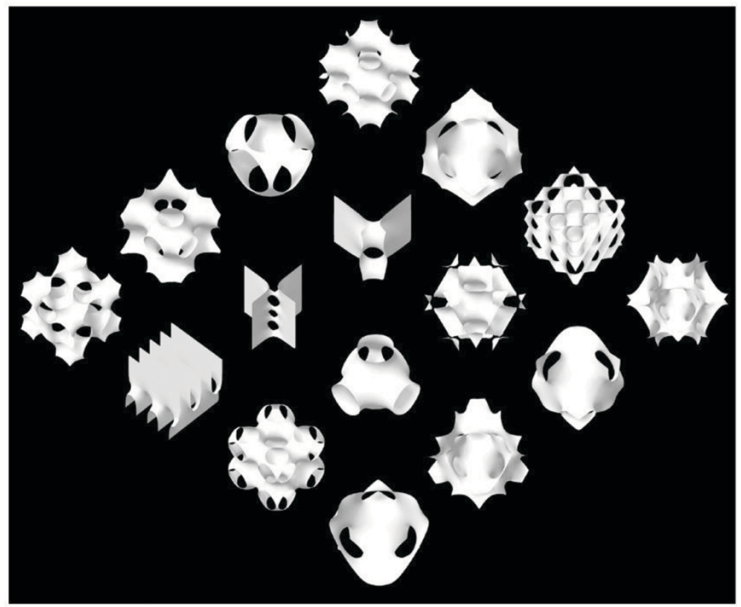
Betreuung: Prof. Bernd Rudolf, Prof. Andreas Kästner, Junior Prof. Reinhard König,

Dr. Sabine Zierold,

Nezar Abuhalaweh

Gastkritik: Stefan Kraus / Author: Zeinab Rahimi, Faezeh Mansourkhaki

Light ——————— Shadow
Movement
Layers



Technology

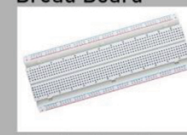
Arduino
(open-source hardware and software)

ARDUINO

arduino prototyping shield

Arduino UNO

Bread Board



Solder

LED strip

Conductive Thread

RIP Sensor

Gesture Sensor

Wire

Touch Designer

TouchDesigne
(Visual Programming software)

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The fundamental design concepts of this two-layer pavilion is based on the baroque architecture concept of high decorative interior design and relatively simpler faced.
The intention is to show pictures of art pieces through interactive LED screens and give the visitor the joy of moving the displayed photo collection by themselves.
we have chosen four modules to show four categories of art pieces which are: Sculpture, Paintings, Patterns, and Objects.

Photo Category: Sculpture

Photo Category: Objects

Photo Category: Painting

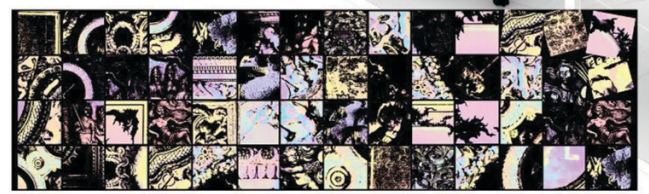
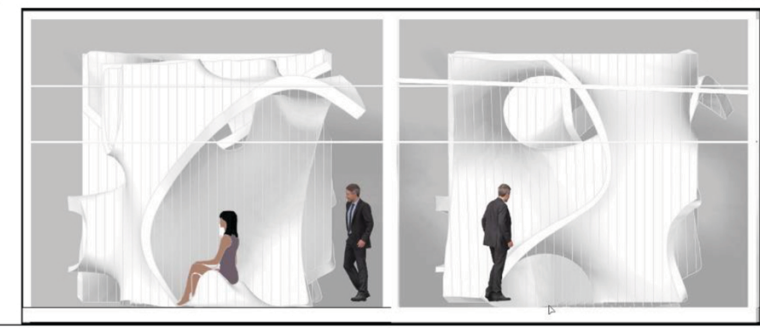


