MEANDER VAN DER WEIJST
PORTFOLIO 2020

Designing for a change

in mindset

CONTEXT

This portfolio showcases some of the things I worked on during the past year, 2020. A year that was dominated by the global pandemic Covid-19. It was also the year I started studying Industrial Design at the TU/e. Most of the design work in this portfolio are projects I worked on during the premaster and the first semester of the master. Additionally, it also contains personal projects and work I did for EAISI (Eindhoven Artificial Intelligence Systems Institute) and FruitPunch AI.

I started this year as an eager but naive product designer, I wanted to focus on helping people with a-neurotypical needs, meet the status quo, design little knick-knacks to help them keep up with everybody else, and if done in a sustainable manner this would even benefit the planet. Now

I believe the real problem is not the people not meeting the status quo, but the status quo itself. Developing new things will not fix that.

What society needs, is a change in mindset. I do not think innovative design or clever new technologies will solve the wicked problems the world is dealing with today. There will not be a new product that solves consumerism, nor will the most fair and unbiased AI technology solve inequality. I believe the solution to the worlds biggest problems will not be found through innovation, but through education, awareness and discussion.
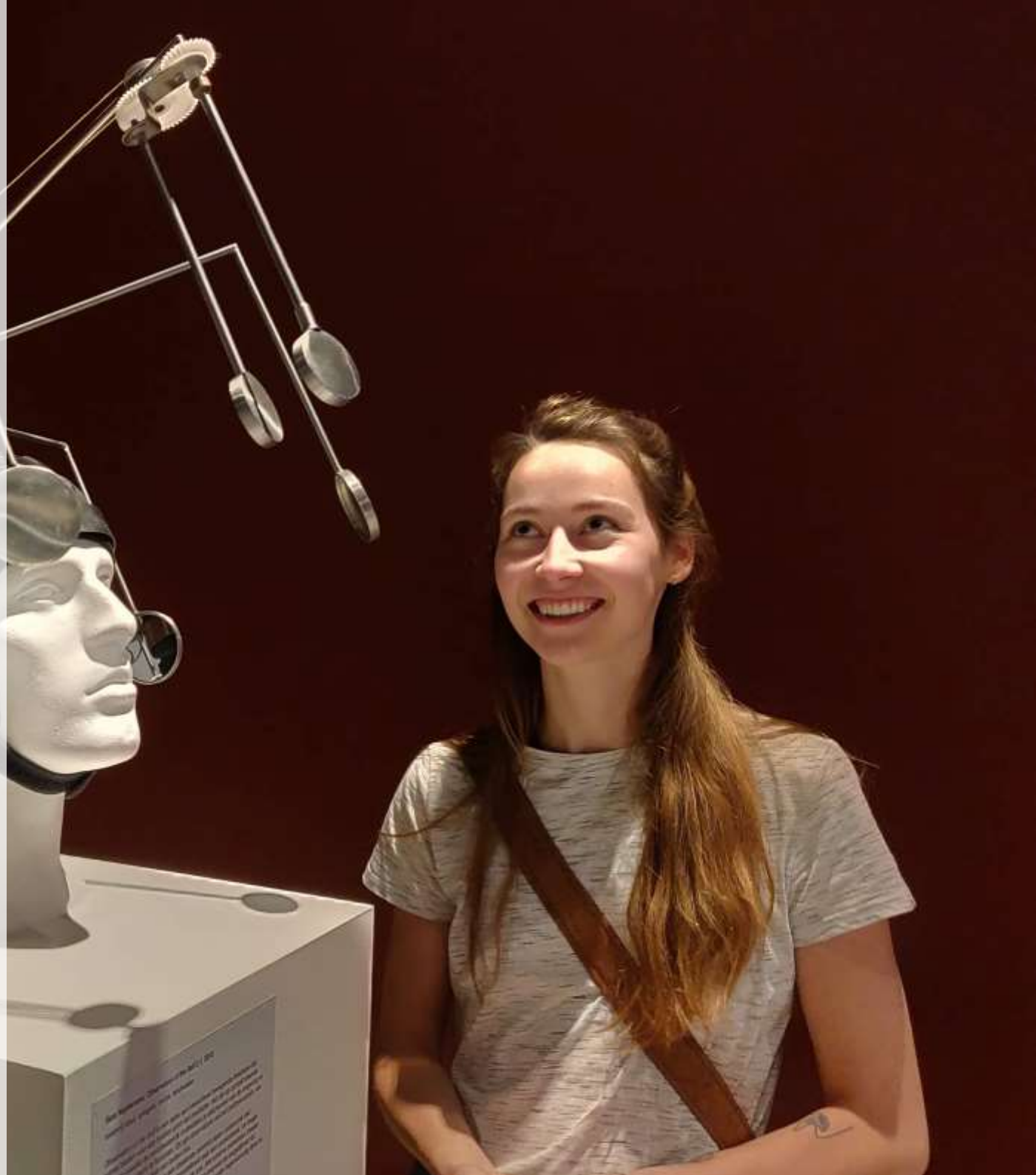
INDUSTRIAL DESIGN

2020 is the year I started studying Industrial Design. In February I started the pre-master, followed by the first semester of the master.

Throughout this years, I sometimes struggled adapting to the different way learning compared to studying Engineering Physics and to studying all together compared to working for nearly two years. But I also noticed that I can bring a fresh and different perspective to the table. I learned a lot this past year, not just from the projects and courses but also from my peers.

An important realisation I had this year is that as a designer my opinion matters. It would be unrealistic to say that when I worked as an engineer or studied physics, my work was completely unimpacted by personal values or opinions, but it was what I strived for. After all, I dealt with hard science and facts and I looked

for objective bests. I struggled a lot during the last project I worked on because of this mindset. I was worried about making the wrong choices or making choices that I could only justify with 'I find this interesting/fun/important/any other adjective'. However, it is never the case that I *just* find something interesting, there is always deeper reasoning behind it. I realised that with this reasoning my opinions are valid and should be part of my work.

Of the following projects, the first four I worked on during the pre-master (Countdown piggybank, Illi-tv, Sundial and Bold Statements). The two projects (Dating with beetles and Vogelvlucht & Kikvors) that are discussed after are things I worked on during the first semester of the master.

COUNTDOWN PIGGYBANK

For the final assignment of the course *Creative Electronics* I designed the Countdown Piggybank, it holds money hostage for a set number of days, giving the user time to overthink the necessity of a purchase.

The original idea was to build the piggybank with digital digit displays that would count down and a pushbutton to switch between three different waiting periods: 7, 14 or 30 days. Unfortunately not all the needed components could be delivered on time, so I changed the design according to electronics components I already had. Instead of using digit displays, an LED-ring of 12 LEDs is used to indicate the waiting period and with potentiometer the waiting time can be adjusted from 1 to 12 days.

