ZESTAN WU

PORTFOLIO

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2024 - 2026



ZESTAN WU

PROFILE

09/30/2003 Fujian, China

Email: zestanwu@gmail.com
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SKILLS

Other Software

EDUCATION

Animations and Interactive Media Undergraduate at Beijing Normal-Hong Kong Baptist University, China

- BNBU 2022 First Class Award
- BNBU 2023 First Class Award
- BNBU 2024 Second Class Award

INTERESTS

Game Concept Design · Digital Cultural Heritage Interpretation · Procedural Design · Scenery & 3D Modeling · 3D Animation · Post-Production / Visual Effects · Music Practices (Electronic Synthesis & Traditional Orchestra)

LANGUAGES

Chinese & English (IELTS 6.5)

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CHROMA DIVISION

Interactive Installation | Color Vision Awareness | Inclusive Design

Project Info

Duration

4 Months | Individual Project

Skills & Tools

Blender, TouchDesigner, VCV Rack, Interactive Installation, Holographic Simulation

Objective

Chroma Division is an **interactive installation** designed to **break cognitive barriers** caused by **color vision differences** and **enhance the experience of color-blind individuals**. By integrating *Ishihara test images, stylized 3D animation, interactive programming, and holographic projection,* it provides a **non-labeled, immersive experience** that **addresses emotional stigma** and **promotes inclusivity and understanding** of **color vision diversity**.

Video Link

https://youtu.be/A8JL7ogYC-Y



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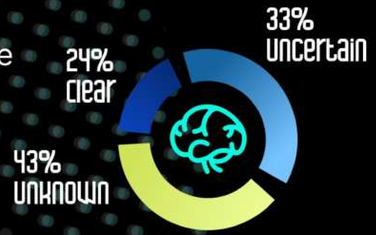
FIELD RESEARCH

A one-week field research of the hospital's color visual testing environment and patient feedback



Finding 1: The Clinical Testing Process Lacks Contextual and Emotional Guidance

The current diagnostic procedure lacks essential informational and emotional support: patients struggle to accept the results during clinical testing and have limited clarity regarding their own symptoms.



Finding 2: The Social Stigma of Public Diagnosis

In open examination settings, such as school-wide health screenings, patients whose color vision deficiencies are publicly announced are highly exposed to peers' attention, commentary, and ridicule. This involuntary exposure not only undermines self-esteem and confidence but also exacerbates feelings of social alienation and labeling.

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Finding 3: Imbalanced Clinic Layout and Patient Anxiety

Testing environments are often open or semi-partitioned rooms, where diagnostic results are announced transparently, offering limited privacy protection. Waiting areas are crowded and impersonal, contributing to heightened patient stress and anxiety.

Finding 4: People with color disabilities have a vague concept and lack of understanding of color naming

In the consulting room, we randomly interviewed several patients with red-green color blindness. 86% of the patients could not correctly imagine the color description of "lotus root starch", 56% could not accurately imagine "mint green", and only "cream white" could be associated with the vast majority of the group. Studies show that over 71% of patients have significant problems with color naming.

Conclusion

Current color vision testing often lacks adequate informational and emotional support, with public diagnosis reinforcing social stigma and testing environments showing little human-centered consideration. As a result, participants experience cognitive confusion, psychological stress, and social anxiety during the process. Therefore, integrating human-centered design with digital media technologies to create an open, inclusive, and psychologically comfortable color vision testing environment is of critical importance.

“I prefer emotionally supportive perceptual tools during testing, instead of clinical standardization.”

I expect to redesign the color vision testing experience through immersive, empathetic and interactive media, thereby breaking through the "labeling" and "standardization" ways of defining people with color vision differences.

Through an online survey of 208 individuals with color vision deficiency (CVD), we systematically identified and analyzed the core perception and discrimination strategies of this group in the process of object discrimination.



Three principles of test experience

Non-stigmatizing:
The testing process is shameless and unlabeled

Transparency:
The test results clearly present experiences from different perspectives

Empathy Through Interaction:
Experience the visual perception methods of others through interaction

DEFINITION

Chroma Division is: an interactive visual assistance system designed for people with color vision differences. It replaces traditional color blindness test cards with gamified animal graphics, 3D overlay layers and mixed reality environments, creating a non-labeled and immersive diagnostic experience.

In response to the current issues of “emotional shame” and “diagnostic exclusivity” in color-weakness and color-blindness detection, **Chroma Division** has introduced multi-perspective color simulation, empathetic feedback mechanisms, emotionally supportive interface guidance, and non-verbal methods for displaying test results to enhance user experience and advocate for perceptual equality.

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Design Goals

- Inclusive testing
- Engaging space

Empathy Goals

- Foster perceptual awareness among users

The Service Content

Platform

- Perception-assisted testing platform
- Visual identity card
- Holographic test device
- immersive space experience

Value of the Design

1. Enhancing perceptual inclusivity across medical and design systems
2. Redefining vision testing from a diagnostic procedure to a perceptual learning experience
3. Mitigating social stigma against color vision deficiency
4. Enabling the co-existence of perceptual diversity in public interfaces and fostering empathy through visualization and interaction



TARGET USER PERSONAS

Personas after observation and interview

After conducting on-site observations and random interviews, I have summarized three categories of potential users and created user profiles.



Diagnostic-sensitive users

They say: Am I abnormal? Can I still be a police officer in the future? Most of them are teenagers or young adults, concerned about labeling and the impact on their careers.

Needed: Emotional soothing mechanism, mitigation feedback mechanism

Worry: "The result will be denied after the test."

Perception-explorer users



They say: Why do I see nothing while you see various patterns? Is there really any difference? Be open to perceiving differences and be willing to understand "the world in others' eyes".

Needed: Comparative interactive experience, MR Multi-perspective demonstration

I enjoy perceptual interactive experiences and can easily empathize with the differences in others' senses.