Photo Category: Pattern



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First collection- sculpture

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First collection- sculpture

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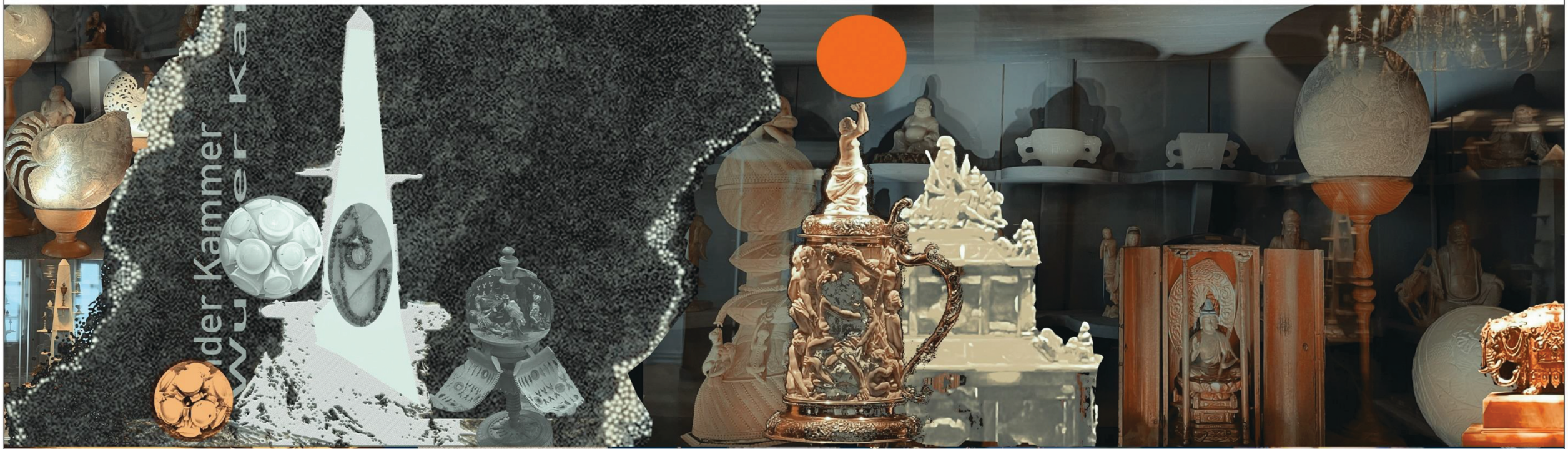
First collection- sculpture



