



HARRHAAHAAHAA

VISUAL AMUSEMENT PARK

**Generating joy
in the concept of
interactive artworks**

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ABSTRACT

This paper introduces a concept for an interactive art exhibition concentrating on joy. The project is inspired by funhouses, science museums and optical illusions.

The exhibition concept consists of seven installations that combine technology, science, serigraphy and mixed media, spiced up with interactivity and visual triggers. In the spirit of Fluxus, HARHAHAHA utilizes humor, everyday objects and events together with moments of surprise and nostalgia. HARHAHAHA tells a story about my year in Poland during the pandemic, converted into a visual amusement park. Even in the midst of melancholy and boredom there is joy, and this exhibition seeks to evoke it.

The aim of this thesis is to explore different mechanisms for generating joy in the concept of interactive artworks. HARHAHAHA is surreal, experiential and playful. The first two chapters concentrate on the idea of the concept and background. The focus is on the themes and inspiration behind the concept, and the chosen methods for achieving the purpose of the exhibition. The process part gives a closer look to both technical and visual processes, and experiments. Finally, the paper introduces the exhibition concept for HARHAHAHA.

Keywords:

Exhibition concept, funhouse, graphic art, interactive art, Arduino, HARHAHAHA, joy

TIIVISTELMÄ

Tämä opinnäytetyö on konsepti interaktiiviselle näyttelylle, jonka tarkoituksena on tutkia ilon tuottamisen mekanismeja. Inspiraationa työlle ovat toimineet huvipuistojen hupitalot, tiedemuseot sekä optiset illuusiot.

Näyttelykonsepti koostuu seitsemästä installaatiosta, joissa yhdistyy teknologia, tiede, serigrafia ja sekatekniikka, visuaalisilla virikkeillä ja interaktiivisilla toiminnoilla höystettynä. Fluxus-taiteen henkeen HARHAHAHA hyödyntää huumoria, arkisia esineitä ja hetkiä sekä yllätyksen tunnetta ja nostalgiaa. HARHAHAHA on visuaalinen huvipuisto, joka kertoo samalla tarinaa pandemian aikana vietetystä vuodestani Puolassa. Jopa melankolian ja tylsyyden keskellä on iloa, ja tämän näyttely pyrkii herättämään sen.

Tämän opinnäytetyön tavoite on tutkia erilaisia ilon tuottamisen mekanismeja interaktiivisen taiteen konseptissa. HARHAHAHA on surrealistinen, kokemuksellinen ja leikkisä kokonaisuus. Ensimmäiset kaksi kappaletta käsittelevät konseptin ideaa ja taustoja. Keskiössä ovat näyttelyn teemat ja inspiraation lähteet, sekä ilon synnyttämiseen valitut menetöt. Prosessiosio kuvaa tarkemmin sekä teknistä että visuaalista prosessia ja installaatioihin liittyviä teoskokeiluja. Lopuksi esittelen valmiin näyttelykonseptin.

Avainsanat:

Näyttelykonsepti, hupitalo, grafiikka, interaktiivinen taide, Arduino, HARHAHAHA, ilo

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INTRODUCTION

Amusement parks are places where we go for entertainment and excitement. But what it all is about, why do we enjoy them so much? Stephens (2018) opens the psychology behind roller coasters: *Enjoying roller coasters is linked to sensation seeking—the tendency to enjoy varied, novel and intense physical experiences such as rock climbing and parachute jumping.* However, this exhibition concept is not about raising blood pressure, adrenaline and euphoria, but about seeking for different ways to arouse joy. Joy needs action and interaction, it is not a passive emotion.

In this paper, I'm going to talk about the concept and methods of a visual and interactive amusement park, HARHAHAHA. I will introduce the sources of inspiration and the chosen techniques for implementing the artworks. In addition to amusement parks, the exhibitions of science museums have played a big role in choosing the way of technical approach on the topic. A number of the installations of HARHAHAHA are utilizing electronics and sensing technology, and the experimental part with electronic devices is an important part of the process. I will tell you about screen printing as a technique, which is an integral part of the works. Finally, I will introduce the visual concept.

1.1 Choosing the topic

I started my thesis process during my exchange year in the *Academy of Fine Arts in Warsaw* in 2020, which has had a strong impact in choosing to approach the topic and thesis work in a more artistic setting. This project is a continuation of the previous series I've made in Warsaw, *Fountain of serotonin*, 2020, in which my ambition was to illustrate happiness. Also, the project is a result of personal interest and enthusiasm for illusions, technology and science.

In my thesis I wanted to express my artistic identity; what is important to me and what is driving me forward – and challenge myself by uniting those things in imaginative and whimsical ways. As an artist and designer I'm interested in telling a story through forms and colors, interaction between people and objects, and movement and emotion.

From the beginning it was clear to me that the emotion I want to work with is happiness or joy. I wanted to design a visual amusement park: HARHAHAHA, an interactive exhibition dedicated to joy.

1.2 EXHIBITION

– Concept and methods



HARHAHAHA tells a story about my year in Poland during the pandemic in the form of a funhouse. It brings together moments of boredom, melancholia, astonishment, exploring new and wandering around the empty streets of Warsaw. But if the story behind is not about joy, how can it represent joy? Does joy need a counter feeling – sadness, fear? My goal is not to illustrate joy, but find different ways to dig it up.

The exhibition concept consists of seven installations that combine technology, science, traditional printing techniques and mixed media, spiced up with interactivity and visual triggers. The series could be described as either a personal or generational experience.

In the spirit of Fluxus¹, HARHAHAHA utilizes humor, everyday objects and events together with moments of surprise and nostalgia. Those are also used as a tool to fight against the puzzlement caused by the global lockdown – like Dada² artists did during WWII.

In this work experiments are done with sensory technology, sound, motors and optical illusions – and combining them

together with graphic arts. HARHAHAHA invites people to touch, play and get surprised. It is inspired by funhouses, science and experiential art.

The majority of the artworks are based on my analog photography diary shots, which are transformed into serigraphy³ prints. The strong contrasts and bright colors are separating the photographs from the reality and turning them into a surreal, dream-like and playful form.

¹Fluxus, founded in 1960, is an international avant-garde and experimental network or collective of artists. It is rather an attitude than a movement or a style. Fluxus artists are working with intermedia – they want to see what happens when different forms of art like sound, poetry, architecture and fine arts are mixed together. Fluxus is anti-commercial, do-it-yourself-spirited, anti-art, humoristic. (Tate 2021.) *Fluxus was a democratic form of creativity open to anyone (ibid).*

²Dada was an art movement formed during the First World War in Zurich in negative reaction to the horrors and folly of the war. The art, poetry and performance produced by dada artists is often satirical and nonsensical in nature (Tate 2021).

**“Fluxus artists want to mix things up. Fluxus is trivial. It is not magnificent. It is not commercial. It’s not complicated. Fluxus has to be simple, it has to be fun. If it’s not fun, it’s not fluxus.”
(Avaruusromua 2015.)**

³Serigraphy, also known as screen printing, is a technique for surface printing. In serigraphy the design is created on a paper, fabric or some other material by pressing ink through a screen with areas blocked off by a stencil. (Fick & Grabowski 2009, 55–56)

1.3 RESEARCH QUESTION

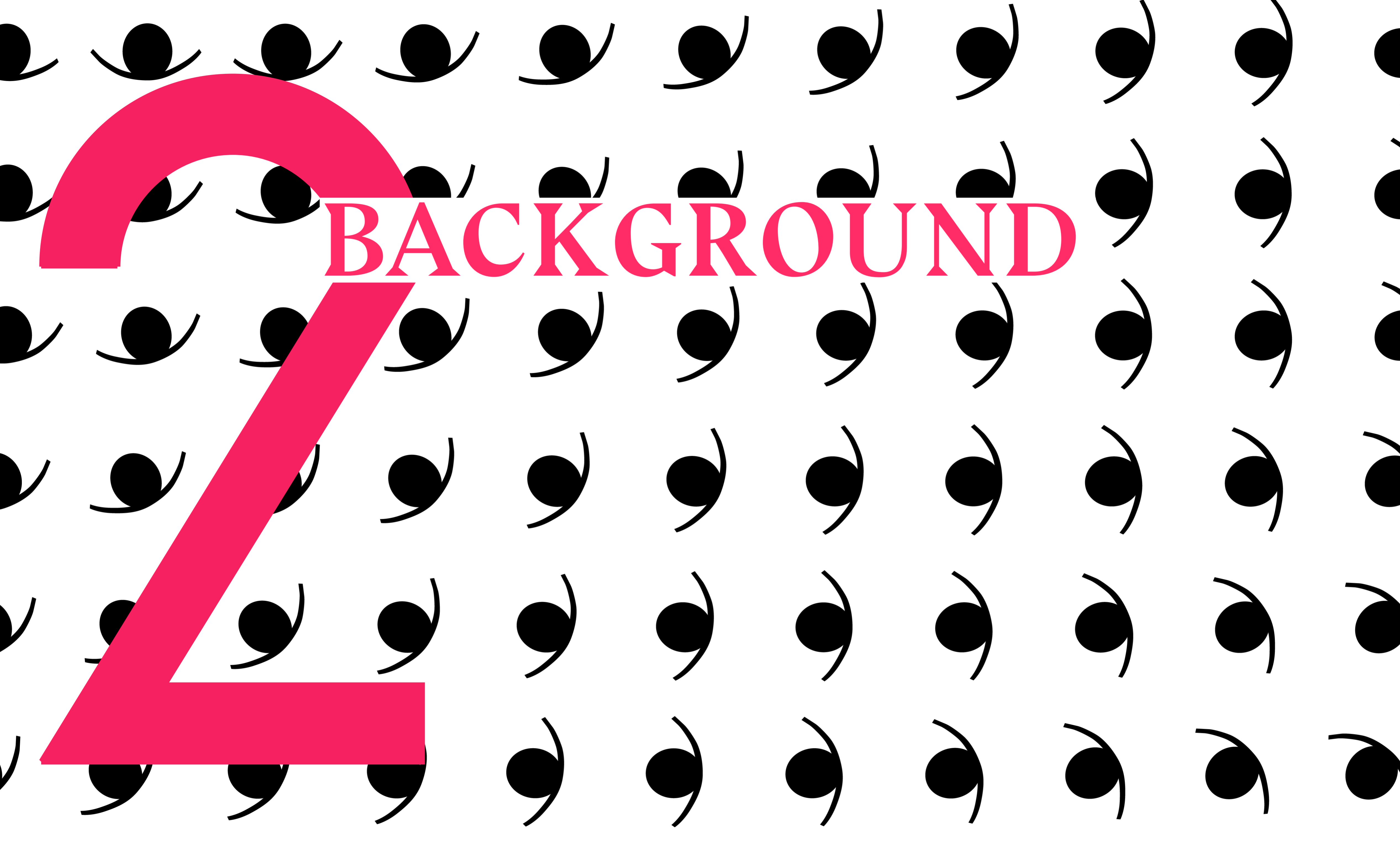
In this thesis report I'm exploring the following:

**HOW TO GENERATE JOY
IN THE CONCEPT OF
INTERACTIVE ARTWORKS?**

I'll be presenting my approaches for evoking emotions that can be utilized in this exhibition concept.



BACKGROUND



2.1 Themes and inspiration

The strongest sources of inspiration for HARHAHAHA have been science museums and funhouses, which are explored deeper in Chapter 3.1. What combines them both are the moments that feel magical – the fine line between science and suspicion. These places utilize the interaction between people and objects in a way that rather arouses questions than gives answers.

In science museums people can steep themselves into wonders of optical illusions, physics and lights, to mention a few. It is about exploring and playing, it is fun and exciting. The same pattern follows in funhouses, usually in less apparent form. Fun houses are designed to startle, challenge and distort conventional perceptions in the name of amusement.

This is something HARHAHAHA also aims for, an enjoyable enigma. Along with experiencing mysteries of vision and solving puzzles, one thing that plays a big role as a source of delight is the moment of surprise. By utilizing sensory technology and motors, some of the artworks offer unexpected treats.

The main theme that connects the artworks together is this question: what brings happiness in our everyday life? Delight can be found in various things, since it is always a subjective experience. In this series happiness lives in melancholy, dreaming, playing, surreal moments, and even in everyday routines.



*“There are things known and there are things unknown, and in between are the doors of perception.”
Aldous Huxley*

2.2 MECHANISMS OF JOY



There is no definite answer to how joy is kindled, but there are ways to stimulate positive emotions. This exhibition concept has three main paths to affect people's feelings: senses of sight and hearing, and the sense of humour.

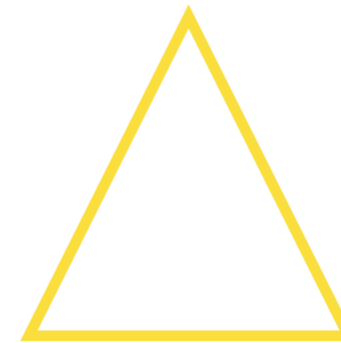
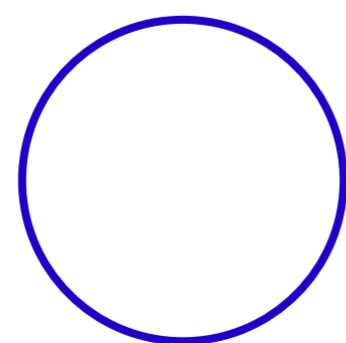
Colors & emotions

Through the sense of sight color is the element with the strongest impact on our emotions. For instance, color can express mood, atmosphere, light, symbol, movement. According to Kandinsky (1977, 23–25.) color has a spiritual power that directly influences the soul. The choice of colors in this exhibition is strongly based on the color theory of Kandinsky.

Different colors have different spirits: lighter shades of red express joy and energy, while yellow can be exciting, disturbing and lunatic (ibid., 38–49). Each color has four shades of appeal – light and warm or light and cold, or



dark and warm or dark and cold. For example, one shade of red can be associated with blood and disgust, and another one with warmth and excitement. (ibid., 23–25.) The spiritual effect of color depends on both the form of it and the combination of colors. However, not all the colors can be universally defined.



The color theory of Kandinsky as simplified:

Yellow = Joy, Sun, Earthy color, Movement outwards, Sometimes disturbing and aggressive, Madness & lunacy

Orange = Joy, Convinced of its powers

Light warm red = Joy, Strength, Vigour, Triumph

Red (vermillion) = Joy, Glowing, Passion, Maturity

Cool red = The cooler the red is the less active it is, A cold light red is bodily and pure

Violet = Color of mourning

Brown = Unemotional, Disinclined for movement

Blue = Calmness, Movement inwards, Typical heavenly color, Restfulness

Green = Peaceful, The most restful color, Color of summer

Grey = Motionless, Spiritually similar to green

White = Harmony of silence, Silence with possibilities, Purity

Black = Silence of death, Mute, Grief

(ibid., 27–45.)

2.2 MECHANISMS OF JOY



Music as emotional arouser

The sense of hearing is utilized by music – it has been shown that emotions may be affected through familiar melodies. Hearing music from our past often evokes strong associations and emotional visions of events or episodes of our lives and its role in memory formation has been identified. Therefore it is possible to trigger nostalgic feelings via music. (Jäncke 2008, 4.) Since the invention of radio and recordings a lot of people listen to music from early morning until late evening – it can be used for uplifting the mood and recreation, for instance (ibid., 1). Through music it is possible to travel in time to moments and emotional states in the past or make imaginative journeys to the future.

Humor and generational experience

Humor often walks hand to hand with generational experiences. The members of the generations from Y to Z, like me, amuse themselves and each other with internet memes, funny face apps and instagram filters. Memes and generational humor can imitate or parody pop culture, history and politics, for instance (Shifman 2014, 4). Also, they can be used as a tool for coping with them. As Kraft and Pressman (2012) show, even a fake smile can relieve stress and lead to a genuine one. One can always find ways to amuse oneself even during the toughest of times. If everything else is taken away, we at least have our sense of humor and imagination.

Internet meme:

- (A) a group of digital items sharing common characteristics of content, form, and/or stance, which
- (B) were created with awareness of each other, and
- (C) were circulated, imitated, and/or transformed via the Internet by many users.

(Shifman 2014, 41).





7 VISUAL PROCESS

3.1

Benchmarking

This part gives a closer examination into the role models of HARHAHAHA, including science museums and amusement parks, and interactive exhibitions with elements of the two above. Vibrant color palette, playfulness, interactive mechanisms and optical tricks seen in the installations of HARHAHAHA have been strongly influenced by the following examples.

SCIENCE CENTERS

Modern science centers are devoted primarily to science, but they also emphasize technology more and more. The interactive exhibitions in science centers feed the excitement of discovery and encourage the inner child to step out. Science museums are popular among both adults and children and often provide opportunities for visitors to interact via demonstration models and touch screens (Lewis 2020).