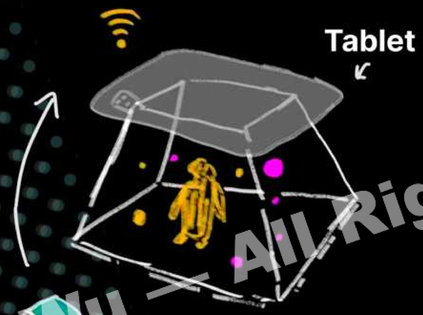
Family-oriented users

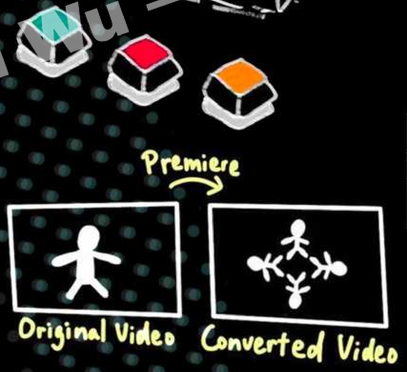
They say: Most children who are not very cooperative are those accompanied by their parents during the test, lacking both fun and interactive guidance

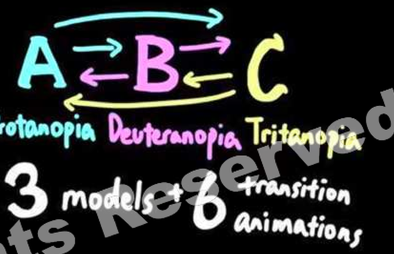
Needed: Cute character guidance, cartoon animals as test media, and fun animation interaction

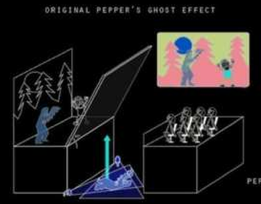
SKETCH & THEORY

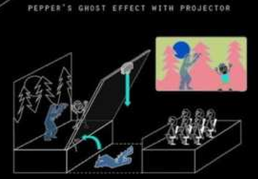
Early-stage installation sketches











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INSTALLATION DESIGN STEPS

Model, texture, geometry nodes, and animation demo in Blender

↓

Import the FBX model files into TouchDesigner; use nodes to edit the 3 color-blind-mode clips and the 6 transition animations

↓

Connect the music output of VCVRack Cardinal to the audio input of TouchDesigner using VB-Audio Virtual Cables

↓

Build a 600mm-tall holographic projection from 4 laser-cut acrylic sheets and mount the playback equipment above it

↓

Switch between animation states using the custom single-unit Bluetooth keyboard

SKETCH & DESIGN RESOLUTION

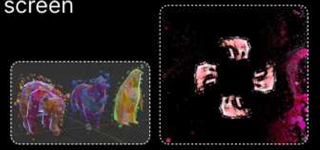
45° Acrylic mirror reflection

Utilizing optical illusions and the principle of reflection



Screen

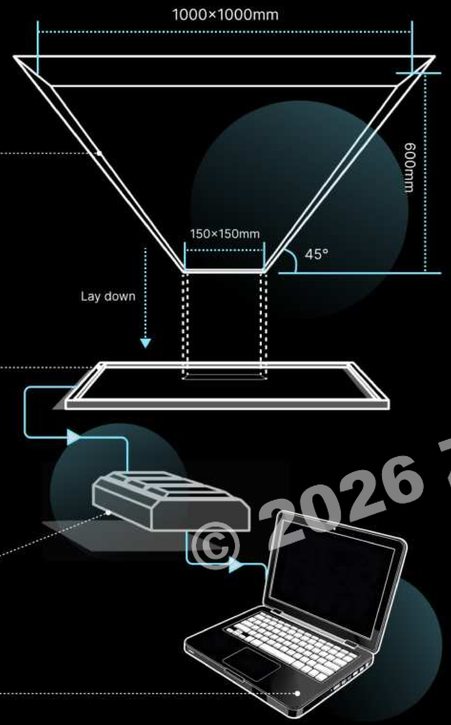
Holographic projection content is presented on the screen



Switch modes

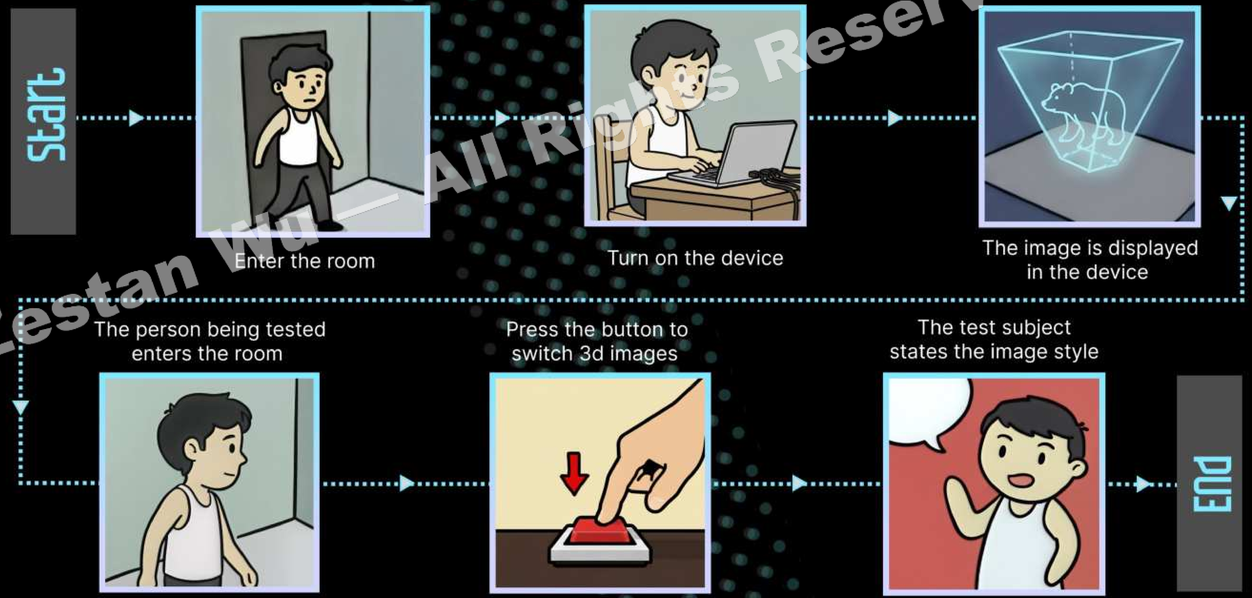
Switch models or particle systems via hotkeys

Main visual & sound source



CONCEPT IDEATION

This project converts traditional color-blindness test plates into 3D forms. Users can switch between a bear, an elephant, and a goat, whose Ishihara-style patterns represent **protanopia**, **deuteranopia**, and **tritanopia**. Each model visualizes a specific color-perception deficiency, revealing how altered color vision reshapes spatial and narrative perception and fostering a more open, inclusive, and comfortable testing environment.