During this project I was responsible for the design and the hardware and my partner (Hans Chia) took on the software.
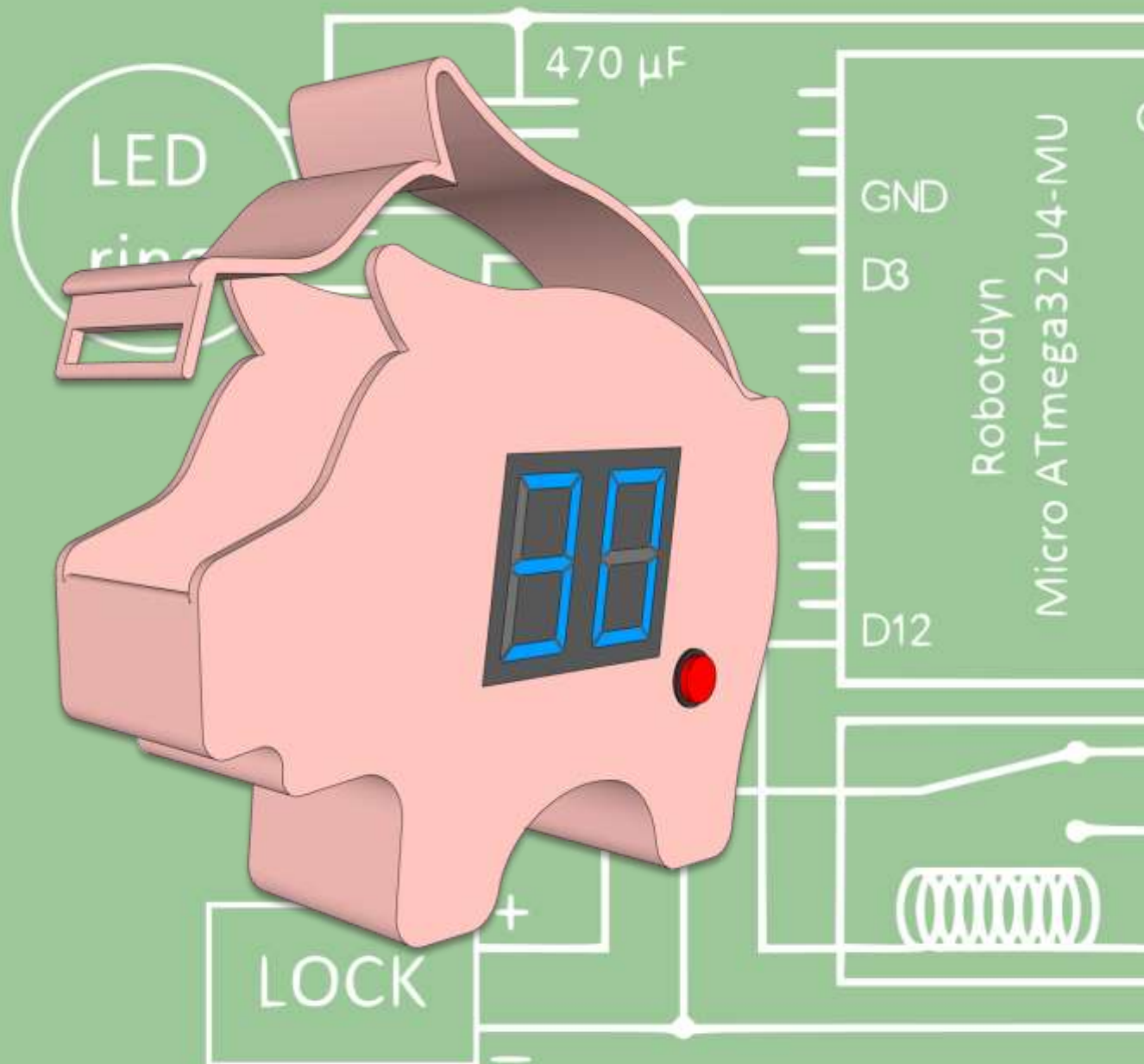
Start the conversation, start connecting

ILLI TV

In the course *Design for and with multiple stakeholders* we were given the task to make the illi tv suitable for the consumer market. I worked on this project with Evan Boessen, Jelle Wijer and Stella Xu.

Illi tv is an entertainment device for elderly care facilities, specifically designed for people with dementia. The illi tv can be connected to the television, using a tablet the care facility staff can select various clips or games, intended to trigger memories in the residents and start a conversation. In to what is already available on the device, personalised content can be added by sending it to the illi tv team.

Currently, the illi tv is only sold to health care facilities but the makers are looking to explore the consumer market. To do that successfully,

certain changes need to be made. The foremost thing that needs to change is the operating system. Now the illi tv is controlled through an extensive menu on a tablet. Due to all the options in the menu, it is sometimes difficult for facility personal to navigate the system, for the residents it is near impossible. Even with a simpler menu with fewer options, it would still be hard for elderly people to operate the touchscreen.

Another problem might arise with the services illi tv offers, like the instalment of the device and the personalization. Now, neither of these tasks can be performed by family members or carers. If illi tv were to move to the consumer market and expand its customer base, it might not be feasible to keep offering these services. A solution would be to make the device so that at least the carers or relatives of the elderly person with dementia are able to install and personalize the illi tv themselves.
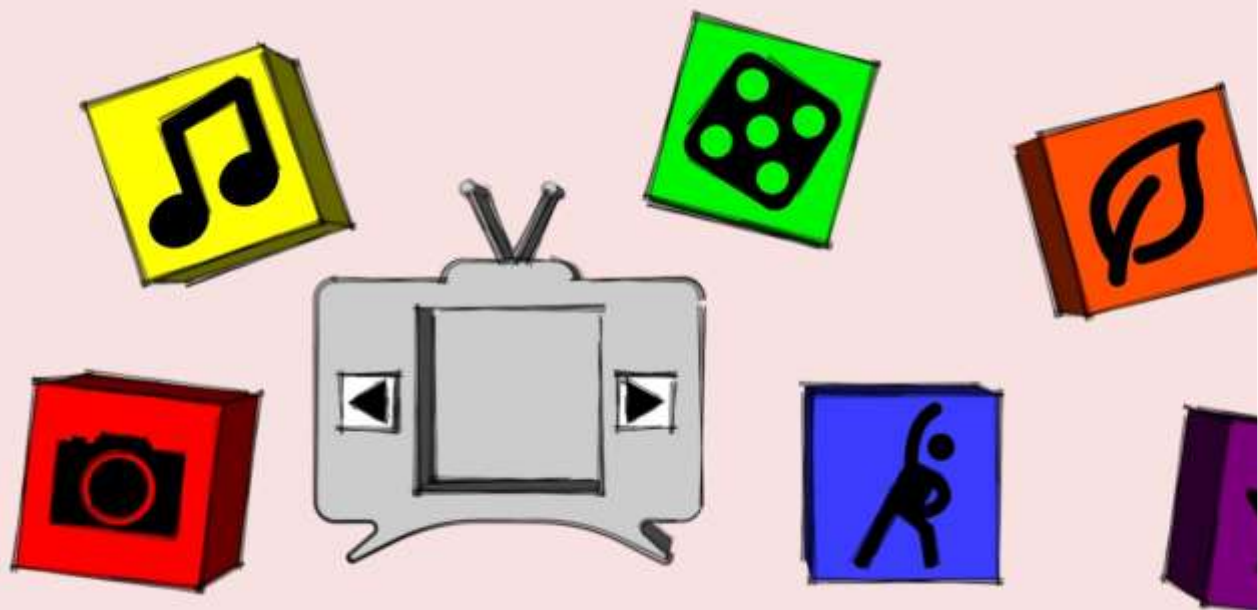
REDESINGING THE PRODUCT

My focus during this project was to redesign the product and user interface to make it usable for elderly people and their carers or relatives.

To do so, I replaced the tablet with a remote controller. The sketch on the top left shows the first controller design. The controller only has two buttons, one to skip to the next item and one to go back to the previous one. The content that is played is chosen by placing one of the 'blocks' in the square clearing in the remote controller. These blocks all contain pictures and clips of a certain category matching to the icon on the block.

The controller is shaped like an old time tv to stay true to illi tv's original design and so people can immediately tell what it controls.

