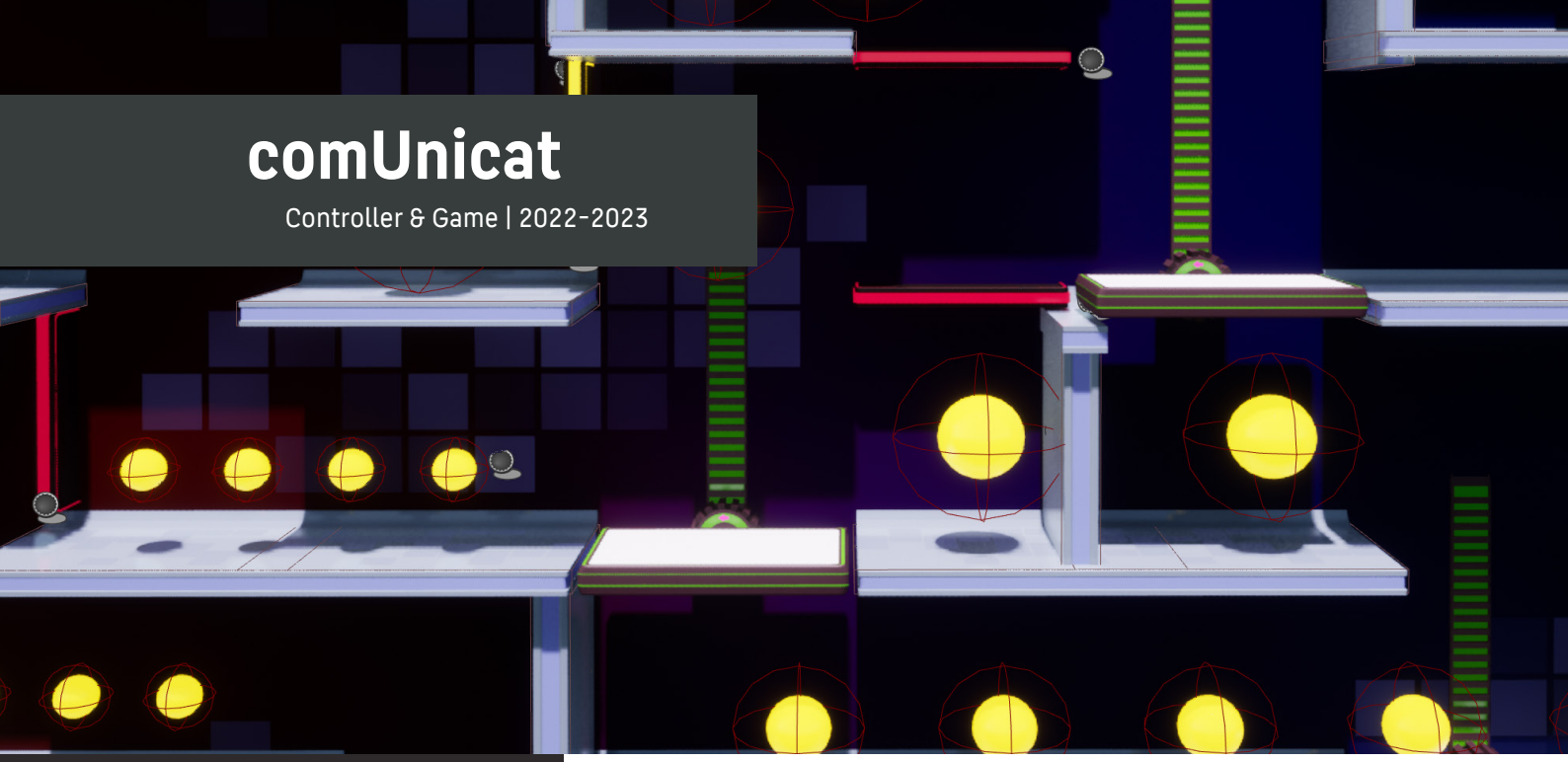


# comUnicat

Controller & Game | 2022-2023

**Time:** October 2022 - March 2023

**Team:** Matheus Zacharska

**Coaches:** Prof. Thomas Bremer
Sebastian Plesch

**Tools:** Unreal Engine 5, Arduino, Blender, 3D Print

**Tasks:** Creating a unique controller with a fitting game

**Context:** Final Bachelor project

## comUnicat

comUnicat is my bachelor project. I created my own controller and a matching game.