For inspiration, I visited two museums in Warsaw: Copernicus Science Center and Cosmos Museum, a museum of illusions and contemporary art. Both museums exhibit numerous installations and elements which are familiar from Heureka Science Center and Vekkula in Helsinki. The main exhibition in Copernicus Science Center, The Experimental Zone, is dedicated to experiments, experiences and exploring with over 200 exhibits (Kopernik 2021). Cosmos, with over 50 exhibits, is presenting illusions, interactive and digital art (Cosmos 2021).

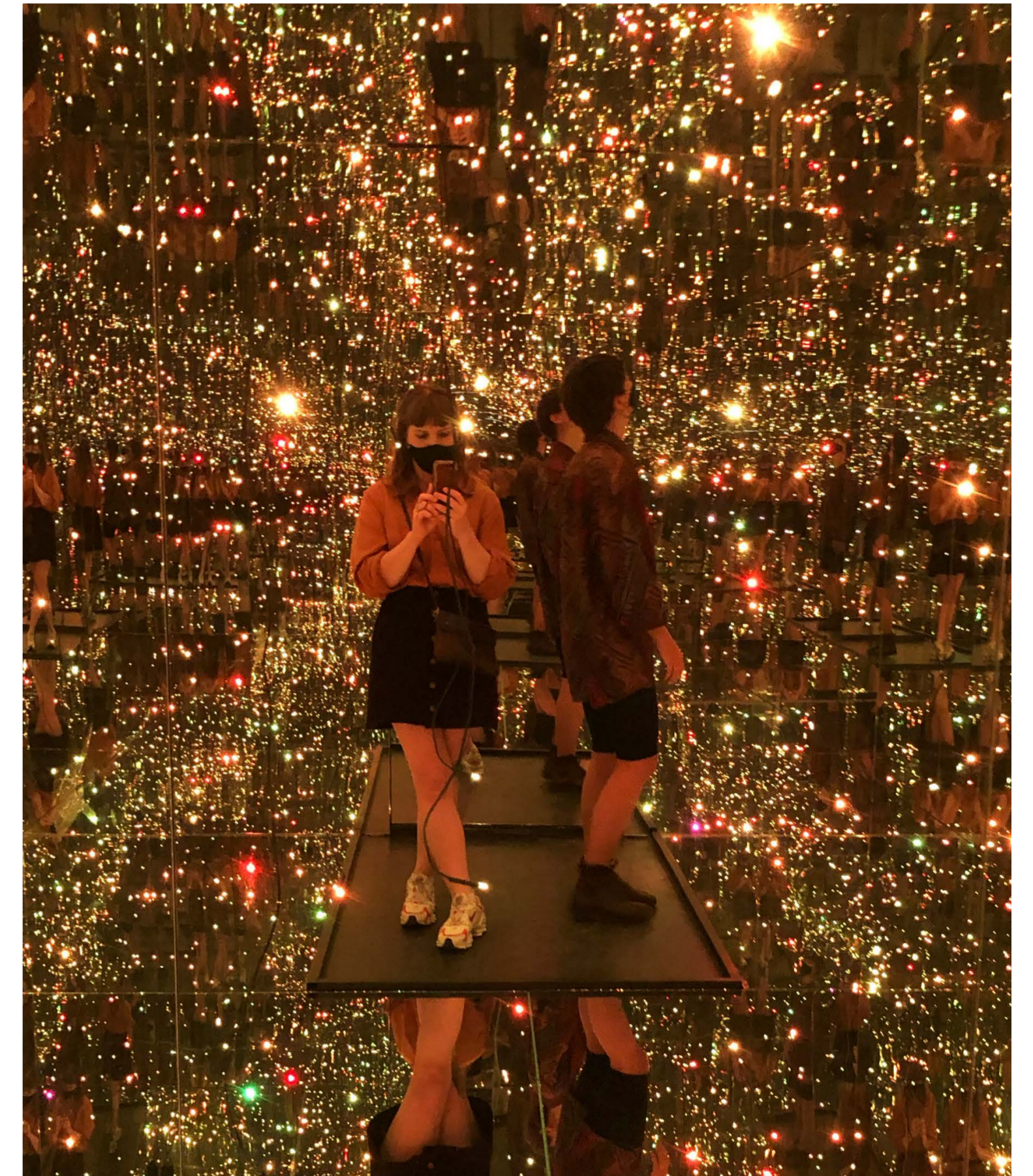
The most common recurring elements in these locations are various mirror installations playing with optics, forms and lights. These installations often require the visitor to interact either with the space, an object or another person. This way the visitor can be part of the installation, the missing element that completes the work. Visitors are able to investigate and make mistakes.



PICTURE 1. Optical apparatus flips the vision upside down. Cosmos Muzeum. (Kurki 2020)



PICTURE 2. Mirror installation at Cosmos Muzeum encourages people to interact. (Kurki 2020)



PICTURE 3. In Cosmos Muzeum, a small room is covered from floor to ceiling with mirrors and light strips, which creates an illusion of infinity. (Kurki 2020)

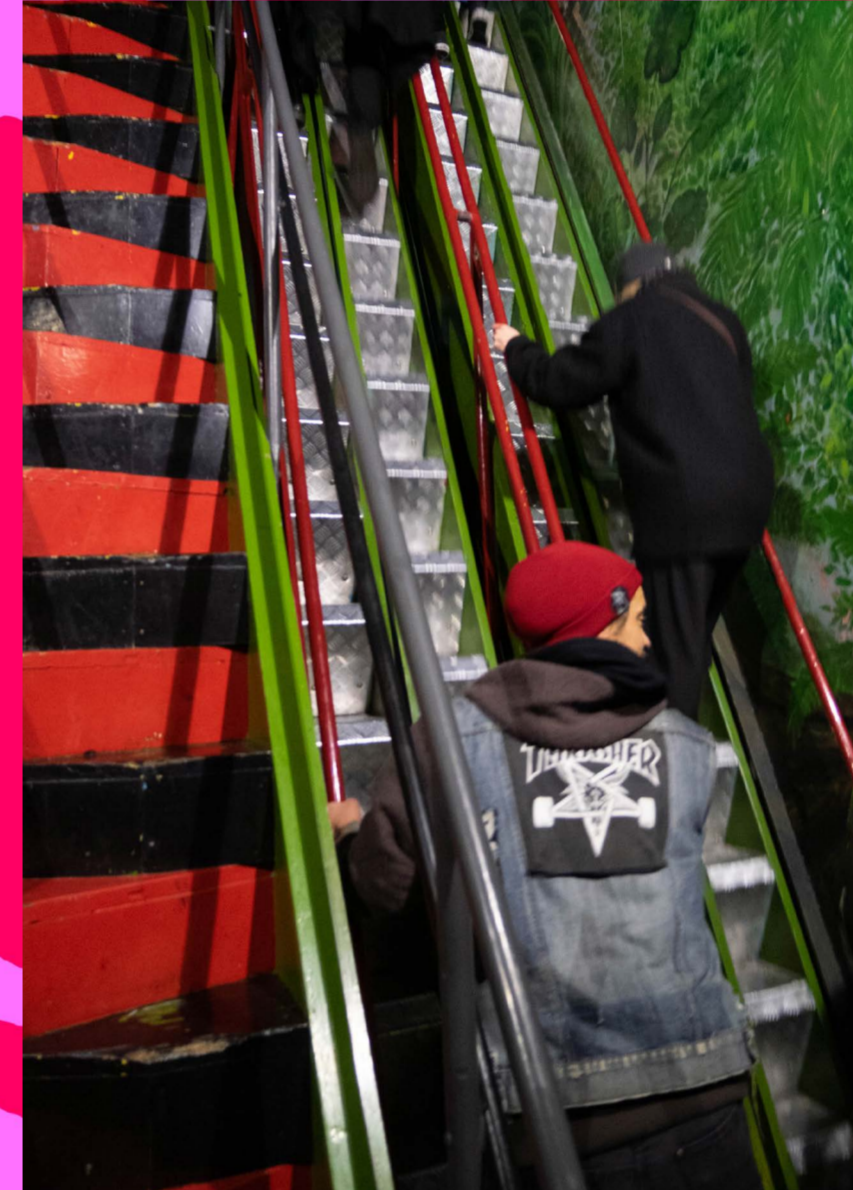
V e k k u l a

Vekkula was a funhouse located in Linnanmäki amusement park, Helsinki, operating from 1961 to 2017. Vekkula was a walk-through facility with various devices, including for example moving stairs (Picture 5.), mirror maze (Picture 7.) and a psychedelic tunnel with rotating walls. Many of the gadgets of Vekkula played with laws of physics, vision and optical illusions. Inside the funhouse it was possible to walk back and forth, explore, enjoy and play without thinking about the passage of time.

Bright and fluorescent colors, kinetic rooms, oblique walls and floors and mirror labyrinths were memorable and frequent elements in Vekkula. The house was fun and challenging – many of the rooms inside Vekkula had functions which provided visitors an opportunity to test their problem-solving ability in order to pass through. If it was too easy, it wouldn't have been fun. To complete the mystical atmosphere the rooms were often filled with moody and atmospheric background music.



PICTURE 4. A spiral patterned room rotating around a pillar created a wild and dizzy illusion in Vekkula. The photo was taken during the last week Vekkula was open in 2017.



PICTURE 5. Moving stairs were one of the most popular devices in Vekkula. The stairs were divided from the middle and the halves were moving back and forth in different directions. They were the last challenge inside the fun house before exiting through the slide. (2017)



PICTURE 6. A room with oblique floor and walls inside Vekkula was painted with fluorescent colors. In this room the sense of balance went completely awry. (Finnkino 2018)



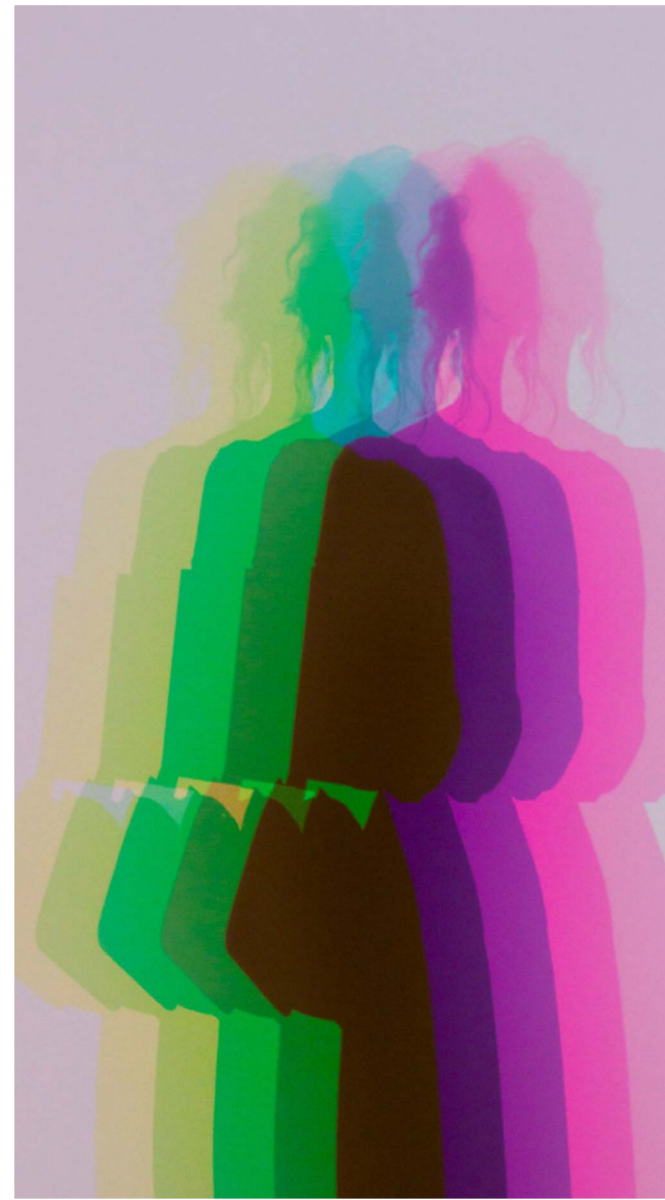
PICTURE 7. A mystical, jingling soundtrack was playing inside a mirror labyrinth in Vekkula. (Finnkino 2018)

OLAFUR ELIASSON

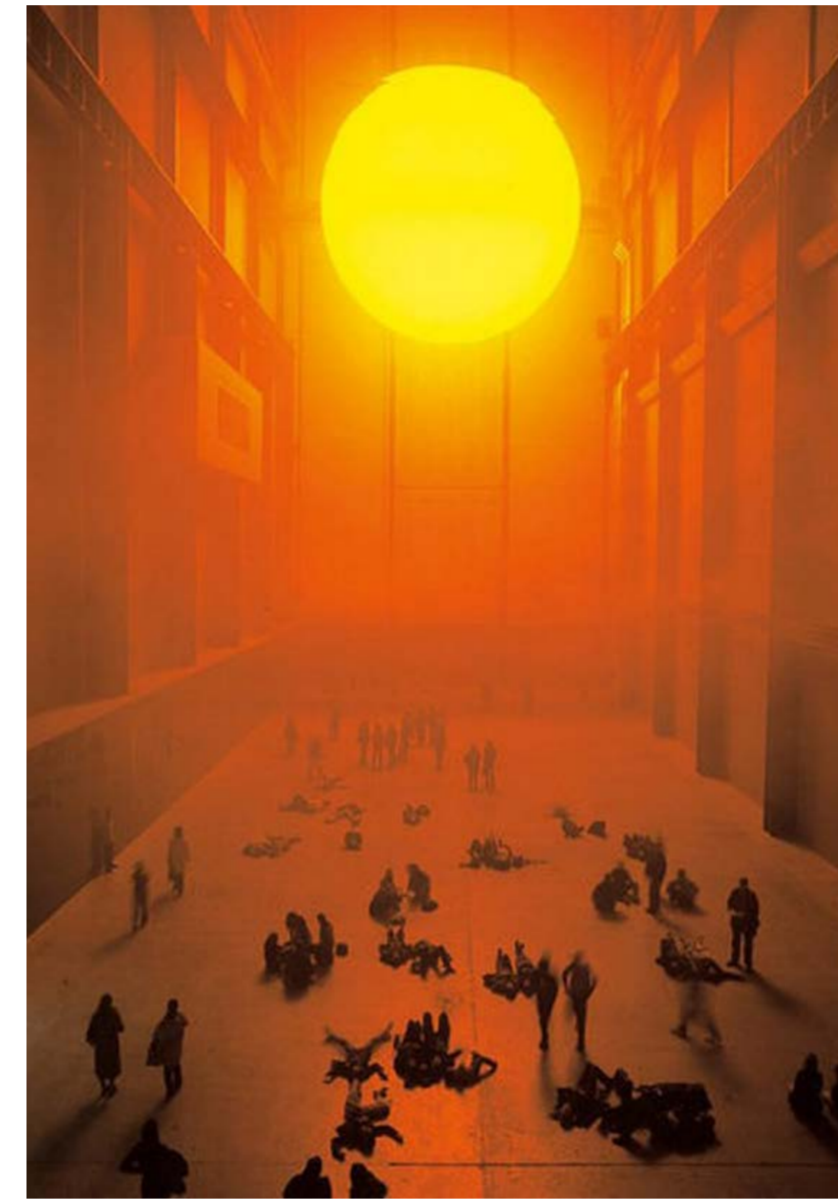
For this project, one of the most significant sources of inspiration from the field of art has been Olafur Eliasson, a Danish-Icelandic sculpture and installation artist. He is known for his experimental, large-scale installations that create unreal atmospheres. The four elements of weather: temperature, light, pressure and water are often present in his works, and they mirror the intense colors of the visible spectrum. The presence of nature and life is strongly perceptible in his approach towards making art, and many of his works take a stand on, among other things, global warming.

The power of his works is best seen in the large installations in which one can step inside, into another dimension. The works of Eliasson encourage people to explore their relationship with their surroundings, both physically and mentally. In his works Eliasson frequently operates with optics, colors and mirrors.

