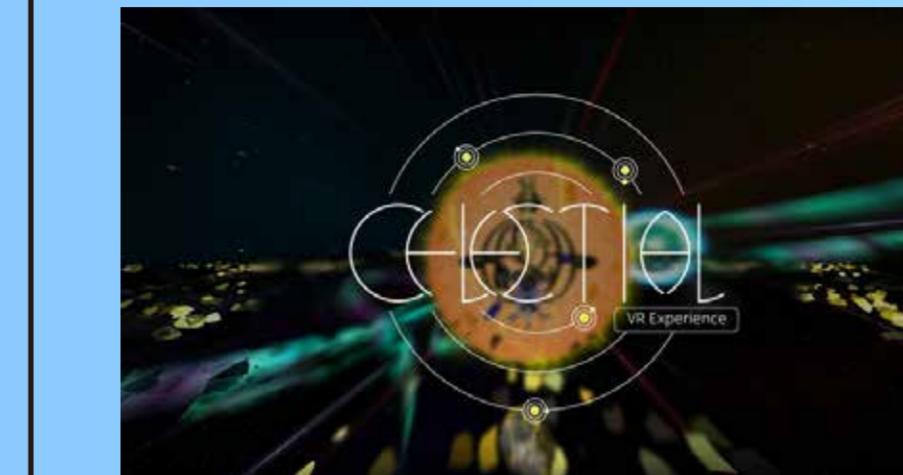


GAME DESIGN & DEVELOPMENT PORTFOLIO



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ZHANG**
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CONTENTS



CELESTIAL

Virtual Reality Immersive Experience
Multiple-media Educational

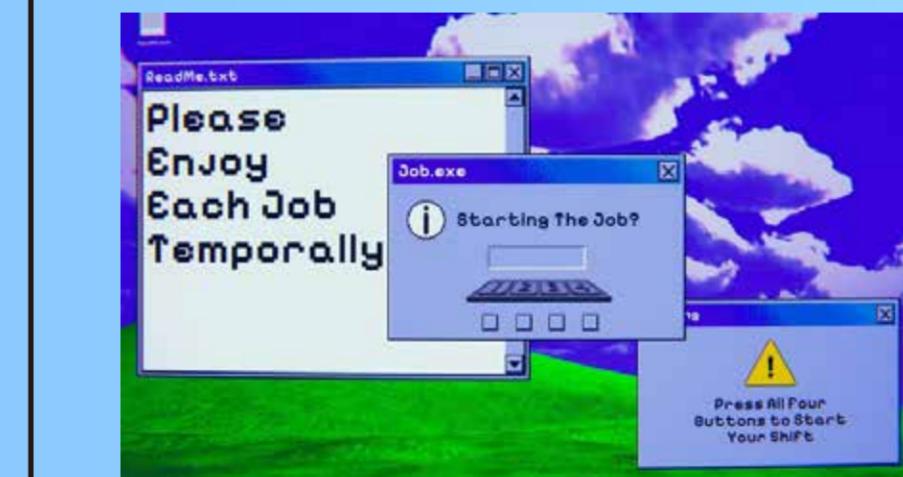
2025.7
DEMO VIDEO: www.youtube.com/watch?v=zK6lsieII



ZOOM

First-Person-Shooter Narrative
Fast-Paced Boomer Shooter

2025.5
STEAM: store.steampowered.com/app/3592960/Z00M
TRAILER: www.youtube.com/watch?v=0vWUfkinD0



PLEASE ENJOY EACH JOB TEMPORALLY

Working-Simulation Number-Driven
Anti-Flow-State

2025.9
VIDEO: www.youtube.com/watch?v=hFfHxAug-EI



PRISON

3D-ART Brutalism
Architecture

2024.11
VIDEO: www.youtube.com/watch?v=bsbV5-600

Links

Game Link(Windows Version):

TYLER-ZHANG.ITCH.IO/CELESTIAL

Trailer:

YOUTU.BE/ZGLRGUHUC6W

Demo Video:

YOUTU.BE/Z6K6LSIEIL1

Keywords:

Virtual Reality

Immersive Experience

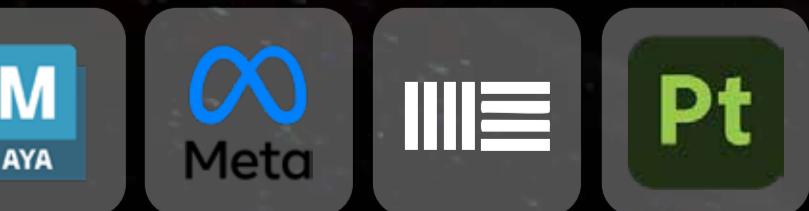
Cross-Media

Educational

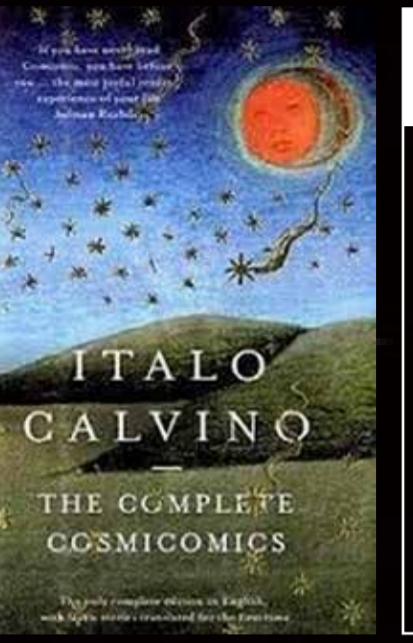


Game Overview

Celestial is an immersive virtual-reality experience that guides players through the life cycle of a stellar system. Using tarot cards, four distinct musical instruments, and a mysterious device, players can customize the formation of their own stellar system. Eventually, players must guide their creation toward its inevitable destruction. Celestial highlights the balance between creation and destruction, science and mythology—aiming to make astronomy ideas approachable through a splendid virtual experience.



INSPIRATION



Calvino's *The Complete Cosmicomics*

- Transforms scientific facts into mythic, human stories
- Blends science with imagination and playfulness
- Inspired me to merge scientific ideas with interactive experiences

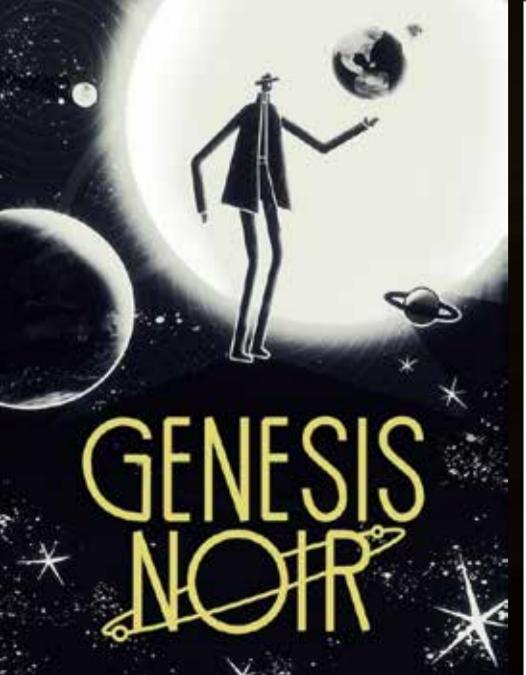
Pulsar, The VR Experience

- Original interactive music
- Virtual reality experience with minimal "game" mechanics
- Inspired me to compose music for a more immersive project



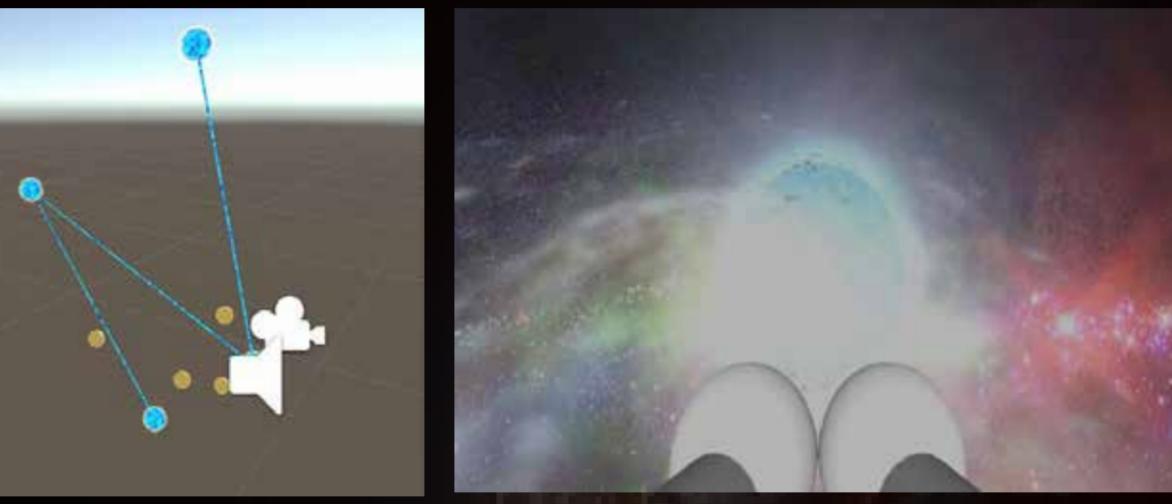
Genesis Noir

- Turns the Big Bang into a poetic, emotional story
- Demonstrates how the universe can be expressed abstractly and philosophically.
- Inspired me to explore the emotional side of science



ITERATIONS & DEMOS

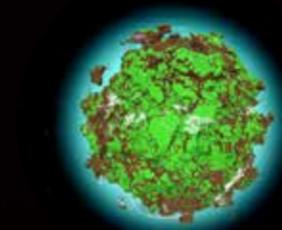
DEMO.1



In the first iteration, I focus on how unity work with **DAW(Ableton Live)**. Also, Players can create planet by solving **Zodiac** sign puzzle.

Video Link: youtu.be/rg6PDL-537c

What is working?



- Making unity communicate with DAW
- Customizable planets
- Real-time Interactive cutscene

What is not working?



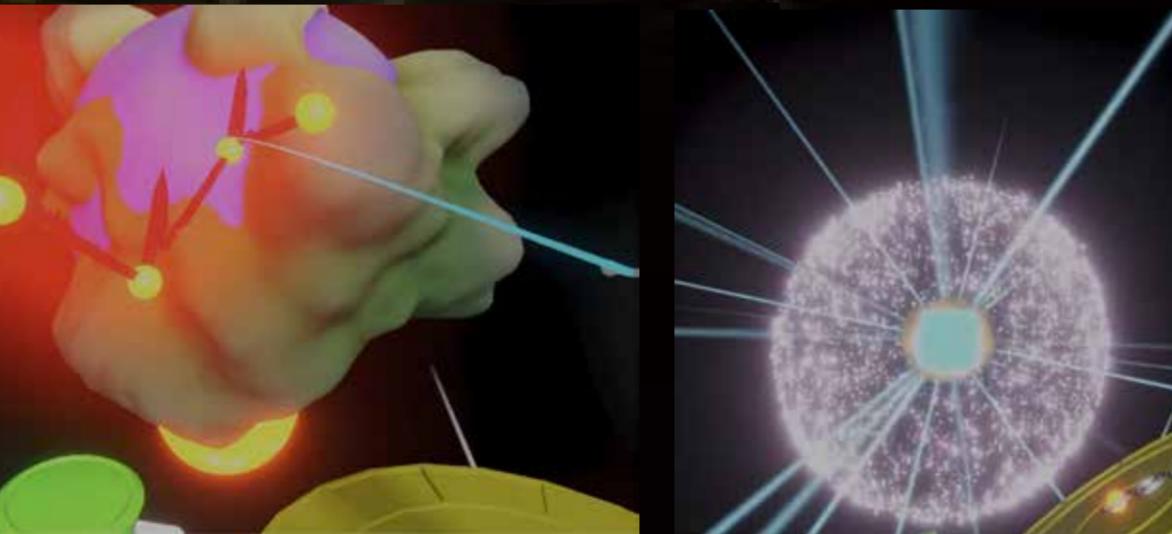
- Game is too abstract and players have no agency in the game
- Limited customization

What did I learn ?



- Create concrete, interactable gameplay
- Replayability
- Give players more options to customize their own play-through

DEMO.2



For the second iteration, I introduced the idea of letting players interact with a mysterious yet tangible device.

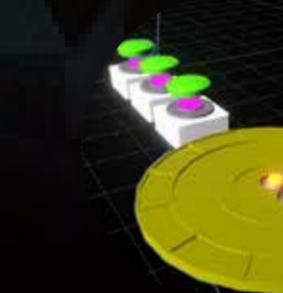
Video Link: youtu.be/VbAFMSxS0h8

What is working?



- Give players a device to interact with
- Real-time and scientifically-accurate **orbit** system

What is not working?



- Redundant design
- Complicated Mechanics
- Interactable objects are limited

What did I learn ?



- If it does not work, just cut it
- Everything players can reach and see must be interactable and provide feedback

GAME LOOP

The game opens in darkness with a small glowing star. It quickly grows brighter, swelling with energy until it can no longer hold itself together. The star erupts into a massive supernova, scattering debris across space and triggering a dramatic meteor shower that marks the beginning of Celestial.