Because the blocks fit perfectly in the controller, the use of it is very intuitive. This is important because people who suffer from dementia would have a hard time remembering how to
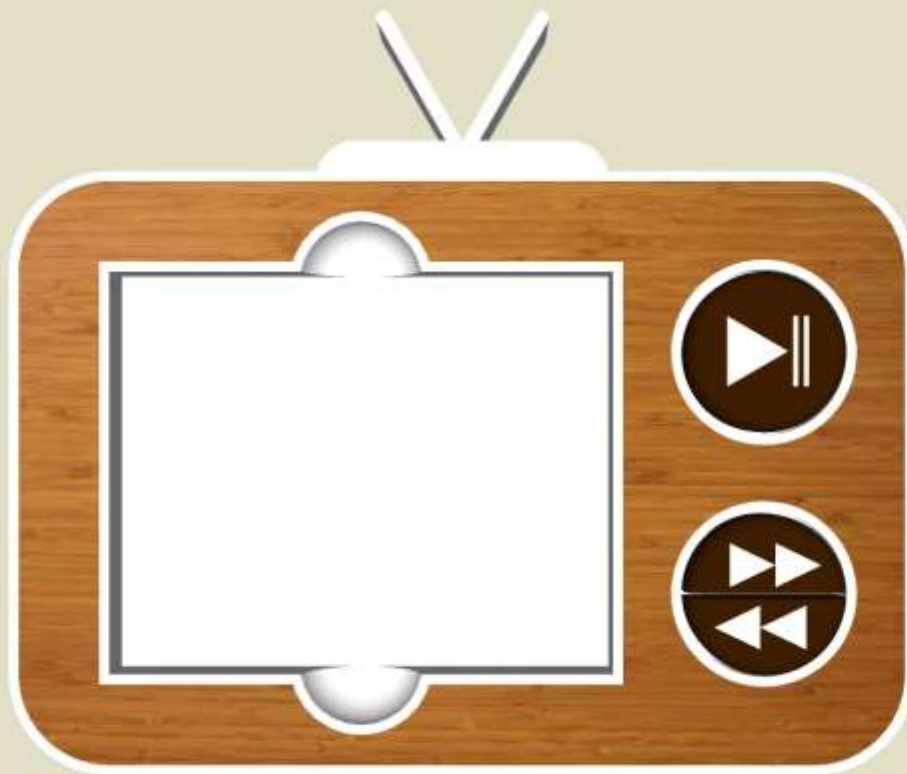
operate a new device. Even if people were to forget how the controller works after a family member explains how to use it, the colourful blocks and the way it is designed, invite people to 'play' with it.

After consulting with my project group I made some changes to the original design. We decided an extra button was needed, so people are able to pause the clip at an interesting photo to have a more in depth conversation about it. Also, we thought the colourful block might feel childish to the elderly, so we changed the shape of the block to discs and chose softer colours.

Additionally, I changed the shape of the controller and added text to the icons, so it is more clearly visible what content is on the discs.

MOCKUP CONTROLLER

For the video showcasing our redesign I made a mock-up of the controller and the discs. The controller and its buttons are 3D printed. The controller is finished with a layer of bamboo veneer and the discs are made of plywood, painted in various colours.

The pictures on the right show the various features of the redesign; the various discs, how intuitive it is to use and how personalized content can be added easily via USB.

BOLD STATEMENTS

During the course *Perspectives on Aesthetics* we were challenged with making bold statements through design for serving or making coffee or tea.

THE TEA PROJECT

Predetermined vs. Open practices

In the Tea Project, I took open practices, or free choices to an extreme by making a statement on addiction. In this concept I combined both illegal drugs and legal addictive substances with the mundanity of drinking tea.

WAIT YOUR TURN

Elitism vs. Egalitarianism

Time is money, but not everyone's time is equally valuable. This coffee machine only makes those wait, who can afford to wait. worked on this concept with Jillian de Bie and Marloes Habraken.
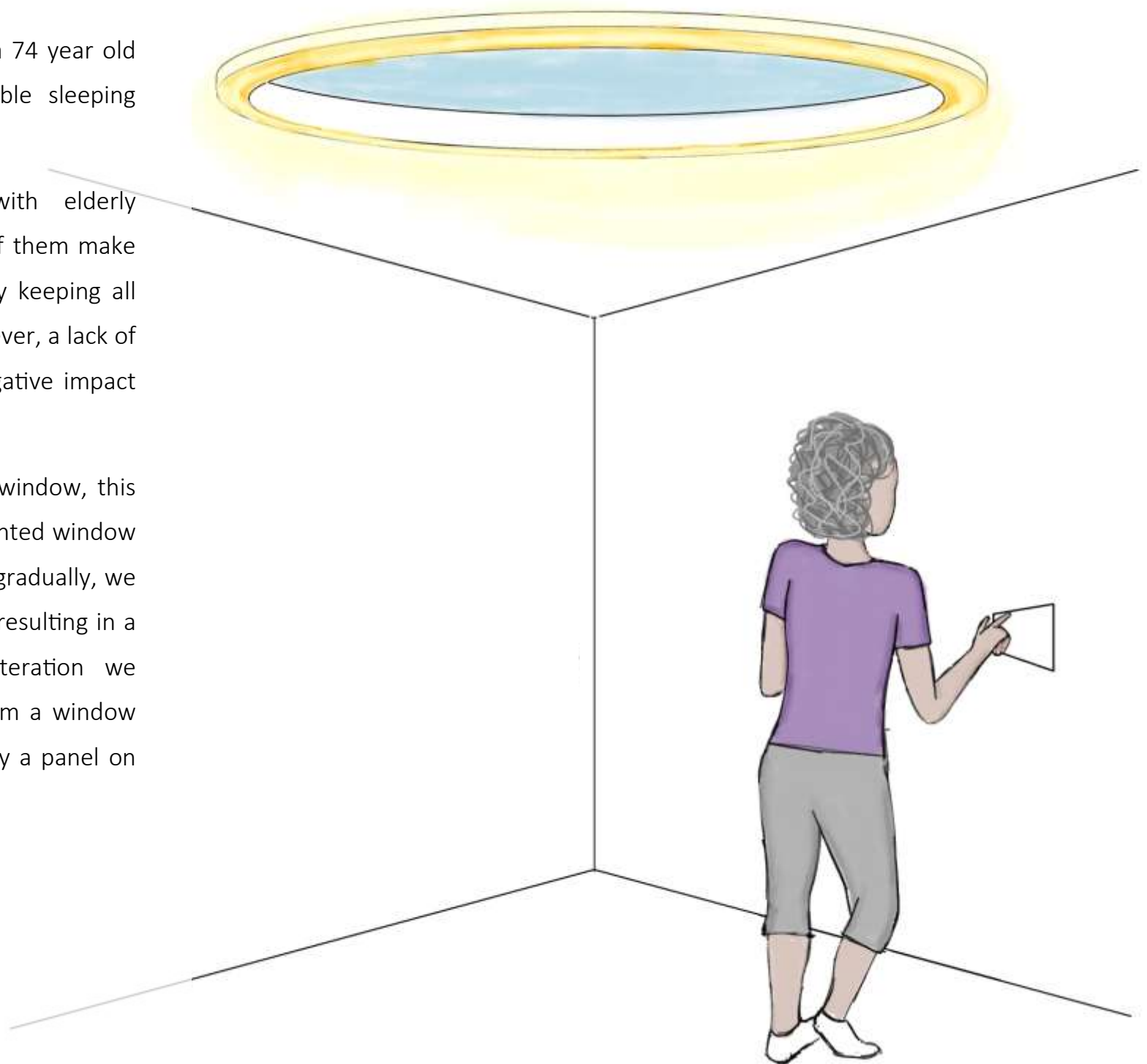
SUNDIAL

The Sundial helps the user keep a healthy rhythm by simulating an optimal light cycle. Getting the needed amount of light during the day improves your quality of sleep at night. The sundial simulates a sunrise, letting you start your day smoothly, and a sunset to prepare you for a good night's rest. The combination of lights in the window frame and light blocking filters, ensure the optimal amount of light in your living space. When it is hot inside, the filters block the sunlight to prevent the house from heating up further, by turning on the lights in de window frame, the blocked sunlight is compensated.

I worked on the Sundial within the DIGSIM squad (Design for growing systems in the home) with Jillian de Bie and Jelmer van der Spek, the project was commissioned by Auping. The goal

of our project was to help Mary, a 74 year old (fictional) woman, who has trouble sleeping during hot summers.

Through interviews we had with elderly people, we found out that most of them make an effort to keep the heat out, by keeping all windows and curtains closed. However, a lack of exposure to daylight can have negative impact on sleep quality.