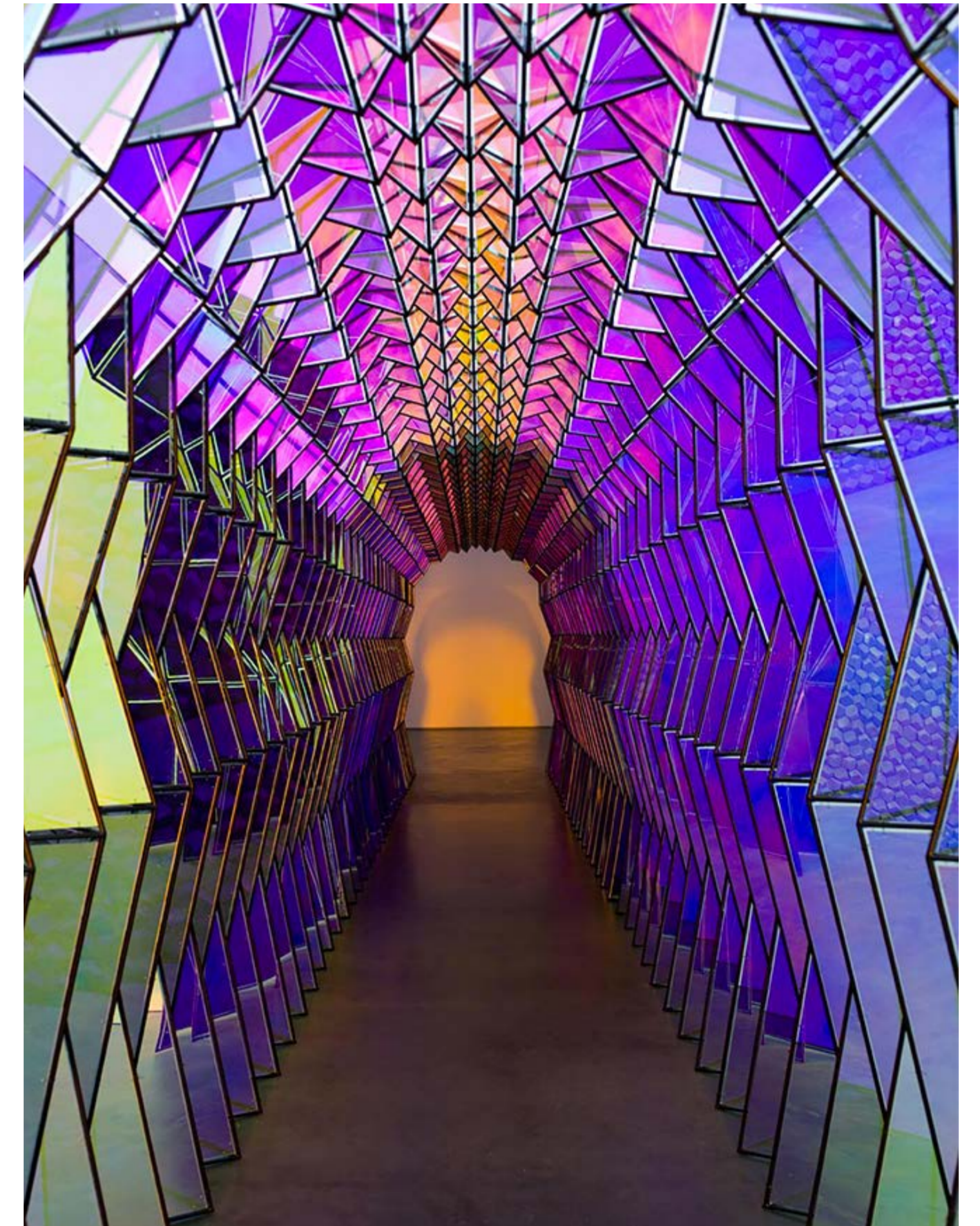
To me, the works of Eliasson have always felt magical, some of them even impossible to exist. His use of colors, and the ability to create mystical atmospheres and huge kaleidoscopes his team has built have inspired me a lot. Each of his exhibitions is most probably an experience not to be forgotten.



PICTURE 8. Lights and shadows in rainbow colors are commonly seen element in Eliasson's art. The visual trick in *Your uncertain shadow (colour)*, 2010 comes alive with movement. The installation lures people to dance. (Saner 2020)



PICTURE 9. *The Weather Project*, 2003, was Eliasson's experiment aimed at recreating the sun, to give an illusion being close to it. The huge installation, that occupied the 26 meters high Turbine Hall in Tate Modern, was implemented by using monofrequency lights, projection foil, haze machines, mirror foil, aluminium, and scaffolding. A morning sun rising from the soft mist. (Tate Photography 2003)



PICTURE 10. Acrylic and acrylic mirrors shine and reflect light in multicolor spectrum depending on the position of the viewer. *One-Way-Colour-Tunnel* is an enormous walk-through installation that seems to be constantly changing while passing by. The angular mirrors make the work resemble a large kaleidoscope – kaleidoscopes are also part of Eliasson's repertoire. (Reeves 2007)

Avantgardevekkula

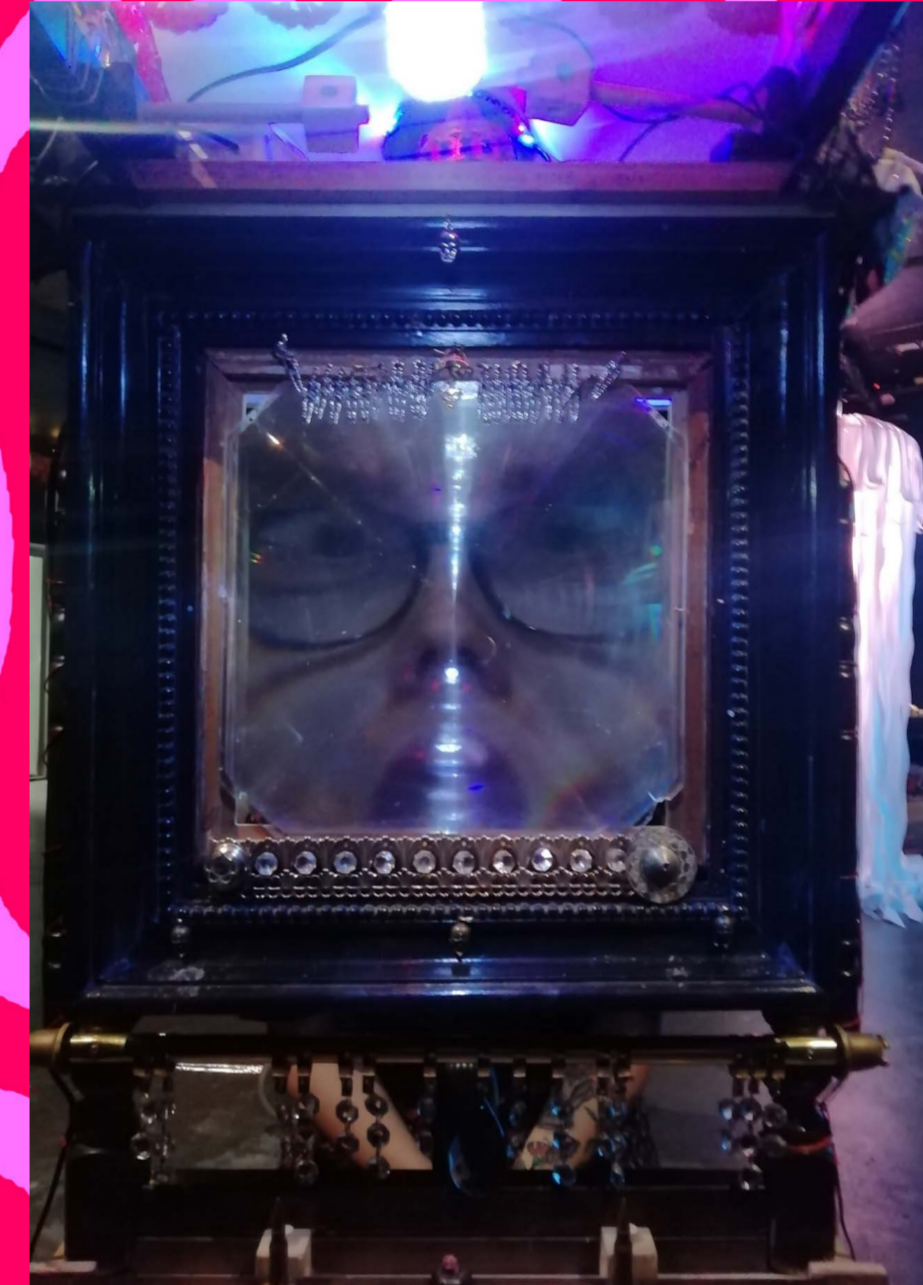
Another inspiring example is Avantgardevekkula, a DIY-spirited concept exhibition which comprises frisky installations, performances, kinetic sculptures and sound. The grip of the exhibitions, curated by the artist Tuomo Vuoteenoma, is playful, a bit punk and hand-made.

Vuoteenoma has selected works that make the audience wonder what it all is about – the purpose of the works is to get the viewer to think whether the idea presented is true or not (Mankkinen 2020). For four years Avantgardevekkula has brought together artists working in various fields of arts and culture (Vuoteenoma 2020).

The bold and raw visual appeal engaged my attention in the works of Avantgardevekkula – the artists are using found materials in imaginative ways and are often leaving the mechanics of kinetic pieces visible.



PICTURE 11. Installation made by Harri Vähänissi & Maippi Ketola (Vuoteenoma 2020)



PICTURE 12. Installation made by Harri Vähänissi & Maippi Ketola (Vuoteenoma 2020)



PICTURE 13. An interesting mechanical robot wolf, by artists Pekka & Teija Isorättä: *Mekaaninen susi*, 2018. *Sekatekniikka*. (Vuoteenoma 2019)



PICTURE 14. Kinetic installation, *First of a Species*, by Tuomo Vuoteenoma. (Vuoteenoma 2019)

3.2 TECHNIQUES



The artworks of HARHAHAHA are a mixture of traditional and modern methods, crossing the boundaries in the fields of art. The process consists of multiple techniques including e.g. photography, serigraphy, electronics and intermedia.

The script of the exhibition is written by analog photographs shot in Poland. The photographs were scanned and converted to bitmap images after retouching. For maintaining the analog touch but dissolving the feeling of reality, the chosen techniques for the printworks are screen printing and digital screen printing¹.

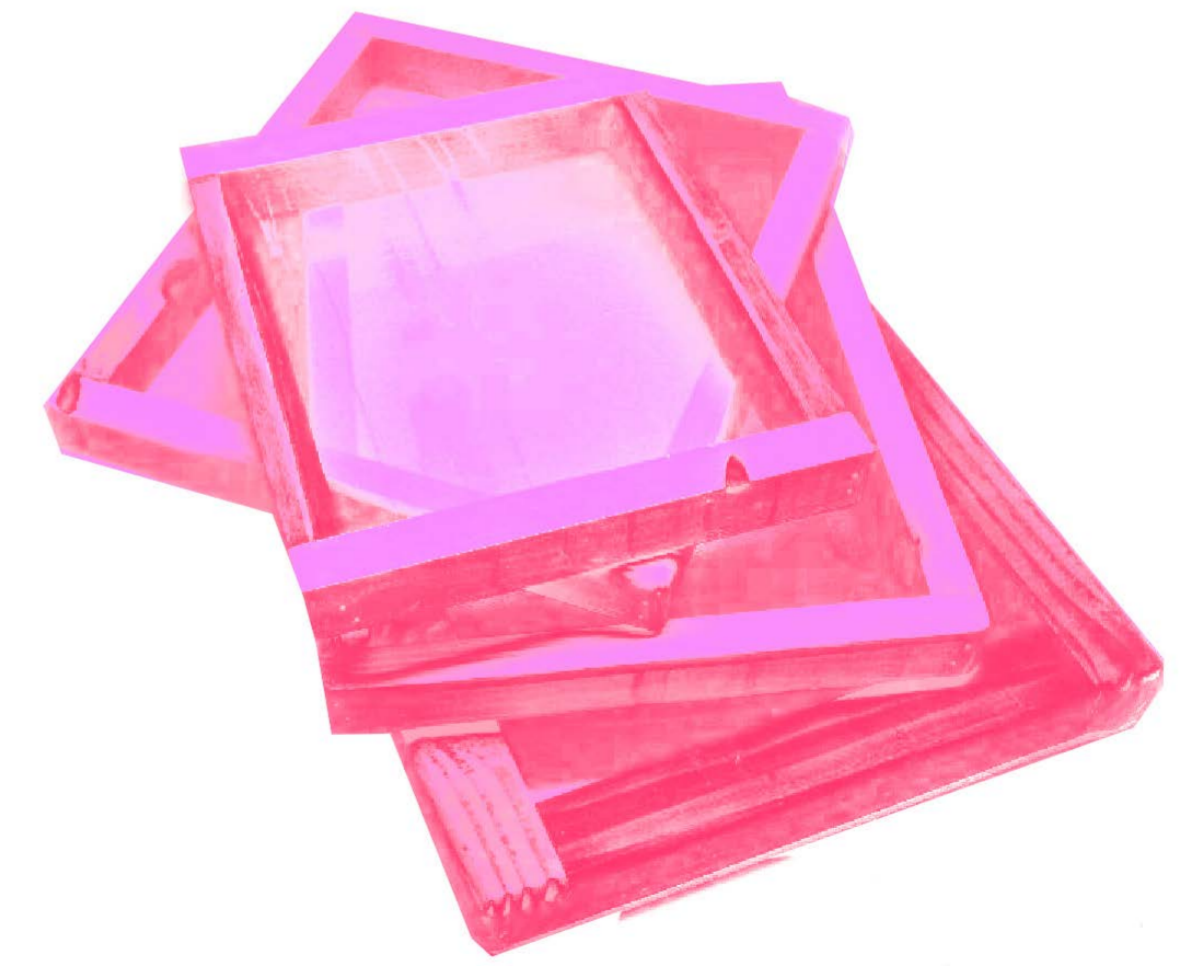
As one of the aims of the exhibition is to surprise, it is also an element that goes along with the manual printing process. In serigraphy, the end result does not always match what the plan was like, but that is what makes it

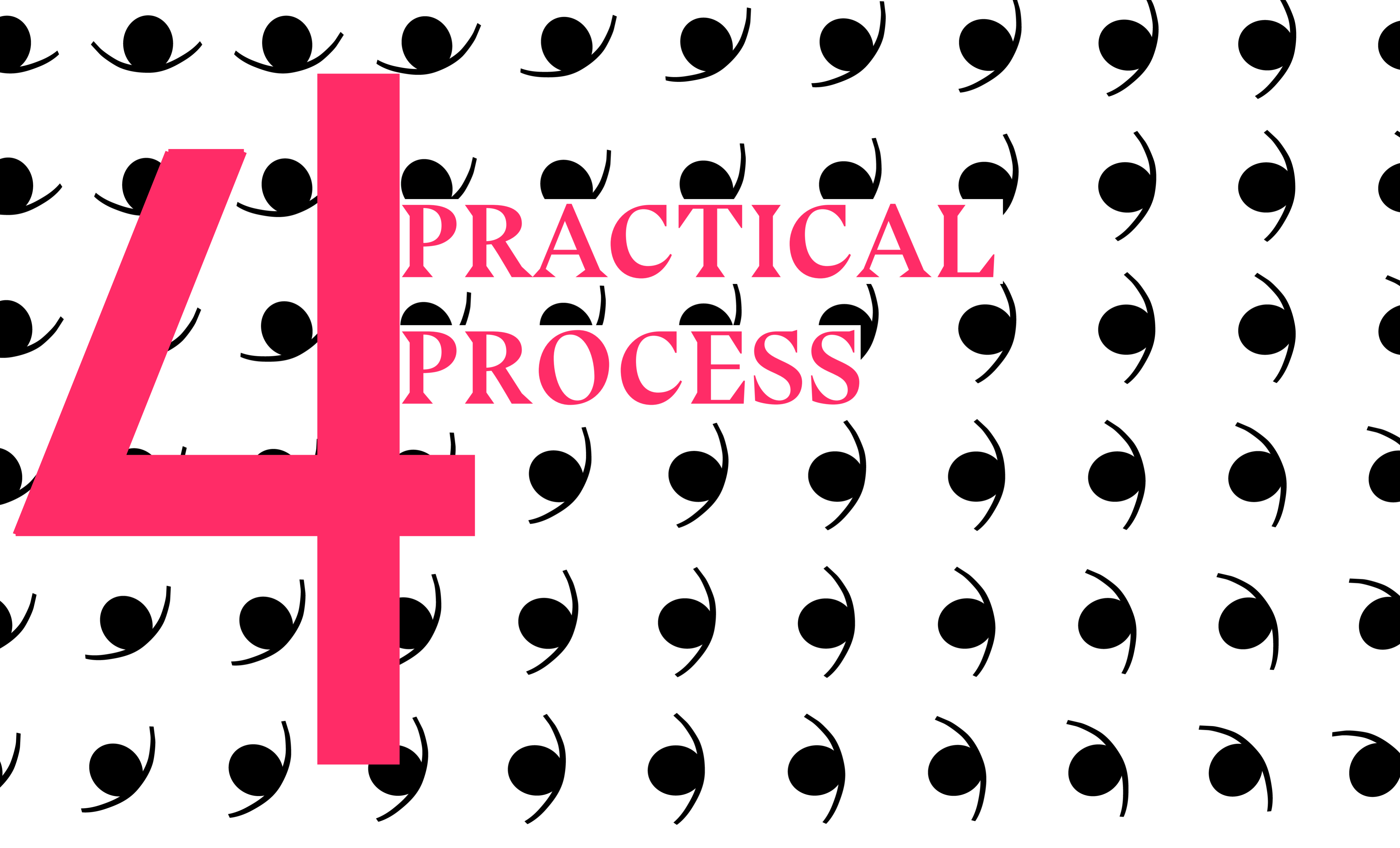
interesting to me. Mistakes are common, and sometimes they surprise in a beautiful way.