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First collection- sculpture

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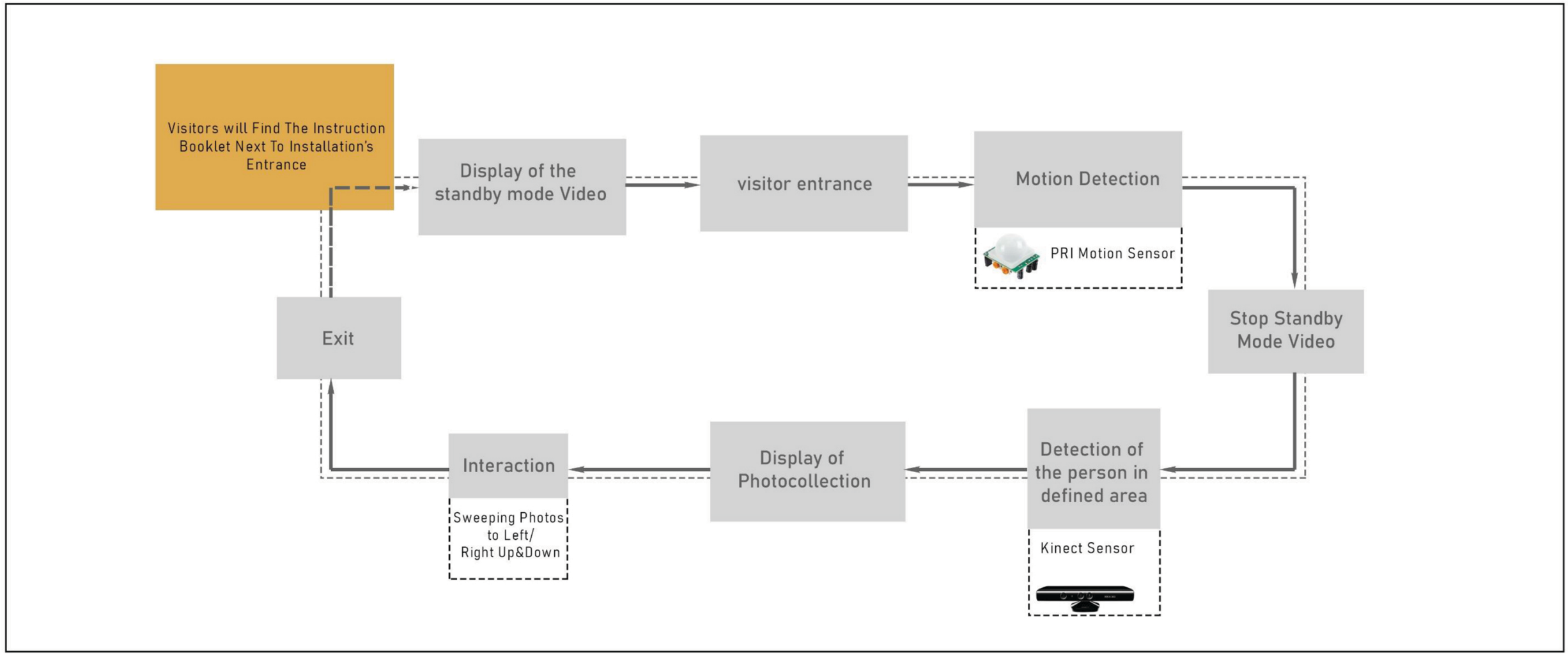
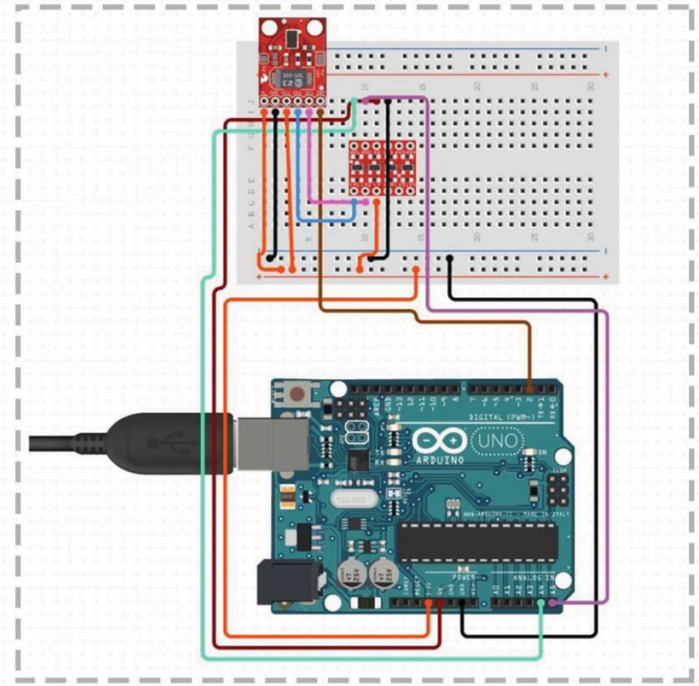


```ino
#include <Wire.h>
#include <SparkFun_APDS9960.h>

// Pins
#define APDS9960_INT    2 // Needs to be an interrupt pin

// Constants

// Global Variables
SparkFun_APDS9960 apds = SparkFun_APDS9960();
int isr_flag = 0;

void setup() {

  // Set interrupt pin as input
  pinMode(APDS9960_INT, INPUT);

  // Initialize Serial port
  Serial.begin(9600);
  Serial.println();
  Serial.println(F("--------------------------------"));
  Serial.println(F("SparkFun APDS-9960 - GestureTest"));
  Serial.println(F("--------------------------------"));

  // Initialize interrupt service routine
  attachInterrupt(0, interruptRoutine, FALLING);

  // Initialize APDS-9960 (configure I2C and initial values)
  if ( apds.init() ) {
    Serial.println(F("APDS-9960 initialization complete"));
  } else {
    Serial.println(F("Something went wrong during APDS-9960 init!"));
  }

  // Start running the APDS-9960 gesture sensor engine
  if ( apds.enableGestureSensor(true) ) {
    Serial.println(F("Gesture sensor is now running"));
  } else {
    Serial.println(F("Something went wrong during gesture sensor init!"));
  }
}
void loop() {
  if( isr_flag == 1 ) {
    detachInterrupt(0);
    handleGesture();
    isr_flag = 0;
    attachInterrupt(0, interruptRoutine, FALLING);
  }
}

void interruptRoutine() {
  isr_flag = 1;
}

void handleGesture() {
    if ( apds.isGestureAvailable() ) {
    switch ( apds.readGesture() ) {
      case DIR_UP:
        Serial.println("UP");
        break;
      case DIR_DOWN:
        Serial.println("DOWN");
        break;
      case DIR_LEFT:
        Serial.println("LEFT");
        break;
      case DIR_RIGHT:
        Serial.println("RIGHT");
        break;
      case DIR_NEAR:
        Serial.println("NEAR");
        break;
      case DIR_FAR:
        Serial.println("FAR");
        break;
      default:
        Serial.println("NONE");
    }
  }
}
```