Start/end

Supernova Exposition

Rotate the Clock

Final Cutscene

Intro Cutscene

Star Condense Into Supernova

Black Hole Resets the Stellar System

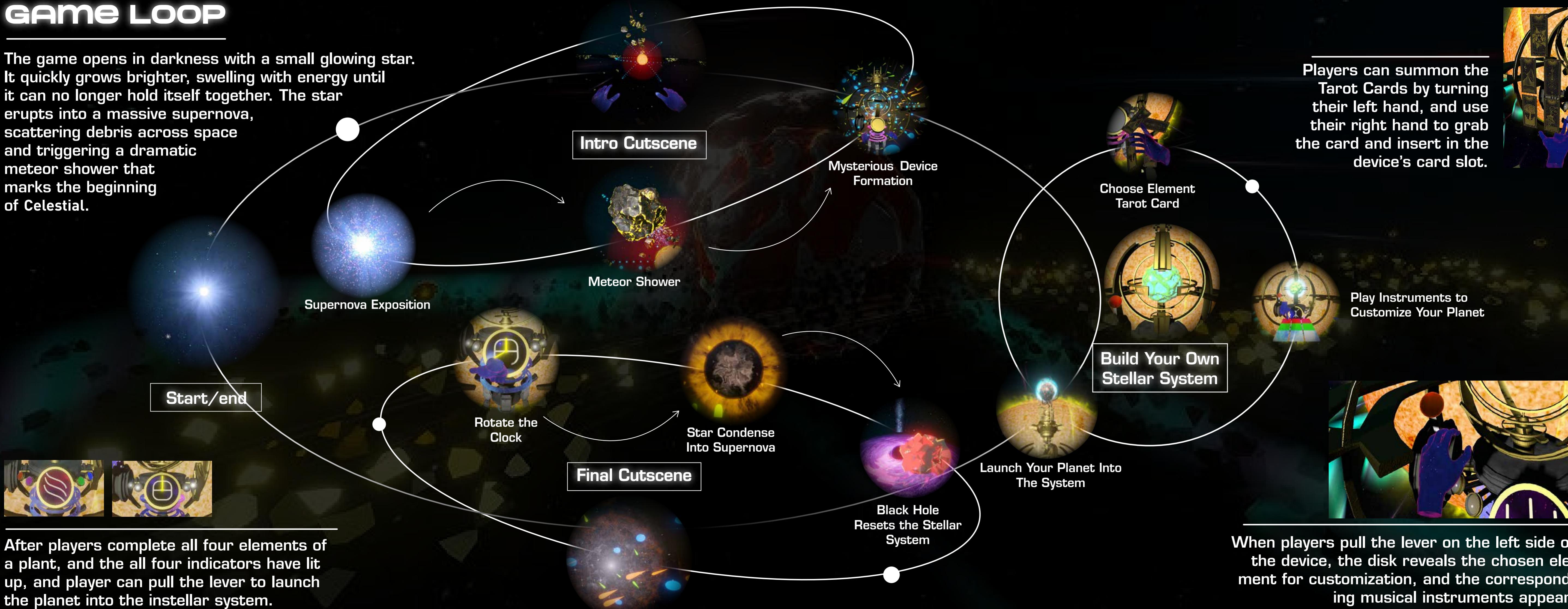
Launch Your Planet Into The System

Choose Element Tarot Card

Build Your Own Stellar System

Play Instruments to Customize Your Planet

After players complete all four elements of a plant, and the all four indicators have lit up, and player can pull the lever to launch the planet into the instellar system.



Players can summon the Tarot Cards by turning their left hand, and use their right hand to grab the card and insert in the device's card slot.



When players pull the lever on the left side of the device, the disk reveals the chosen element for customization, and the corresponding musical instruments appear.



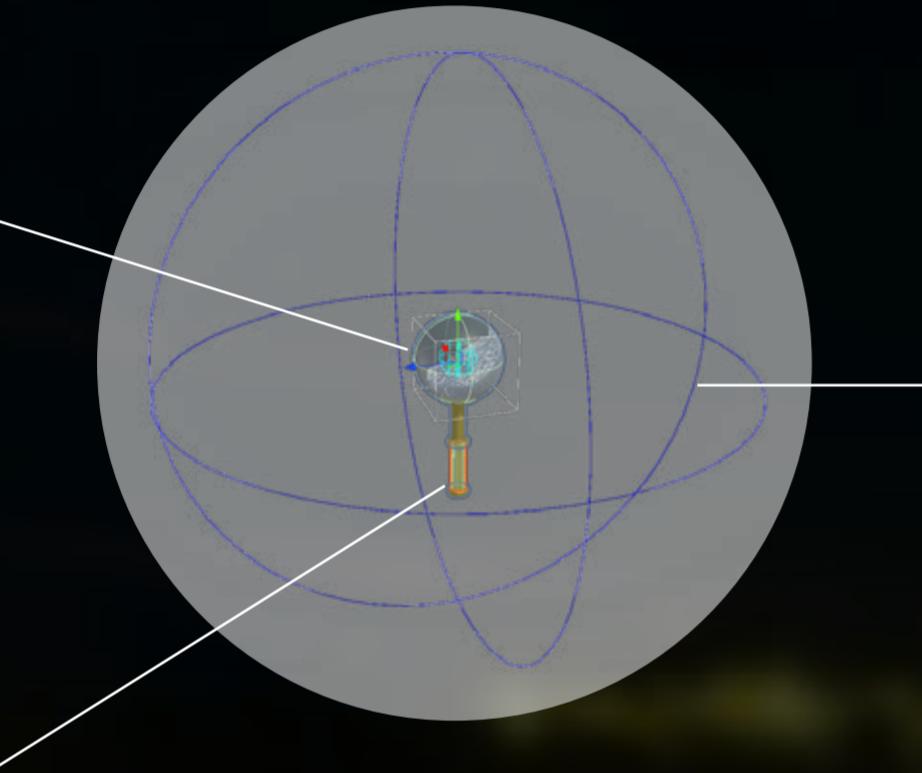
MECHANICS

In Celestial, each musical instrument **has its own unique interactions**. Instead using traditional controller buttons or mouse and keyboard for inputs, I want to make all the interactable objects in the game **intuitive and self-explanatory**.

MARACA

01

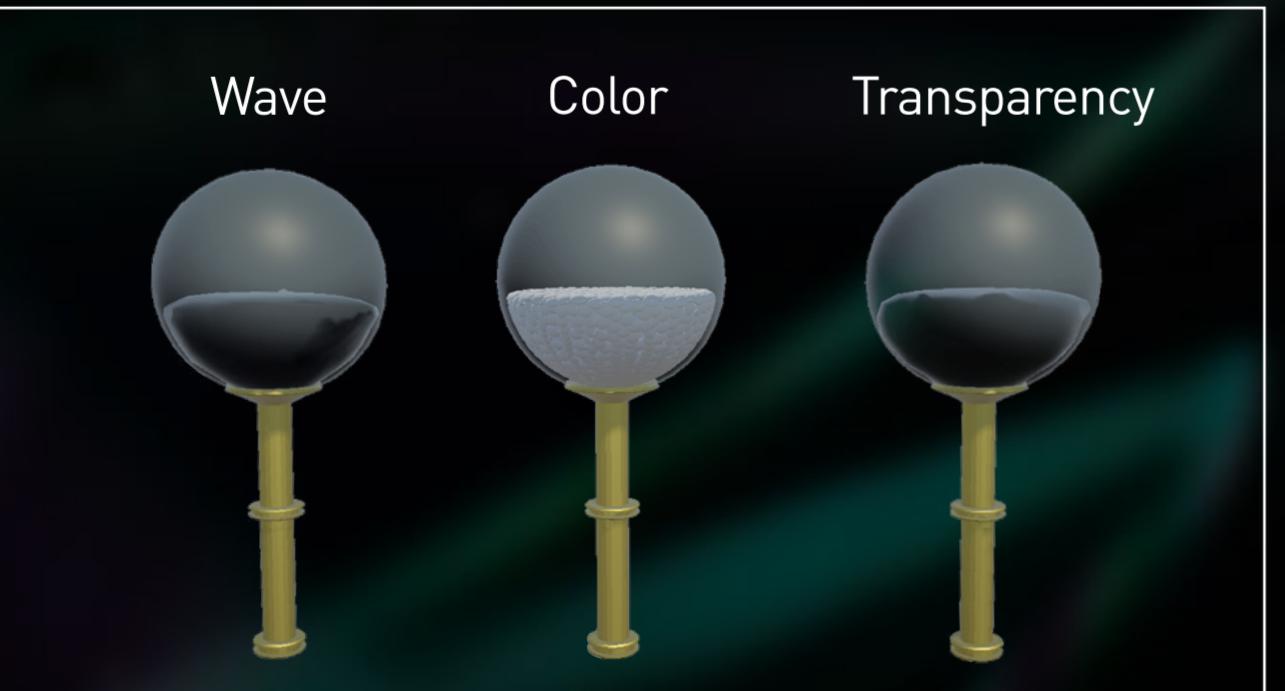
Real-time liquid simulation inside the Maraca, indicates it controls the planet's water component.



02

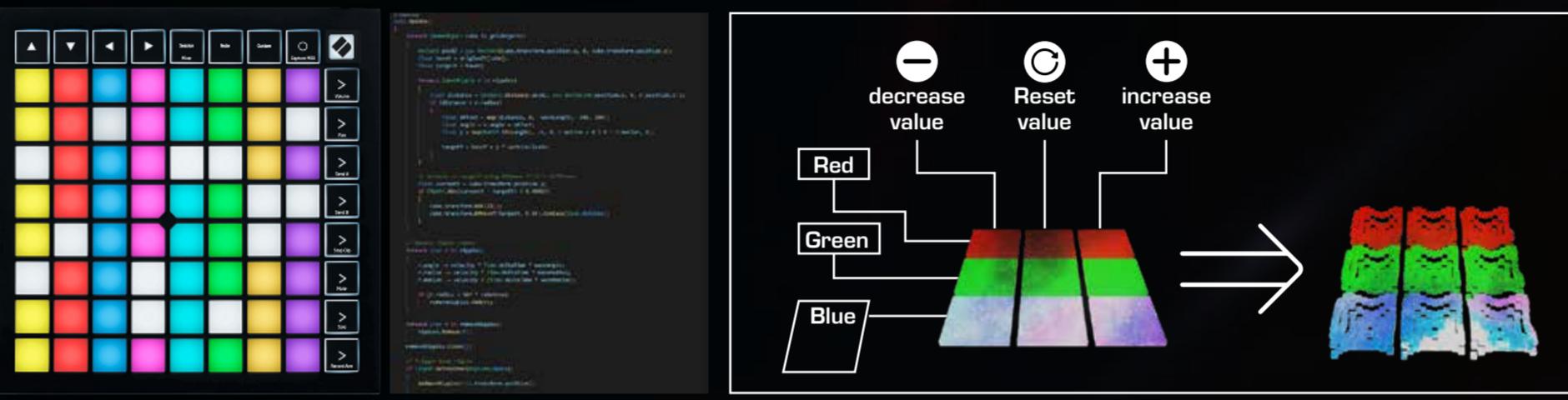
The handle's mesh is separated and attached with **grabbable script**.

There are three different maracas with different types of liquid simulation inside, and separately controls the water's waves (normal map), color, and transparency.



LAUNCHPAD

Designing a simple instrument that lets players customize their planet's colors was challenging, so I chose the **Launchpad**—a colorful and performative device, its grid layout makes color customization more intuitive.



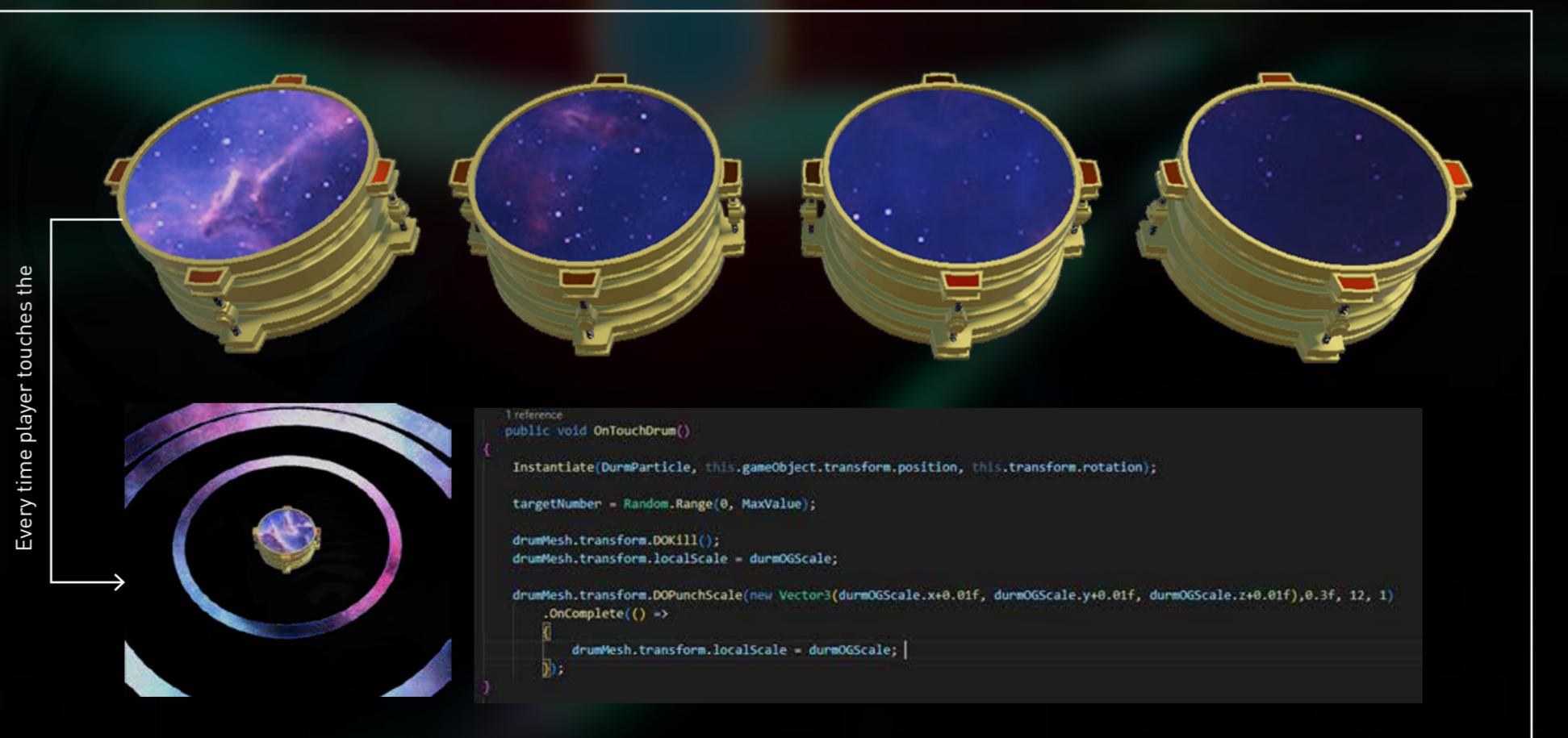
03

I also attached a **Magnetic-like movement** script to the maraca, so it always goes back its original position after player release it.

To enhance feedback, I built a ripple script that uses dozens of cubes to form each button. When pressed, the cubes animate outward, creating a **wave-like effect**.