The goal of the artworks is to offer people small journeys into moments that can feel familiar and into something that cannot be described, into dream-like worlds. To obtain this, along with the psychological impact of colors, HARHAHAHA uses optical illusions. Objects that seem to be familiar form surreal illusions when repeated and/or removed from their natural habitat or coloration. There's always space for imagination.

The artworks will take their final form in the exhibition space when they're built as installations. The printworks will be combined together with electronic devices, such as sensors, motors, speaker and micro controllers, as well as mirrors and everyday objects, which I will explain more in Chapter 5.

'Digital screen printing resembles manual screen printing; it's a fast and affordable technique in which design is transferred straight from computer to the printer, without need to prepare the screen manually. It allows printing on various materials, like fabrics and plastics. The printer is using a primer and water-based CMYK inks. It is a very economical way to print a single product to order. (Blandino 2018.)





4

PRACTICAL
PROCESS

4.1 Experimenting with electronics

I started the practical process with the part that was still a mystery to me: the world of electronic devices. Before planning the installations further I wanted to find out what is possible for me to implement. This part is about the process of electronic experiments with conductive ink, Arduino¹, servo motor² and audio. These experiments have essentially determined the direction of the project.

¹Arduino is a micro controller platform, which allows you to connect electronics through its pins. With Arduino it is possible to control electronic devices such as lights, sensors and motors. (Monk 2016, 8.)

²A servo motor is an electrical device which can push or rotate an object with great precision. (Circuit Digest 2017.)

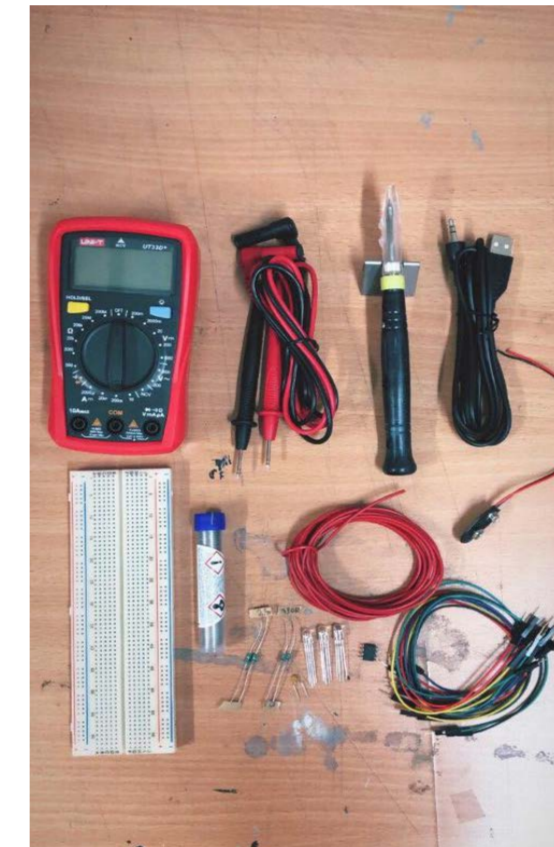
³A schematic, or schematic diagram, is used to describe the connections between the components in an electric circuit.

Touch sensitive circuit and conductive ink

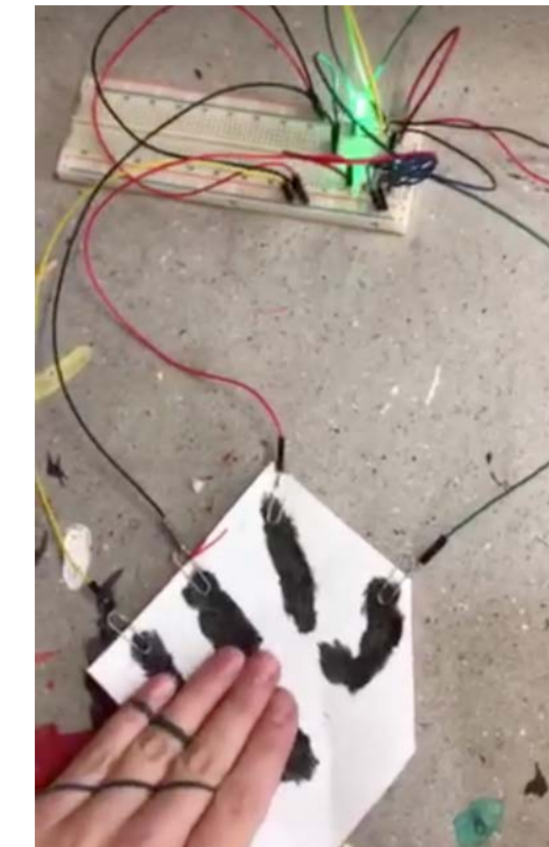
The first mission was to build a touch sensitive circuit that would work together with conductive ink – ink, that would work as a touch sensor. The process started with searching for a suitable schematic³ for connecting the needed components and assembling a prototype of the circuit.

After the built device was working properly, the next step was to make the conductive ink. It would be possible to buy conductive paint from Bare Conductive, but since it is slightly expensive I wanted to find a more economical way to make it.

Experiments were made with various powders that conduct electricity – materials that could be mixed with the water-based ink used in serigraphy. Out of graphite, charcoal, salt, copper and iron the graphite was the ultimate winner.



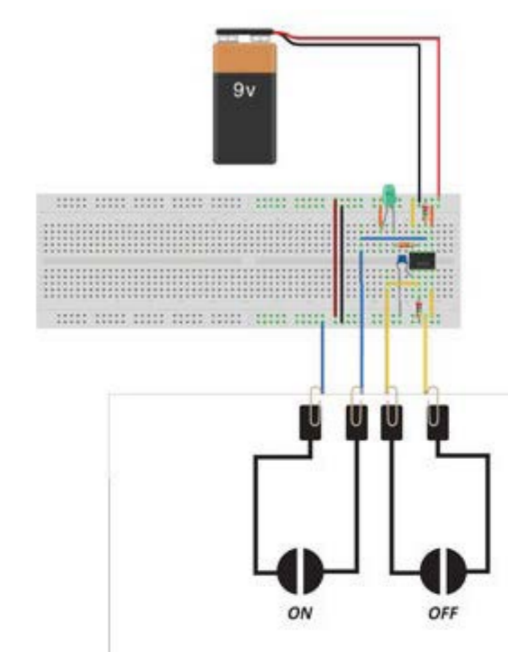
PICTURE 15. All the needed tools for assembling a simple touch sensitive circuit. Soldering iron and voltmeter are important tools to get started with. (Kurki 2020)



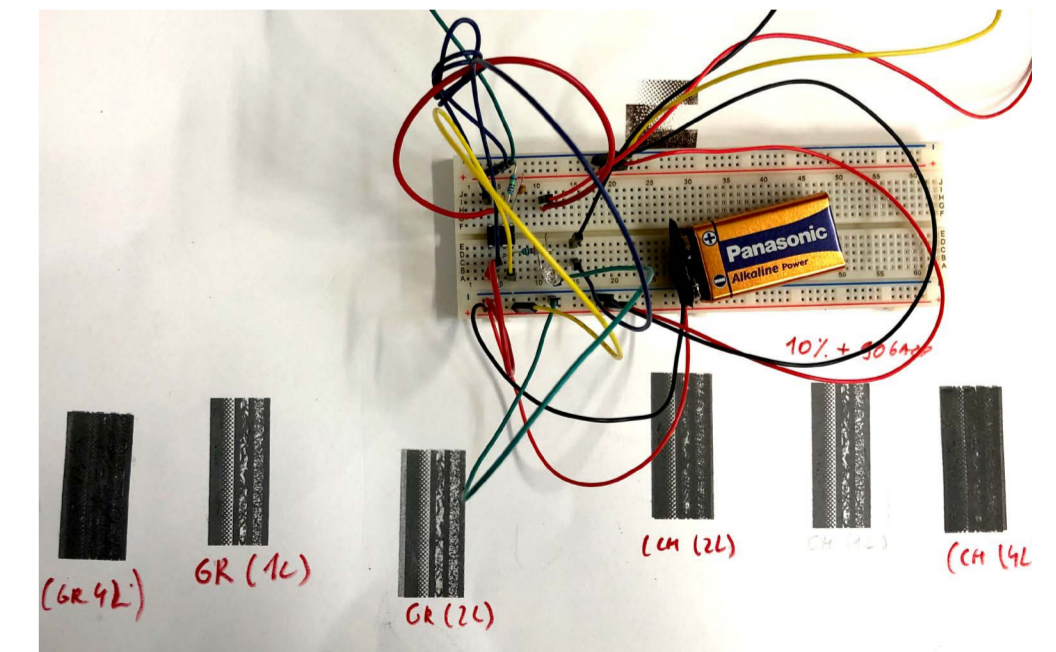
PICTURE 16. The first prototype was tested by lighting up a LED light with self-mixed ink containing graphite powder. (Kurki 2020)



PICTURE 17. One of the tested ingredients for conductive ink was salt. (Kurki 2020)



PICTURE 18. Schematic is a visual instruction for assembling electronic circuits. This one is for the touch sensitive circuit. (Kurki 2020)



PICTURE 19. The practical research process with conductive materials included silk screen test prints to see how the amount of printed layers and percentage of ingredients mixed in the ink affects the conductivity. The picture shows a comparison graphite and carbon. (Kurki 2020)



However, the biggest disadvantage with graphite is its dark color – the ink will be black. For solving this problem it was important to find out if the touch sensitivity is still maintained when there are several coats of ink on top of the graphite layer. Fortunately, the sensitivity was unchanged after applying one layer of white and one layer of colored ink.

The experiments showed that it will be possible to screen print graphics that will work as touch sensitive sensors. Also, it is possible to use the built touch sensitive circuit with other electrically conductive materials instead of ink, such as metal.

Arduino + servo motor

The next challenge was to combine the touch sensitive circuit with a motor, since some of the installations include rotating movement. The chosen method was to use an Arduino together with a servo motor, which is a simple electronic motor that rotates objects with a great precision and is controlled with an electric signal. Arduino works as a controller.

To determine which commands Arduino is giving for the servo motor, Arduino needs to be commanded too. Arduino reads its commands from a code uploaded in it, a sketch⁴. In the code it is defined what servo motor is supposed to do. The Arduino desktop program has

some built-in example sketches for free use. Also, it is common for the user community to share knowledge, practical details and advices about projects they have implemented, including codes.

However, for this particular project, with touch sensitive circuit and servo motor, there was no ready made sketch to be found online – but by combining a few different codes written for nearly similar purposes it was possible to achieve the desired functions.

For assembling the physical prototype it was only partly possible to utilize the structure already made for the touch sensitive circuit. Changes and additions were mandatory, since new devices were brought in,. Luckily, combining few different schematics in order to understand how to connect the components was much easier than reading and fixing Arduino codes.

After reaching the point where the built prototype was working as expected, I was able control the servo motor to rotate light-weight objects smoothly to either one direction or back and forth, at quite high speed. It is possible to define whether servo motor will run repeatedly or just some rounds. With the built prototype, Arduino and servo motor can be connected to the touch sensitive circuit together with the serigraphy prints that were made with ink containing graphite. The motor can be turned on by touching the print with bare hand.

⁴A sketch is the name that Arduino uses for a program. It's the unit of code that is uploaded to and run on an Arduino board. (Arduino, 2021.)



PICTURES 20. & 21. Testing the prototype with Arduino & servo motor. (Kurki 2020)

```
SERVO_paalle_kosketuksesta
/* Servo motor with Arduino example code. Position and sweep. More info: https://www.makerguides.com/ */

// Include the servo library:
#include <Servo.h>
#include <CapacitiveSensor.h>

// capacitive sensing constant
CapacitiveSensor Sensor48 = CapacitiveSensor(4,8); // 1M resistor between pins 4 & 8, pin 8 is sensor pin

#define servoPin 9
int min = 480;
int max = 2500;
Servo myservo;

// Create a variable to store the servo position:
int angle = 0;

void setup() {
  // Attach the Servo variable to a pin:
  Sensor48.set_CS_Autocal_Millis(0xFFFFFFFF); // turn off autocalibrate on channel 1 - just an example
  Serial.begin(9600);
  pinMode(2, OUTPUT);
  myservo.attach(9);
}

void loop() {
  // put your main code here, to run repeatedly:
  long sensor1 = Sensor48.capacitiveSensor(50);

  Serial.println(sensor1); // print sensor output
  if (sensor1 >= 300)
  {
    digitalWrite(2, HIGH);

    // Sweep from 0 to 180 degrees:
    for (angle = 0; angle <= 90; angle += 1) {
      myservo.write(angle);
      delay(50);
    }

    // And back from 180 to 0 degrees:
    for (angle = 180; angle >= 90; angle -= 1) {
      myservo.write(angle);
      delay(50);
    }
  }
}
```

PICTURE 22. A code snippet from Arduino desktop program (2020)



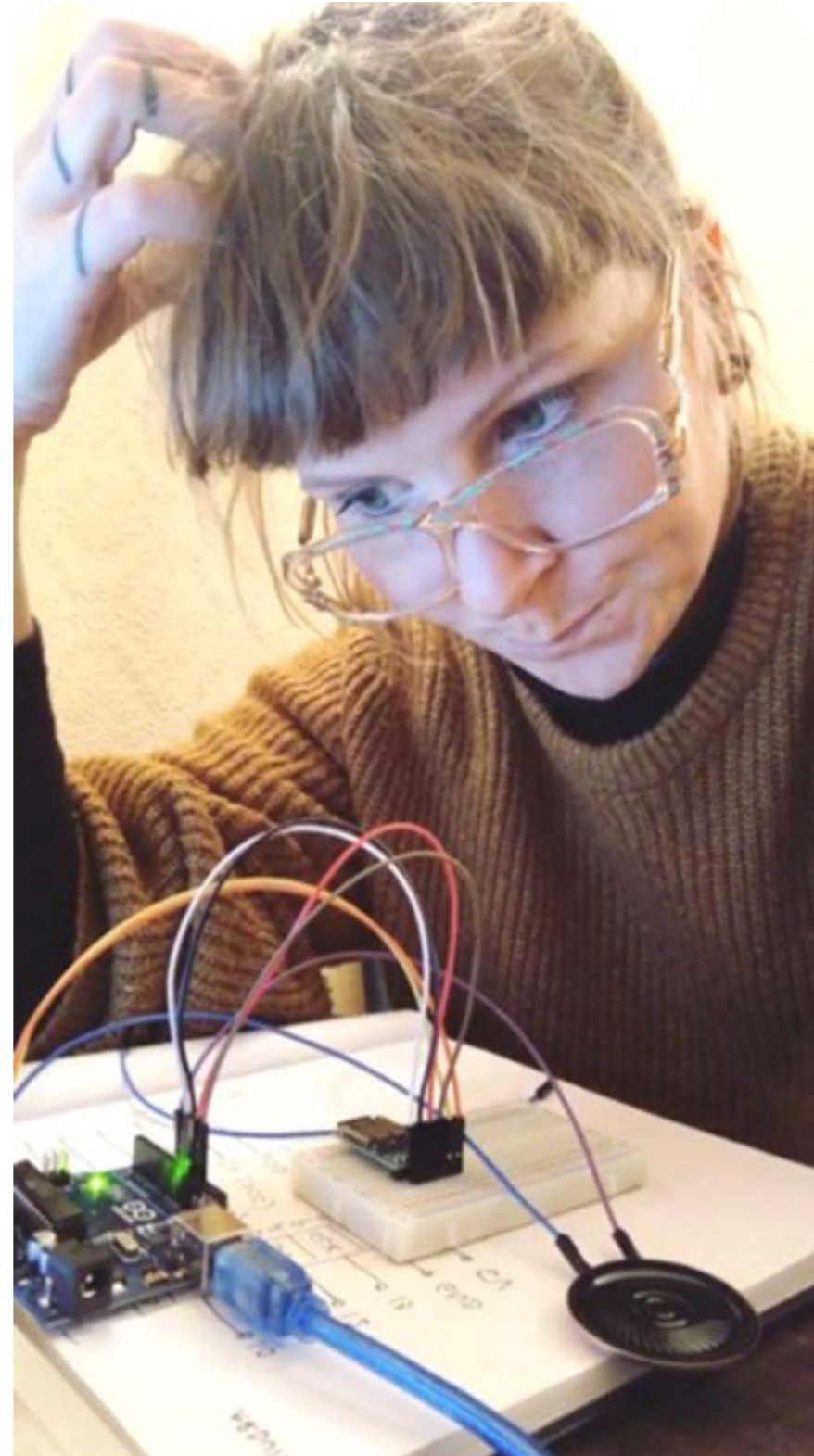
Arduino + audio circuit

One of the installations, *My Personal Time Capsule*, includes audio. To design the functionality of it, the first step was again looking for suitable circuits and sketches, as well as assembling a prototype on a breadboard⁵. The sketch was uploaded to Arduino, which was connected together with the touch sensor and a speaker. The audio file was uploaded into a micro SD card, which was attached to Arduino with a card reader.