The first iteration, was the smart window, this square window has blinds and a lighted window frame. To block the sunlight more gradually, we decided to use polarisation filters, resulting in a round window. For the final iteration we decided to change the Sundial from a window into a skylight, that is controlled by a panel on the wall.

To showcase the final design, I made a scale model of a living room (1:20), with a 3D printed Sundial prototype. The protype has an LED ring that is connected to a micro controller, which cycles through a natural light simulation program, and two polarisation filters that can rotate.
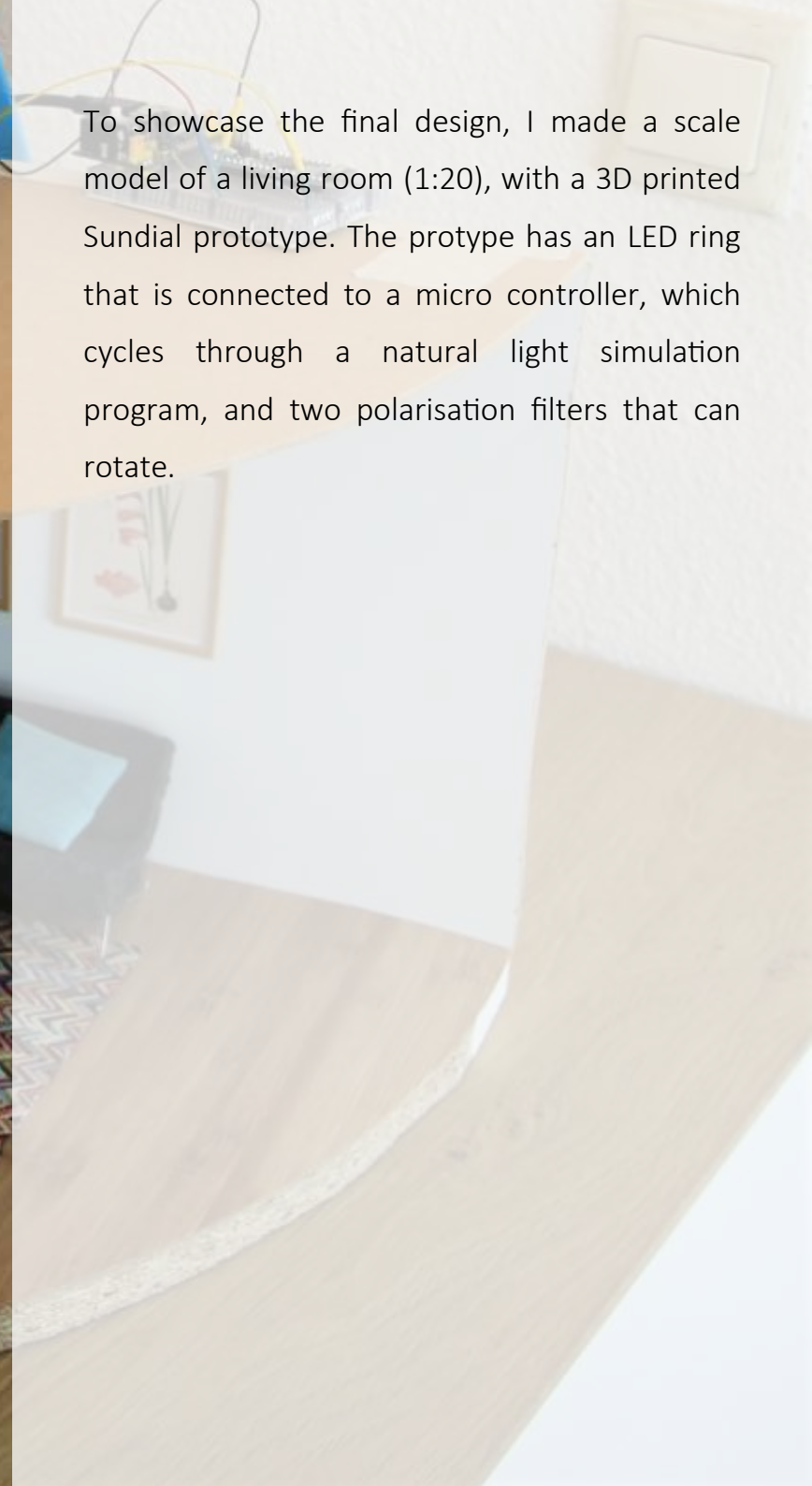
DATING WITH BEETLES

During the course *Constructive Design Research* I studied the relationship between humans and non-humans using the showroom research method with Emma van Amersfoorth, Charlotte Bording, Iris Camps, Malu Sieben and Sam van Zandbergen.

In order to combat problems like climate change and the loss of nature, we need to de-centralize humans in the design process. But are humans interested in making the world a less human-centred place?

To answer this question we chose a showroom research approach, because this well suits the speculative and critical nature of the topic. By introducing people to an unrealistically large, talking beetle, we intended to provoke them and make them think about their relationship with insects.

The main goal of the prototype was to draw participants into our speculative scenario in which humans can talk with insects. Additionally, through the prototype we wanted to give participants a strong sense of cohabitation. The design choices for the beetle and the bench were made to best serve these aspects:

- Realistic aesthetic, participants can more easily fit the beetle in their perception of the world;

- Large size to illustrate that it is a representative of a larger population (the insect world) and so it takes up half the space on the bench;

- Insect hotel, to make the bench a multifunction item that is not only meant for humans (de-centralize humans in design);

- Insect sounds coming from the bench to increase the feeling of cohabitation.

VOGELVLUCHT & KIKVORS

I did my M1.1 project in the Transforming Practices (TP) squad for Rijkswaterstaat, specifically: Expeditie RWS2050. I worked on this project with Simon Bavinck, Janita Bolhuis and Anouk Timmers.

Through the project Expeditie RWS2050, Rijkswaterstaat is exploring possible futures. The goal of our project was to contribute to and broaden discussions within Rijkswaterstaat about the future. To make the future experienceable, we created two scenarios set in 2050, centred around three themes: biodiversity, data and citizen participation. We chose these themes based on literature, conversations with experts and our own values and interests. In both scenarios, Vogelvlucht and Kikvors, we described the role of Rijkswaterstaat

and of citizens. To illustrate these roles and to make the scenarios come to life, we designed four objects.

The booklet was made as an addition to the prototypes to give more information about the scenarios. It contains a short introduction to our project in relation to Expeditie RWS2050 and the TP squad. Followed by the focus areas, biodiversity, data, and citizen participation. Then the scenarios are described along with photos of the prototype, so it can also be used as a conversation tool on its own. It also contains three stories about people that live in Vogelvlucht and Kikvors. And finally, three questions are asked to the reader to support the discussion within Rijkswaterstaat.