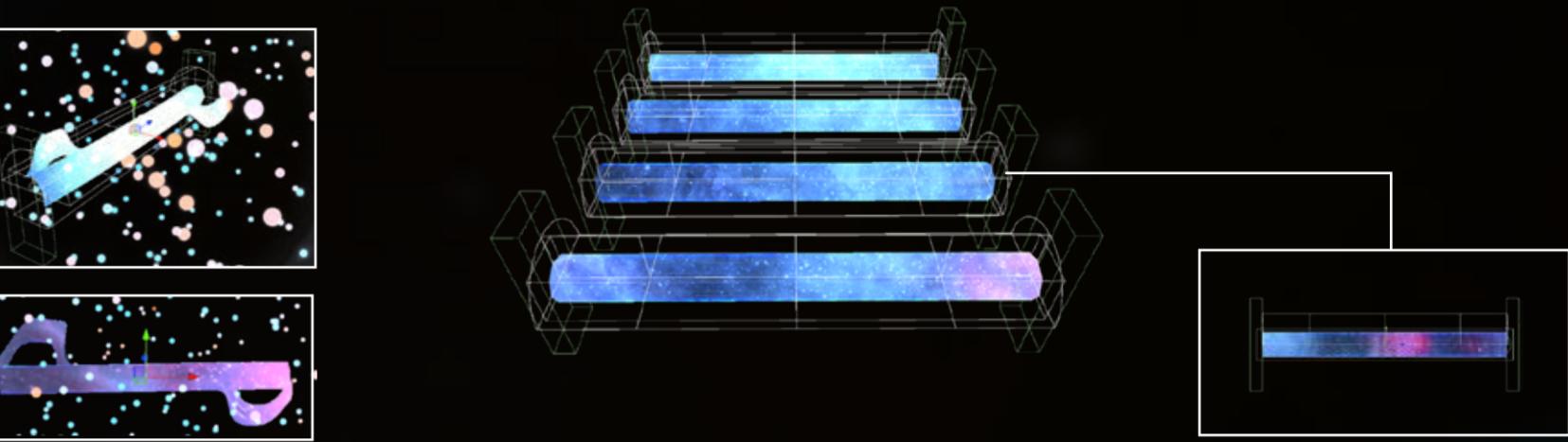
DRUMS

Every time players touches the drum, it plays a elastic animation and release a sound wave particle effect.



STRINGS

Each string is anchored to invisible cubes that vibrate on touch, producing a realistic **string-vibration effect**.

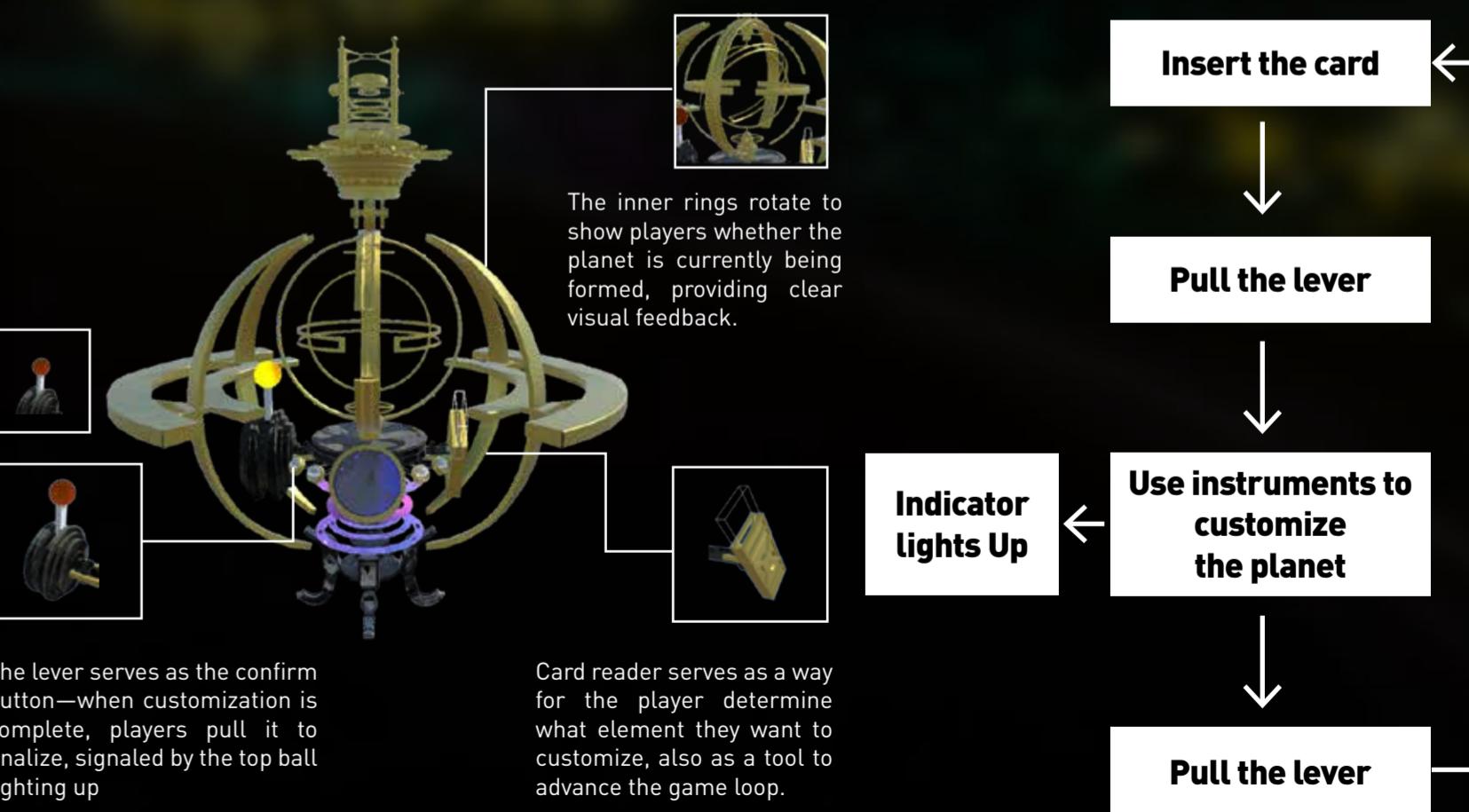


When triggered, the string releases layered effects—shockwave particle effect, and a swirl—to make its vibration visually convincing.

Each string contains several fragments that are connected by chain joints.

"MYSTERIOUS DEVICE"

The "mysterious device" is the core of the experience, and players interact with it in two ways: **through tarot cards and a lever**.



CROSS-MEDIA

Real-time Music Generation

Music is central to Celestial. To deepen the sense of immersion, I created a mechanic that uses players VR controllers' movements to automatically generate music in Ableton Live.



I made a script to transform players controllers' position into a midi file and send to Ableton Live in runtime, creating a emergent music.



This is music that I created for the trailer, aims to capture the life cycle of a planet.



I use a climbing arpeggio as the primary motif, symbolizing both ascent and discovery. Its upward motion reflects the epic scale and mysterious atmosphere of the universe, giving players a sense of awe and progression as they explore.



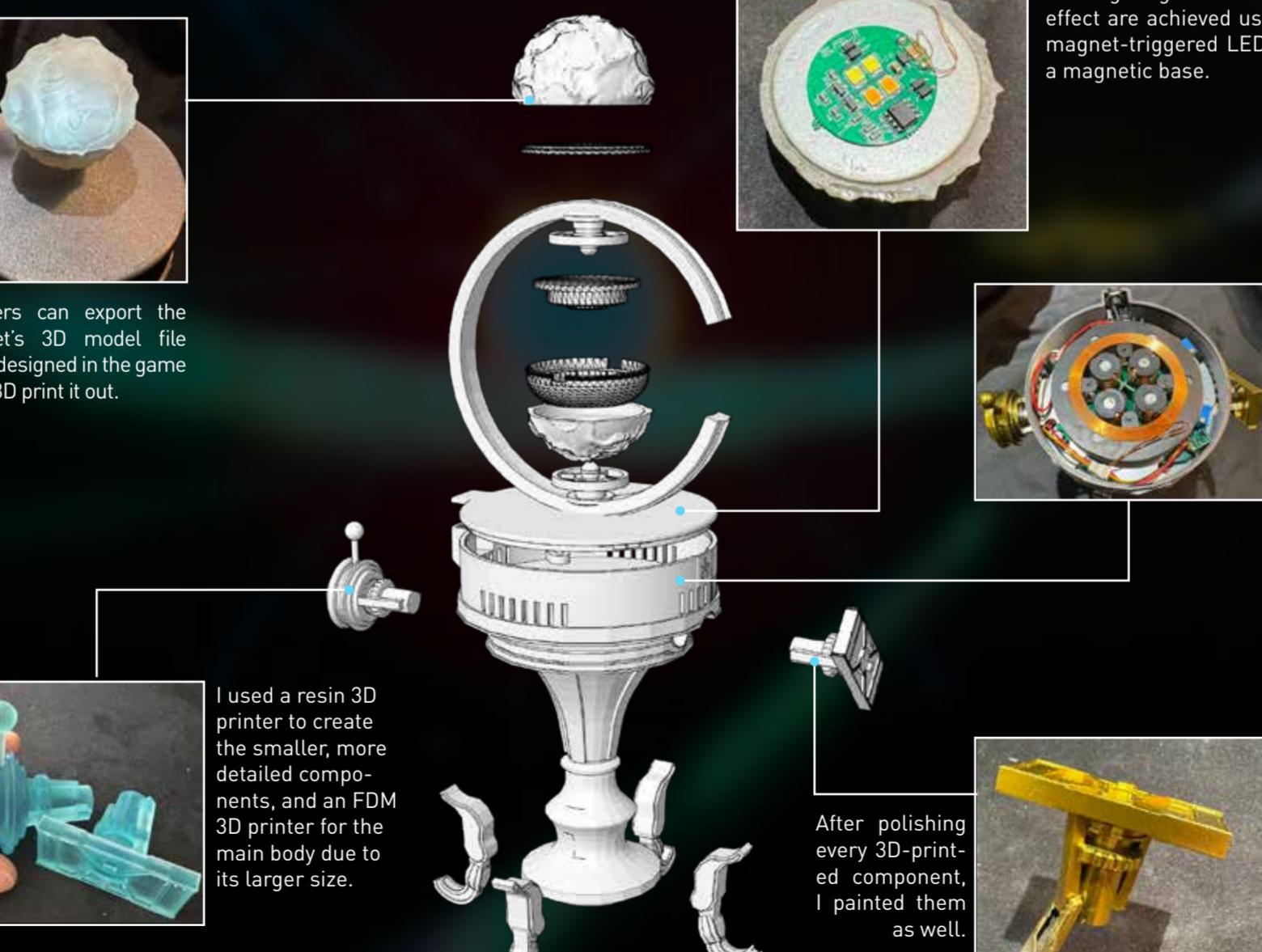
I use generative sound plug-ins that takes random midi files from the player's movement into emerging ambient sound.



Give it a listen: soundcloud.com/tyler-501173876/celestial-ambient

PHYSICAL INSTALLATION

I want this project to be more than just a virtual experience—I want it to share astronomy knowledge and spark curiosity about science. So I built an installation where players can 3D-print the planets they create in the game and actually take them home. I also built the 'Mysterious Device' with a magnetic levitation system, so the planets can float in real life the same way they do in the game.



DEMONSTRATION



TAROT CARDS DESIGN





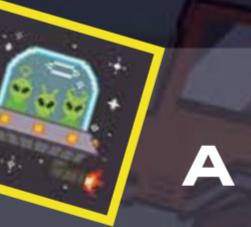
Game Overview:

ZOOM is a fast-paced silly FPS with strategic gun-and-skill swapping. Play as an F(eeding) B(easts) I(ntelligence) agent armed with a special food gun tasked with satiating the residents of a zoo gone mad with hunger!

LINKS:

Steam Link: store.steampowered.com/app/3592960/ZOOM/
Trailer Link : www.youtube.com/watch?v=OvWUiFkimDo

TEAM:

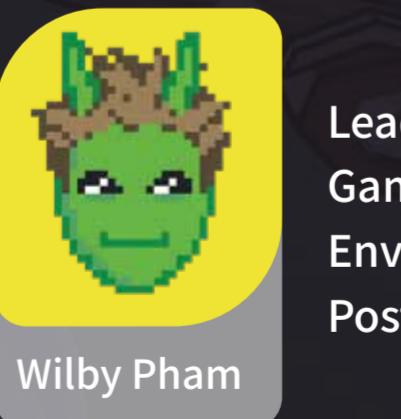


A 3 ALIens IN A SAUCER PRODUCTION



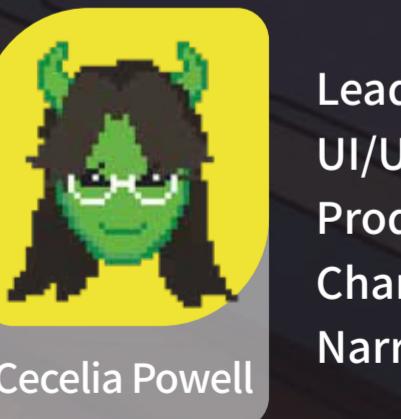
Tyler Zhang

(Me)
Lead Game Designer
Lead Programmer
Level Design
Sound Designer



Wilby Pham

Lead Level Designer
Game Designer
Environment Artist
Post Production



Cecelia Powell

Lead Art Director
UI/UX Designer
Producer
Character Designer
Narrative Designer



INSPIRATION

DOOM-LIKE/BOOMER SHOOTER

From the start, our goal has been to capture the **essence of Doom-like/ Boomer Shooter** games while identifying core concepts that allow us to push the genre forward through **innovations**.

REFERENCE



KEY CONCEPTS

Violence Constant forward momentum

Aggressive push-forward mechanics

Diverse gun mechanics Fast-paced combat

No cover Resource juggling

WHAT



AIMS TO DO

A subversion from the typical gory style of Boomer Shooter

Classic boomer shooter linear experience

Cute and low poly style with detailed texturing.

Creating a variety of enemy types with unique abilities

Fundamental mechanical changes from the genre

Linear level design with arena orchestration

NARRATIVE & ARTSTYLE



We quickly confirmed our art style and story after the initial brainstorm stage.

Keep the classic boomer shooter's low poly style while subverting the usual ultra-serious gory style of the DOOM-like genre.

- Thick outlines
- Bright colors
- Unrealistic



To complement our light-hearted art style, we want a unserious, humorous, and satirical story.

STORY OVERVIEW

On your first day on the job as an FBI agent, you are dropped in front of a zoo in chaos! The last agent they sent here has gone MIA and the animals have gone absolutely wild with hunger. Feed them and figure out what's going on here!

ITERATION

We began our first iteration back in 2023.



There are numerous core mechanics and concepts tested in this version of Zoom:



With experience from our first demo, we realize there are multiple aspects we can improve:

Enemy interactions with player is too little

Still no fundamental changes from the genre

Movement was too boring

After various prototyping and playtesting, we eventually came up with three pillar design philosophies:

Scan enemy to change shooting patterns and get ammo (No other ways to get ammo)

Three enemy categories with particular attack behaviors

Traversal movement abilities

MECHANICS

"ROCK PAPER SCISSORS"

The core philosophy behind the game's enemy design and movement abilities centers on the idea of counterplay—much like the balanced loop of rock, paper, scissors.



HOVER

float briefly in midair, helping them avoid ground-based attacks.



GRAPPLE

Grapple lets players launch toward targets and reach high ground quickly.



SCAN

This scanning system is what sets Zoom apart. Scanning enemies grants ammo, enemy-specific firing patterns, and movement abilities—turning foes into resources rather than obstacles. Instead of traditional pickups and cooldowns, players must choose targets strategically, juggling which enemies to scan or eliminate to stay mobile and handle tougher threats.