The first prototype was built with a simple button speaker. Though, the volume was extremely low – in order to increase the volume, an amplifier circuit would be needed in the structure. In the next attempt the button speaker was replaced with a bluetooth speaker that has an internal amplifier, which worked well. The final construction of the installation will show which will be the most suitable solution as a sound source.

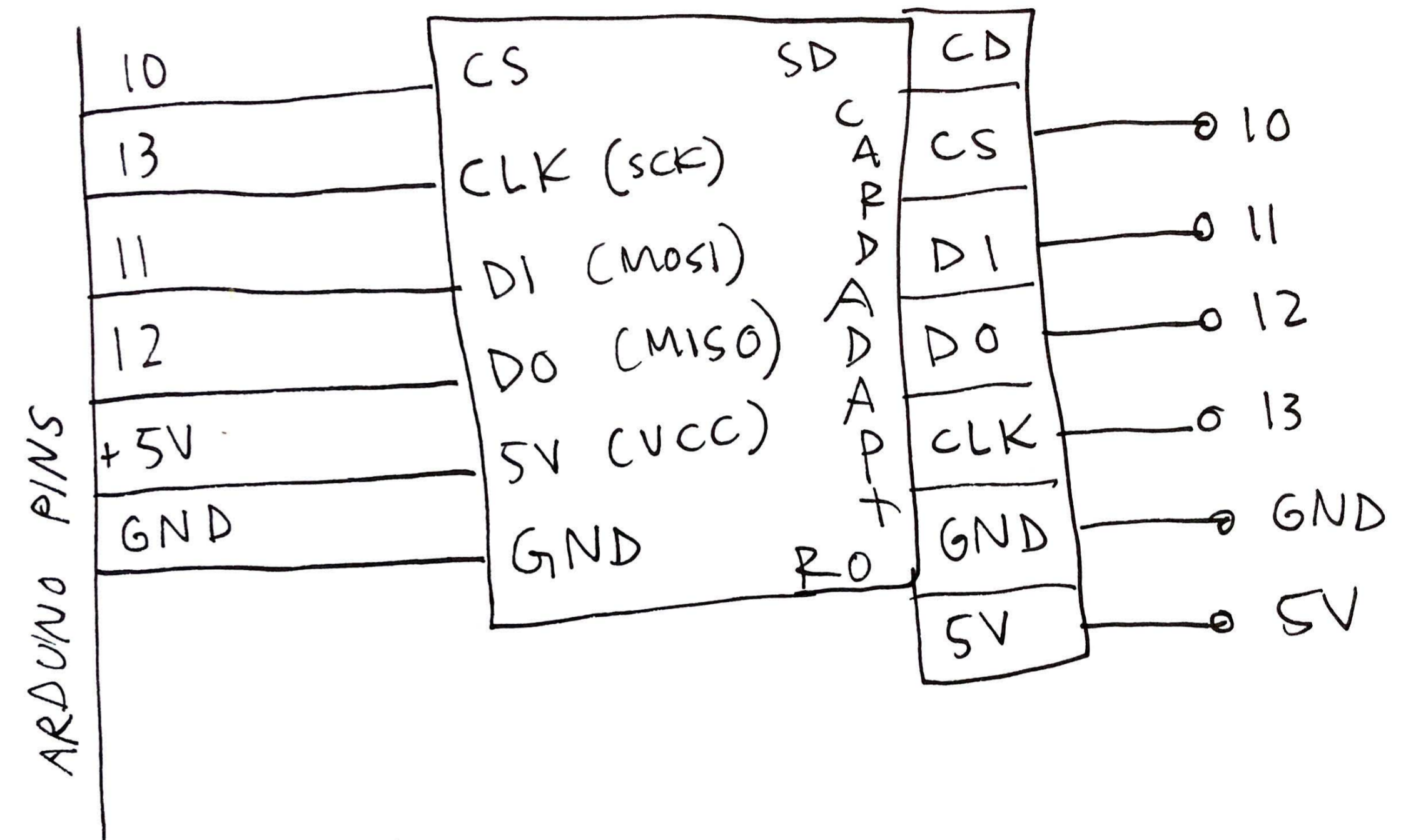
Based on these tests, there are already two different options for using sound with Arduino. The audio circuit can be combined together with the touch sensitive circuit including a sensor.

⁵A breadboard, or protoboard, is a construction base for prototyping of electronics.



PICTURE 23. Trying to figure out why the first attempt is not functioning. The volume of the button speaker was hardly audible. (Kurki 2020)

ARDUINO AUDIO CIRCUIT



PICTURE 24. Notes for connecting wires. (Kurki 2020)



4.2 SCREEN PRINTING

Silk screen printing, or serigraphy, has its origins in the stencil, which is perhaps one of the oldest forms of printing. In screen printing the stencil is affixed to a fine-weave silk stretched to frames, a screen. In addition to screen, the needed basic supplies in serigraphy are squeegee, printing table, stencil material, plastic spatulas, water-based inks, paper and water place for cleaning. (Fick & Grabowski 2009, 55–57.)

The process starts with preparing the stencils, which in this case were made digitally out of the scanned photographs. The photographs were converted into bitmap-images by placing different elements on separate files, each file representing a different color layer.

The bitmap files were printed on transparent plastic film with black ink. The film with the print works as an indirect stencil for the screen.

After the stencil is prepared the screen is coated with light-sensitive liquid emulsion that is exposed to light together with the stencil. This way the image transfers

from the film to the screen. After the exposure the screen is cleaned with water in order to stop the chemical process of the emulsion. The emulsion sticks on the white areas of the exposed image, and the parts that were covered with black during the exposure are left “open”. This way the silk screen lets ink through only the wanted parts.

As a final preparation the margins of the screen are covered with waterproof tape, in order to avoid the ink leaking through the silk screen from the border parts where there is no emulsion.

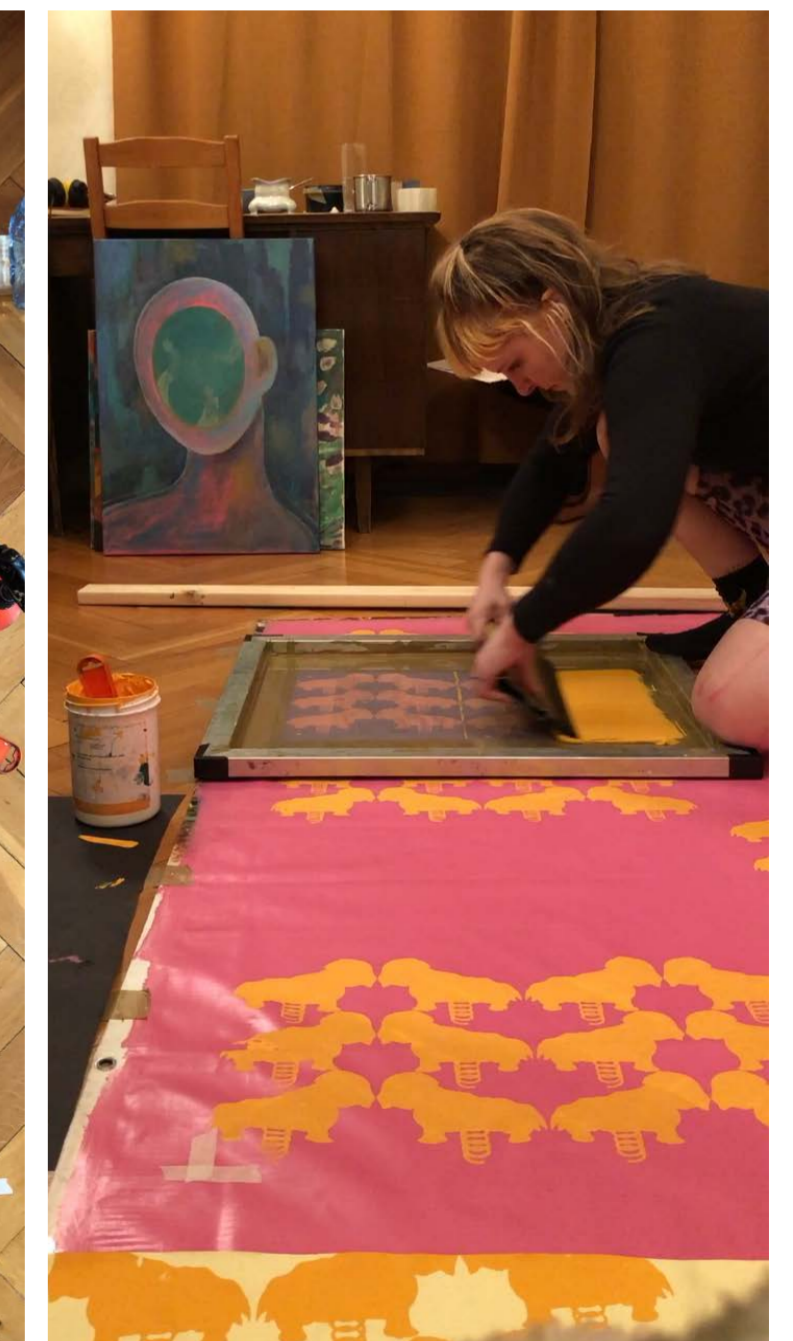
While printing, the ink is applied through the silk screen by using a squeegee. The squeegee pushes the ink through the stencil openings onto the paper.

Each color layer of the artwork needs its own screen prepared. As the works of HARHAHAHA are mostly multicolored with many layers, a plastic sheet attached to a printing table was used for achieving correct registration during the printing process. The registration plastic is a

helpful tool to make sure that the layers align together. However, some of the prints were made free-handed to achieve a more organic result – sometimes mistakes are the salt of the printing process.



PICTURE 25. Silk screen printing tools. (Kurki 2020)



PICTURE 26. Sometimes larger artworks may be easier to print on the floor. (Kurki 2020)



FINAL CONCEPT

In this part the final artworks are introduced together with the installation plans. The color palette leans on the color theory of Kandinsky, which I presented earlier in Chapter 2.2. The concept covers a total of seven installations that can be placed in the actual exhibition space depending on the terms of the space.

HARHAHAHA is open for modifying and expanding – the concept is meant to continue its life in a way that allows the collection of works to grow and change.

My personal time capsule

Serigraphy on paper

Arduino + sensor + speaker

97x67 cm

Time travel to the 90's – flirting with nostalgia.

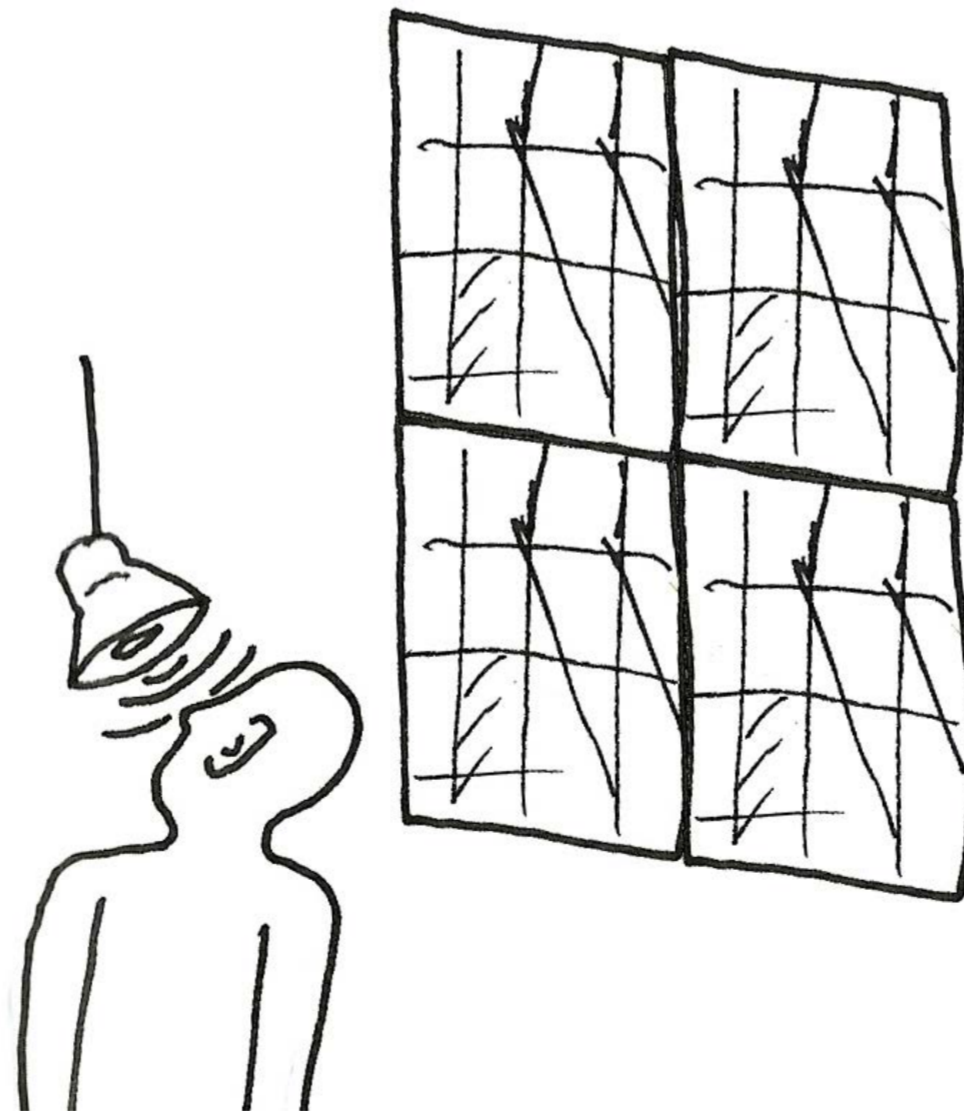
This artwork utilizes music together with a surprise element by combining theme music of Broadcasters television production company, that used to play after many TV programs in the 90's, with colors that strengthen the association of that era. The dark toned theme music, composed by Manne Railo, ends on a woman's hoarse laughter. It has etched in the memories of many Finnish people who watched shows like *Uutisvuoto*, *Kokkisota*, *Far Out* and *Hyvät, pahat ja rumat* from TV during the 90's and early 00's.

The color palette in the 90's was colorful and moody. Different shades of pink, rich blue and yellow were common during that decade. (Juicebox 2020.) The exhibited printwork has the appearance of joy and energy due to yellow and pink, but also the feeling of calmness and silence caused by deep blue and black colors.

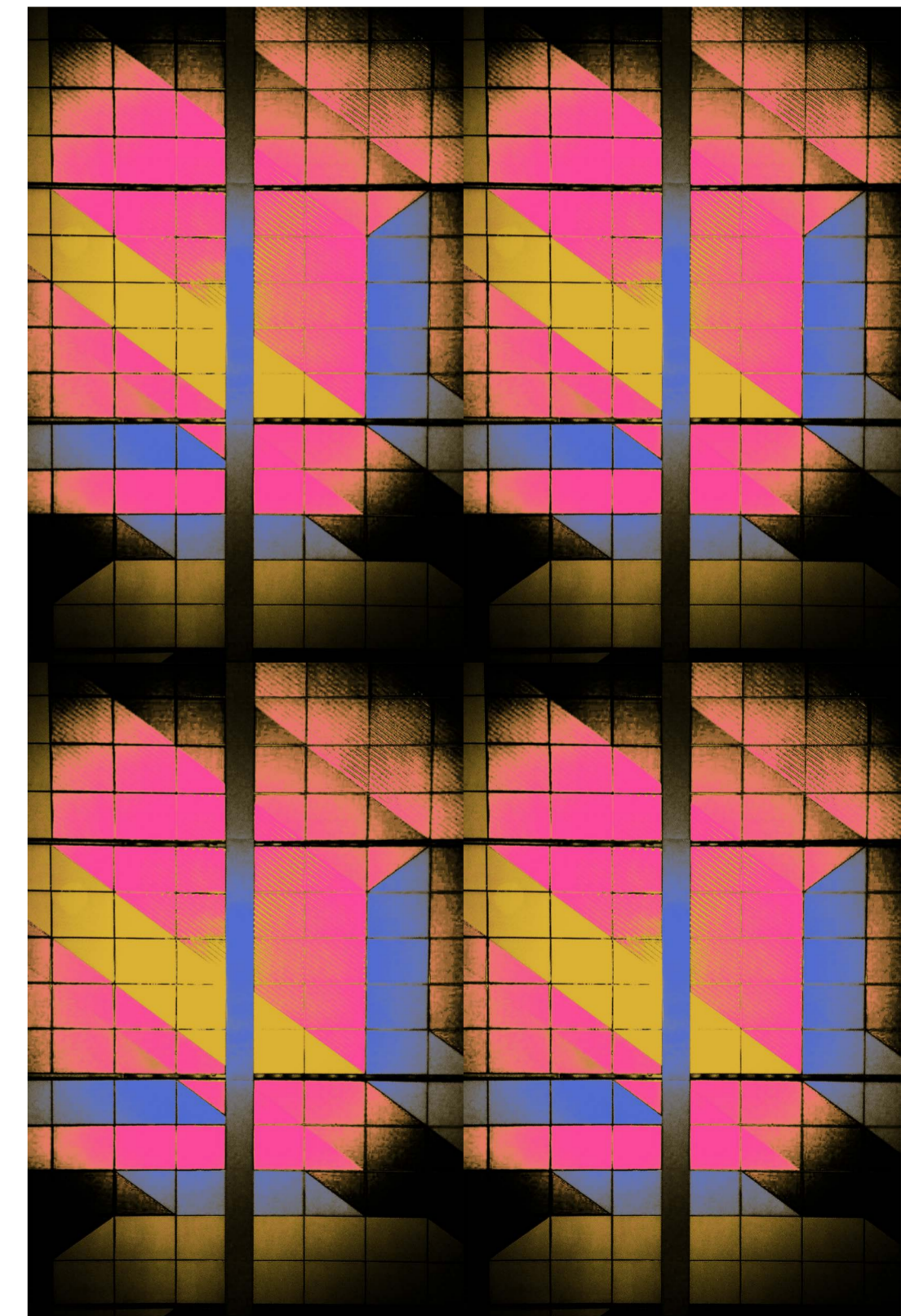
The music of Manne Railo will play only when a person approaches the speaker placed near the printwork.