Vogelvlucht & Kikvors

By Simon Bavinck, Janita Bolhuis, Anouk Timmers & Meander van der Weijst

VOGELVLUCHT

Collecting data

Interested citizens can apply for the RONB drone program. Citizens participating in the program, receive a drone at home that can be used to gather essential data to monitor biodiversity. Citizens take this drone on walks or hikes to collect data. During the walk, the drone autonomously searches for data. Although the drone is not always in sight, it is constantly in contact with the hiker through an app that can show beautiful areal footage and interesting data. Whenever there is too little data gathered in certain areas, the application will suggest a hiking route. Proud participants share their hiking routes on social media, and boost what data their drone has collected. By connecting the drones to individual citizens, resistance and vandalism against the drones from society are reduced, because every drone flying around has its owner nearby, who can answer questions other people might have.
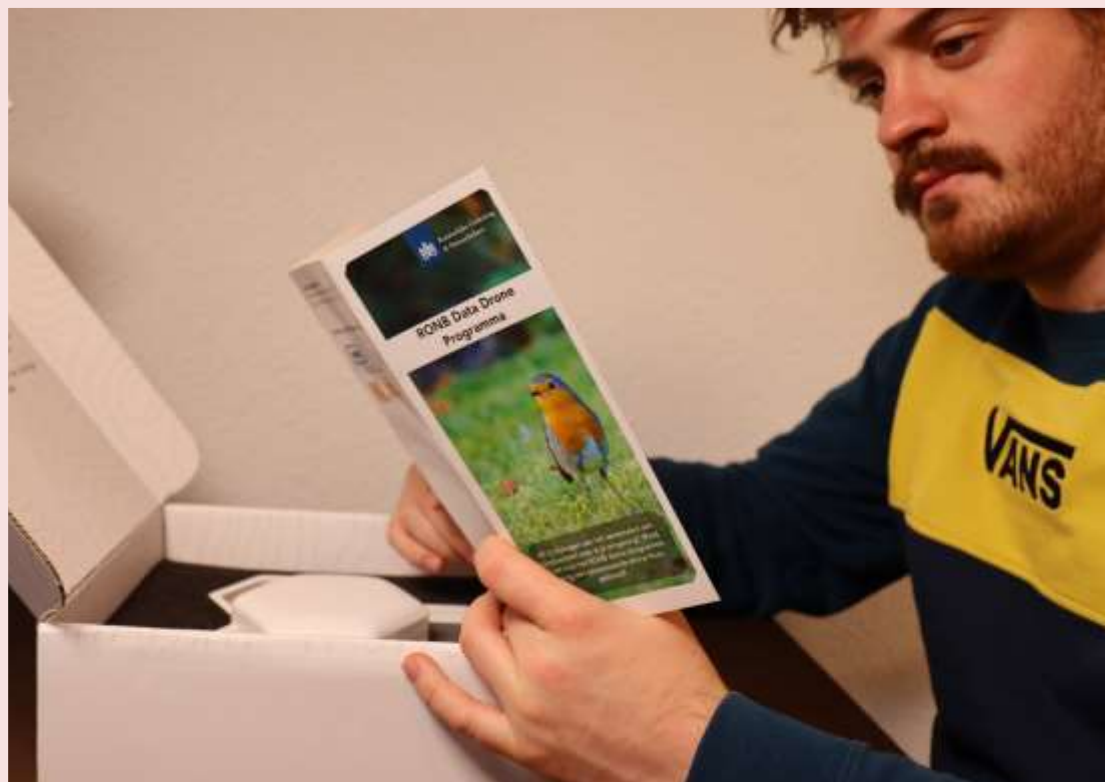
Making decisions

The gathered data is sent to employees of RONB (this is a new organisation Rijkswaterstaat is a part of), they connect the biodiversity data to other data that is gathered, data on infrastructure for example, to be able to make the best decisions for humans and nature. Decision making takes place in multidisciplinary teams in a specially designed conference room. There are various people involved in this, like: biodiversity experts, infrastructure experts and spatial planners. Meetings are led by a chair, to make sure all experts are heard. The conference table in the room shows an actual map of the Netherlands on which data can be presented.

KIKVORS

Collecting data

To help citizens make well informed decisions, RWS maintains a vast network of sensors that collect data on biodiversity. Broad Spectrum Technology Wildlife Cameras can be used to spot animals day and night. This way populations and interspecies relations in ecosystems can be mapped. The cameras are placed in forests, nature parks, on roadsides and along meadows.

Making decisions

RWS allows citizens to cast their vote on spatial planning with the government StemLokaal application. Government agencies use this app to let citizens vote on local issues when citizens visit the location in question. This way, only citizens that frequently visit a specific location can decide on what happens to that location. To do so, citizens use their smartphone, -glasses or -watch. RWS makes data they collect with the Broad Spectrum Technology Wildlife Cameras freely available, as well as other data they collect. This data can be used to support arguments in the StemLokaal app. Local citizens can also submit issues to vote on, also adding to their influence on local policy making.

HANGING SHELFS

In January I moved into a new house. Eager to make this new house a home, I wanted to fill it with plants, so I decided to put up some shelfs.

However, I am not to drill holes in the walls. Instead I am supposed to hang things from the horizontal wooden slats on the walls. So, I decided to make these suspended hanging shelfs, inspired by suspended bridges.

The open spaces between the strings give the shelf an open and light feel to it.

PLANT HANGER

During the first lockdown in March, my interest (bordering on obsession) with interior plants grew. After putting up four shelfs and filling my windowsills with plants, I started to look for other ways to add more plants to my living room, that is when I came up with this plant hanger design.

The first plant hangers I made, were made with a 3D printed bowl. 3D-Printing bowls is tricky and requires support. Because of this I had to sand the bowls and afterwards spray paint them.