ULTIMATE

To give players a release from the intense combat, I added an ultimate ability that instantly kills enemies once enough orbs have been collected.



DASH

Rapid reposition, helps players dodge attacks



PLAYTEST

To test out our newly designed mechanics, we attended various playtest events and received a decent amount of feedbacks.



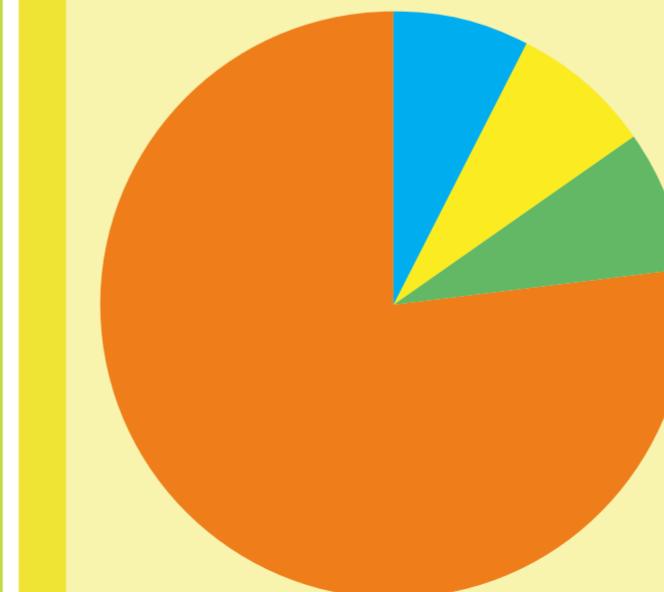
2025 GDC

Hexhouse Playtest

Wonderville Playtest

FEEDBACK

WERE THE PROVIDED INSTRUCTIONS IN THE TUTORIAL SUFFICIENT?



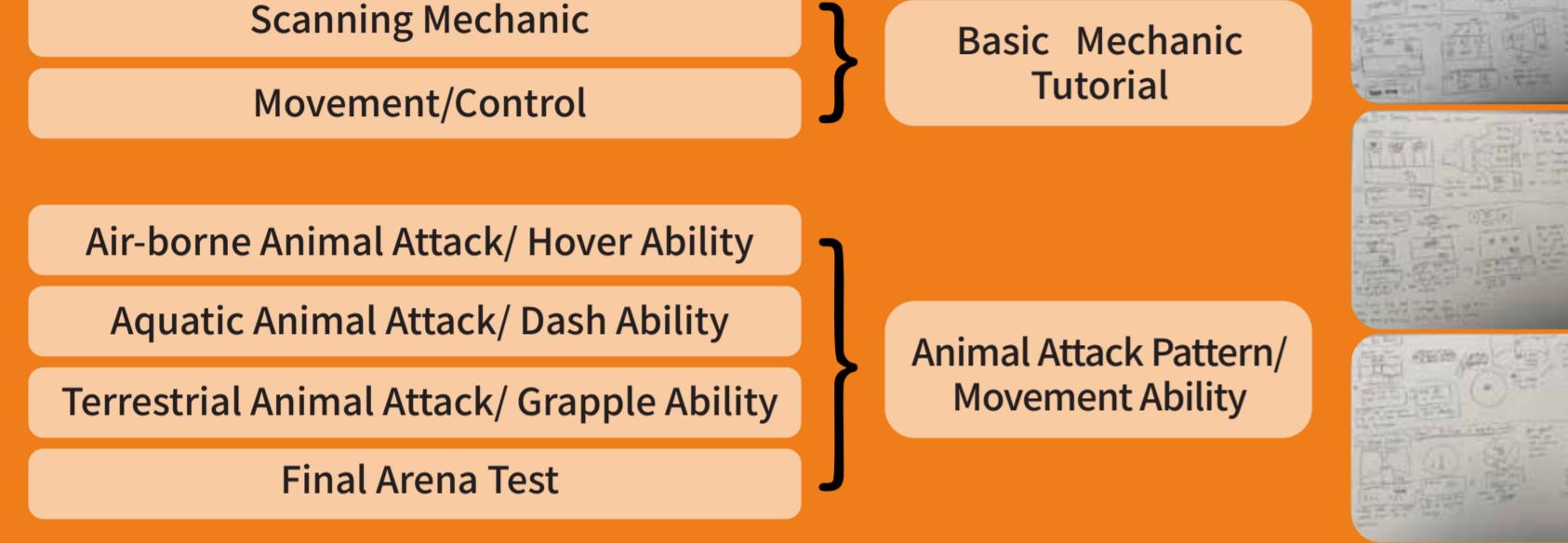
- The final arena is
- The combat is too
- The pacing is too
- I perfectly understand

Most of the non-bug feedbacks we received focused on **level design** and the **tutorial**. Many playtesters found the instructions overly **complex and confusing**, and noted that the final arena in tutorial fails to serve as an effective rehearsal for the main level. Additionally, the level pacing felt too fast. In response, we decided to completely overhaul the tutorial and redesign the arena's scale and flow to address these issues.

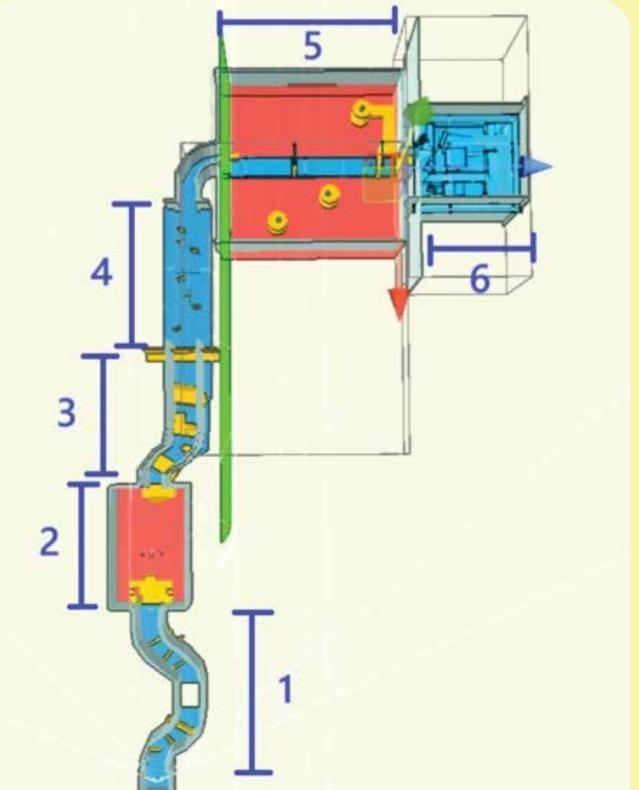
LEVEL DESIGN

After getting feedback, we spent a great amount of time on improving the tutorial level.

TUTORIAL SKETCH:



ORIGINAL LEVEL DESIGN:



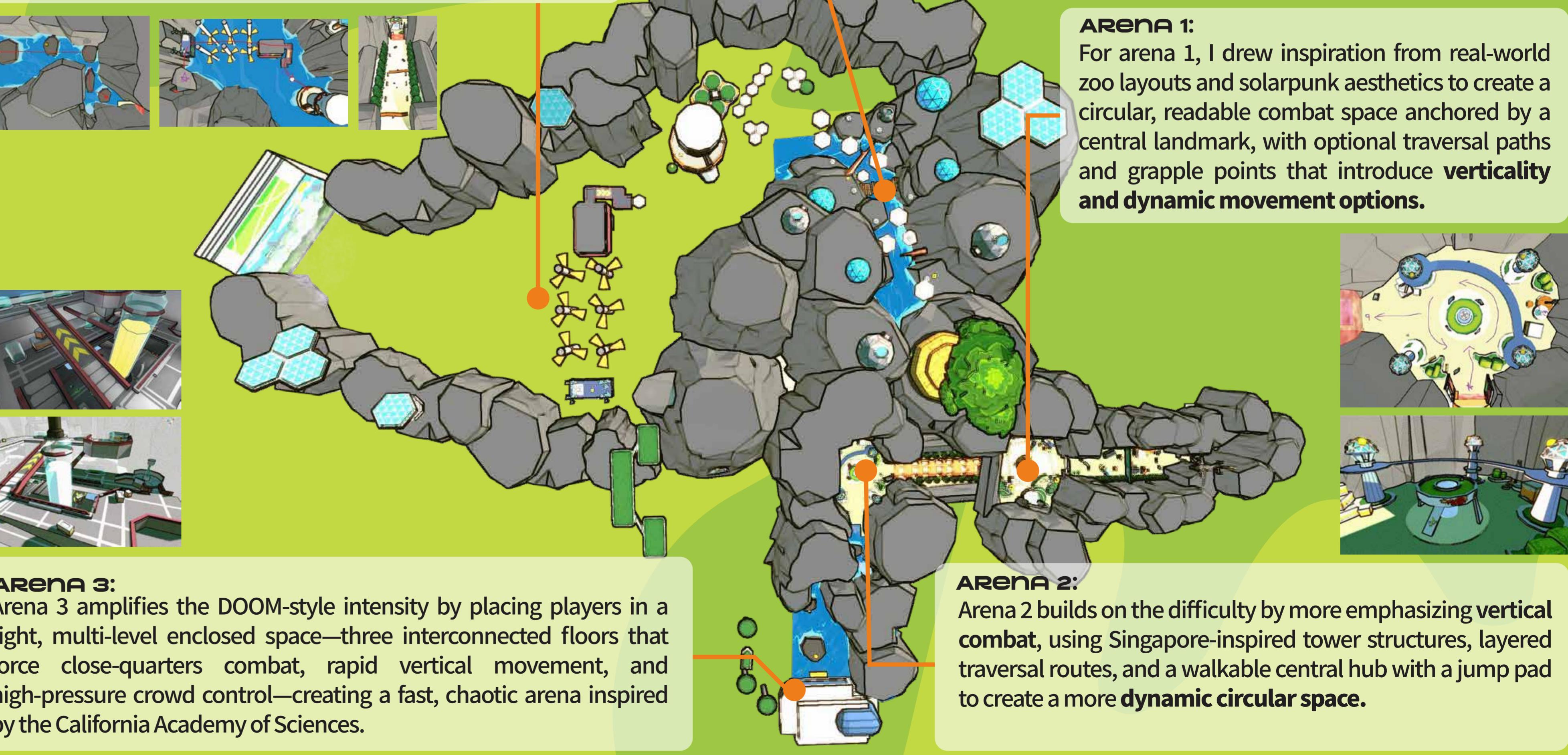
TUTORIAL OVERHAUL:

Instead of a large tutorial map with uneven pacing, we shifted to a series of small, isolated rooms where each task is completed separately. This lets us fully control the pacing and gives us natural intermissions for voice-over narration.