The speaker has a hidden distance sensor that detects if someone is standing close to it. The sensor and the speaker will be controlled by Arduino.

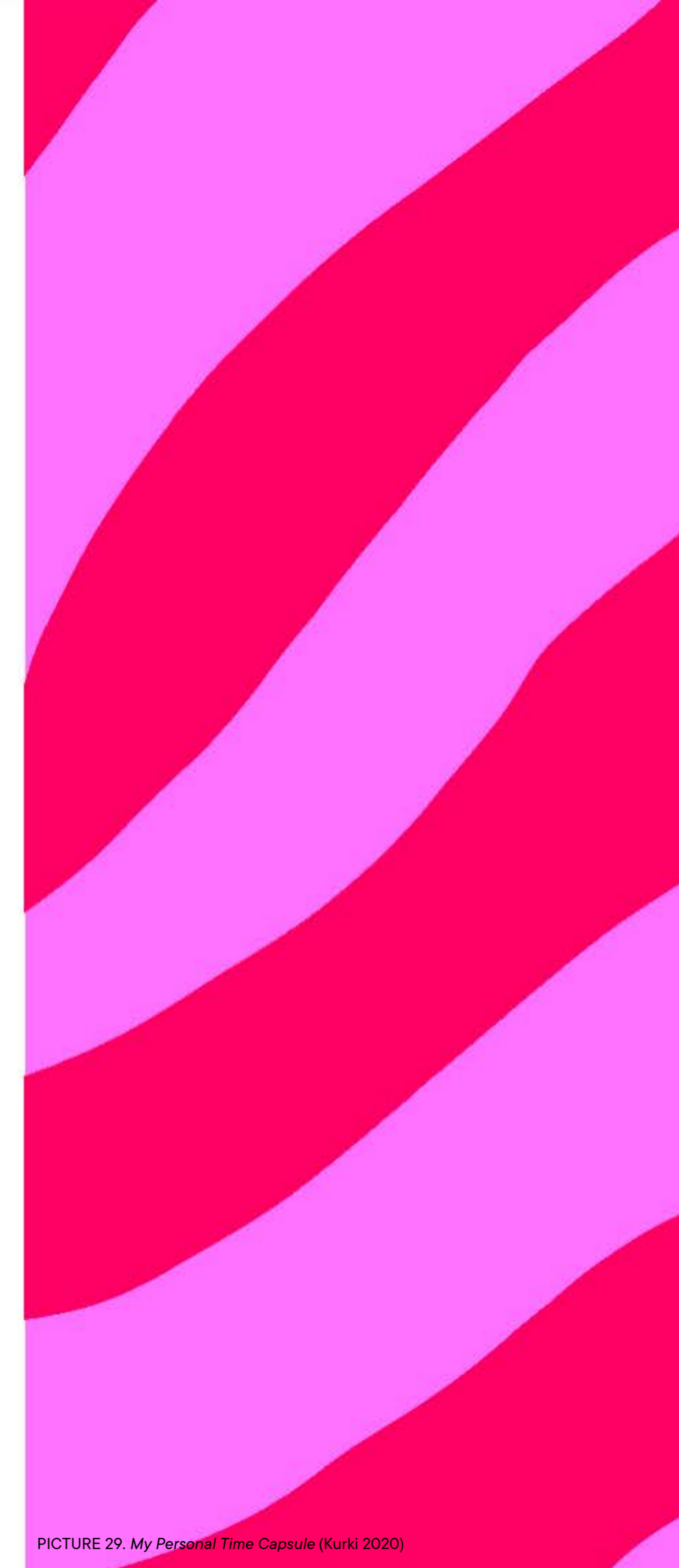
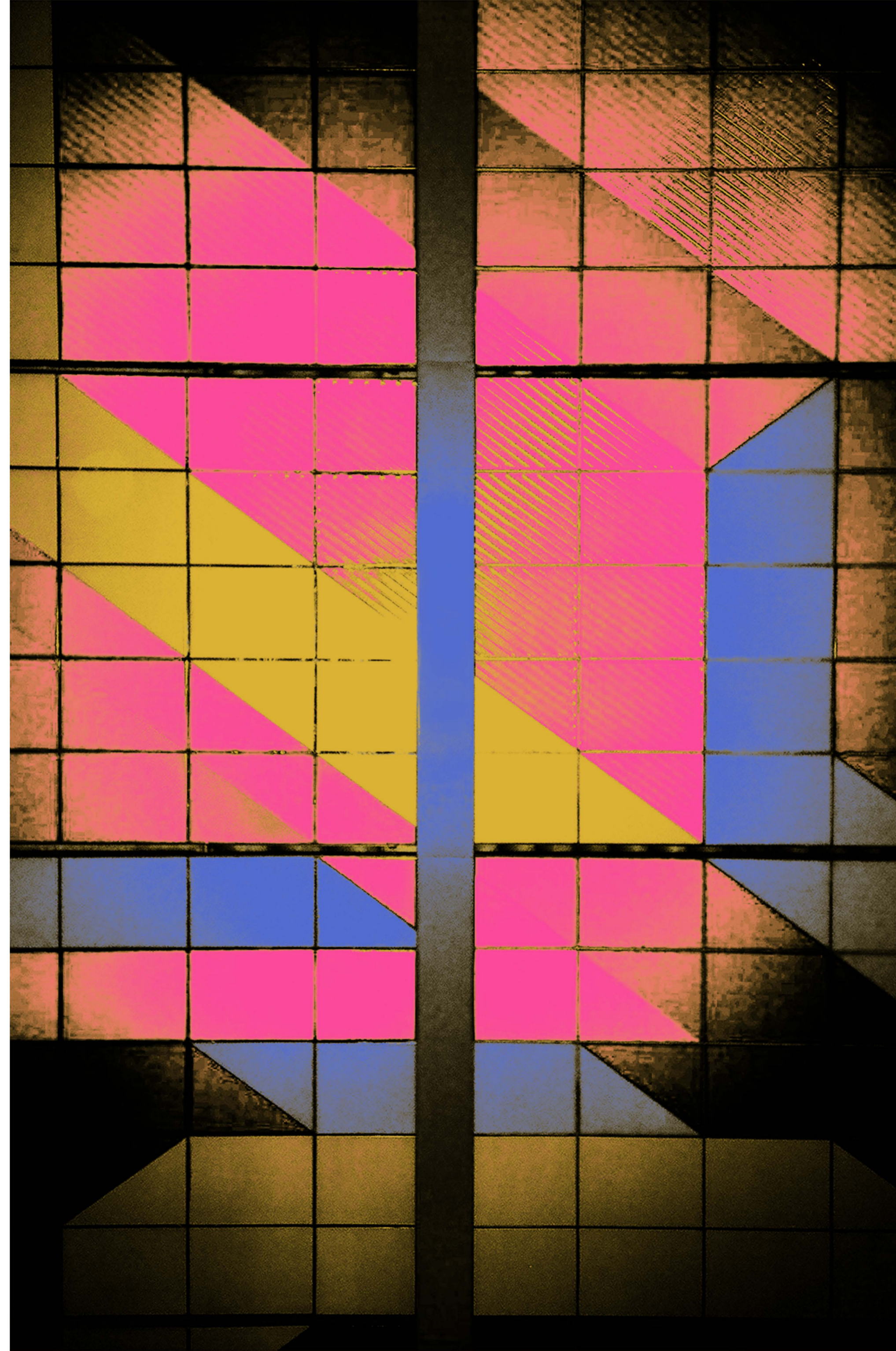
In the exhibition space the image will gain more powerful form when several prints are placed together on the wall, each of them being slightly different.



PICTURE 27. In the exhibition space four prints will be presented together. A speaker, that is activated by a distance sensor, will be placed near the print. (Kurki 2020)



PICTURE 28. Installation plan (Kurki 2020)



PICTURE 29. *My Personal Time Capsule* (Kurki 2020)

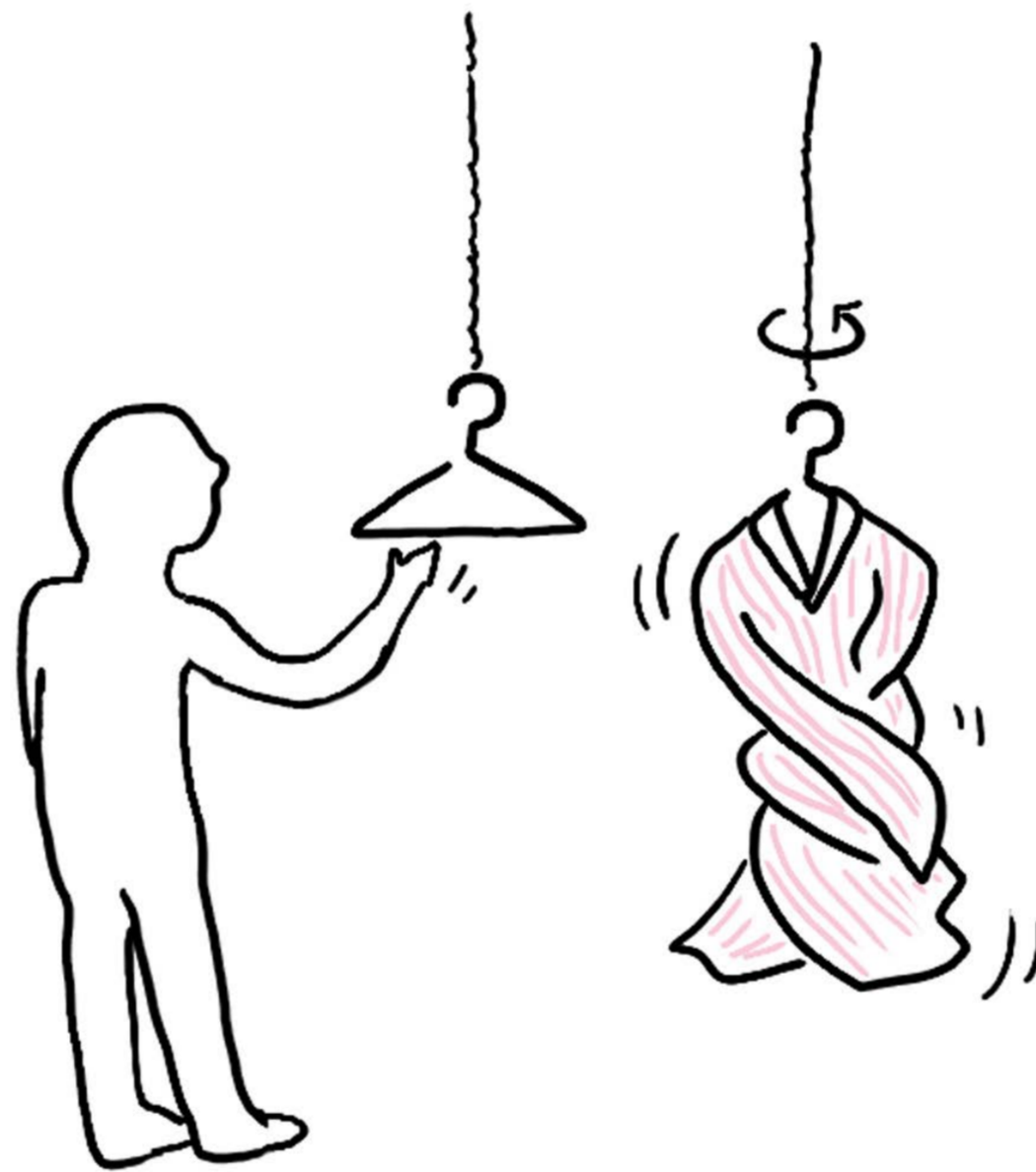
Laundry Day Every Day 2020

Digital screen print on PVC
Arduino + servo motor
93x150 cm

Laundry day every day 2020 is a representation about daily routines during the pandemic. The use of masks has brought a new pattern to the daily lives of Europeans: the masks should be changed and disinfected after every use.

The day-to-day tasks we create for ourselves can be comforting counterweight for moments of spontaneity and surprise. By forming routines, we feel safer when we know what to expect. This is important especially during the exceptional circumstances.

In this printwork the color palette is a mixture of warmth, joy and peacefulness – mellow yellow, pink and green. The printwork is combined together with two clothing hangers; one of them is empty and the other one, equipped with a motor, holds a dressing gown. The rotating movement represents routines and recurrence, while the shiny satin dressing gown symbolizes romanticization of everyday life.



PICTURE 30. Installation plan for *Laundry Day Every Day 2020*. A metal clothing hanger works as a touch sensor. (Kurki 2020)



PICTURE 31. In the first installation prototype the image was printed on a fabric. (Kurki 2020)



PICTURE 32. *Laudry Day Every Day 2020* (Kurki 2020)

WHY MEDIEVAL CATS LOOK LIKE...

Serigraphy on reflective paper

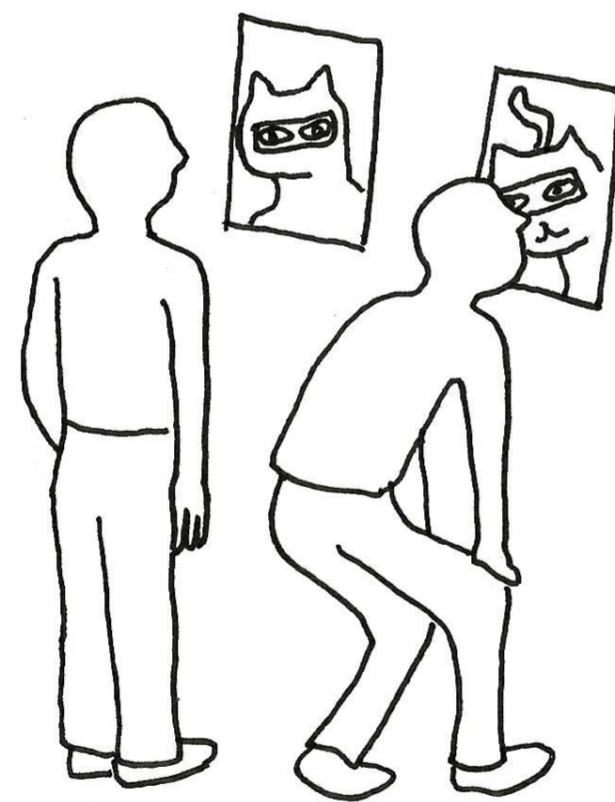
21x30 cm

Triptych

In this triptych the fun of instagram face filters and medieval cat memes merge together. Only here the idea of an instagram filter is brought to an analog form, by utilizing a reflective surface instead of a camera. The face or mouth of each cat is “covered” with a mirror, to lure a visitor to fit their own face in it.

The cats are recreations of medieval paintings shared on the internet, colored with joyful pink and energetic yellow that form strong contrast with blue and green.

The artworks are challenging us to take a step away from our fleshy human shells and look ourselves through a quirky animal mask. One of the three throws a question to visitor: Can you make a smile wide enough to fit it into the green cat’s face?



PICTURE 33. Installation plan (Kurki 2020)



PICTURE 34. Cat number 1 (Kurki 2020)



PICTURE 35. Cat number 2 (Kurki 2020)



PICTURE 36. Cat number 3 (Kurki 2020)

THAT.