The hexagon frame the bowls rest in is made of laser cut plywood. The frame consists of three hexagon shapes that fit together. The hexagons are hold together with a paracord string.
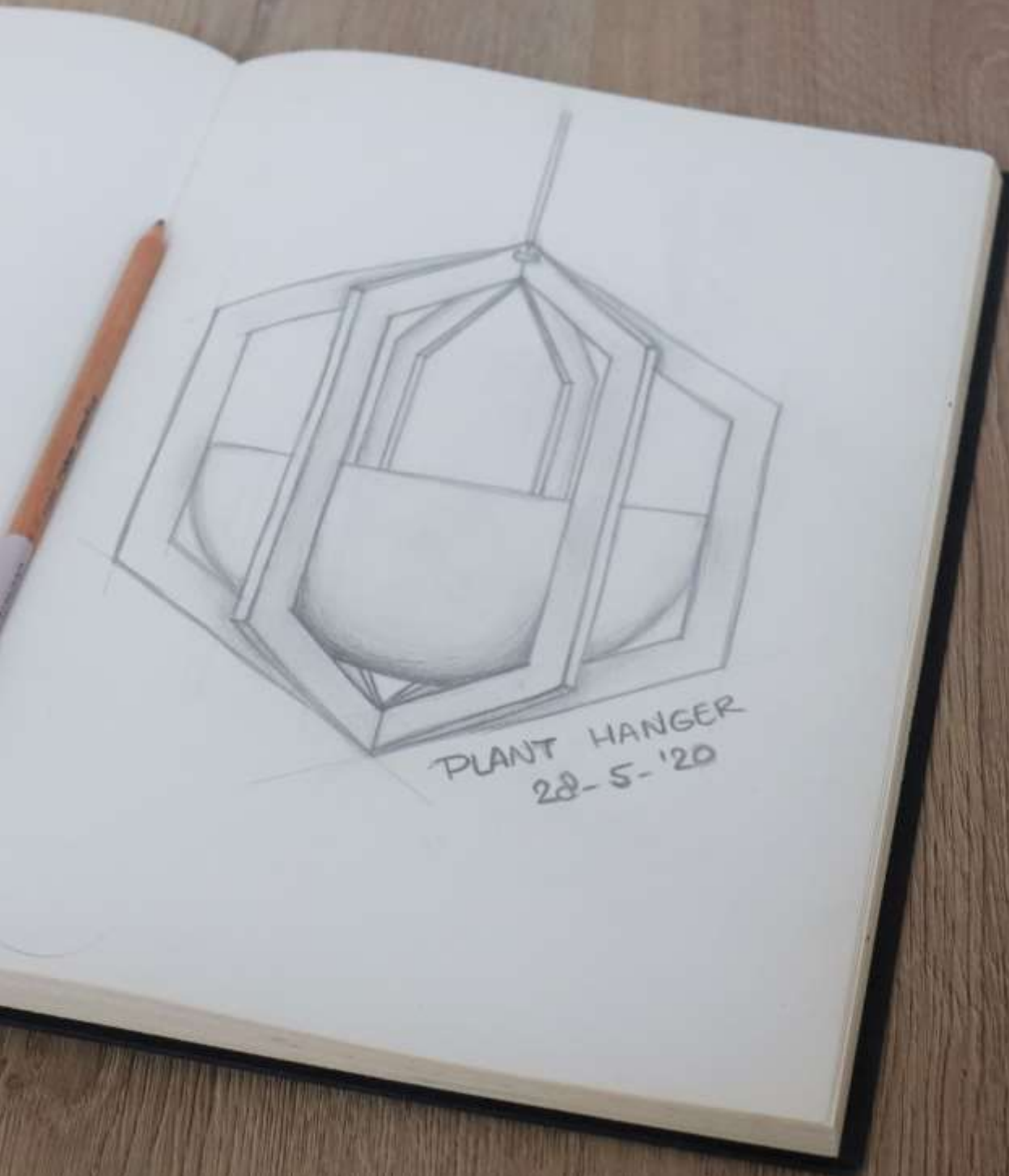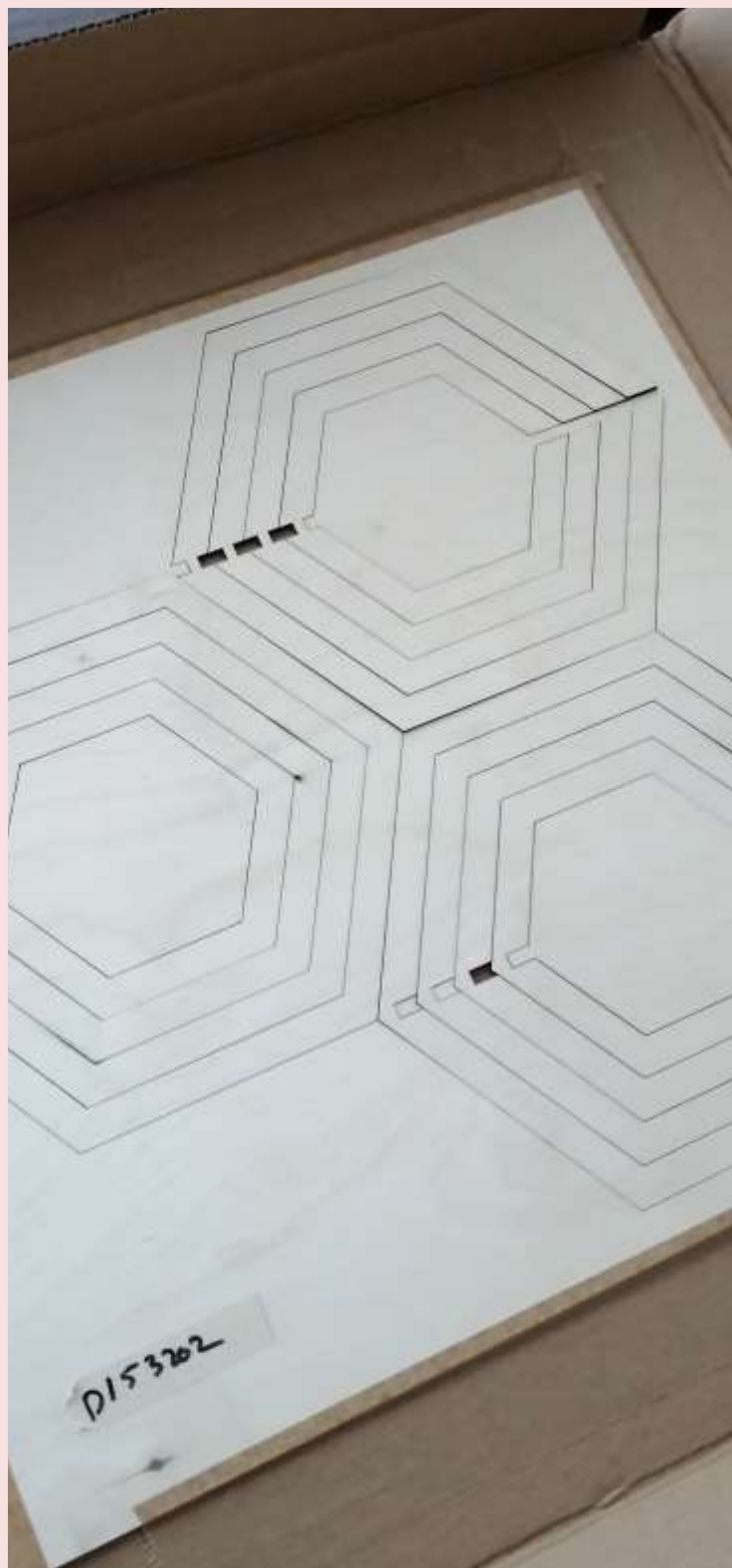
Because 3D printing the bowls took much processing afterwards to make them look nice, I looked for an alternative for 3D printing the bowls. I searched for bowls on the internet of similar shapes and sizes, but I realised I wanted a more sustainable material than plastic.