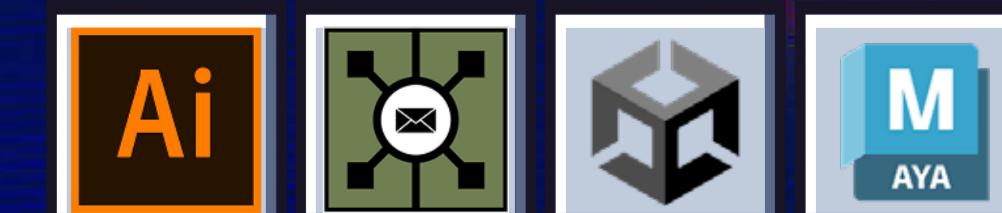
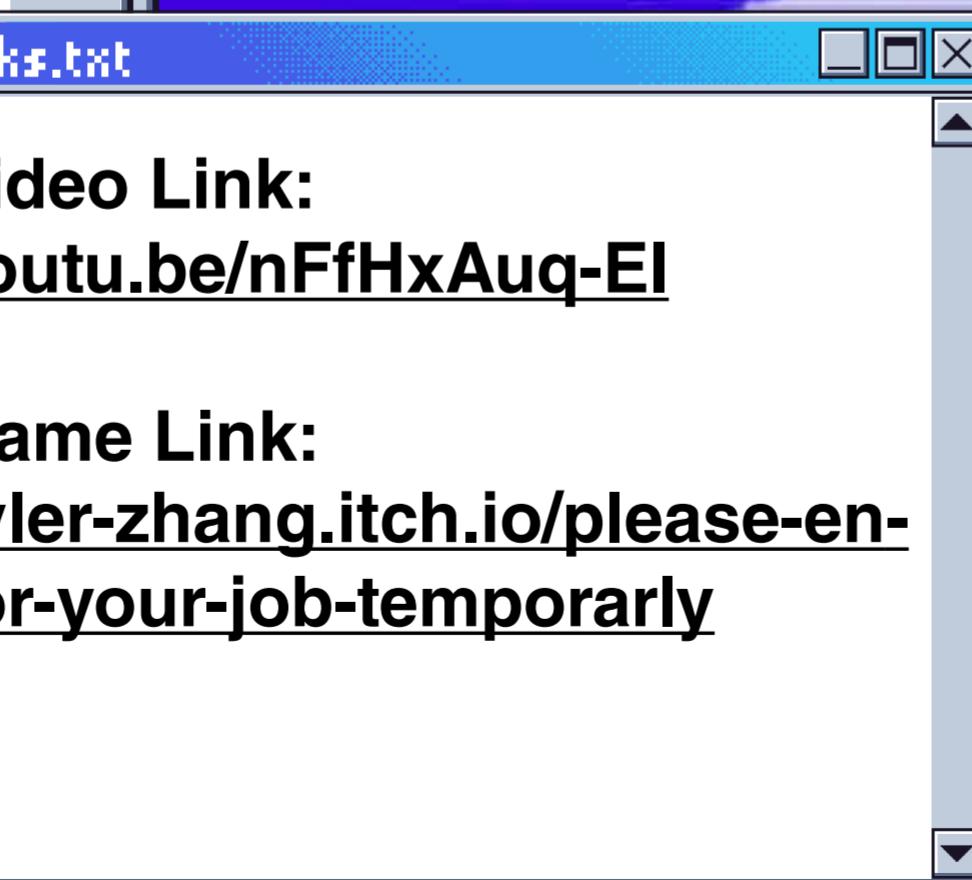
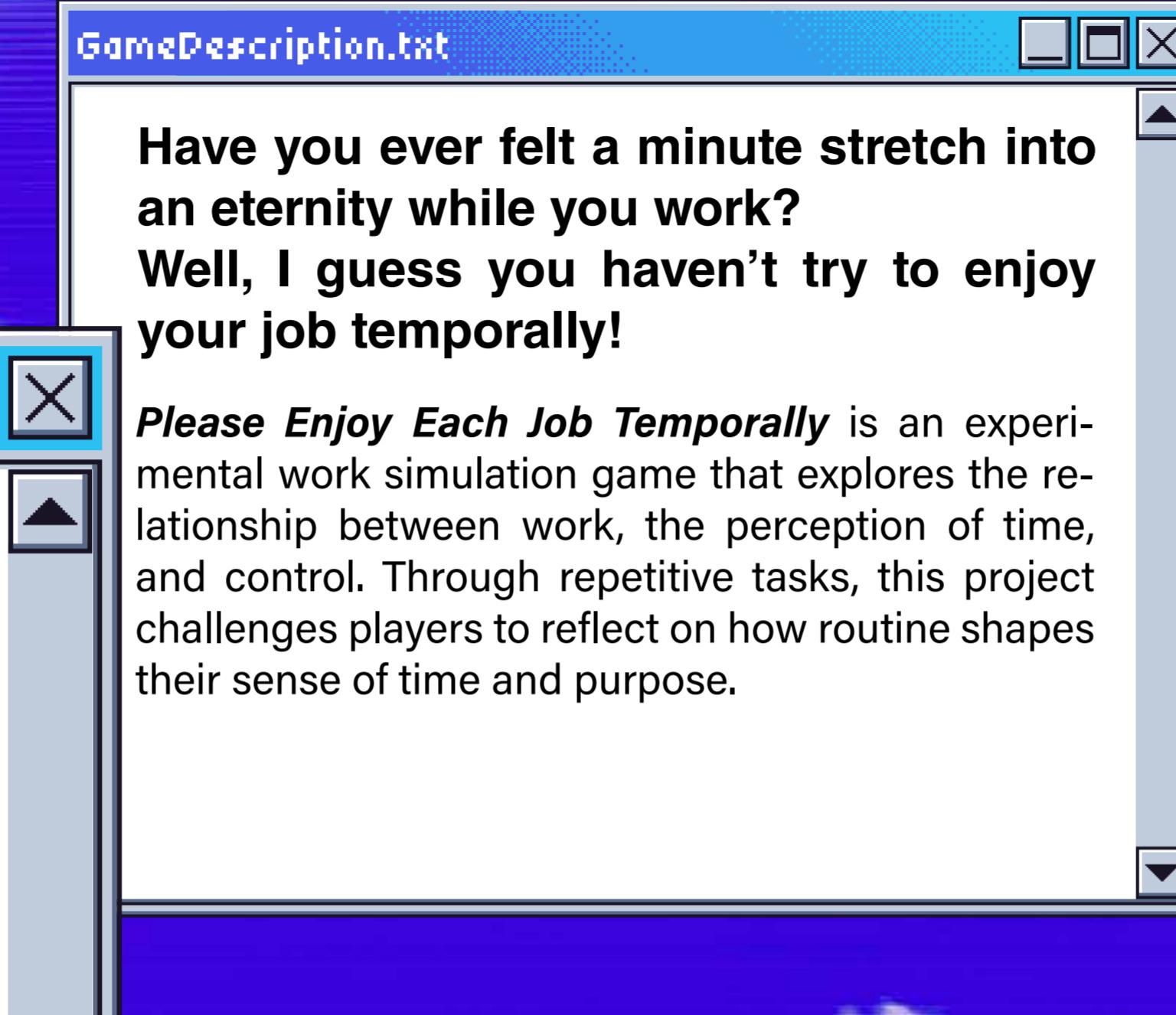
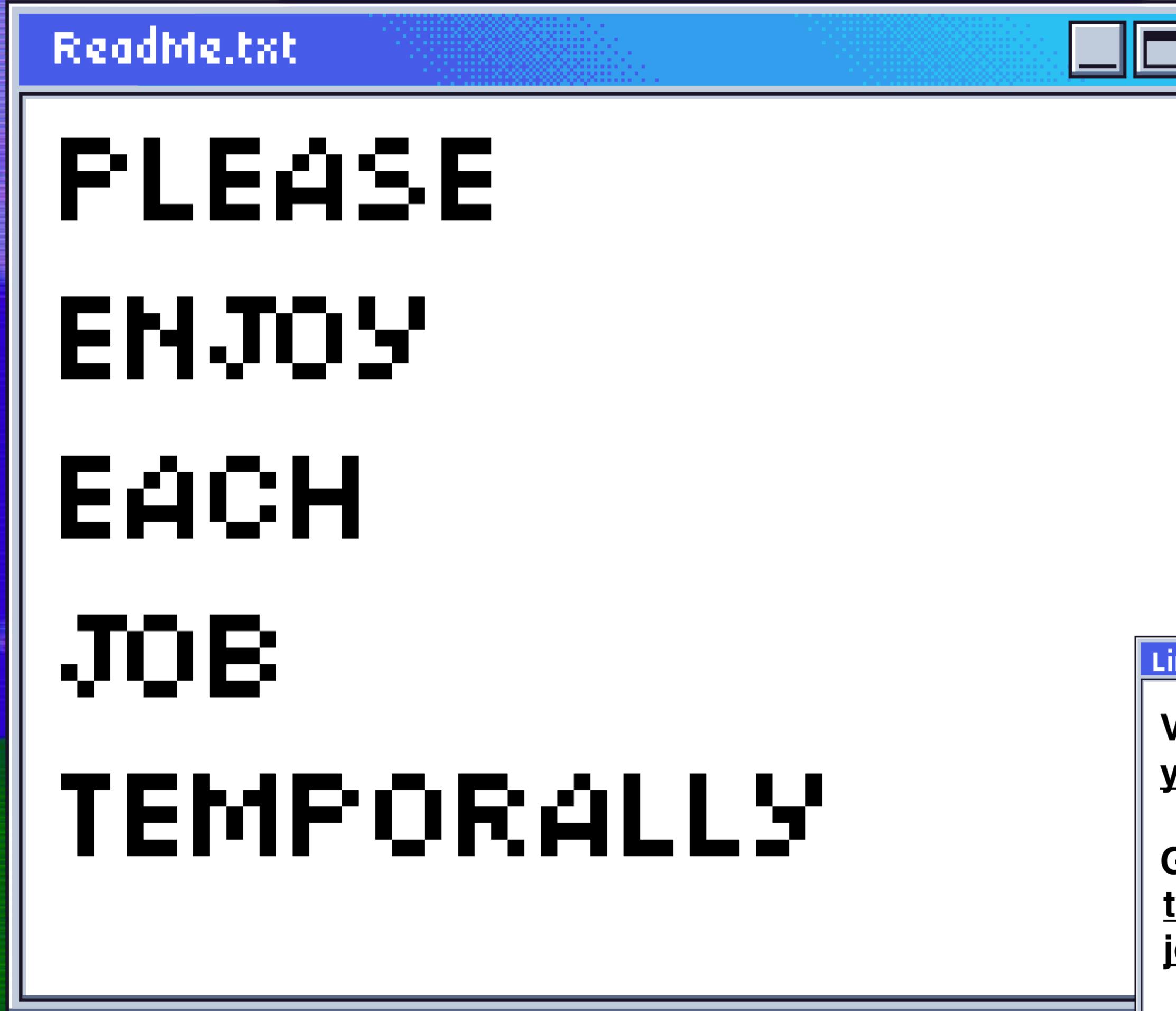
PATHWAYS:

There are also multiple pathways filled with **movement-focused** puzzles, designed to help players practice and master a variety of advanced mobility techniques.





ReadMe.txt



INSPIRATION

Personal Experience

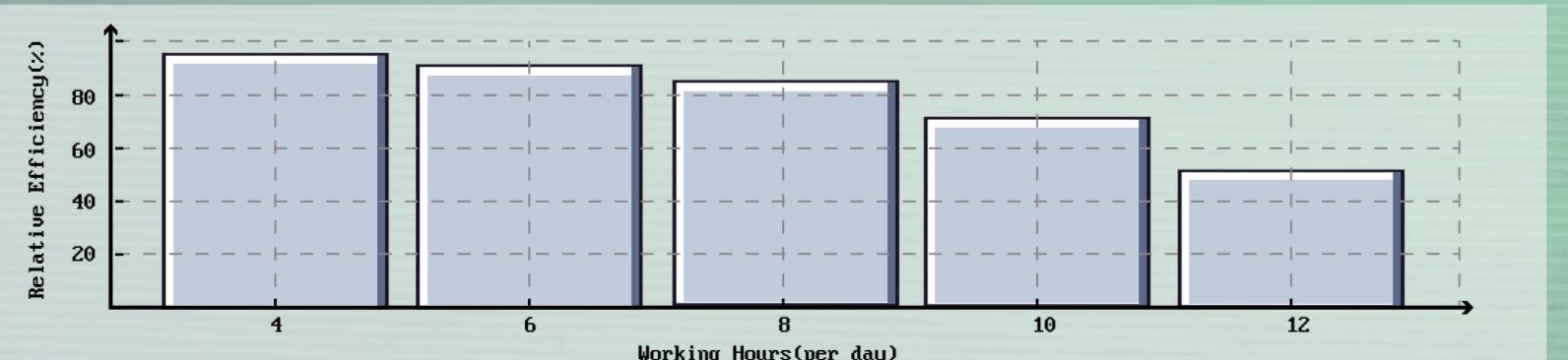
One day, my friend and I stopped for boba tea at a shopping mall. As soon as we walked in, the workers shouted a slogan in unison. So, I wondered if they had to do that every time someone entered—but even when no one came in, they repeated it every few minutes, almost like **clockwork**.



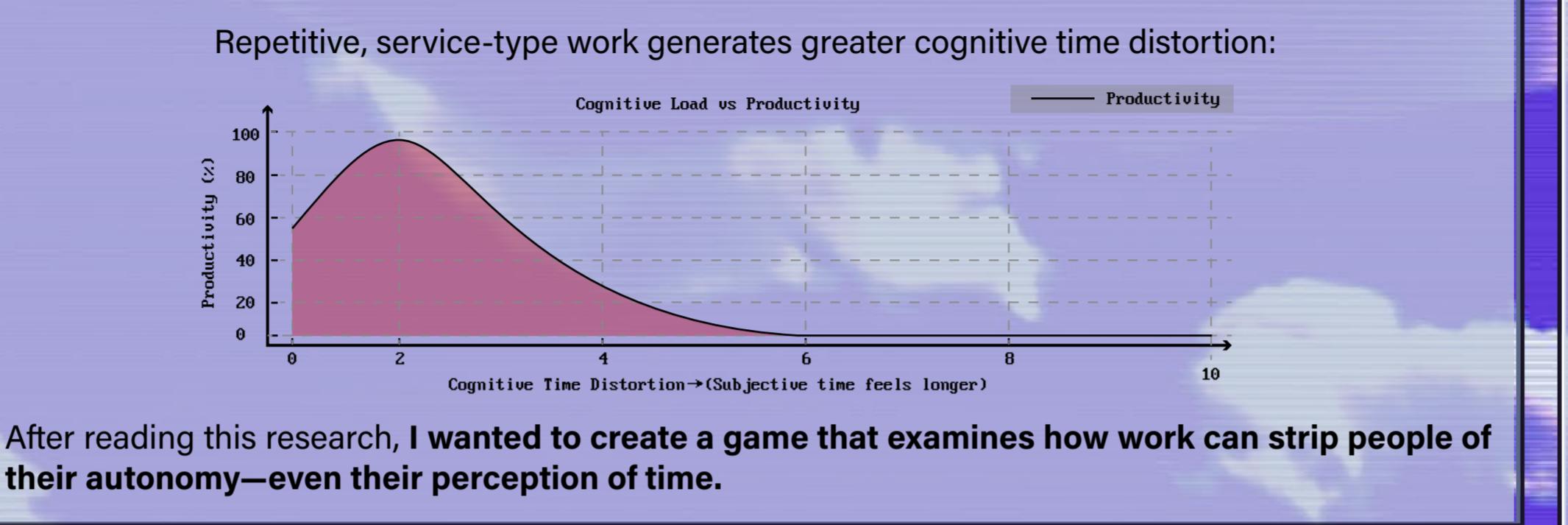
It reminded me of when I helped at my friend's restaurant in high school—how slow time felt while working, compared to how quickly it passed when we were just hanging out afterward. I've always been fascinated by how our perception of time shifts depending on what we're doing—how work can take away not only our sense of **autonomy**, but even our sense of **time** itself.

Academic Research

There is growing research connecting **productivity** to **subjective time perception**. Studies show that when time feels slower or distorted, efficiency declines even if the actual working hours stay the same. These diagrams visualize the findings, showing how our efficiency is shaped by both our working hours and our perception of time.

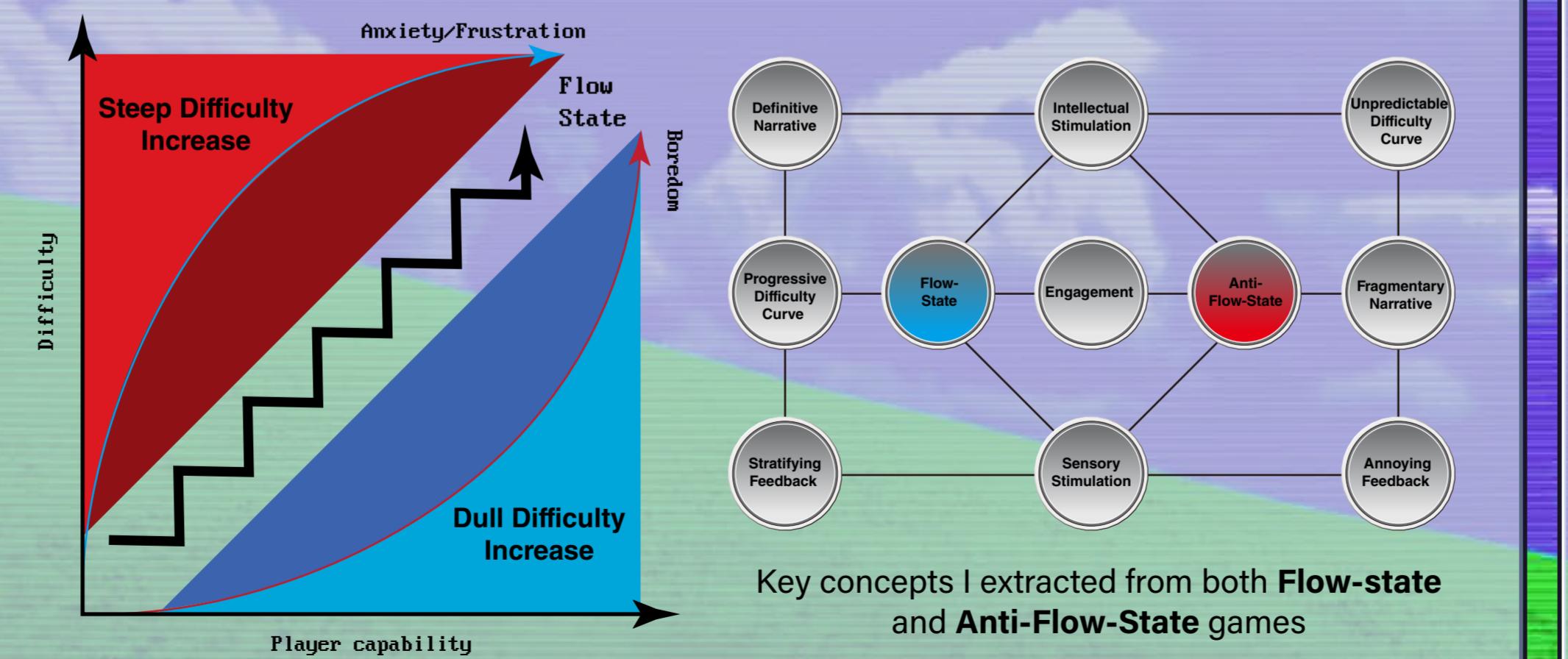


The more cognitive time distortion occurs, the less efficient the output becomes—even if the same number of hours is logged.