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ANALYSIS

1. **Hardware Equipment**
   - Horizontal screen
   - High transparency PVC board
   - Sensing equipment
   - Auxiliary switch
2. **Software application**
   - VB-Audio Virtual Cables
   - Infrared/distance sensing
3. **Image/sound source**
   - TouchDesigner
   - Blender
   - VCV Rack Cardinal

WORK FLOW

Blender Modeling → Blender Materials (demo)

Blender Geometry Nodes (demo)



Blender Export fbx (Mesh+Materials)

TouchDesigner Import Model

TD Object Materials → TD Object Particle Effects

TD model switching



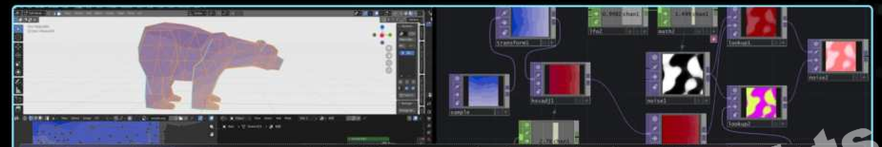
TD Animation Production

TD background particles (sound interaction)

Device setup

PROJECT PROCESS & TECHNICAL CHALLENGES

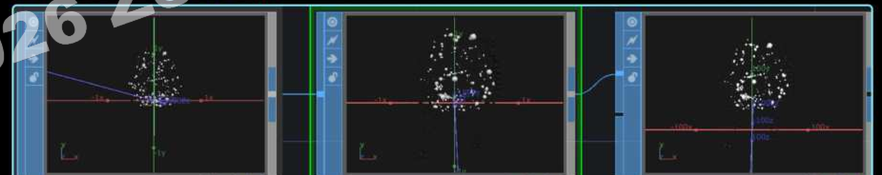
1. After importing the model into TD, the material's base color became uniformly flattened, and UV mapping errors appeared.



Solution: In Blender, expand the UVs using spherical projection, define sharp edges, and apply angle-based smoothing. Additionally, create original psychedelic dynamic materials in TD using node operations such as LFO, Noise, and Math.

Models → Unfold → UV → Export → FBX files → Touch Designer → Nodes → Original psychedelic dynamic material

2. Particles generated through Blender's Geometry Nodes cannot be exported to TD in their grid form.



Solution: Use noise node to create particle motion effects in TD.

3. Initially, the object's rotation animation could not be seamlessly connected through keyboard interaction, resulting in stiff and abrupt.



Solution: By using the Alpha channel of the material, the switching between keyboard input and the animals' material Alpha is controlled through nodes such as Logic CHOP. Then, Math CHOP is used to control the keyboard input parameters, adjusting the speed of position, scale, and rotation to achieve a squash-and-stretch effect based on animation principles, making the motion more vivid.

4. The background particle system initially had low interactivity, system lag, and was unable to change color.

Solution: Reduce the particle display resolution. Adding the audioAnalysis node enables the system to detect the low frequencies and kick elements of the input audio, which are then converted into particle motion speed and rotational acceleration through CHOP components.



The ramp's RGB values are generated via a Math CHOP, and keyboard–particle color interaction is controlled through a Switch component.

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5. Setup issue: Large holographic projection equipment was unavailable, and holographic chambers were too expensive with poor results.

Solution: Using the Pepper's Ghost principle, four isosceles-trapezoid transparent panels are placed at a 45-degree angle to the ground to form the image. High-transparency PVC sheets are purchased, cut, and assembled with hot-melt adhesive.

SOUND DESIGN



Mass music assets lacked compositional balance, randomness, and interactivity, making it hard to create a relaxed, dreamy atmosphere.





Use VCV Rack Cardinal to write algorithm music, the core of which lies in the synthesis of control voltage and audio using each module. This project employs sound synthesis techniques such as subtractive synthesis and physical modeling, and features two original pieces for future exhibitions.

INSTALLATION CONSTRUCTION PROCESS

01 | Acrylic Structure Assembly



To achieve the holographic illusion, I used ***four laser-cut acrylic sheets*** assembled into a 45° inverted pyramid, following the ***Pepper's Ghost principle***.

I carefully glued and calibrated the edges to ensure ***structural accuracy and optical clarity***, laying the foundation for immersive projection.

02 | Optical Alignment & Projection Test



After initial assembly, I adjusted viewing angles and conducted ***projection calibration*** using a laptop output.

I created a darkroom setup with curtain blocking to enhance the illusion. This allowed ***suspended 3D animations*** to float vividly in the center of the pyramid.

03 | Interaction System Integration



I installed a ***custom-designed single-button switch*** to allow audiences to interact with the animation sequences.

The switch triggers transitions between ***three simulated color perception modes*** (protanopia, deuteranopia, tritanopia) and ***six animated transformation states***. I used ***TouchDesigner + Blender*** for system operation and content output.

04 | Final Testing & Presentation



I placed the completed setup in a dark environment for final testing.

When audiences interacted with the device, different animals and visual forms became ***visibly distinguishable depending on their color vision type***, offering both a scientific simulation and a ***non-stigmatizing experience***.

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FINAL DISPLAY



Video Link
https://youtu.be/A8JL7ogYC-Y









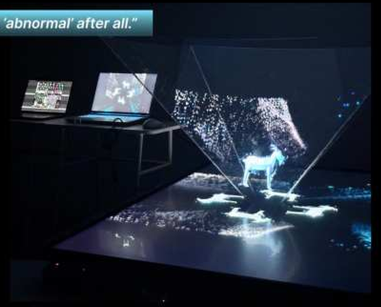


"I never thought color vision differences could be this beautiful."

"When I saw the floating creature, I felt like I wasn't 'abnormal' after all."