Ceramics would have been aesthetically pleasing but might be to heavy for the hexagon frame. Eventually I came across coconut bowls. These have the correct shape, light in weight and more sustainable than plastic. Another benefit to the coconut bowls is that they are a natural material and therefore are all unique.
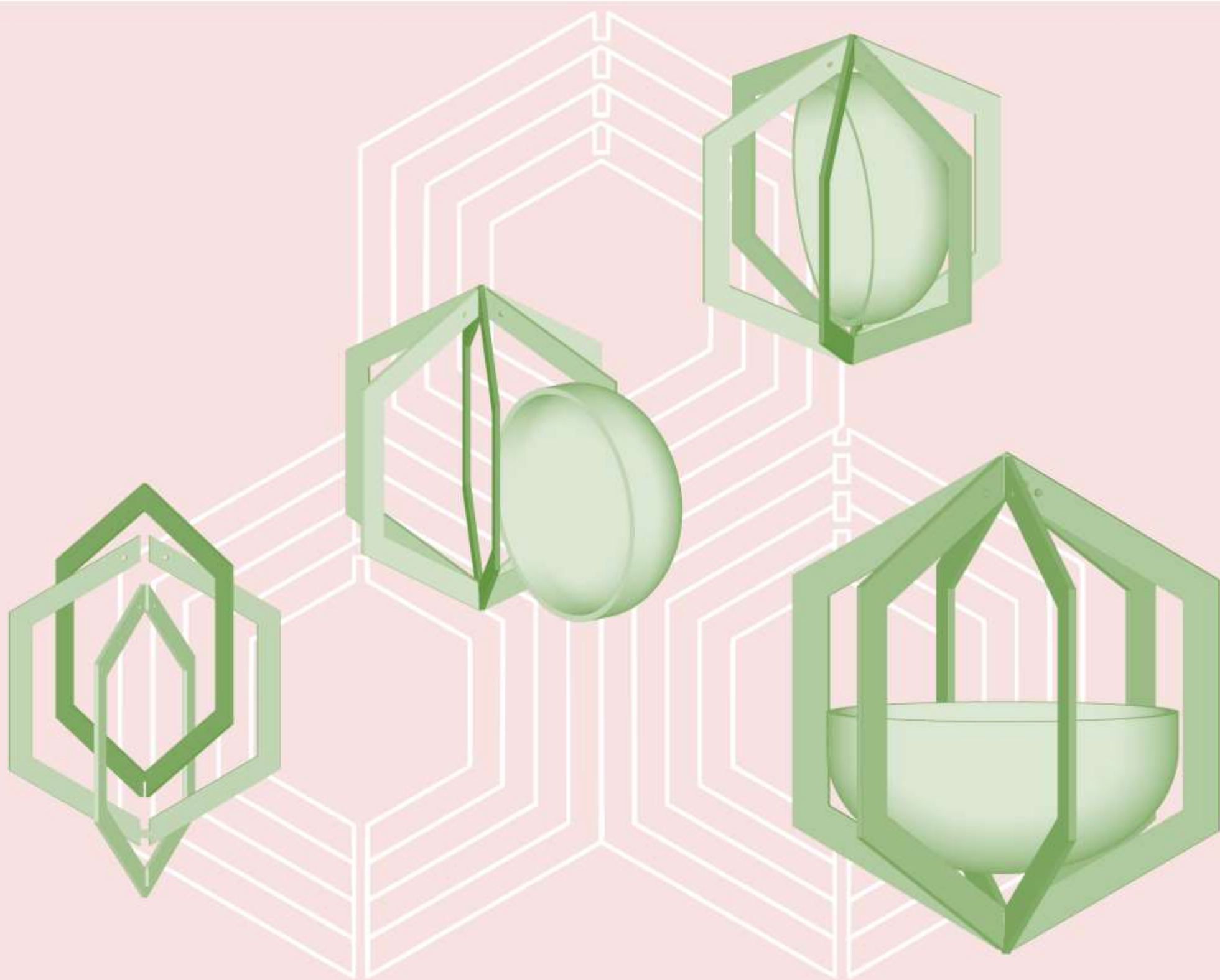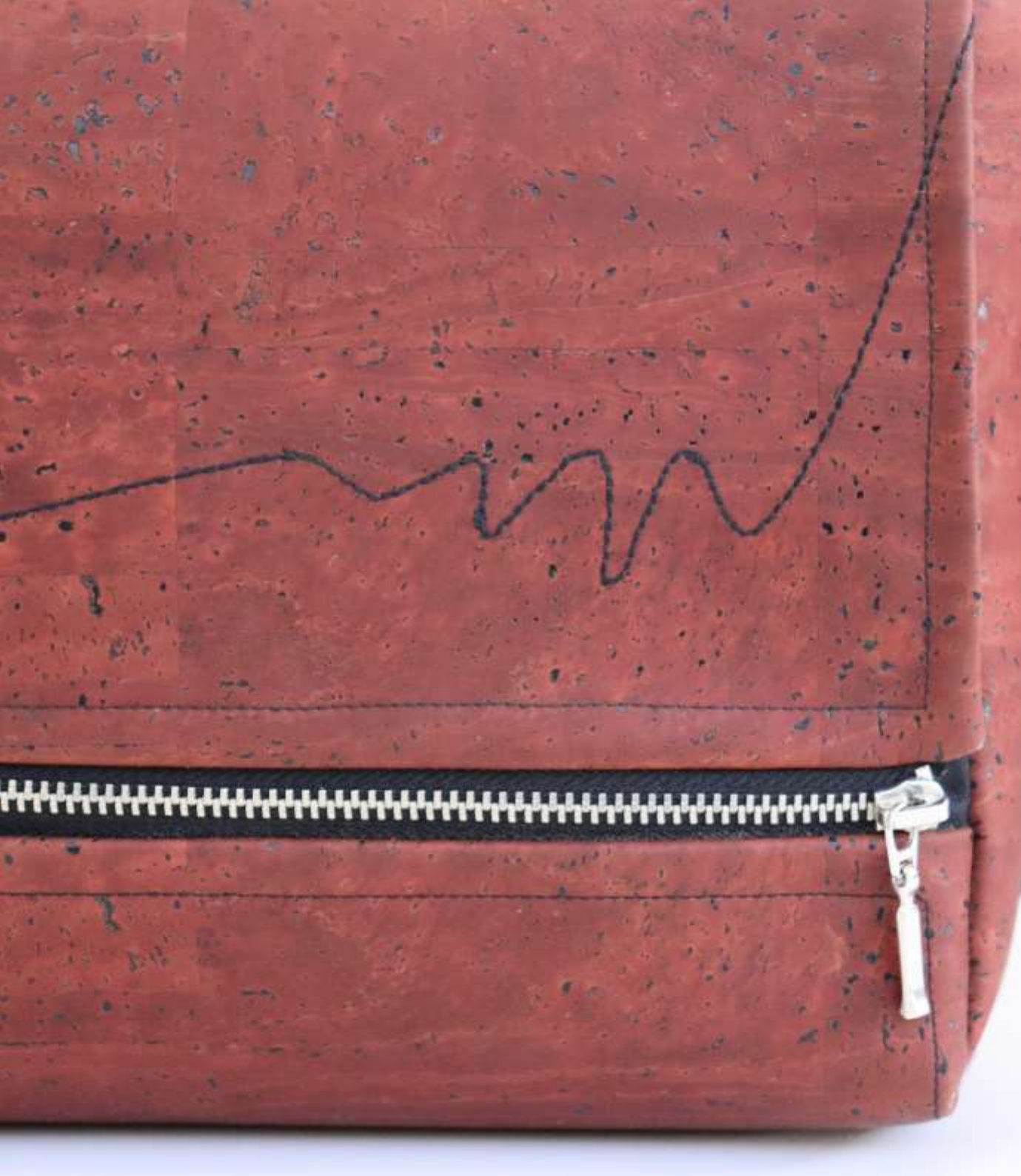
CORK LEATHER BAG

Cork leather offers a sustainable alternative to real leather. As the name suggest, the material is made from the bark of cork oaks, the bark of the tree can be harvested every seven years without the need to cut it down.

Cork leather is durable and ages well like leather and it has the same uniqueness to it. Much like no two animal hides are the same, no two pieces of cork leather are the same either.

Other benefits to cork leather are that it is water resistant and it is a very light weighted material, thus making it well suited for a laptop bag.

Meander

The laptop bag has a main compartment, which is closed off by the zipper on the front of the bag and three other compartments. Two of these compartments are inside the bag, one of these compartments is lined with an extra layer of stuffing, making it suitable for a 12 to 13 inch laptop.

There is a third compartment on the backside of the bag. This compartment is also closed off with a zipper and it is carried against your body, thus making it a secure place to keep, for example, travel documents in.

After making the first version of the cork leather laptop bag last year, I made some alterations and adjustments and I decided I wanted to make more to sell. To cut back on time and to make the production process more accurate, I made patterns that are easy to trace. The patterns are laser cut from 3 mm thick MDF.

cork main

sapis

frontside

sides

cork main

sides

frontside

cork main

cork main

FRUITPUNCH AI AGROBOT

This year I worked at the TU/e for EAISI, to build the an AI experience lab. The FruitPunch AI Agrobot is one of the projects demoed in the lab. Led by Buster Franken, I worked on this project with Andrea Favia, Vincent Fokker, Saber Naderi and Naomi de Vos.

FruitPunch AI describes the challenge of the Agrosim project as: *"Artificial Intelligence (AI) and robotics can help farmers to produce higher-quality food and have less impact on the environment. However, training and testing of agriculture robots is time consuming and expensive, because this usually happens in a physical environment and often involves the robot breaking down. In our project, we create a digital version of the robot that is tested and trained in a simulated environment. This way, training and testing of robots becomes faster and cheaper."* *

* FruitPunch AI for Food https://fruitpunch.ai/ai-for-food/

In creating the Agrobot demo for the EAISI experience lab, I was responsible for designing and building the physical environment.

The physical environment consists of three mesh panel hedges, decorated with fake hedera vines and three fruit crates. The hedges have magnetic 'stems', which the fruits can be attached to and plucked from.

The fruits (lemons, strawberries and apples) are made from 3D-printed PLA.

SUPPLY CHAIN MANAGEMENT GAME

Another demo I worked on this year is the Supply Chain Management Game. The original board game was made by Remco Dijkman and Willem Jaarsveld. With Buster Franken, Xander Verstraeten and Agoston Walter, I redesigned the board game to make it more engaging and intuitive and turned it into a semi digital game demo.