The hardware of the controller is based on an Arduino Nano Every.

To program it, I used Arduino as the software.

For the game, I used Unreal Engine 5.

## Development

For my final project for my bachelor, I decided to create an individual controller and a matching game.

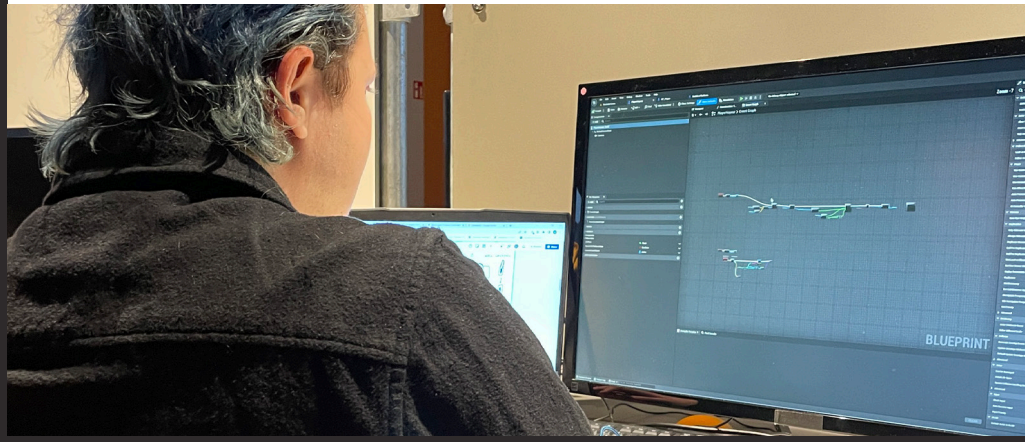
First, I created concepts for my controller and which inputs I wanted to use. I tried to avoid ordinary buttons or joysticks.

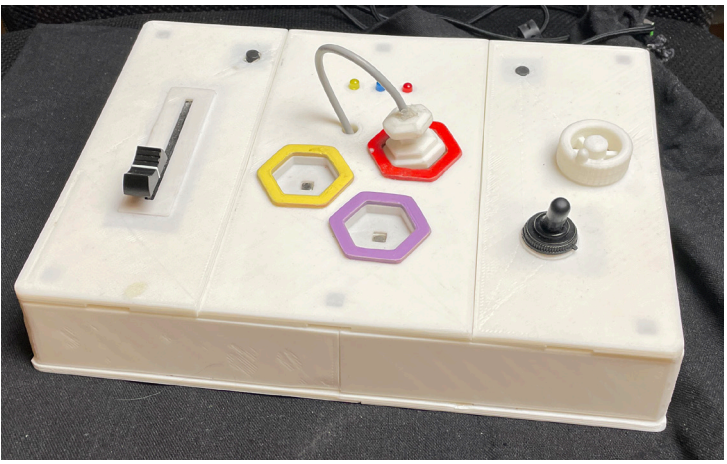
I used an Arduino Nano Every for the hardware and programmed in the software Arduino.