USER FEEDBACK

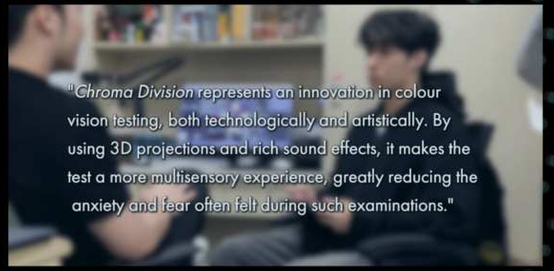




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PROJECT REFLECTION

Outcome Validation:
This installation transformed traditional color vision tests into an empathy-driven experience centered on visualizing perceptual diversity. Viewers compared their own visual perception with others', ***challenging the dominant norm of color-centric vision.***



Challenges & Limitations:
For users with severe color deficiencies, ***layered color distinctions remain challenging*** and require further tuning.

Future Development:
The system will expand to support ***multi-user empathy switching*** and perspective comparison. A ***portable version (tablet or AR)*** is planned for schools, clinics, and community use beyond gallery spaces.

GEO DRIFTING

Game Design | Landscape Exploration | Gamified Education

Project Info

Duration
2 Months | Individual Project

Skills & Tools
Maya, Blender, Unity3D, Character Design, Level Design, User Journey Map

Objective

Geo Drifting is a **3D educational adventure game** featuring unique **geological landscapes**, where players **drive** and **solve puzzles** to explore landform structures, evolution, and their ties to ecosystems. Through immersive interaction, the game bridges **science and experience**, inspiring interest in **nature's complexity** and promoting the value of geomorphic and ecological diversity.

Video Link

https://youtu.be/9GBr5PVHmYU



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Introduction



Landforms are natural features shaping the Earth's surface, such as mountains, valleys, plains, and plateaus. Iconic types like glacial, karst, and volcanic landforms are visually striking and play key roles in water retention, biodiversity, and climate regulation. Yet they're often reduced to "tourist attractions" in public perception, with their ecological functions and formative processes overlooked.

Current Problem

2670 billion

Global glaciers: Over 267 billion tonnes of ice lost annually since 2015 (UNESCO/IUGG, 2023).



30-40 %

Global volcanoes: Fundamental monitoring absent for 30% of active volcanoes (GVP, 2024).

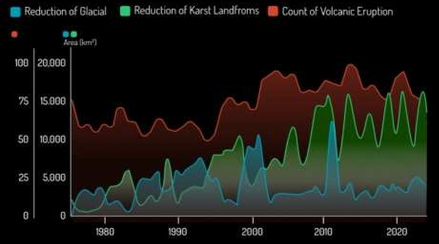


90,000 km²

Southwest China Karst: 90,000 km² of rocky desertification, erosion intensifying (Nature Reviews, 2020).



Global Retreat of Glaciers, Recession of Karst, and Count of Volcanic Eruptions (1975-2024)



2D charts and text alone fail to capture the spatial dynamics of geological processes.



Experience live geology: shape mountains and redirect rivers in real-time gameplay.



What I Will Do...

I want to use puzzles and terrain exploration in Geo Drifting to help players intuitively understand landform evolution. I plan to convey ecological awareness and encourage players to reflect on the natural environment.

Further Discussion

Why Gamify? The Power of Engaging Learning

- Develop Spatial Reasoning
- Understand Complex Systems
- Analyze Regional Geography
- Apply Knowledge Practically

Students

Teachers

- Inefficient Resource Integration
- Limited Process Visualization
- Fading Student Motivation
- Lack of Adaptive Feedback

Why This Format?

Feasibility: Multimedia & Tech Stack

VR/AR	3D Animation	Game Engine Rendering
Immersive Experience	Depth & Comprehensiveness	Multi-Element Integration
High Cost & Hardware Limits	Limited by Low Interactivity	High Immersion & Complex Interaction

Gaming stands as the ultimate synthesis of multimedia. Its power lies in interactivity, which fosters a first-person, participatory narrative and creates an inherent environment for learning and practice.

The Public Awareness & Education Gap

Investigating Public Awareness of Geomorphological Knowledge (e.g., Danxia, Karst, Glaciers) and Identifying the Most Overlooked Aspects.

40 Valid data points

30% Be able to explain the causes of landforms

10 In-depth interviews

Project Rationale and Objectives

To Close The Gap Between Public Awareness And Geological Knowledge, I Propose The Creation Of A Gamified, Interactive Experience That Is Both Educational And Engaging.



To The game adopts a third-person, top-down perspective in which players navigate a terrain-adaptive tour vehicle through a series of iconic landform environments.



By manipulating forces such as the passage of time, temperature, wind, and precipitation, players actively shape the landscape, solving environmental puzzles that simulate millions of years of geological transformation.



Players master the cause-effect relationships between environmental forces and landform evolution, transforming abstract geological literacy into actionable stewardship for fragile ecosystems.

Competitive Analysis



Over the Hill

- Jeep drives varied terrains, exploring nature.
- Puzzle-solving meets terrain challenges.



The Gardens Between

- Manipulate time, solve dream puzzles.
- Friendship theme, hand-painted style.



World to the West

- Action-adventure with puzzle exploration.
- Fantasy world with multiple characters.



Terra Nil

- Restore ecosystems from barren landscapes.
- Reverse city-building with nature recovery.

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User Analysis



LUKE

"I spent three years memorizing landform features in high school but rarely saw real ones, so experiencing how they form would teach me why conservation matters far more than textbook facts."

"My impression of educational games is that they are usually dull, but if designers balance entertainment with clear science, I believe the game is truly successful."