MOODY DOGG

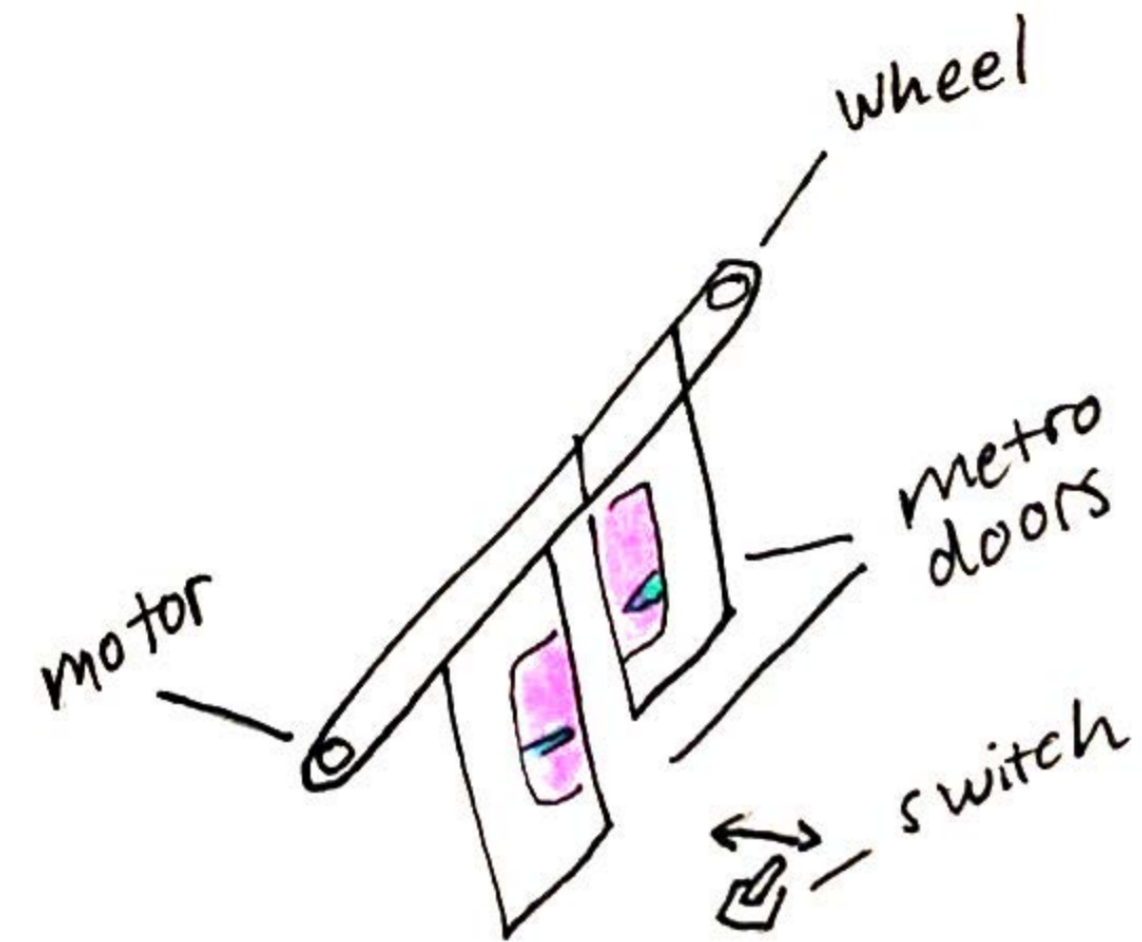
Digital screen print on film
Arduino + servo motor
34,5x51 cm

The visual part of the artwork consists of three layers of prints on transparent plastic films and a painted wall as a background. Together the layers are forming the whole image, and when placed a bit apart from each other they create the feeling of 3D space.

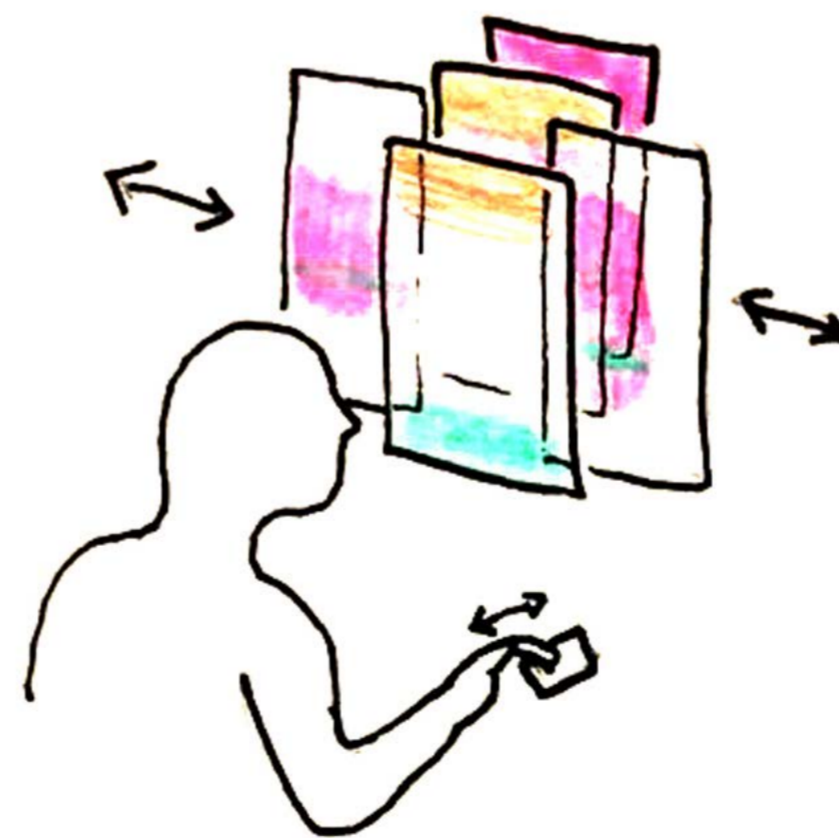
To create the movement the plastic film with metro doors is attached to a motor and splitted in the middle. The motor is controlled with a switch.

The most powerful color in the image is energetic pink, and as a counterweight the dark brown and light green colors indicate peacefulness and absence of movement, even dullness.

At first glance Moodydogg might seem melancholic. The surprising side comes up when a person finds the way to control the subway doors – together with the chosen colors this playful function creates contrast to the whole.



PICTURE 37. Metro doors will be attached to a string, which is moved by a motor. (Kurki 2020)



PICTURE 38. The motor is controlled with a switch. (Kurki 2020)



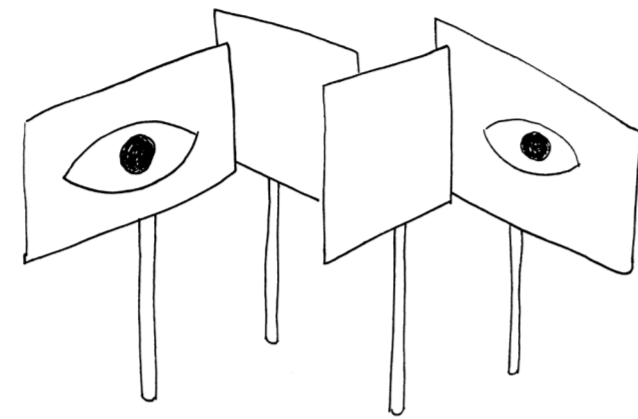
PICTURE 39. *Moodydogg* (Kurki 2020)



PICTURES 40.-43. Different color versions of Moodydogg. (Kurki 2020)

What a fucking pseudoscope???

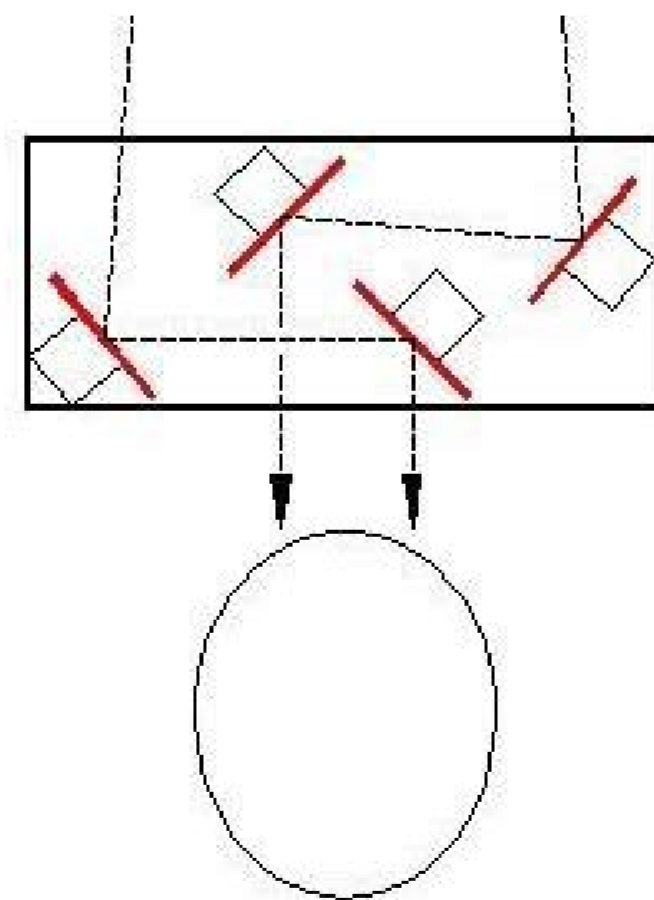
Serigraphy on paper
Mirrors + chains
Arduino + servo motor
160x70



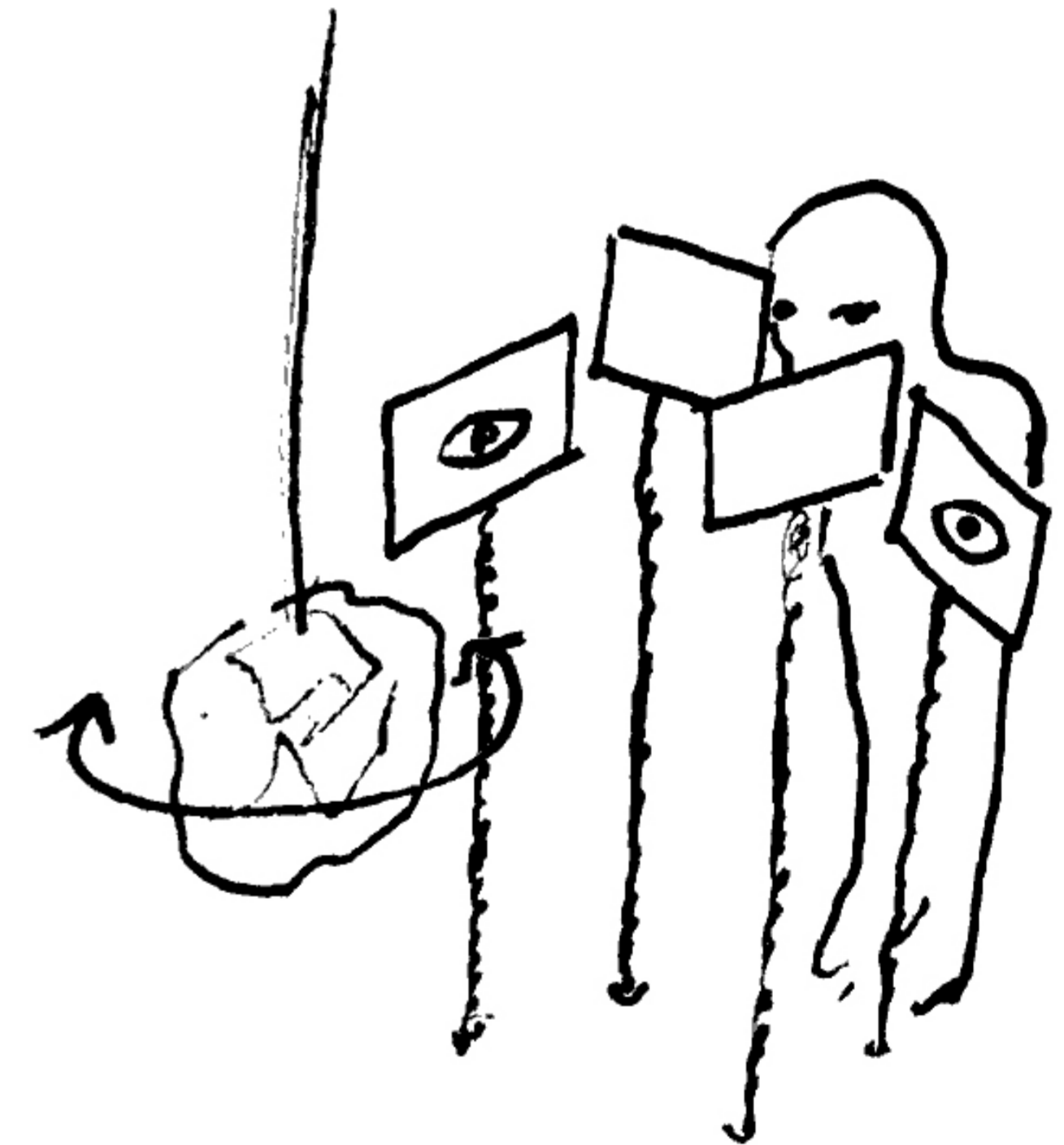
Pseudoscope is a device that flips the vision of the left and the right eye. A simple pseudoscope can be built with 4 mirrors which are set at particular angles and distances from each other. The effect of the device is the most powerful while the person holding the device is moving or looking at a moving object through it. For example spinning objects seem to be spinning in the reverse direction with a pseudoscope.

The theme of the installation is dreams, the hidden desires. It consists of two constructions: a pseudoscope, four mirrors, attached to chains rising from the floor. Pieces of mirrors resting on top of static chains are meant to give an unreal impression. The second element is a printwork, reshaped as a three-dimensional object, hanging from the ceiling and rotating. The print itself is an abstract collage; layers of different episodes and moments in a surreal form.

The installation trifles with reflections, images, emotions and sensations. My intention is to let people sink into the absurdity and observe their surroundings from a different perspective through a game of mirrors, like in a hypnagogic state, the transitional period between sleep wakefulness and sleep.



PICTURE 44. The illusions seen through this device are caused by switching the input for each eye. (Rob H. 2007)



PICTURE 45. Installation plan (Kurki 2020)

You can stop us from going to the playground, but you can't take away our imagination

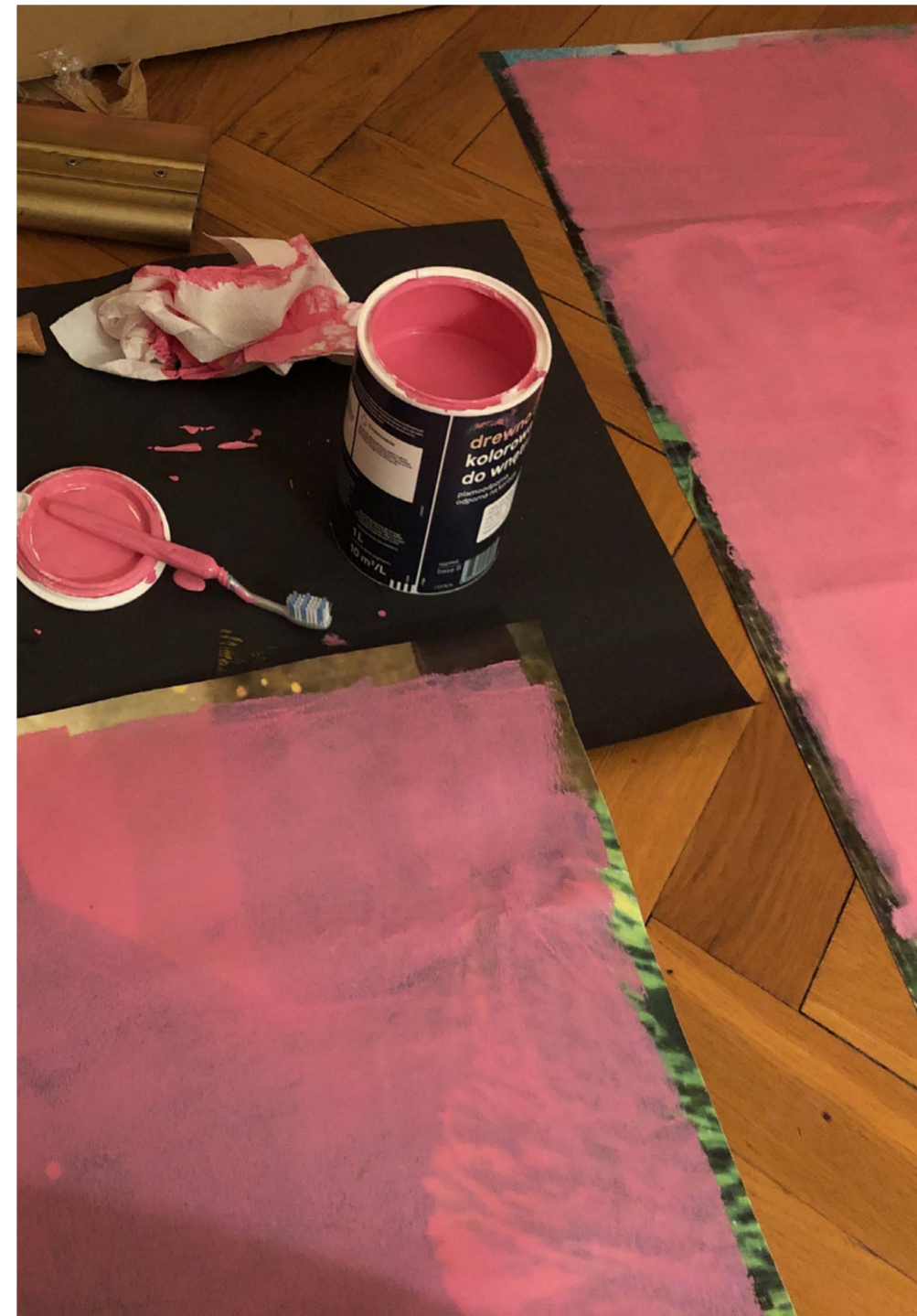
Serigraphy on PVC

98x140 cm

Triptych

The main element in the prints is a spring swing that is covered with black plastic to prevent children from playing in the playground due to the pandemic. The same spring swing is repeated and repeated, until the mind creates new forms both inside the negative space and out of the compositions that the multiplied swings form. This is called Figure-ground perception. It is the tendency of the visual system, or ability, to differentiate forms from the background (ground) of the actual figure (Cherry 2020).