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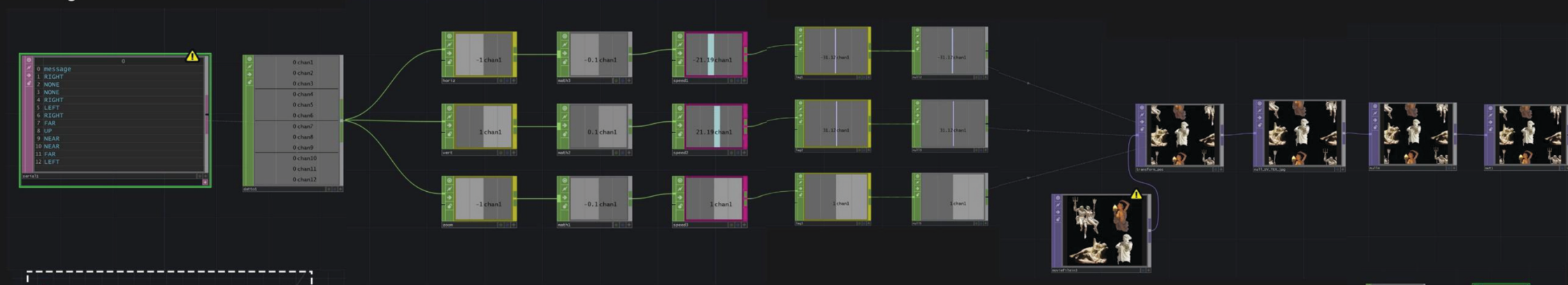
Touch Designer inner shell code



```
# me - this DAT
#
# dat - the DAT that received the data
# rowIndex - the row number the data was placed into
# message - an ascii representation of the data
#           Unprintable characters and unicode characters will
#           not be preserved. Use the 'bytes' parameter to get
#           the raw bytes that were sent.
# bytes - byte array of the data received

def onReceive(dat, rowIndex, message, bytes):

    #message = op('select1')[0,0]

    #print(message)

    if message == 'RIGHT':

        op('horiz').par.value0 = 1

    elif message == "LEFT":

        op('horiz').par.value0 = -1

    elif message == "UP":

        op('vert').par.value0 = 1

    elif message == "DOWN":

        op('vert').par.value0 =-1

    elif message == "NEAR":

        op('zoom').par.value0 = 1

    elif message == "FAR":

        op('zoom').par.value0 = -1

    elif message == "NONE":

        op('horiz').par.value0 = 0
        op('vert').par.value0 = 0
        op('zoom').par.value0 = 0


    return
```

The code to connect the arduino to Touchdesinger and convert the input data (from sensor) to move the photo on geometry

RESET

```
# me - this DAT
#
# channel - the Channel object which has changed
# sampleIndex - the index of the changed sample
# val - the numeric value of the changed sample
# prev - the previous sample value
#
# Make sure the corresponding toggle is enabled in the CHOP Execute DAT.

def onOffToOn(channel, sampleIndex, val, prev):

    op('speed1').par.resetpulse.pulse()
    op('speed2').par.resetpulse.pulse()
    op('speed3').par.resetpulse.pulse()

    return

def whileOn(channel, sampleIndex, val, prev):
    return

def onOnToOff(channel, sampleIndex, val, prev):
    return

def whileOff(channel, sampleIndex, val, prev):
    return

def onValueChange(channel, sampleIndex, val, prev):
    return
```

The code used to reset the data

Bauhaus-Universität Weimar

MA MediaArchitecture Wintersemester 2021 / 2022

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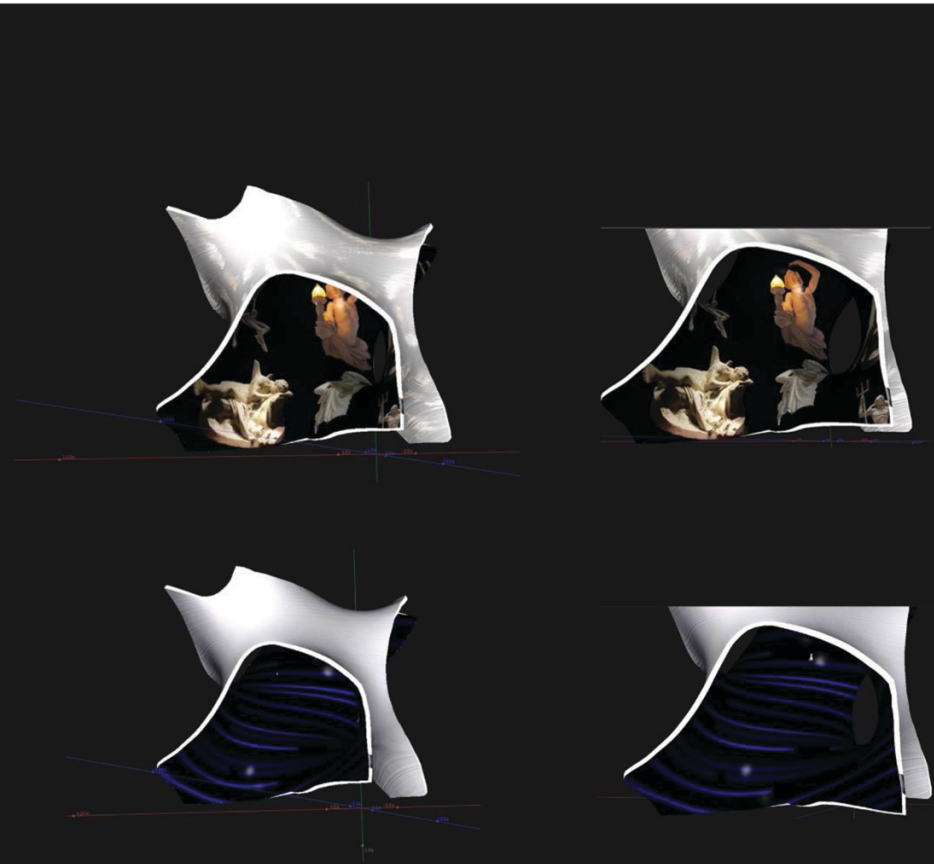