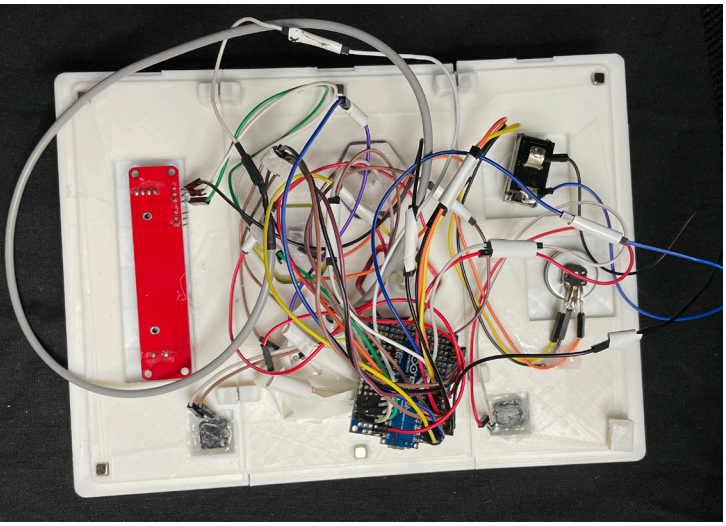
I created a 3D model for the case of the controller in Blender. After that, I printed it with a 3D printer.

Meanwhile, I developed a game concept fitting to the controller inputs.

I planned to focus on building a new controller. So I divided to use Unreal Engine 5 to save time in character modeling or animation.







## Gameplay

This game is a high-score game. The character is moving on its own from left to right and back. The character changes direction automatically when it reaches one of the walls.

Instead of controlling the character, the player can move different objects in the environment.

So, the player controls the rotation or height of one kind of platform.

Another feature is that the player can connect one of the three colored wires to activate corresponding platforms.

The character will move more and more to the bottom of the level. It can collect points, and by controlling the environment, the player can decide which way the character should go.

There are different ways in the level to explore.

## Learnings

This was my first project with this size during my study, which I had to do alone. With each project, it is easier to do time management.

I learned how to build a controller and connect it to the computer with Unreal Engine 5. I could improve my programming skills in Arduino and scripting with Blueprints.

I learned how to create 3D models for a whole case and print them with a 3D printer.

I was able to realize a whole project, from hardware to software. I am inspired to do more.

# Winkel Wrinkle

Single Player Jump & Run | 2020-2021

**Time:** October 2020 - February 2021

**Team:** Michelle Than
Kristoffer Nagel
Sebastian Voigt
Matheus Zacharska

**Coaches:** Prof. Susanne Brandhorst
Prof. Thomas Bremer
Sandro Heuberger

**Tools:** Unity 3D, Blender,
Substance Painter, Photoshop

**Tasks:** Lead programming, Technical Art, Game Design, 2D Art, 2D Animation,

**Context:** five months 3rd semester project

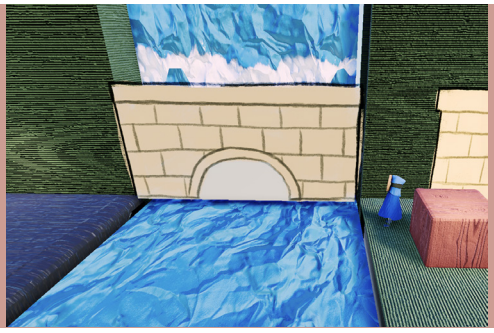
## Gameplay

Winkel Wrinkle is a platformer in which the player can walk and jump. The following mechanics in this game expand the gameplay in a special way.

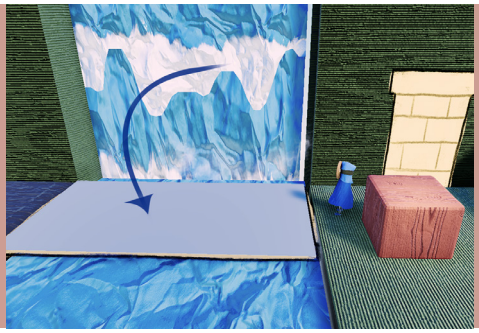
You are able to fold obstacles like paper, switch dimensions by crushing your player or turn an object around to open new ways.