MAY



ROGER

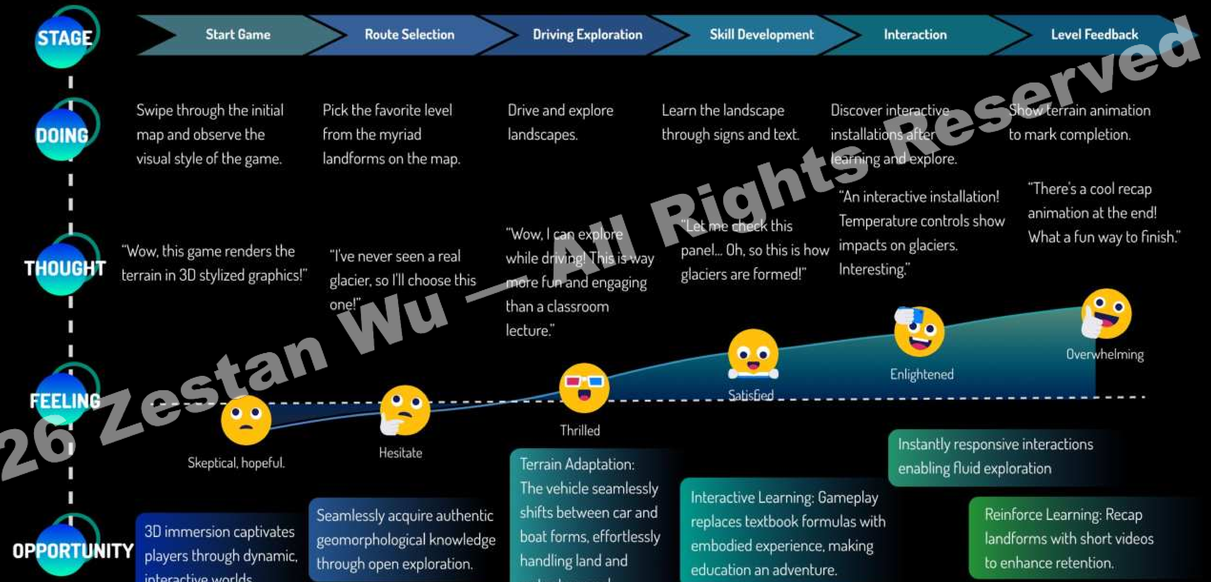
"School knowledge feels flat and impractical, possibly limiting our perspective and hindering reflection on how humans and geography interact."

Insights/Solutions



User Journey map

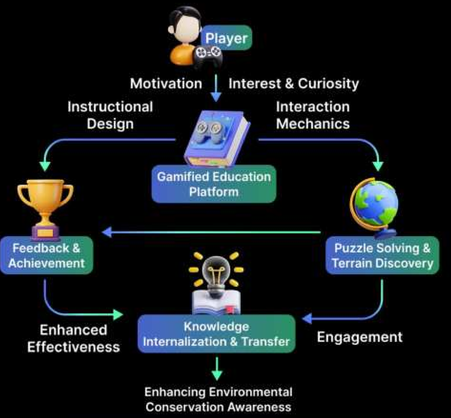
I step into the player's perspective and clearly map out their full journey through the game — including their actions, emotional responses, the system information they encounter, and the needs and pain points that arise at each stage. This allows me to refine the game's pacing and interaction design.



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Insights

This diagram shows how game-based learning engages players, reinforces understanding, and builds environmental awareness.



1. **Promote Knowledge Acquisition and Transfer**
   Through game-based learning, students become more active learners, gaining deeper understanding and more easily applying what they've learned in new contexts.

2. **Multifaceted Exploration and Interaction**
   Through immersive terrain exploration and puzzle-solving experiences, the game sparks students' curiosity while subtly nurturing their awareness of nature conservation.

Design Concept

Based on the analysis and research above, I created a mind map to brainstorm the game's overall narrative structure and the various aspects involved.



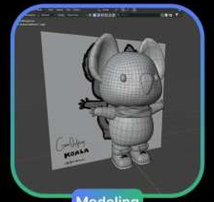
Brainstorm

Game Characters

Protagonist - Koala



Draft



Modeling



Texturing



Skeleton



Fur Effects & Final Render

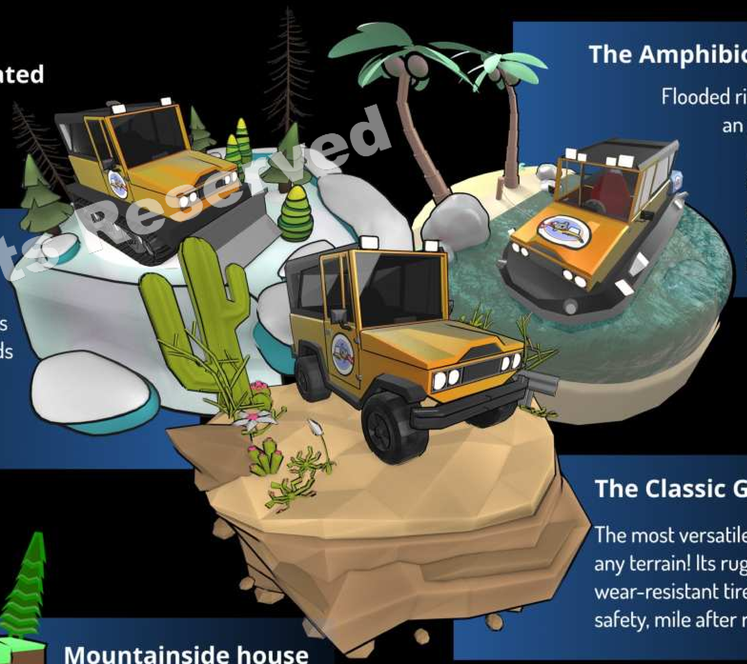


Logo
I created

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The Tracked Geo Jeep

Custom-built for glacial terrain with tracks and a snowplow! This modification significantly extends its operational range on ice and enhances maneuverability.

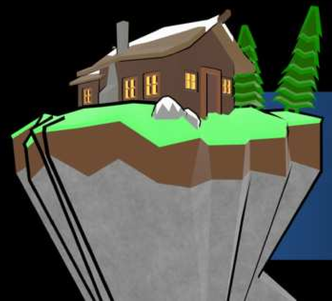


The Amphibious Geo Jeep

Flooded river? Open sea? With an integrated boat hull, the Geo Jeep takes its capabilities to the next level, tackling diverse aquatic terrains with ease.

The Classic Geo Jeep

The most versatile choice, built for any terrain! Its rugged shell and wear-resistant tires ensure driver safety, mile after rugged mile.



Mountainside house

The koala lives in a house perched high in the mountains.