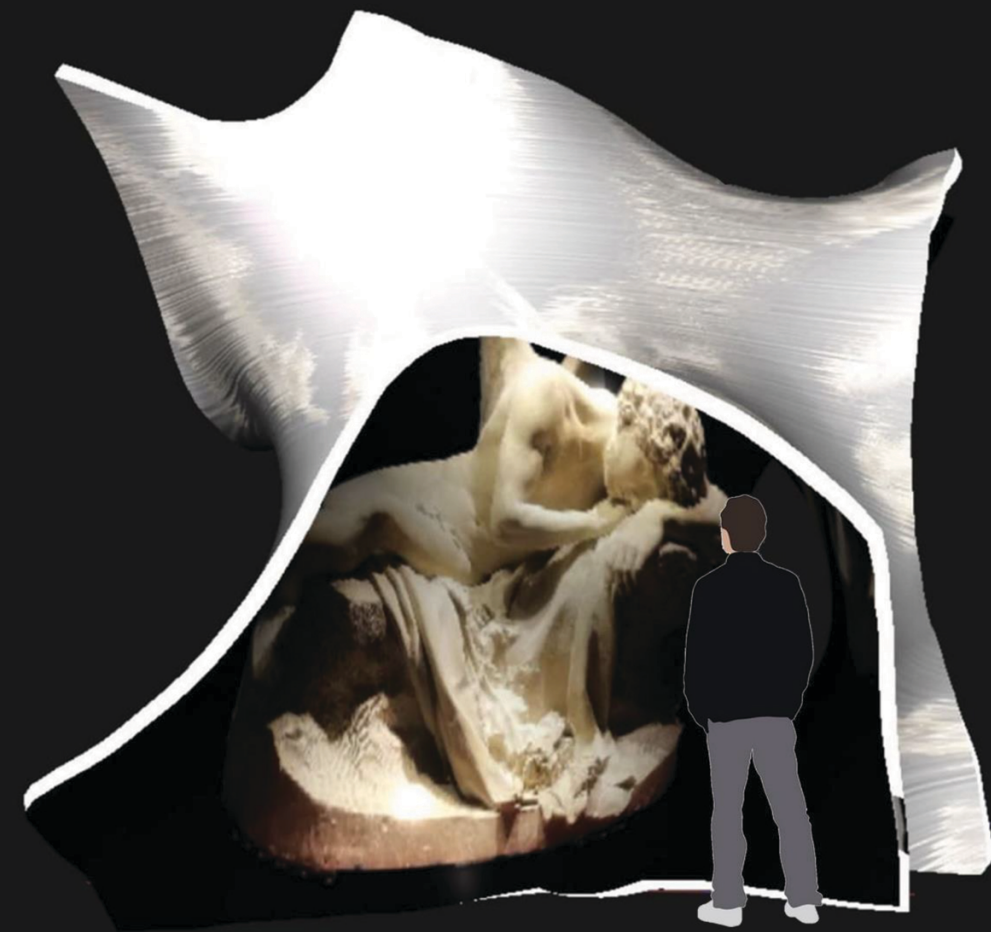

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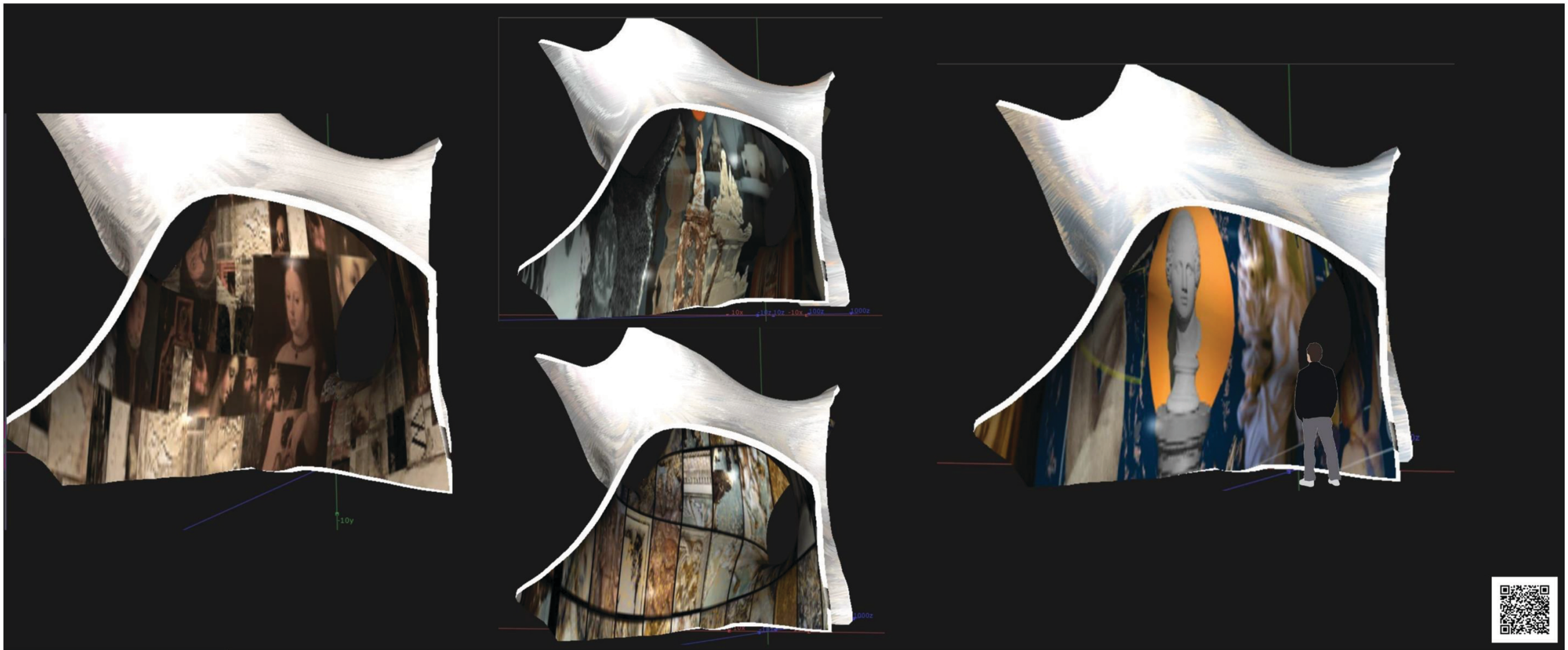