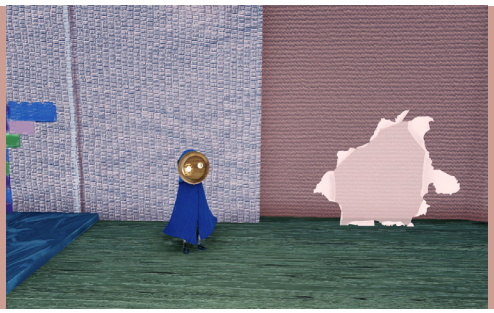
As the player you are controlling, a small character in a world full of objects known from everyday life. Even the player is a construct made up of such objects.

The goal is to reach the end of the level which is the highest point in this world.

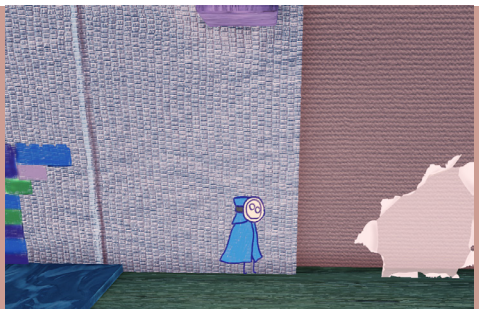


This example shows how you can fold some obstacles. Here you can make your way across the water.

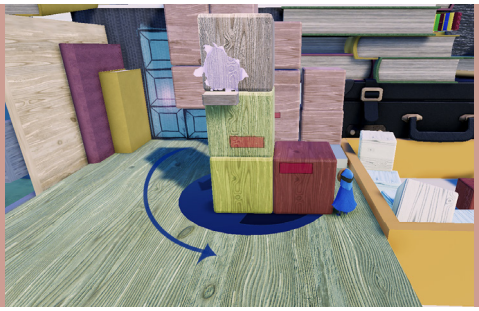




With the help of some objects, you can switch the dimension. A hammer can flatten you into the 2D world. A tear in the paper can bring you back to the 3D world. You can also let some obstacles switch the dimension, too.



To get through the level, you have to turn some objects around. You need a round platform for that. Sometimes something special is hidden on the other side of a turning object. In this example, a 2D passage is revealed.



## Development

I worked on this game project in the 3rd semester in a group of four people. We wanted to create a game where 2D and 3D are combined. So we thought about a 3D paper world early on.

Soon we got the idea of our three main mechanics.

My main role was programming in C# but I also created the 2D art and 2D animations.

The game was our first game developed in Unity 3D. First, we were able to work together in one room but then we were challenged to continue working in home office.

The home office situation made it more and more difficult to stay focused, but in the end it led to a good result.