Level Design

Starting Point

In search of another habitable world, the koala embarks on an adventurous journey. Traveling through volcanic landscapes, karst terrains, and icy mountains, he navigates ever-changing natural environments and ultimately finds a place he can call home.

Map



Level 1 - Volcano



Gameplay interactions:

- Drag the timeline → volcanic eruption → cooling → geyser formation.
- Transform into a tank vehicle and choose the right timing to pass through the area, avoiding lava obstacles.

Level 2 - Karst



Gameplay interactions:

- Scroll wheel: move from surface view to an underground cross-section to discover hidden underground rivers.
- Drawing to guide water: draw rainfall and water flow paths to drive terrain evolution, allowing vehicles to traverse the transformed terrain.

Level 3 - Glacier



Gameplay interactions:

- Switching between seasons to show changes in glacier thickness; or adjusting a temperature gauge, where temperature changes affect the rate of glacier melting.
- In spring and summer, ice and snow melt, allowing vehicles to travel smoothly on main roads. In autumn, main roads become blocked, and the ice surface is not fully frozen. In winter, main roads are inaccessible, but the vehicle can transform into a boat and travel across the ice.

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Final Design

Level 1 - Volcano

Players need to adjust the vehicle to avoid volcanic ash and reach as many star-marked locations on the map as possible to earn points. By adjusting time, wind direction, and temperature, players can influence volcanic eruptions to help the koala move forward. Players must also keep an eye on the koala's health bar to avoid failing the level.



Gameplay analysis

Time Module: Press to accelerate geological changes over time, allowing you to form mountains, carve canyons, and shift tectonic plates.

Wind Speed Module: Press to adjust wind intensity, which can be used to erode terrain, speed up water flow, and control volcanic ash.

Temperature Module: Press to control temperature changes in the scene, which can be used to break glaciers, clear snow, and more.

Map: It senses the player's current location and surrounding conditions.

Health Bar: You can check Koala's condition at any time. If the health bar drops to zero, you'll need to restart the level.



Level 2 - Karst



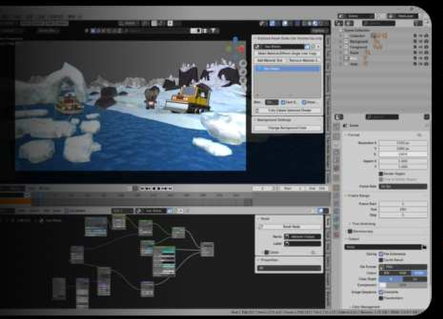
Level 3 - Glacier



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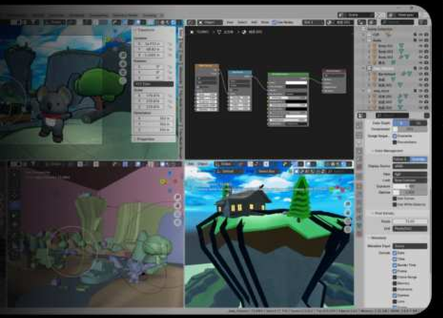
Software Screenshots

The model I sculpted in Blender











Driving and Coin Collection



Game Demo Map Overview

Includes:

- Jeep driving roads
- Basic karst terrain (caves, stone forests)
- Floating islands (bonus levels)



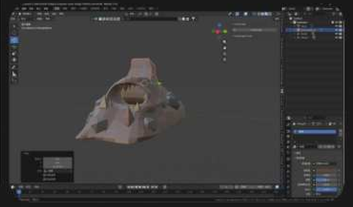
Cave Design:

Caves are natural formations created when limestone is dissolved by water containing carbon dioxide.

In the game, they illustrate the erosive effects of water on karst landscapes. A Particle System simulates rainfall, and terrain elevation controls allow the jeep to enter the caves.

Production Workflow: Model and sculpt in Blender → retopology → export as FBX → import into Unity and add Mesh Collider.







Demo Design:

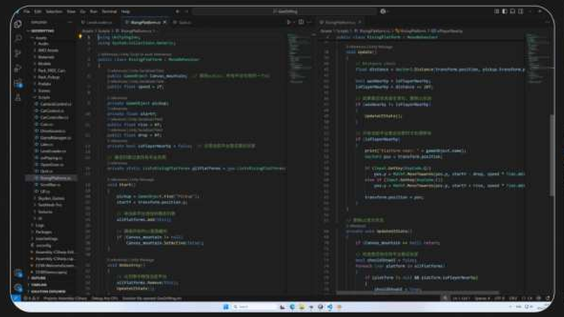
In the game demo, players freely explore the karst terrain, collecting coins scattered throughout. When navigating complex areas, they can use the Q and E keys to accelerate time, controlling the rise and fall of the terrain.



Core APIs:

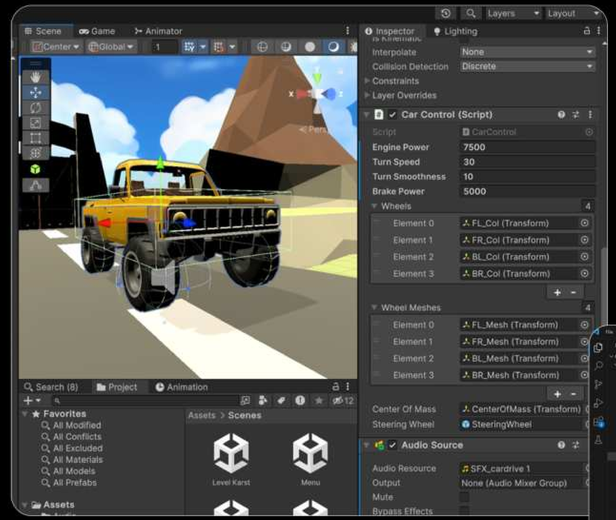
1. Vector3.Distance() (distance detection),
2. Input.GetKeyDown()/Input.GetKey() (key input),
3. Transform.Translate()/Vector3.Lerp() (platform movement).

Terrain Elevation Script: RisingPlatform.cs



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Software Screenshots



Jeep Controls:
In Unity3D, I added colliders and a CarControl.cs script to the jeep to implement vehicle control logic, including steering, acceleration, and braking. The system defines wheel setup, center of mass, and steering wheels, handling wheel rotation and steering states to optimize the player's driving experience.