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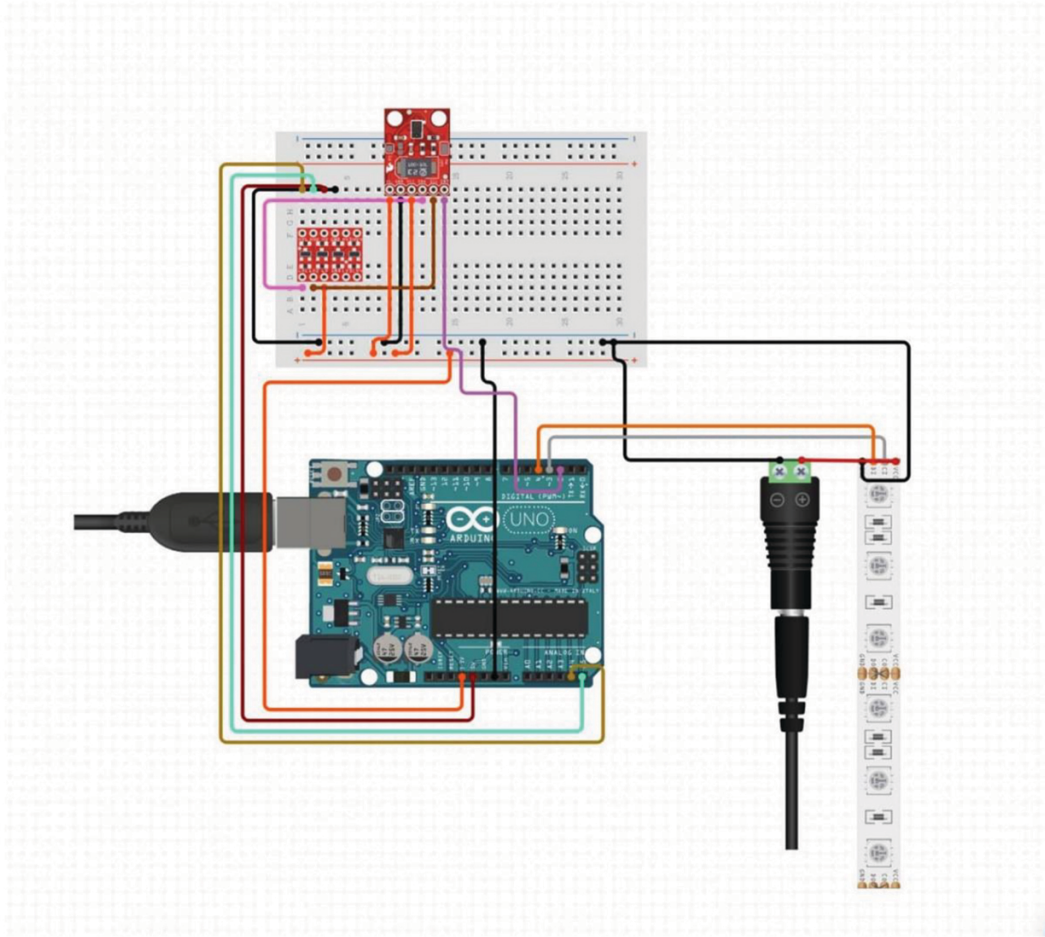
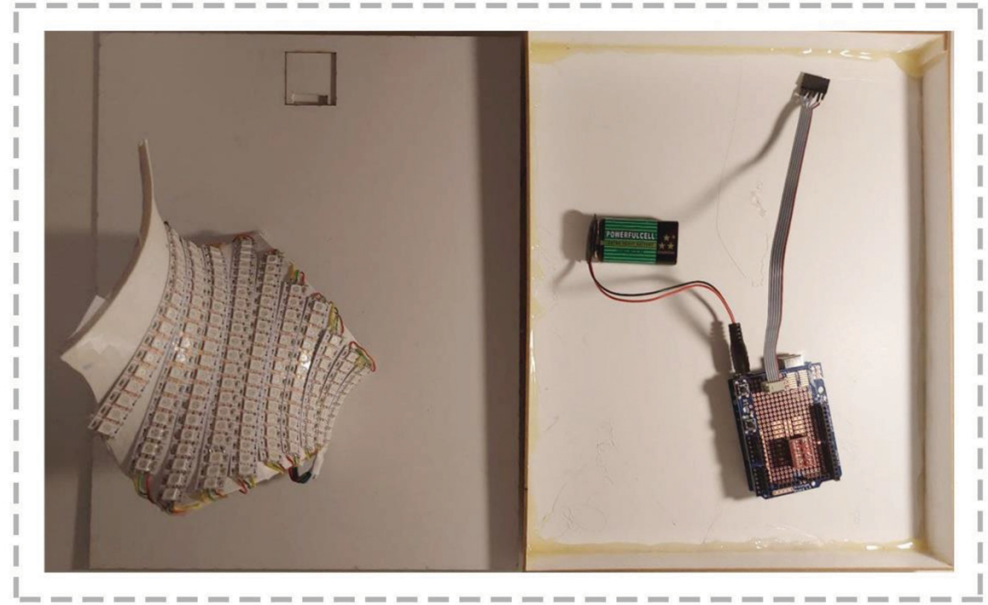
physical prototyping arduino code