## Learnings

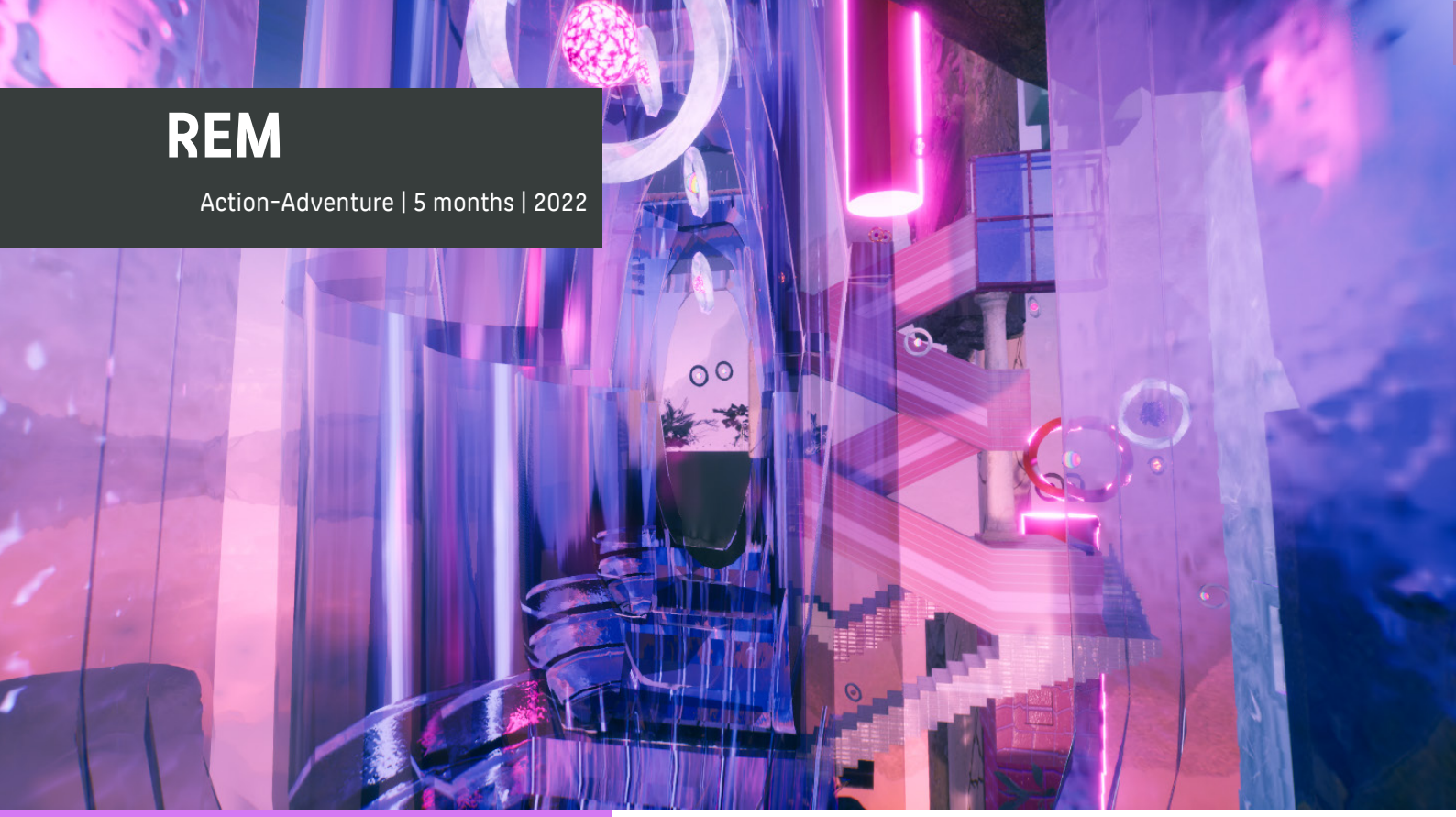
As I mentioned before, this was my first long term game project and I learned a lot. It was a good new experience to create the first game from start to finish.

Time management was very important, especially due to the home office situation. I learned a lot about the organisation for myself and my team.

I have worked in teams before but in this case the period of time was greater. This project and team dynamic gave me confidence in my role as a programmer. It was the first time I was fully responsible for code management.

My skills in Unity 3D, C#, Git and Blender improved as well.

Working in home office was a big challenge but we handled it well.



# REM

Action-Adventure | 5 months | 2022

**Time:** April - August 2022 (5 months)

**Team:** Luca Rawe
Ewa Berg
Victoria Raetzer
Vanessa Kollburg
Matheus Zacharska

**Coaches:** Prof. Susanne Brandhorst
Prof. Thomas Bremer

**Tools:** Unreal Engine 5

**Tasks:** Programming, Technical Art, Level Design

**Context:** semester project in the 6th semester

## Gameplay

REM is a first person singleplayer game, created in Unreal Engine 5 in a team of five people.

There are two different main mechanics for the gameplay:

First, you can use a hookshot to pull you from hookpoint to hookpoint. Sometimes you can use it to pull objects to your direction.