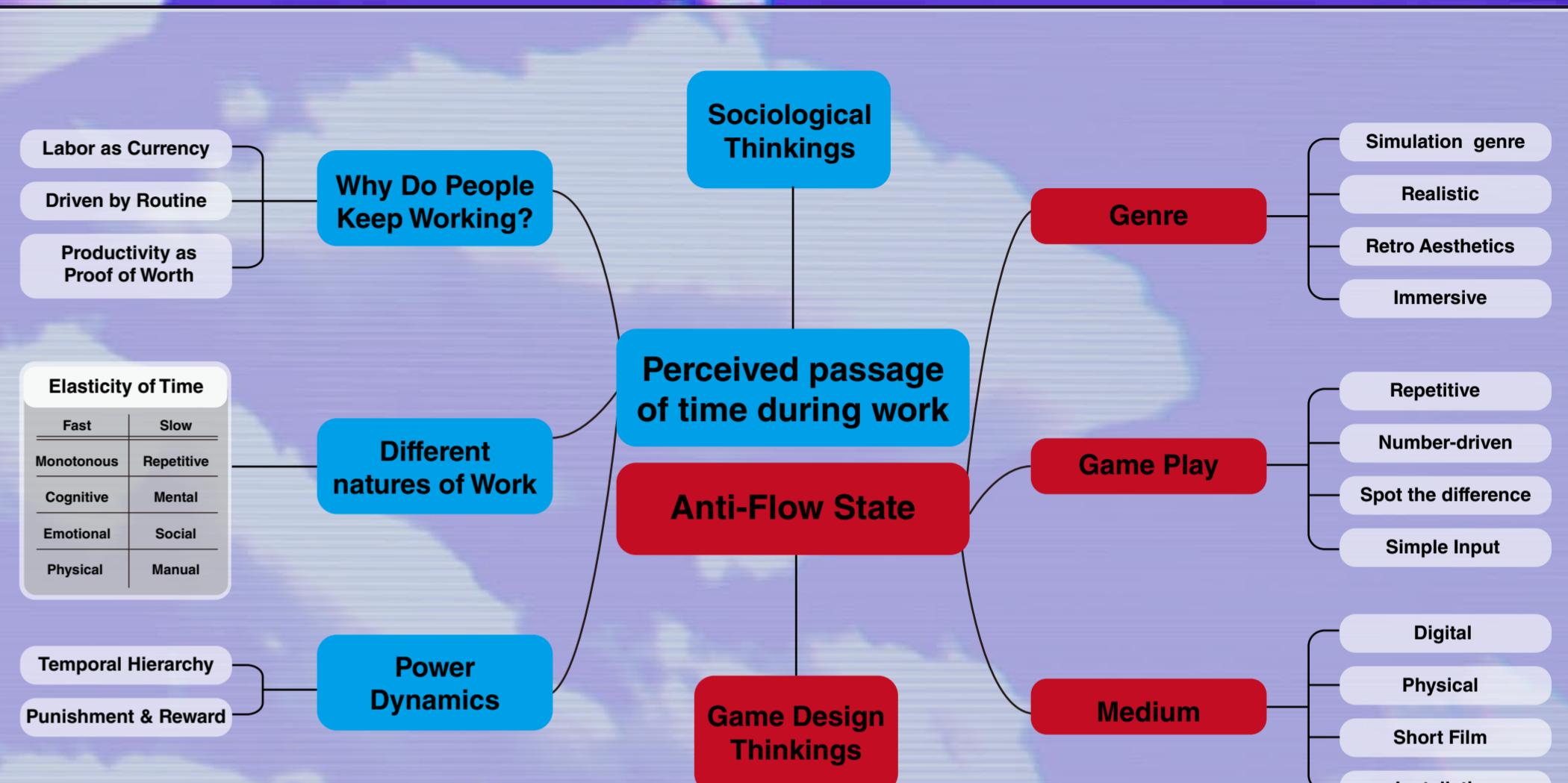


Game Design Thinking

Game designers often shape how players perceive time by fine-tuning difficulty curves to sustain engagement and speed up subjective time — the classic **flow-state** model shows this well. But to reflect how work can influence our sense of time, I chose to do the opposite. I want to create an "**Anti-Flow-State**" game that constantly disrupts flow, mirroring how real work forces us to push through even when time feels painfully slow.



BRAINSTORM



My Thinking

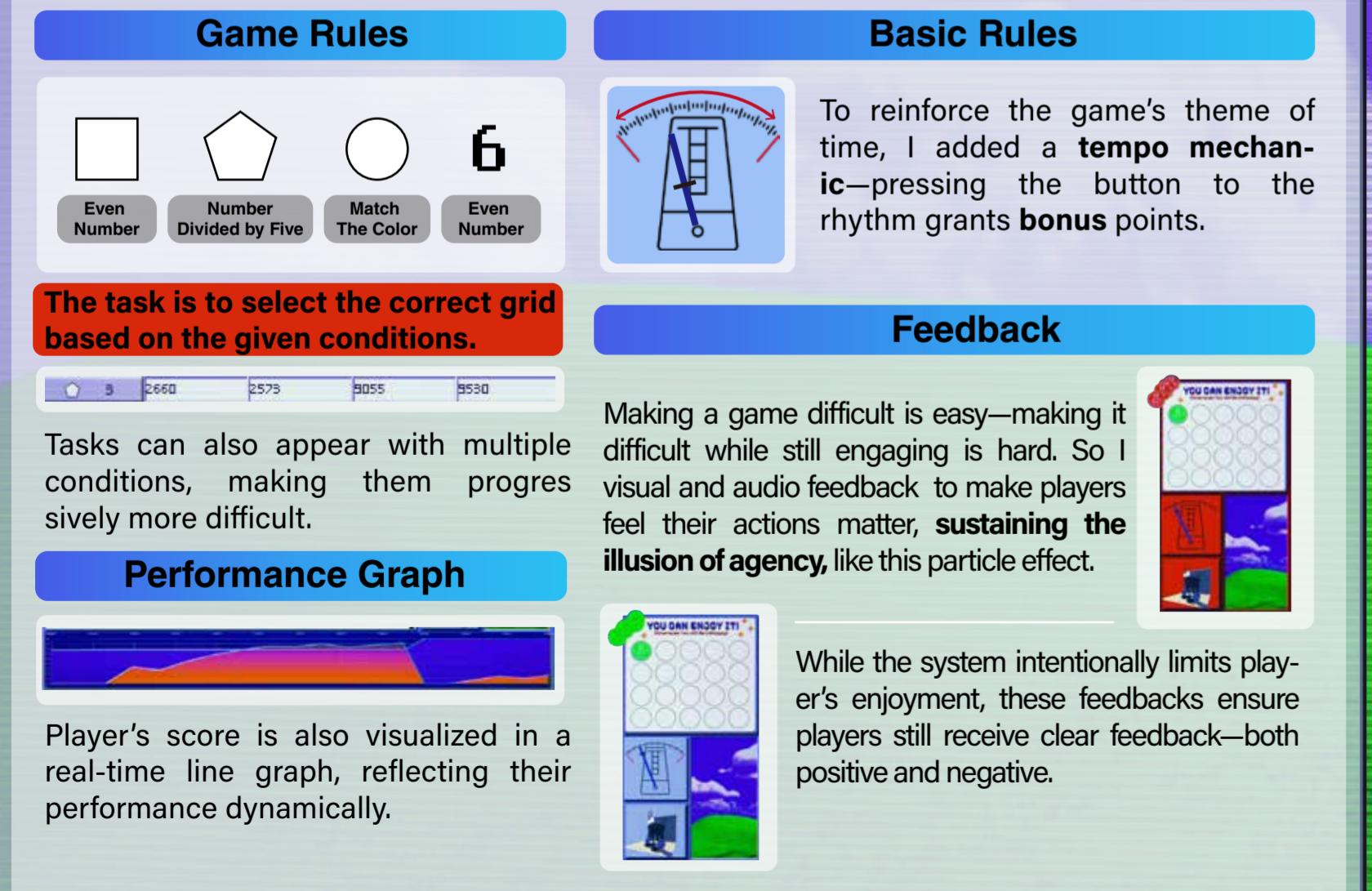
Both in academic work and mundane work settings, tedious repetition is inevitable — often driven by schedules set by superiors. I'm fascinated by how hierarchies grant power to the assignors, stripping assignees not only of autonomy but even their sense of time. Similarly, as game designers, we become "task assignors" ourselves, controlling players' actions— including their perception of time.

Goal of this game

I want to create a game that **defies** what I've learned about traditional game design — instead of guiding players smoothly through well-crafted challenges, it aims to evoke irritation and disorientation. The experience explores what it feels like to lose control over one's perception of time, yet keep playing out of a lingering sense of duty or responsibility.

GAME MECHANICS

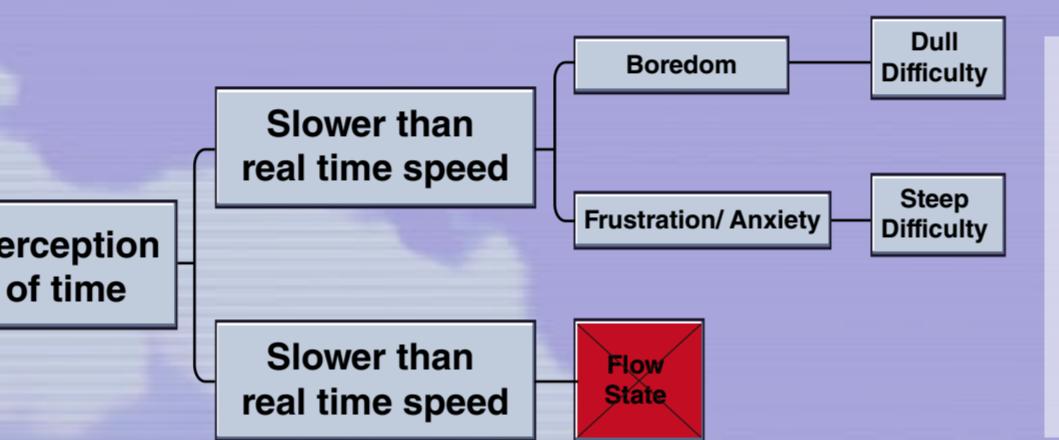
When designing the game system, I wanted it to resemble real-life work. So I chose shapes and numbers, and built the mechanics around matching, counting, and sorting—those basic, tedious patterns of labor. **The game is meant to reflect how real-world jobs often reduce our thinking into simple, trackable actions.**



Dynamic Difficulty

To create an intentionally irritating work experience that feels both rewarding and tedious, I designed a system with dynamic difficulty that deliberately contradicts the principles of flow theory, forcing players into a restless mindset.

Player Perception of time VS. Game Difficulty



How to control game difficulty ?

1 Condition	2 Conditions	3 Conditions	Four Conditions
Difficulty Factor 0.25	0.5	0.75	1

Overall Difficulty

$t(\alpha) = 0.25e^{\alpha} + 0.5e^{2\alpha} + 0.75e^{3\alpha} + 1.0e^{4\alpha}$

e^{α}

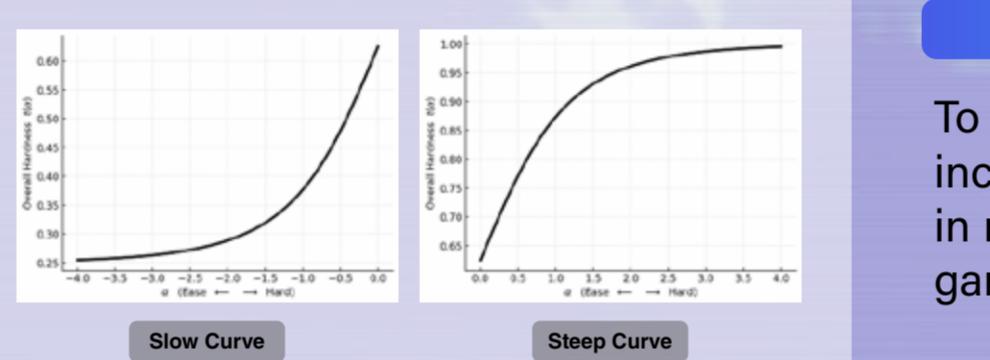
α Difficulty [-4~4]

-4 means the easiest

4 means the hardest

(Euler's number) is a fundamental irrational constant

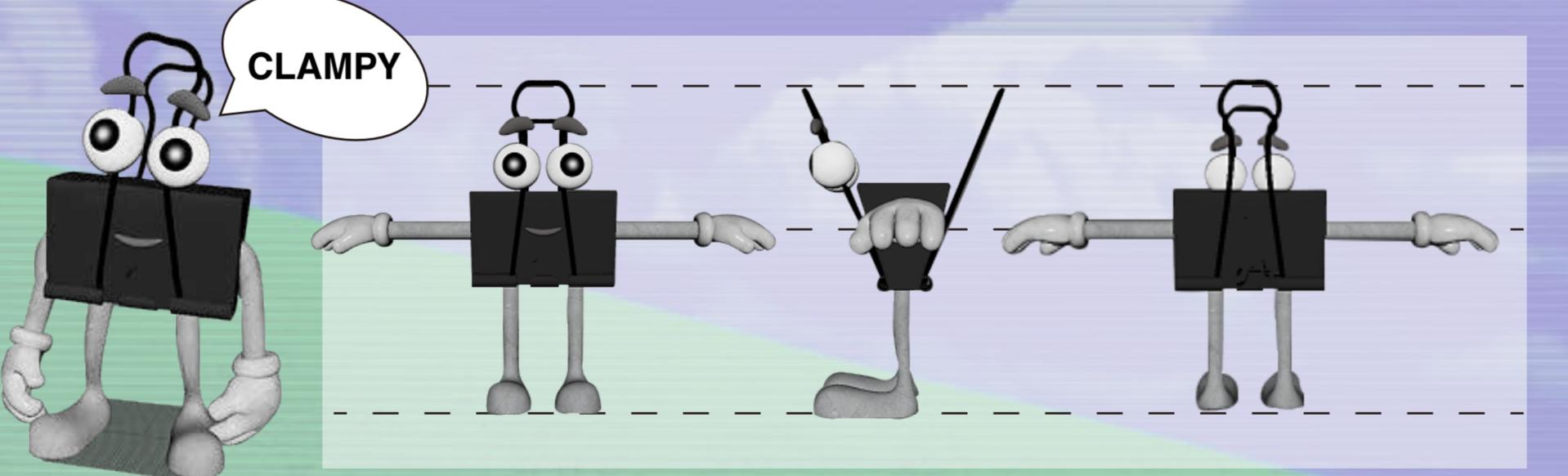
probability of a problem with X conditions



Curves of my Game

To achieve either a steep or a slow increase, I also implement this formula in my game to dynamically adjust in the game based on player's performance.