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109	108	107	106	105	104	103	102	101	100	99	98	97	96	95	94	93	92	91	90	
69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51		
		37	38	39	40	41	42	43	44	45	46	47	48	49	50					
			36	35	34	33	32	31	30	29	28	27	26	25						
					16	17	18	19	20	21	22	23	24							
					15	14	13	12	11	10	9	8								
				0	1	2	3	4	5	6	7									

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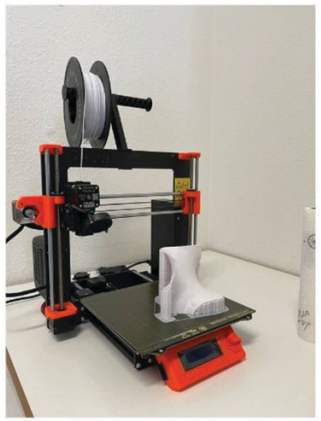
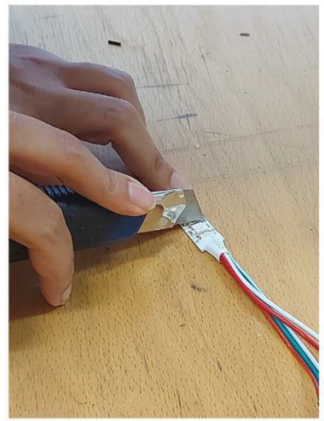
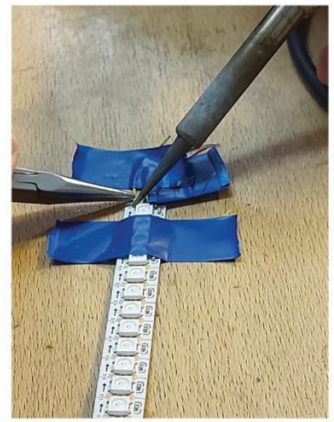
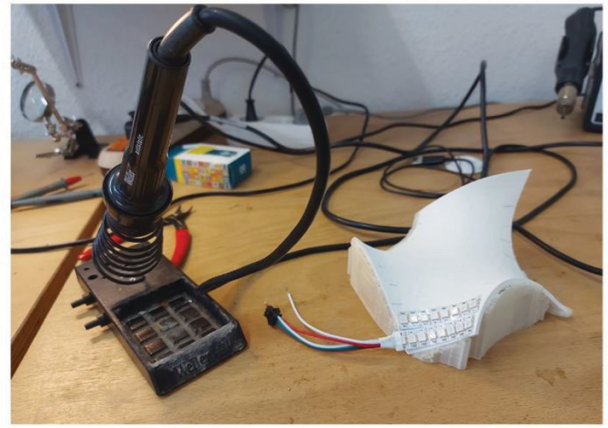
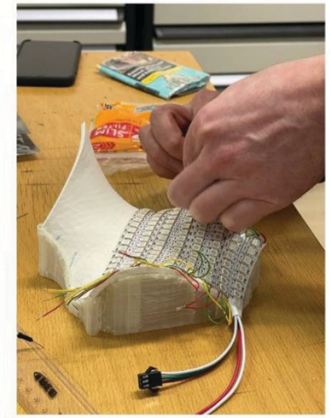
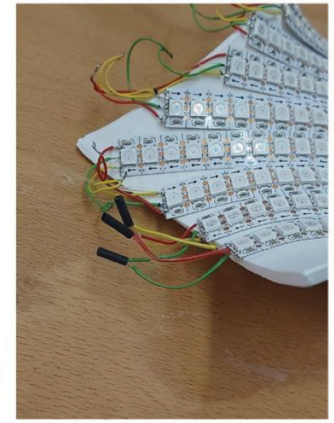