The Supply Chain Management Game can be played with two people on separate boards. On one of the boards the person playing the game is advised by an AI, the other player has to make all decisions on their own. The objective of the game is to sell products to retailers. This is done by moving parts and products along the supply chains on the board.
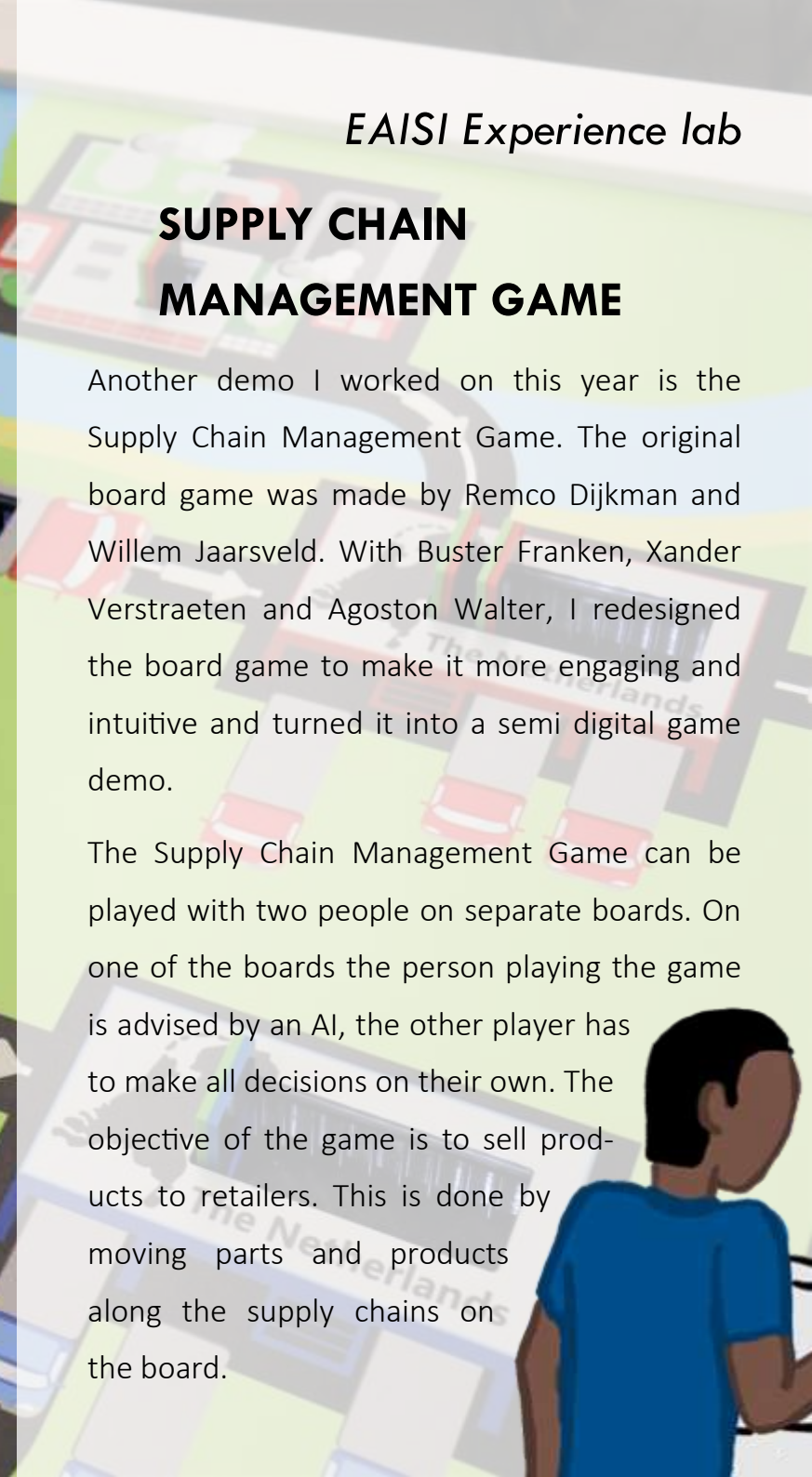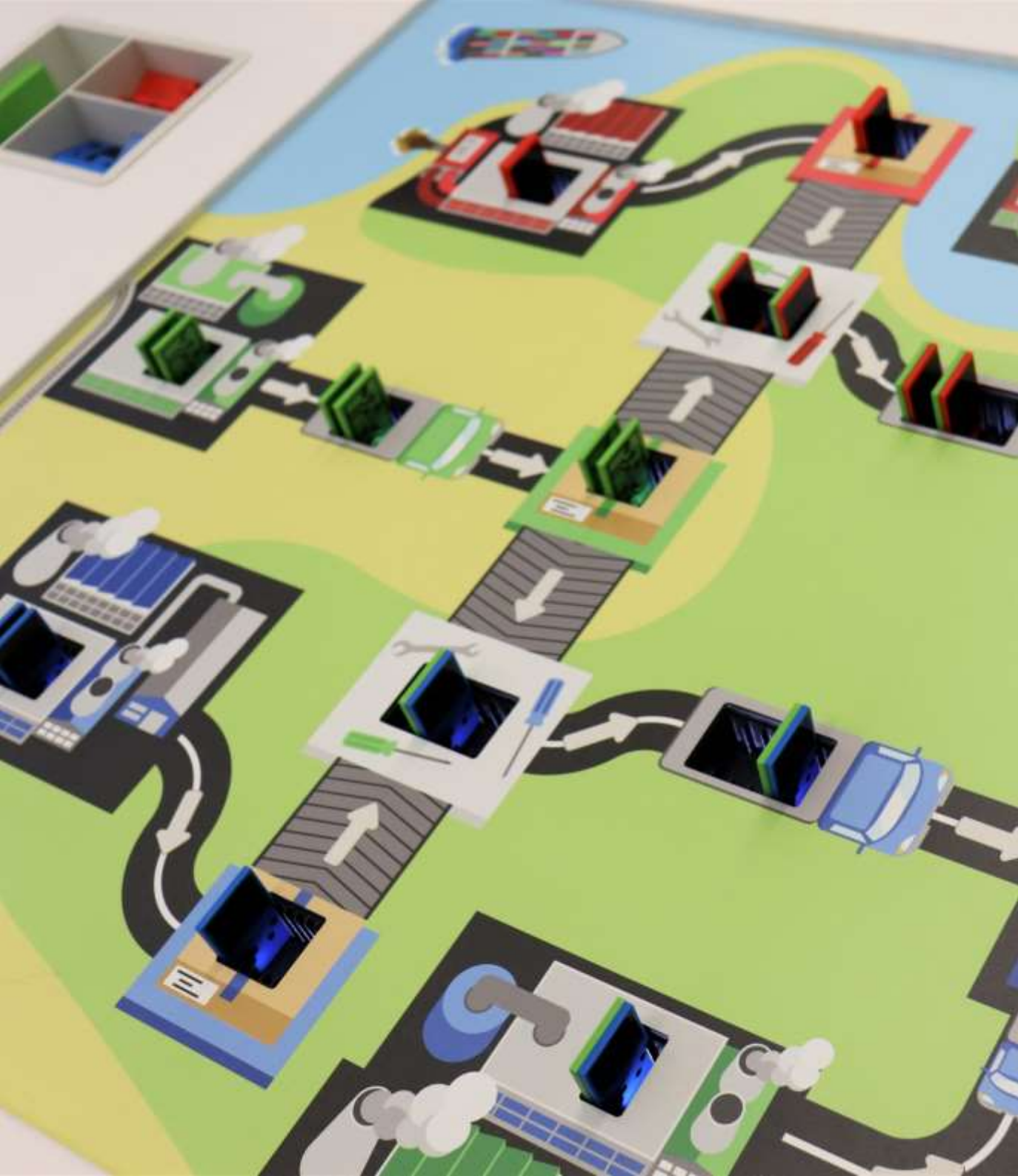
In creating the Supply Chain Management Game demo for the EAISI experience lab, I was mainly responsible for the graphical design of the board and user interface and the design of the play pieces (the tablet and game computer casings, and the electronics).

The board contains a touchscreen, the screen displays the rules and guides the players through all the phases of the game.

The play pieces are made of 3D printed PLA with a small magnet, which allows the player to combine parts (the casing and the electronics) into an assembled product.

A Christmas gift from FruitPunch AI

FRUITPUNCH ORNAMENT

I ended 2020 with a small project for FruitPunch AI. As a gift to their partners and volunteers I made these Christmas tree ornaments. When placing a light on the back, the ornament will light up with a pink hue.