Aesthetics & Character Design



I chose Windows XP as the main reference for the game's aesthetics because its retro, office-like interface complements the work-simulation mechanics and reinforces the feeling of performing simple digital tasks.



To reinforce the retro aesthetic, I created Clampy, a modern, playful tribute to Microsoft's Clippy. Fully rigged and animated, Clampy moves in real time and reacts dynamically to player's interactions.

GAME FLOW

Main Menu

Introduce the mechanics of the game

Start Job

Introduce the rules of the game

Feel Bored

- The game starts easy
- Slow increase of difficulty if player did not get high score
- Harsh Punishment

Feel frustrated

- Steep increase of difficulty if the player gets high score
- Player makes illegal moves

No Definitive Ending

Even when players try to quit, the game keeps tracking their perception of time

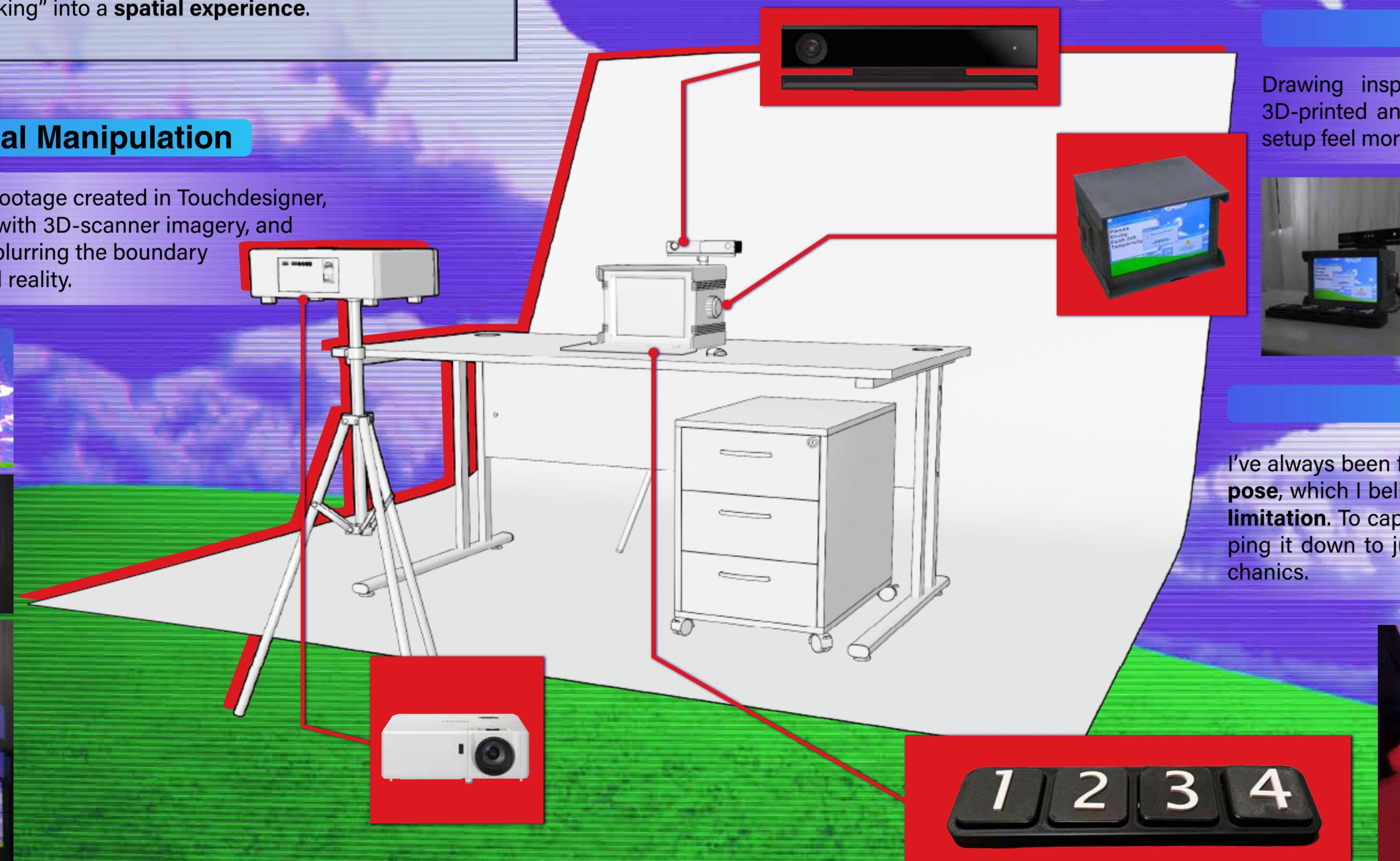
INSTALLATION

To create a more immersive experience, I designed an **interactive installation** that extends the game *Please Enjoy Each Job Temporally* beyond the screen. Using interactive devices that capture player's movements and responses, I aim to amplify the way repetitive labor bends and blurs our sense of time.

Through synchronized lights, sounds, and sensors, the installation transforms the act of "working" into a **spatial experience**.

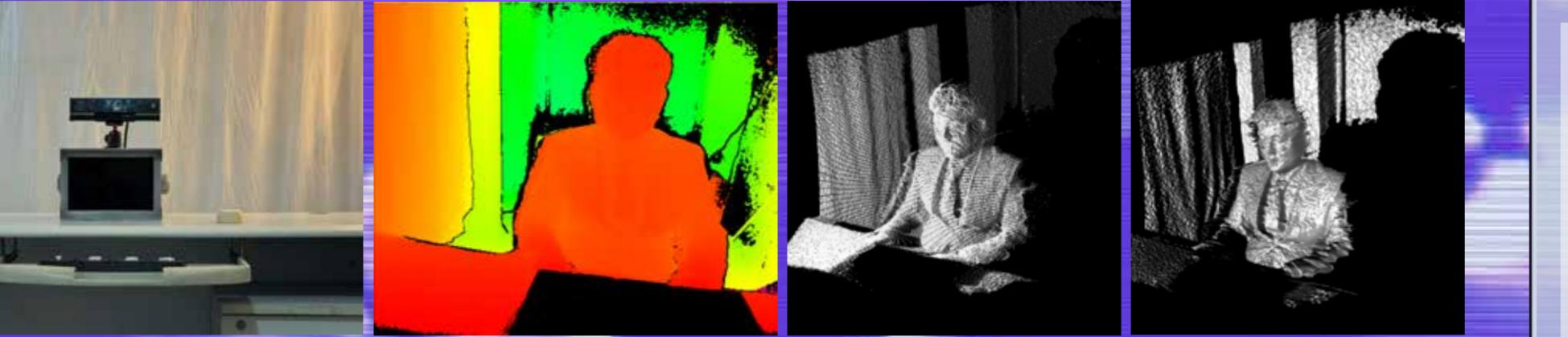
Real-Time Visual Manipulation

The projector displays footage created in Touchdesigner, blending game visuals with 3D-scanner imagery, and casts it onto a curtain, blurring the boundary between the virtual and reality.



Motion Sensor

I used a Microsoft Kinect to capture participants' movements and feed the data directly into Touchdesigner and Unity.



Custom Computer

Drawing inspiration from my previous project *Prison*, I 3D-printed and built a custom computer to make the entire setup feel more authentic and convincing.



Custom Input

I've always been fascinated by **tools designed for a single purpose**, which I believe embody some kind of **efficiency through limitation**. To capture that idea, I customized a keyboard—stripping it down to just four keys that mirror the game's core mechanics.

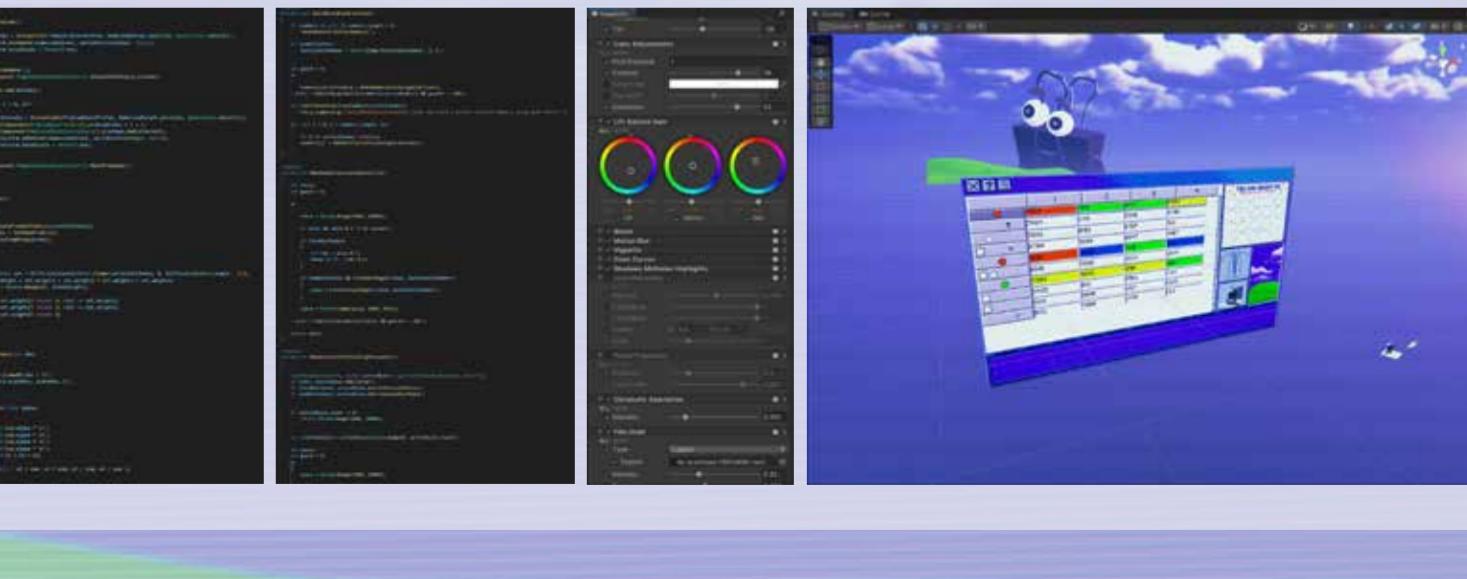


PROCESS

Making of Installation



Unity Production



DEMOSTRATION



TESTING

I sent out 20 copies of my game to various people, including friends and family, along with a questionnaire to ask them about their feelings regarding the game.

Observation

The goal is to observe whether players remain engaged when the game feels emotionally unrewarding yet structurally rewarding, and to see whether the game can **alter their perception of time dynamically**.

[Questionnaire Link](#)



After I don't know how long, I just repetitively pressing the buttons. I did not particularly think that the duration of time is longer.



I think the timing mechanic is very tricky. It's very hard to press the button on time while solving the puzzle.

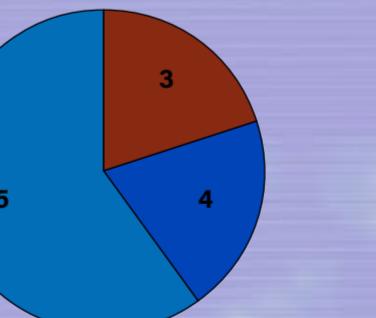


The punishment jumpscared me at first. After that, I spent more time on accuracy.

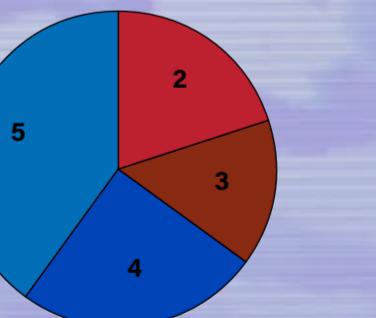


After I realized that pressing the button at the correct time can give me a higher score, my focus was shifted, hence my accuracy is lower.

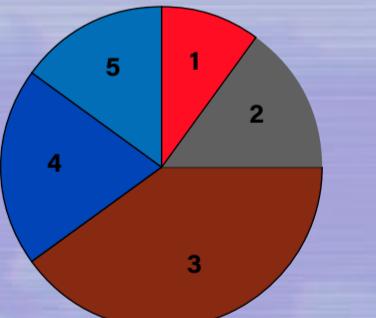
On a scale of one to five:



How much did the game make you think about work, repetition, or time?



How motivated were you to keep playing?



How rewarding did the game feel despite its difficulty?