Second, you can use a wind blow to push objects away and reveal new ways.

The gameplay is about having a dreamy atmosphere and exploring it on the way to the top.

## Development

I worked on this five-month project in the 6th semester in a group of five people.

Our focus was to create a dream-like exploring game. It ends up with being more action-packed then planned in the beginning.

It was the first Unreal Engine 5 project for us all. I worked on it as the main programmer and wanted to use the chance to learn, how to use Unreal Engine 5.

Before that, I had more experience in using Unity.

The mechanics were clear from an early point. We wanted to have a hookshot and swing from point to point.

The biggest challenge was the level design. We needed to think about the balance between fast and slow pacing and answer the question, what is more fun in our setting.

## Learnings

I learned a lot out of this project.

The main thing I learned is working with Unreal Engine 5. I used Unreal Engine 4 before but not as intense then for this project.

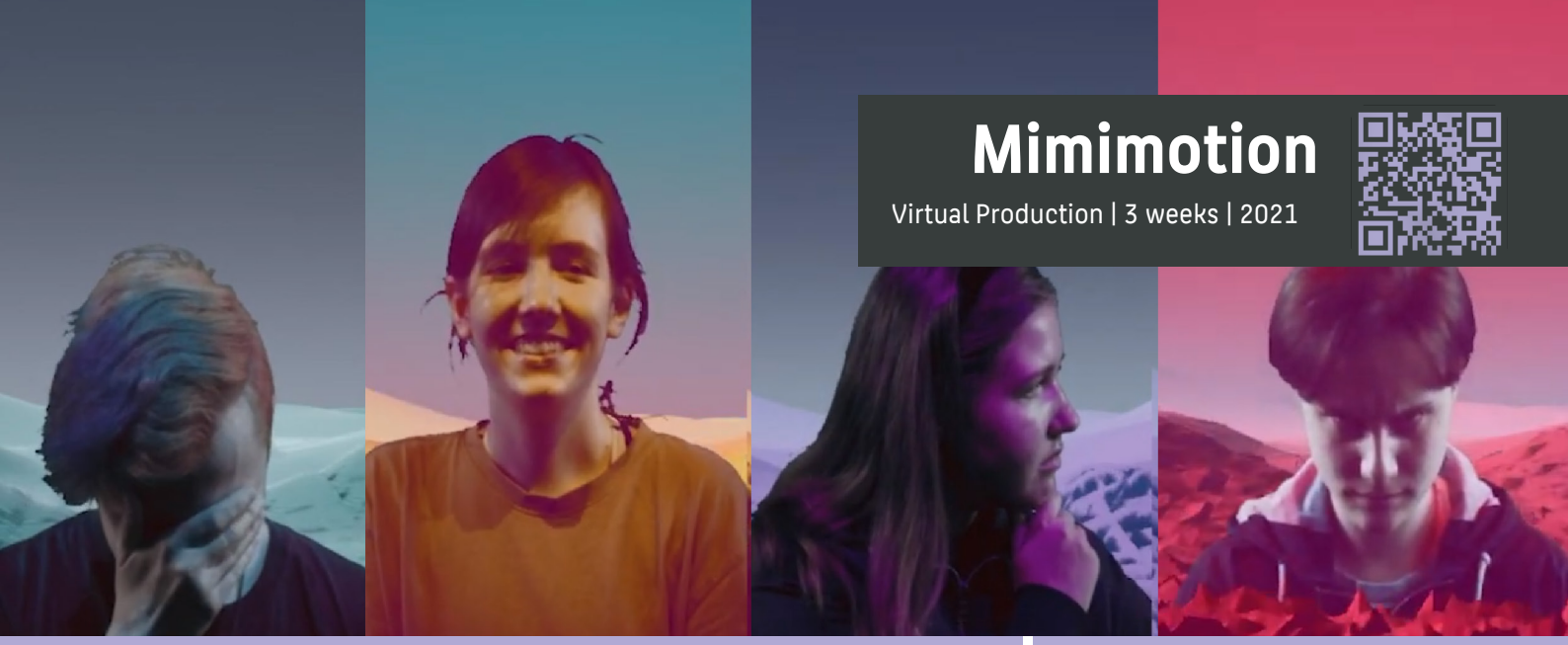
Because I was the main programmer. I had to learn many things on my own and it was fun to do so.