I created a game demo, set up an exhibition space at school, and invited classmates to playtest it so I could identify areas for improvement.

Jeep Control Script: CarControl.cs



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Play Testing



Future to do...

Dynamic Terrain: Introduce interactive physics-driven hazards such as rockfalls and landslides that respond to player actions.

Improved UI: Upgrade map and health displays, and integrate interactive controls for temperature, wind speed, and environmental conditions.

New Environments: Explore challenging volcanic and glacial regions with unique gameplay.

Vehicle Updates:
- Optimize driving controls and refine vehicle models.
- Add the Amphibious Geo Jeep and the Tracked Geo Jeep for versatile terrain handling.

GLIMMERS OF BUTTERFLY

Digital Heritage Preservation | Immersive Storytelling | Cultural Game Design

Project Info

Duration
4 Months | Team Project (Technical Implementation & Environment Art)

Skills & Tools
Unreal Engine 5 (Blueprints/Niagara), RealityScan (Photogrammetry), Jawset Postshot, Blender

Objective

Glimmers of Butterfly is an **immersive 1st Person exploration game** designed to digitally preserve the historic **Wansong Academy** while reimagining the classic **"Butterfly Lovers"** narrative. By integrating **Gaussian Splatting, Nanite geometry**, and **photogrammetry**, the project authentically reconstructs cultural sites like the "Three Memorial Archways". It features a unique **calligraphy interaction system** developed in UE5, bridging tangible architectural heritage with **intangible cultural storytelling** to provide an educational experience that connects players to the **Confucian spirit** and traditional Chinese aesthetics.

Video Link

https://youtu.be/-0_9Lm2pvG4

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BACKGROUND

"Liang Zhu" (also known as "Liang Shanbo and Zhu Yingtai") is one of the most famous folk love tragedies in China. After being passed down for hundreds of years, it has deeply rooted in the soil of Chinese culture.

"Liang Zhu" Story content

During the Eastern Jin Dynasty

Zhu Yingtai disguised herself as a man and entered the academy to study. **She met Liang Shanbo.**



Three years of being classmates

The two studied together. Liang Shanbo regarded her as a close friend but didn't know her gender. **Zhu Yingtai secretly developed feelings for him.**



After the school term ended

Zhu Yingtai hinted at her identity before returning home, but **Liang Shanbo failed to fully understand.**



The proposal was rejected

Liang Shanbo's marriage proposal was rejected. Zhu family had already arranged for him to marry Ma Wencai.



Tragedies followed one after another

Liang Shanbo died in depression; Zhu Yingtai was forced to get married and requested that the sedan chair pass by Liang Shangbo's tomb.



The Eternal Transformation into a Butterfly

Zhu Yingtai jumped into the tomb to commit suicide in a tragic love act, and **the two turned into butterflies** and flew together.



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The core theme of the story

- **The conflict between love and fate:**
  The predetermined arrangement of fate left them with no choice but to submit. Eventually, the union of love and death became the climax of the story.
- **Loyalty and sacrifice:**
  The two main characters demonstrated their unwavering loyalty to each other's love.
- **The oppression of feudal ethics:**
  Through the marriage arrangement of Zhu Yingtai and the death of Liang Shanbo, the constraints of the feudal patriarchal society are depicted.

Historical Background

The story itself possesses a **strong element of literature and symbolism.**

The Eastern Jin Dynasty

The story of "Liang Zhu" is set in **the Eastern Jin Dynasty.**

↓

Turbulent times, Political corruption, Social unrest, Nobility class

↓

The legal and moral system gradually became more rigid.

↓

Provided strong historical support for the **feudal marriage** and **patriarchy depicted** in "Liang Zhu". The tragic love story of Liang Shanbo and Zhu Yingtai precisely **reflects the suppression of individual destinies by the society in that era.**

CULTURAL SIGNIFICANCE

Since it became popular during the Ming and Qing dynasties, "Liang Zhu" has become an important theme in various artistic fields.

Opera

"Liang Zhu" holds a significant position in traditional Chinese operas.



Literature



It has been adapted into various forms, such as novels and essays, by numerous literary writers, exploring the interplay between love and social-historical contexts, making it a timeless classic that transcends time and space.

Film

The 1954 version of "Liang Shanbo and Zhu Yingtai"

1963 Edition of "Liang Zhu" (with incorporation of traditional Chinese opera)

The 1994 version of "Liang Zhu" (enhanced artistic expression)

AUDIENCE ANALYSIS

The target audience of this project includes cultural enthusiasts, historians, students, tourists, as well as the general public who are interested in the integration of traditional culture and digital media.



Characteristics: Has a strong interest in traditional culture and attaches great importance to historical authenticity.

Cultural enthusiast

Expectations:

- Accuracy of the architectural structure
- Completeness of the historical background
- The profound interpretation of cultural symbols



Characteristics: Professional background, rigorous and realistic approach

Historian / Researcher

Expectations:

- The accuracy of architectural scale proportions
- The accurate presentation of historical documents
- Verifiable reference materials



Characteristics: Highly curious, with limited attention span, and fond of interaction.

Student group

Expectations:

- Entertaining dissemination of knowledge
- Game-based learning experience
- Social sharing function



Characteristics: The visiting time is limited, one prefers visual experiences and likes to take photos and make posts.

Tourist group

Expectations:

- Quickly understand the highlights of the academy
- Virtual photography function
- Tour Route Recommendation

WANSONG ACADEMY

Historical Background

Wansong Academy originally belonged to the Baoen Temple in the Tang Dynasty. It has a history of over 1,000 years up to now.

In 1498

Zhou Mu, the Right Vice Minister of Zhejiang Province, personally transformed Baoen Temple into the historic Wansong Academy.

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The founding of Wansong Academy marked a significant milestone in the dissemination and development of Confucianism.

The Ming and Qing Dynasties

Wansong Academy has undergone multiple renovations and reconstructions, particularly with imperial support.