There are a couple of things from my questionnaires really fascinated me. First, many playtesters said the retro styles and **asthetics help them to get into the mindset of they are at work**, which also influence their overall perception of time. However, there are only about 8 playtesters said that the game makes them feel the time slowed. A lot of them find the game is, **overall challenging but still interesting**, as the feedback is somewhat rewarding. **What I learned is that visual and audio feedback play a crucial role in shaping the player's experience—often even more than the game's difficulty itself.**

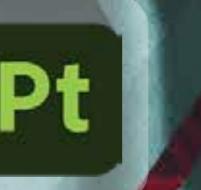


VIDEO LINK

<https://youtu.be/bsbvT5-660Q>

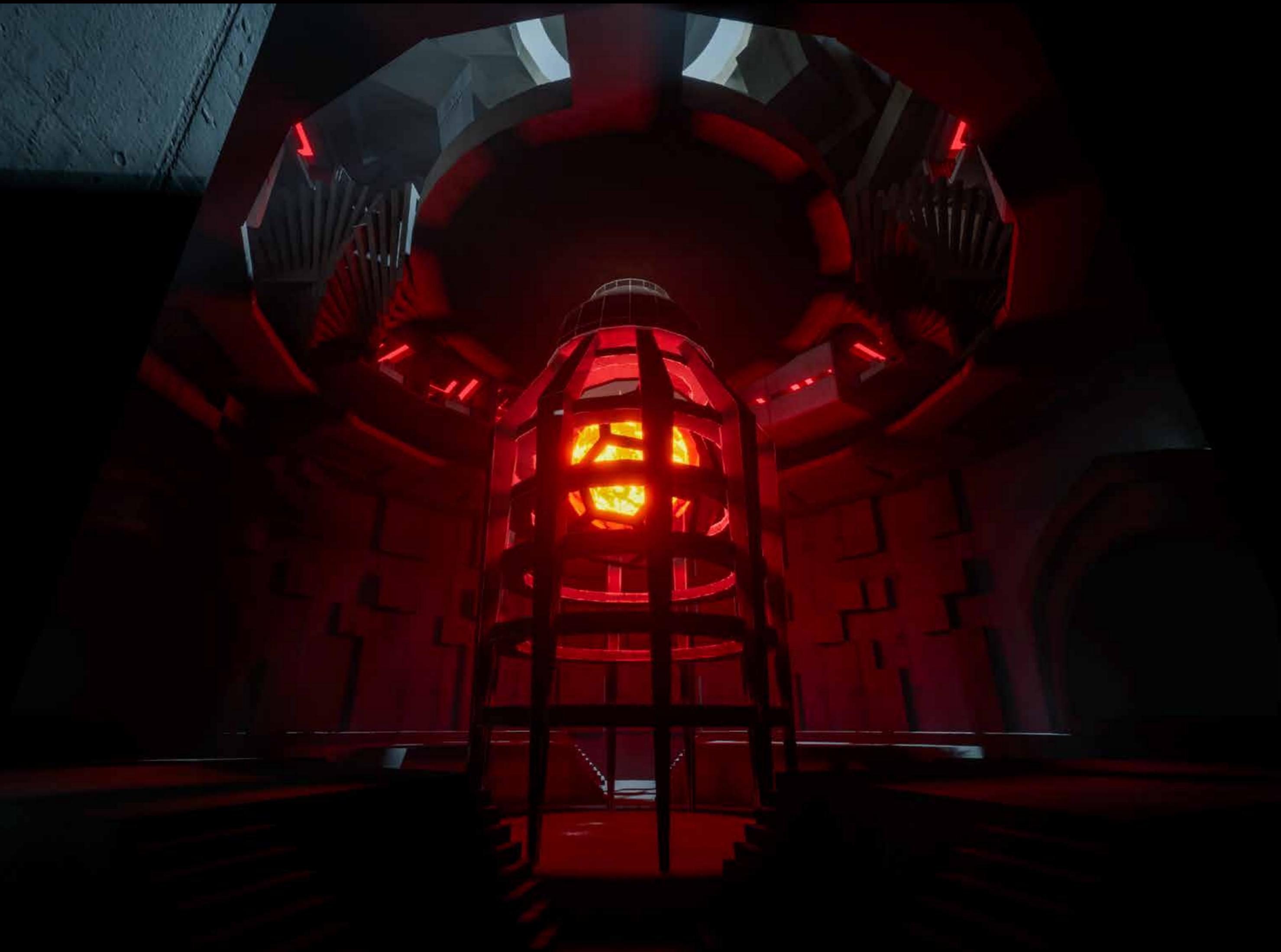
PRISON

Prison is a 3D environment render project created in **Unreal Engine**, inspired by the **panopticon** — a circular, surveillance-oriented architectural design where individuals feel constantly observed. The project uses this concept as a lens to critique how **individualism** and **privacy** are exploited in modern office spaces. In contemporary institutions, where **productivity** is often prioritized over personal space, **individuality** is often neglected or compromised.



SCREENSHOTS

Most **brutalist** architecture uses a grim, desaturated color palette to emphasize simplicity, functionality, and honesty. However, I want to introduce something natural and warm into the space—creating a contrast between organic materials like wood and the surrounding concrete structures. This dichotomy symbolizes the relationship between the **overseers** and the “**prisoners**.”



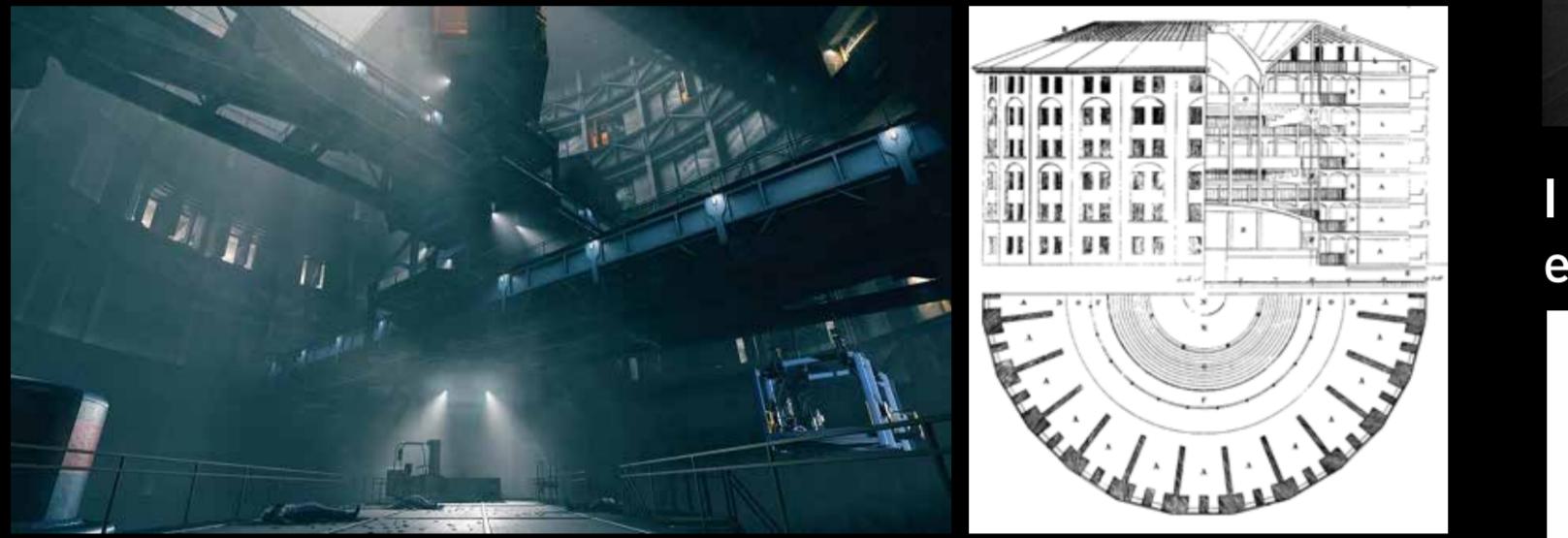


SCREEN SHOTS

When it comes to lighting, I want the contrast between light and shadow to be intentionally over-the-top, letting the light carve out natural dividing lines that shape the composition of the final render.

REFERENCE

Inspired by brutalist architecture, this project shows how rigid office layouts and invasive monitoring tools can eliminate employee privacy, autonomy, and identity, turning the workspace into an uncomfortable place to be.



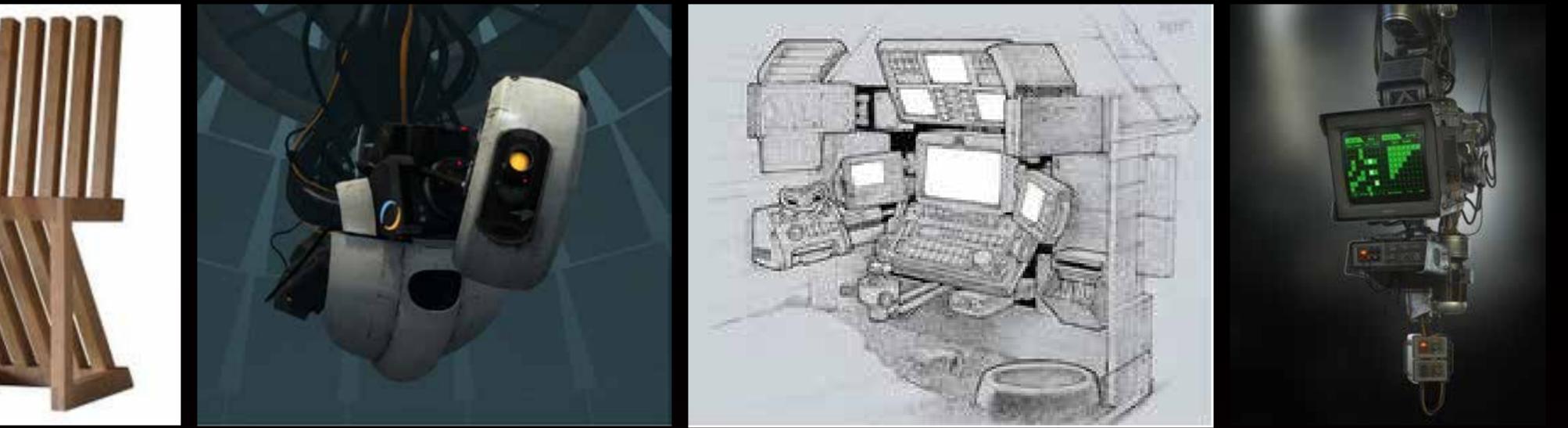
This project draws inspiration from the panopticon, a structure designed for constant surveillance with minimal oversight, originally for prisons. Similar themes appear in the game *Control*, where a circular panopticon imprisons supernatural entities. This circular, **symmetrical layout** serves as the project's **initial visual motif**.



Remedy Entertainment's game *Control* is the main inspiration for this project. Its brutalist architectural style carries a grim, heavy look that supports the **stifling** atmosphere I want to convey.



I want the lower areas to look dark and grimy, while the upper sections feel more elite, emphasizing the workspace hierarchy. These references informed this contrast.

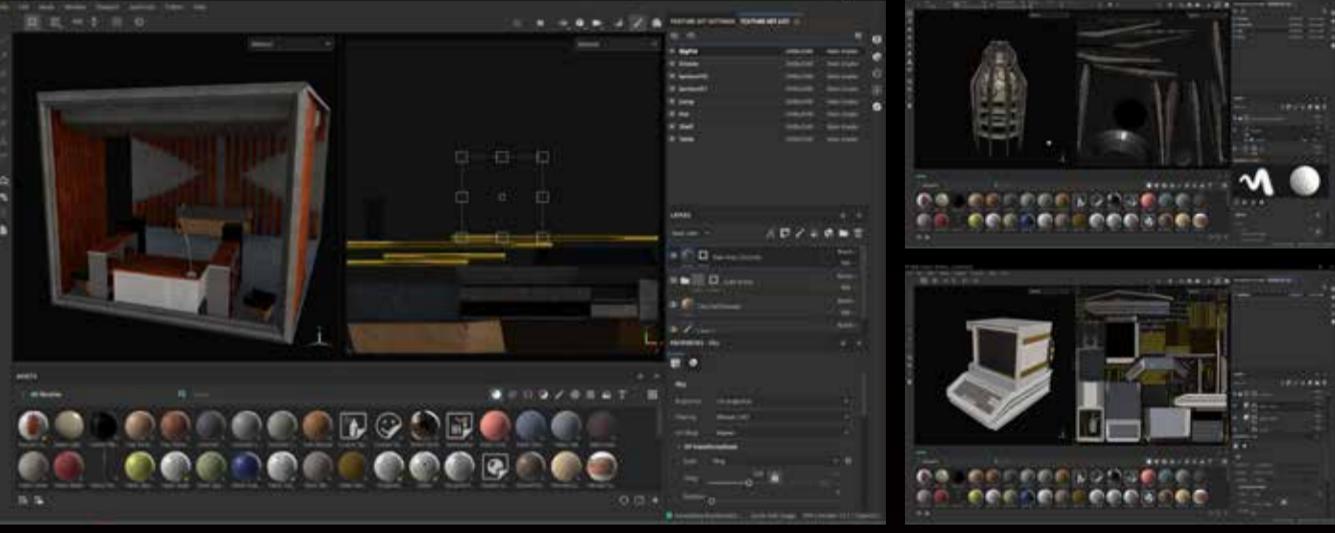


TEXTURING IN SP

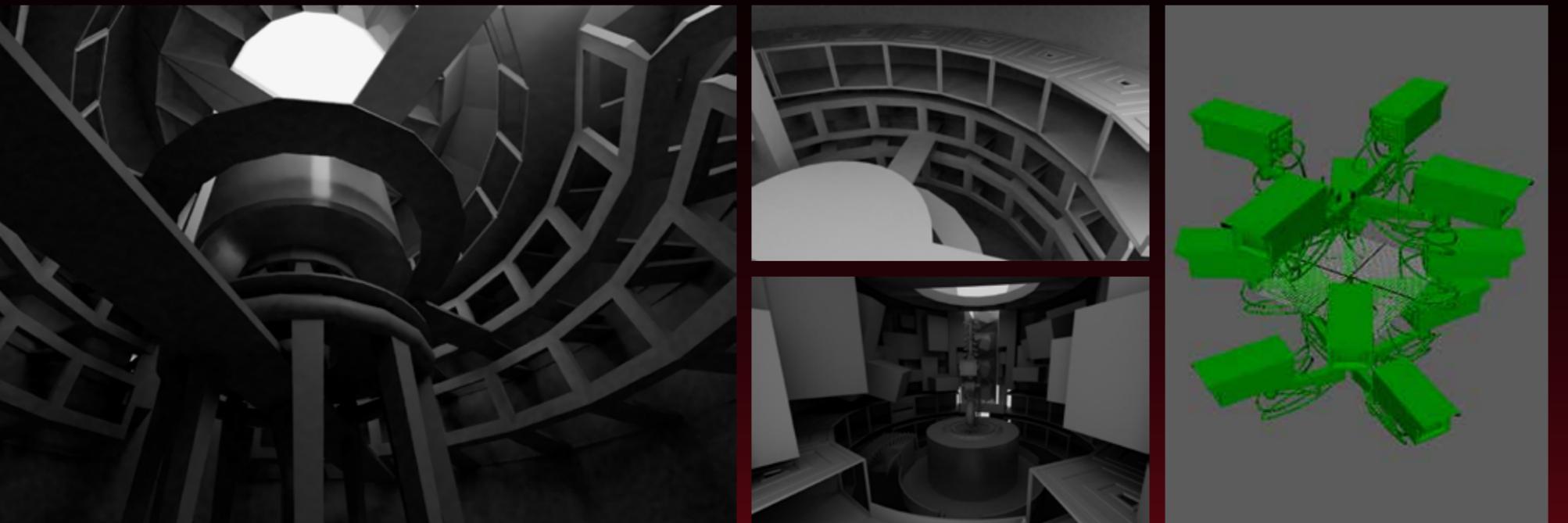
I want to create something **intimidating** for the central surveillance tower. The 80s retrocomputer aesthetic inspires the look of the sentinel tower, and since the project focuses on omnipresent surveillance, GLaDOS from the *Portal* series became my main inspiration for designing the tower's arm.



For the furnitures in the office cell, I want to make them visually uncomfortable to use. To achieve this effect, I take examples from medieval instruments of torture and office chairs with bad ergonomics.



MODELING IN MAYA



SCENE BUILDING IN UNREAL