In the end of the project, I also worked with the settings to get a better performance.

It took me much time for organizing my tasks.

This was a game project of our study, and I was also working as a working student. So I needed to think about my time management, too.

Also, I worked with new people together. There are always new learnings through group-work, because every person and every group dynamic, is different.



# Mimimotion

Virtual Production | 3 weeks | 2021

**Time:** June - July 2021 (3 weeks)

**Team:** Sina Behrend
Lena Rawe
Dala Klimek
Matheus Zacharska

**Tools:** Unreal Engine 4, Lobe, Blender, Photoshop, DMX

**Tasks:** Technical Art, DMX Lights, machine learning

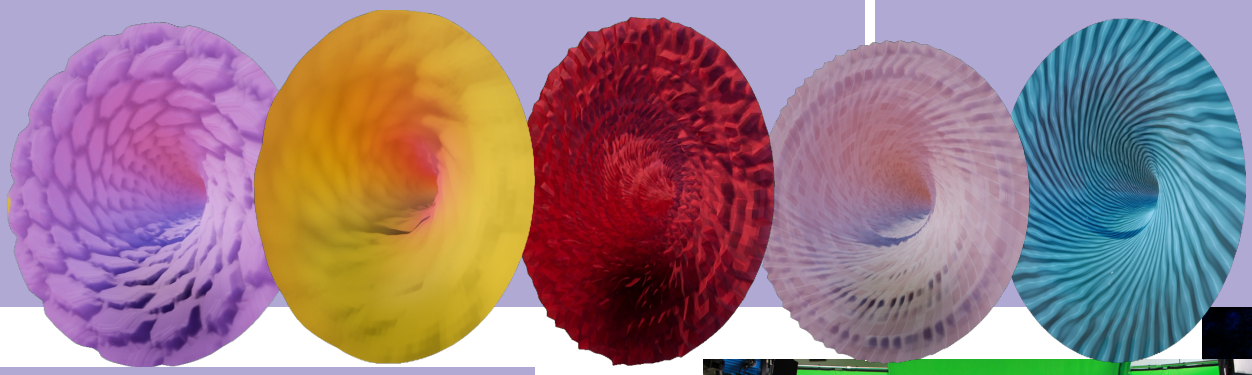
**Coaches:** Susanne Brandhrst
Thomas Bremer

**Context:** 3 weeks Experimental Game Jam in the 4th semester

## Virtual Production

Mimimotion was created within our second Experimental Game Jam within three weeks. This is a virtual production.

The background is reacting to the emotion you are showing.



## Development

Thanks to our institute DE:HIVE we were able to use the rooms of the HTW Berlin to make our project.

We used many types of technical equipment such as a green screen, camera but also DMX lights and more.

We worked with the machine learning software Lobe and taught it to recognize our emotions: neutral, sad, happy, angry and thoughtful. Because we only had three weeks we combined the emotions with gestures to make a clear difference.

In the end, we were able to put a person in the Unreal Engine and make the background transparent. It can recognize the emotions of the people and reacts by changing the background.

## Learnings

I was able to use my knowledge about the hardware but also try new things, especially working with the DMX lights which I had never used before.

Unreal Engine was new for me. I learned a lot about the BluePrint system and Python.

I realized that I enjoy experimental projects.

# Lava Level

Level Design | 1-2 months | 2022

## Lava Level

This project was made for the course ‚Level Design' of my study.