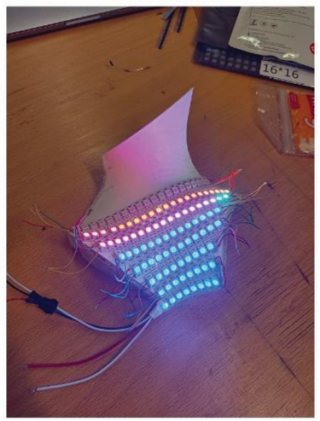
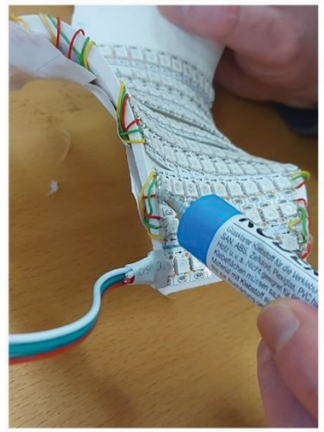
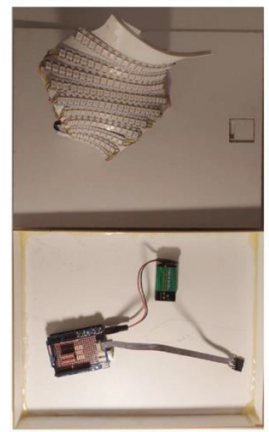
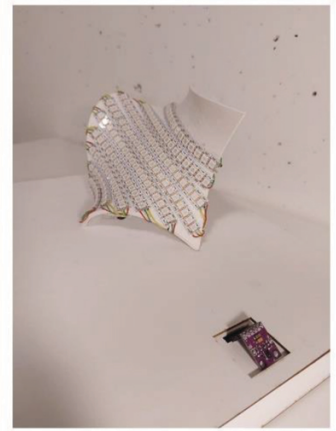
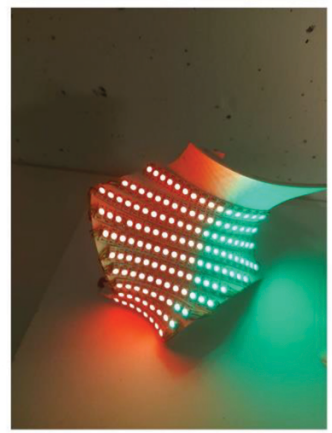
physical prototype procedure

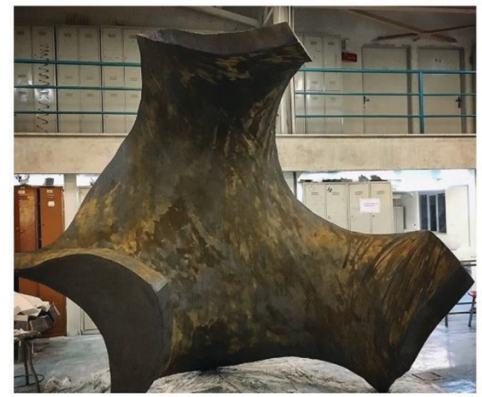











Future construction inspiration

Nejur, A., & Steinfeld, K.). Ivy: Progress in Developing Practical Applications for a Weighted-Mesh Representation for Use in Generative Architectural Design. ACADIA 2017,446-455



Batwing Structure / Mini - Fab Workshop Workshop / Iran University of Science & Technology (IUST) /December 2018

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THANK YOU!