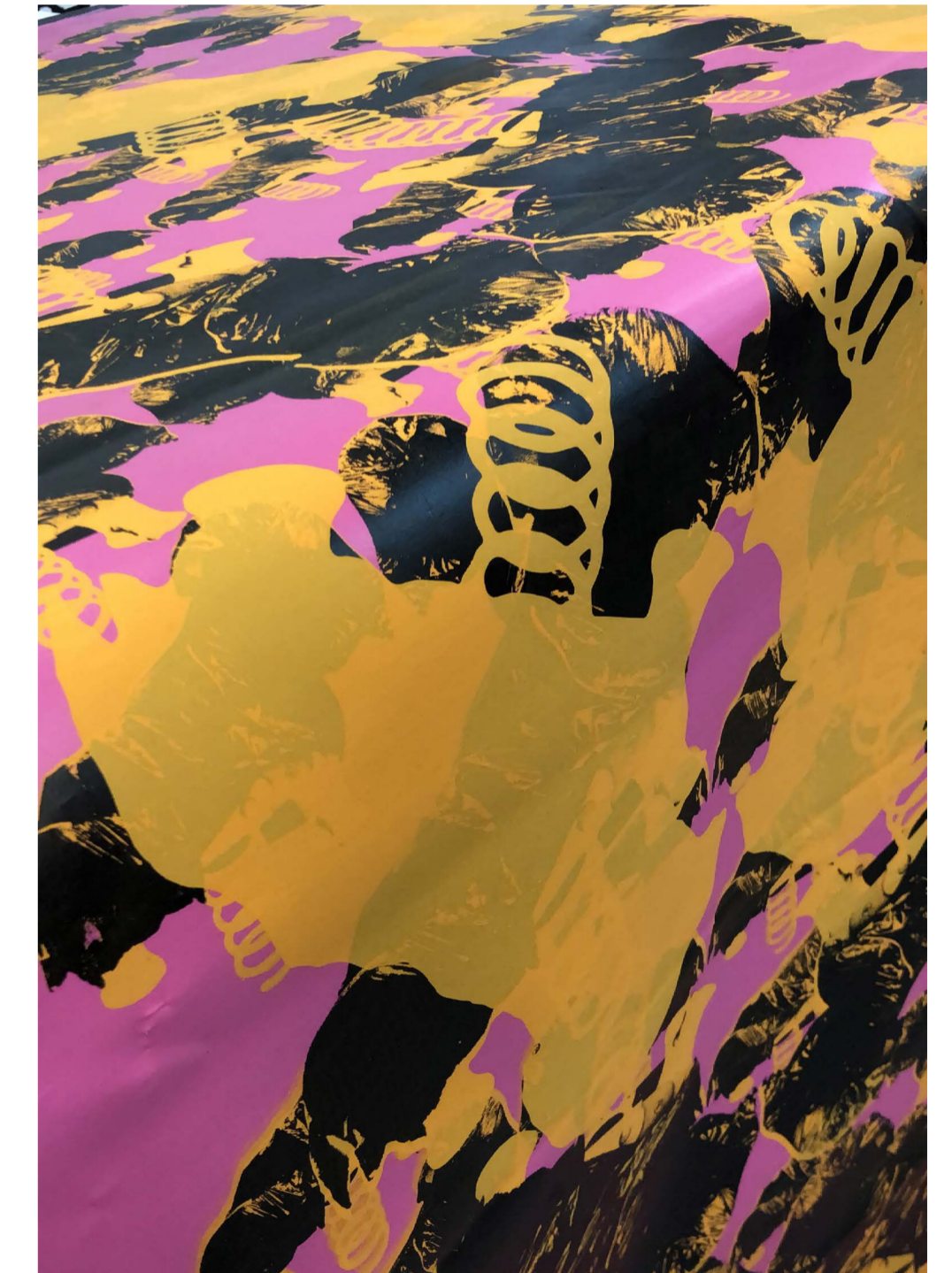
When the spring swing is variably repeated many times, the result is beginning to resemble a scenery inside a kaleidoscope. The hot pink and warm yellow, energetic and together even disturbing colors, combined with silent and dark black, are forming together a strong contrast. Taken as a whole the color palette might even be considered as lubricious.



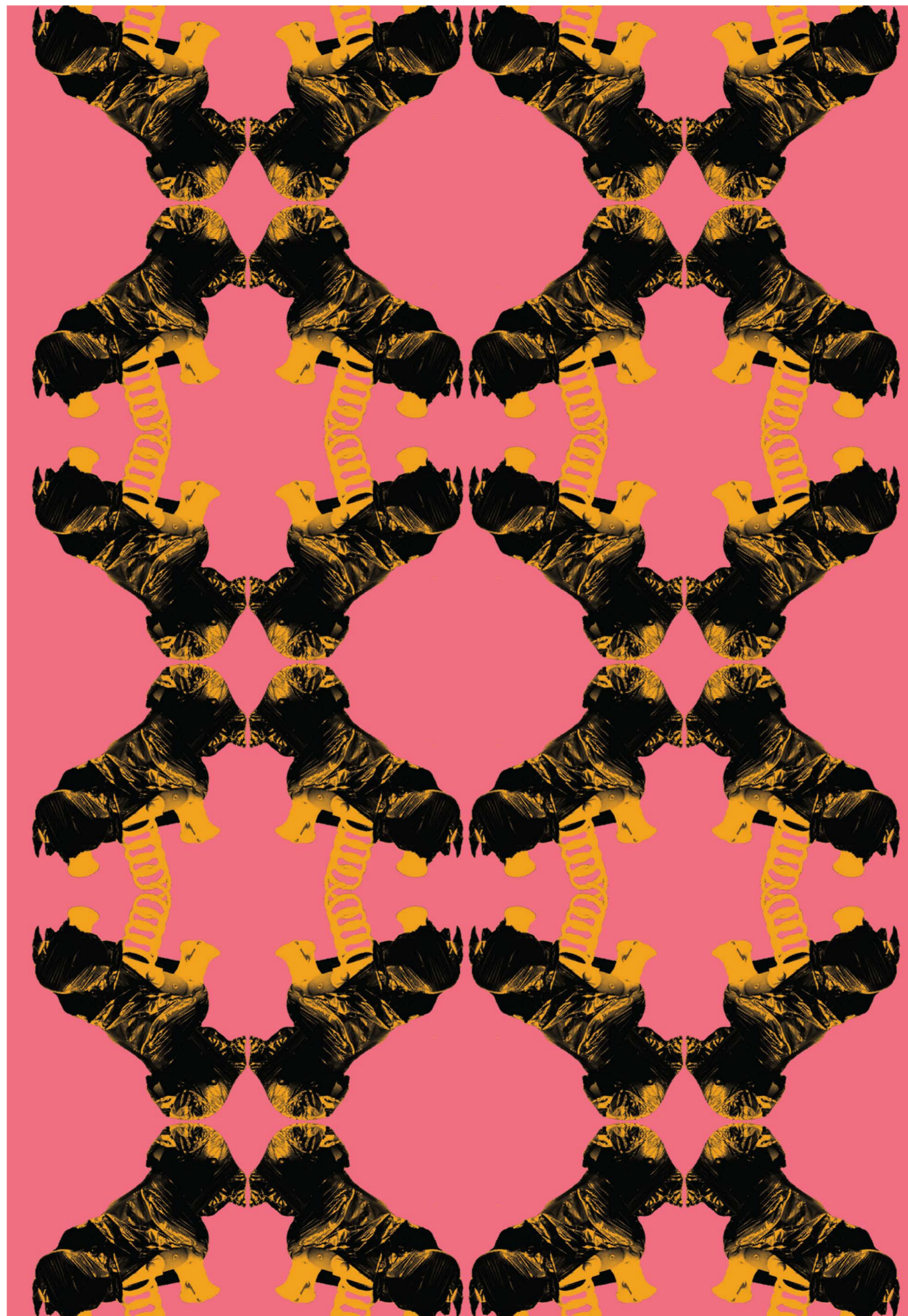
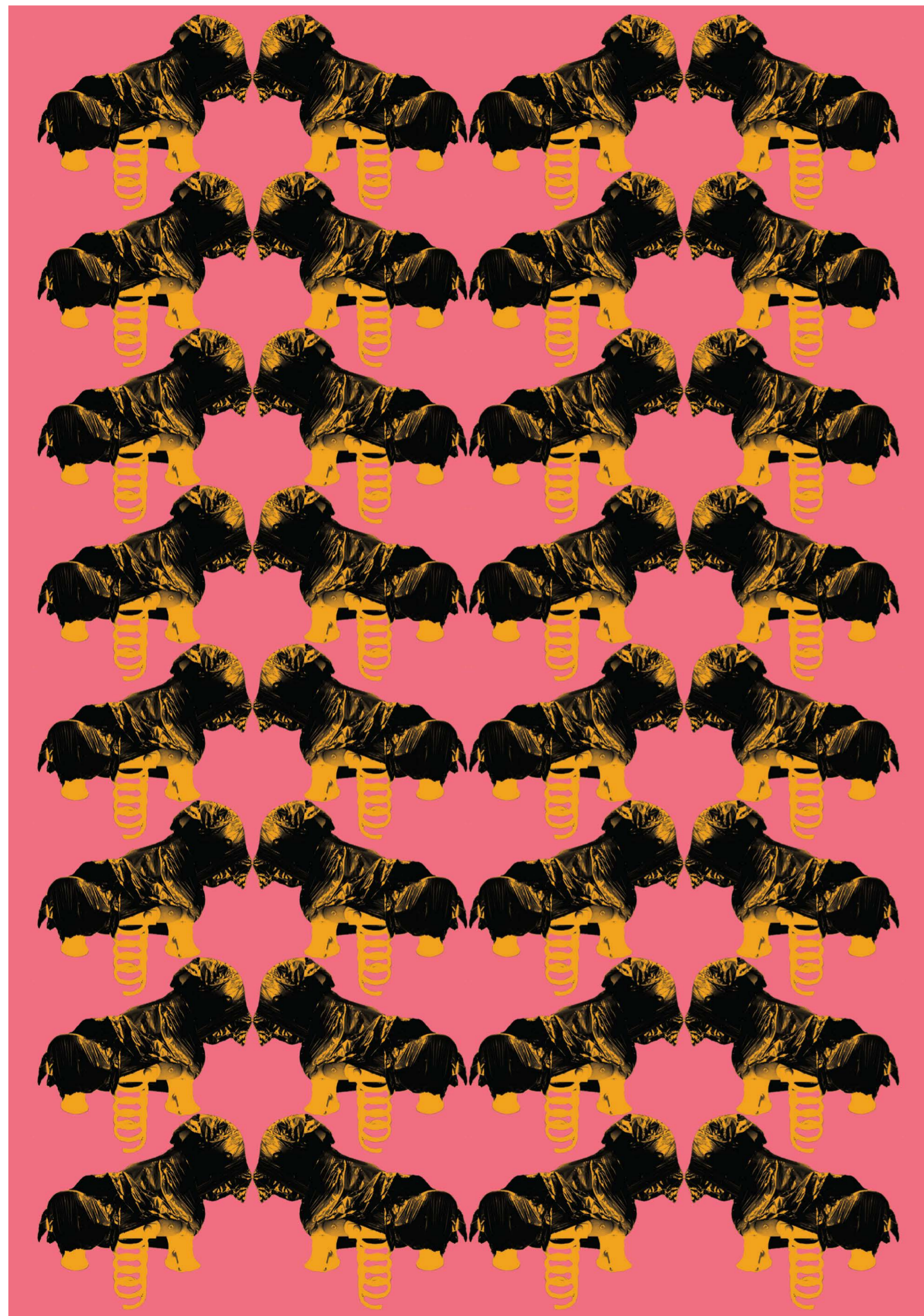
PICTURE 46. Used surface material was an old advertising tarpaulin. (Kurki 2020)



PICTURE 47. In silk screen printing, each color needs its own layer. (Kurki 2020)



PICTURE 48. Printing in progress (Kurki 2020)



PICTURES 49.–51. *You can stop us from going to the playground, but you can't take away our imagination* (Kurki 2020)

When illusions are all we have left to harvest



**Serigraphy on paper
67x97 cm**

A Café Wall Illusion can be found as one of the elements in the image. It's an optical illusion that is formed out of dark and light colored rectangle tessellations with thinner medium colored lines in between them. The rectangle lines are shifted into a zigzag pattern. The pattern seems to diverge towards the upper and lower corners. The illusion was first paid attention to as a wall decoration in a café in Bristol in 1973. (Gregory & Heard 1979.)

Geometric patterns, Café Wall Illusion, and cyan, magenta and yellow color palette create a twisted and surreal atmosphere. The artwork invites viewer to the warped world of an imaginary botanical amusement park, where everything seems to be upside down.



PICTURE 52. *When Illusions are all we have left to harvest* (Kurki 2020)

6

CONCLUSION

In this paper, my intention was to answer the question:
How to generate joy in the concept of interactive artworks?

I've looked for the answer by observing my own daily life and that of the people I interact with. I focused on what kind of spontaneous situations make people laugh, which little things ignite joy in my everyday life, what we do for fun and how we entertain each other. The themes of the artworks were built around observations on these topics.

In Warsaw I explored science and interactive art museums to study the mechanisms in interactive installations and optical illusions. Funhouses and experiential exhibitions I have previously seen also served as models. In these places, the most important observations in terms of joy and this thesis were not the mechanisms of the exhibited artworks but the experience of surprise and the pleasure of discovery. Both visual and mechanical parts of the works of HARHAHAHA were inspired by these experiences. The absorbed inspiration led to experimenting with electronic devices, which became an essential part of the exhibition.

By utilizing sensing technology together with sound and movement, it was possible to bring the fun of aha moment and surprise also to HARHAHAHA.

In addition to my passion for exploring new methods of creating art and experimenting, one of the most important means of expression for me is colors. Colors have a strong impact on people's emotions in the visual world. As Kandinsky (1977, 23–25.) says, it has a spiritual power that directly influences the soul. The color palette of the artworks of HARHAHAHA is leaning on the color theory of Kandinsky, and is also inspired by amusement parks. Though – the color alone doesn't trigger an emotion. Composition and contrast needed for it too.

Based on different theories, my research and empirical observation, a few different mechanisms were chosen to delight people – to generate joy. The choice of colors, music, humor and providing the joy of discovery were essential tools in this project.

However, the genuine effect of the artworks will be seen in the physical exhibition, from which I can also draw new ideas for the future. I'm curious to see how people will communicate and interact with the artworks. It is my intention to continue working on this project – I don't feel there will be a moment it will be complete, or that it needs to reach an endpoint. Instead, I see here an opportunity to let this project grow on my side. The concept of HARHAHAHA is flexible and doesn't draw boundaries for implementation methods and techniques. It tempts me to continue creating art for the sake of joy.

What was expected but also surprising was the impact of this project on a personal level. While investigating joy as an emotion in daily life, I focused on even the smallest things that aroused joy. After being immersed in this topic for several months, I could clearly see its joyful impact on me – based on this I would say that the process of making was a success.



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