The focus was to create a small level by choosing a limited number of gameplay mechanisms and by using quixel assets in Unreal Engine 5.

**Time:** September - October 2022 (1-2 months)

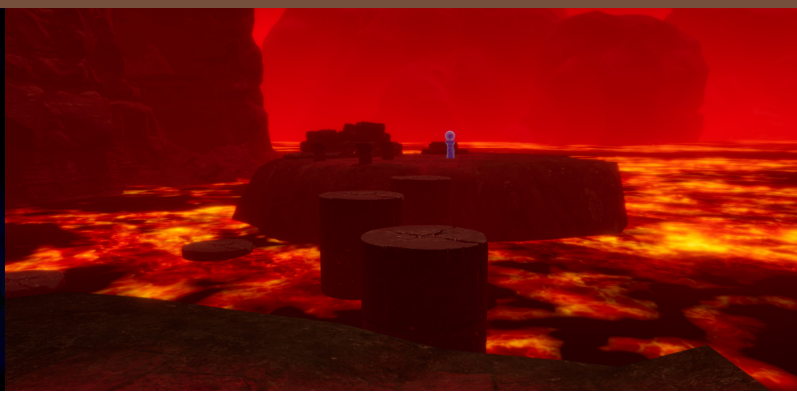
**Team:** Matheus Zacharska

**Tools:** Unreal Engine 5, Quixel Assets

**Tasks:** Level Design, Coding, creating a whole project

**Coaches:** Friedrich Schadow
David Witzgall
Zwi Zausch

**Context:** Level Design course 6th semester



## Development

The task of this course was, to use the standard character controller and build a small level with the help of Quixel assets, also by using different functions of Unreal Engine 5.

We got some code for the level mechanics from our professors. But because my wish was to learn how to code in UE5, I decided to code everything by my own.

It was the first time I worked in UE5 and made an own project in it from the beginning to end.

I decided to have a small puzzle game. The goal is to put all the three icy spheres on the pedestals in the middle of the level. But you have to find them first, by solving different puzzles.

## Learnings

This was my first project I did on my own in Unreal Engine. That is why I learned a lot about this engine.

Although we got some examples of mechanics to use because the focus was on Level Design and not coding, I coded all the level mechanics on my own because I wanted to learn it from scratch. So I could learn how to handle with UE5.

# Inner Team

Online Multiplayer | 3 weeks | 2021


**Time:** April - May 2021 (3 weeks)

**Team:** Ewa Berg
Marco Perschke
Selina Stückler
Hannah Wissmann
Matheus Zacharska

**Coaches:** Prof. Susanne Brandhorst
Prof. Thomas Bremer

**Tools:** Unity 3D, Blender, Photoshop

**Tasks:** Programming, 3D Art, Technical Artist, Level Design

**Context:** 3 weeks Experimental Game Jam in the 4th semester

## Gameplay

Inner Team is an online multiplayer game for a maximum of four players. You can choose one of four different characters in a chaotic shared apartment.

Every character has their individual personality, so their home furnishings are different, too.

We wanted to integrate the topic of 'social dilemma' by creating a special interaction between players.

Every player has their own tasks and you can win the game by completing all of them. But you have to hurry, because the others could be faster than you.

In this case, you can plant some traps.
But if you are too mean, everyone will lose the game.

Fullfilling the tasks equally might be your best strategy, but are you really sure the others think the same way?

## Development

I worked on this three-week project in the 4th semester in a group of five people.

Our focus was to create a game with the topic 'social dilemma'. For experimental reasons, we chose to make an online multiplayer.

The Gameloop was difficult to create because there has to be a good balance between winning, losing and the 'social dilemma' part.

## Learnings

The challenge was to create a game in just three weeks. I contributed a lot to the organisation of the group. I also learned a lot about the organisation for myself.

I was involved as a programmer and learned how to create an online multiplayer in Unity 3D, with all the technical relations.