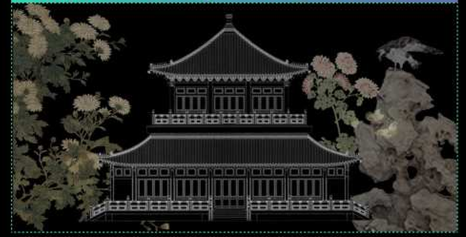


Emperor Qianlong even personally inscribed words for the academy.

Architectural style and layout

The architectural style of Wansong Academy closely follows the typical spatial layout and formal principles of academic buildings from the Ming and Qing dynasties.

Adopt a central symmetrical axis layout



The adoption of a centrally symmetrical axis layout reflects the etiquette and order inherent in Confucian culture.



The main buildings of Wansong Academy



Three Memorial Archways

Symbolizing the reverence for academia and Confucian etiquette.



Mingdao Hall

It reflects the tradition of imperial examination culture and scholarly exchange.



Dacheng Hall

This site is devoted to the veneration of Confucius and stands as a symbol of Confucian values.



Yuxiu Pavilion

Once the academy library, it is now the "Liang–Zhu Lecture Hall," showcasing the Liang–Zhu cultural heritage.

The functions and symbolic significance of the academy

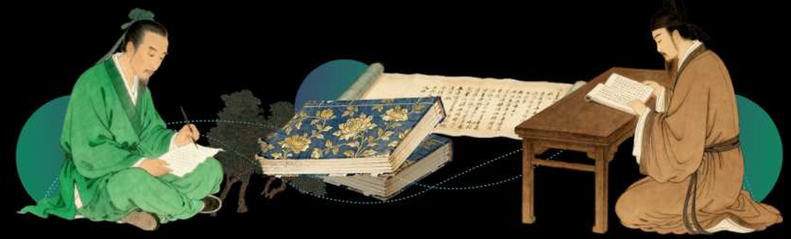
Wansong Academy was founded in 1498 and is one of the four major academies in Zhejiang Province.

In Chinese traditional culture, academies served as **the centers for education and academic research**, and hold a very significant position.



Wansong Academy is not only an academic education venue, but also plays a role in the dissemination of social culture and ideas.

The academy fosters a cultural atmosphere through poetry, calligraphy, and academic debates.



Not only does it help them enhance their knowledge, but it also enables them to recognize each other's emotions through the exchange of ideas.

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GAME SCENE DESIGN

This first-person immersive game scene features the "Three Memorial Archways" and the "Eternal Model Teacher" stele.

Three Memorial Archways (The historical symbol of Wansong Academy)

The arch is not merely a building; it also embodies the historical changes of Wansong Academy.

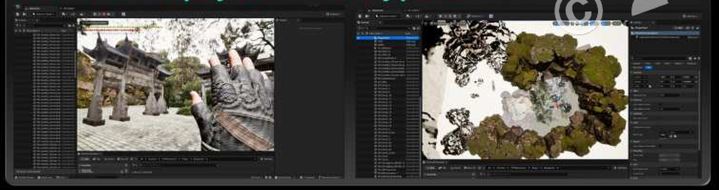




It symbolizes the rigorous academic atmosphere and lofty cultural mission of Wansong Academy.

The design of the Three Memorial Archways in the game

In the game, the Three Memorial Archways are deliberately selected as the player's initial entry point.





The "Eternal Model Teacher" Stele

The "Eternal Model Teacher" Stele is a historically significant stone monument and one of the few authentic relics of Wansong Academy that has survived from ancient times.

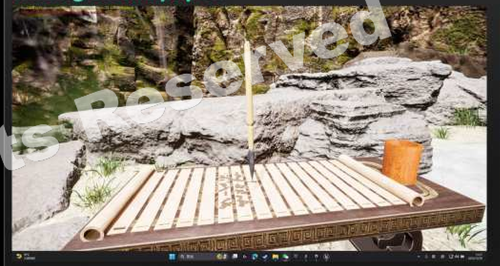




This monument expresses profound respect for Confucius and Confucianism, and embodies the inheritance and promotion of the educational spirit of Confucianism.

The design of the "Eternal Model Teacher" stele in the game

The game design features brushes and paper on the table, allowing players to interact by writing on the paper.









This enables players to form a deeper emotional connection with the embodiment of all virtues. By writing, they can express their feelings, experiencing the scene as if fully immersed in its culturally rich historical context.

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UE5 PROJECT

This project employs techniques such as **photogrammetry, Gaussian splatting, and Nanite virtualized geometry** to digitally reconstruct the Three Memorial Archways and The "Eternal Model Teacher" stele at Wansong Academy.



Part of the Three Memorial Archways

The Three Memorial Archways were processed in point cloud form in Postshot and then exported as a PLY file.

The Three Memorial Archways

Photo/Video capture → Point cloud generation in Jawset Postshot → Point cloud range cropping → Removal of redundant points → PLY export



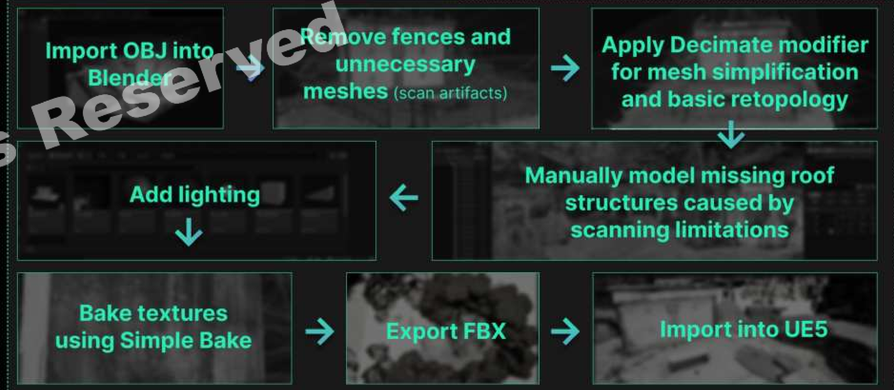
Part of The "Eternal Model Teacher" Stele

The "Eternal Model Teacher" Stele has been reconstructed into a static grid model using RealityScan.

The "Eternal Model Teacher" stele



Model optimization and engine pipeline:



Unreal Engine 5 Workflow



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INTERACTIVE SYSTEM

This game introduces a set of calligraphy interaction systems:



The system enables players to pick up the brush by **pressing the F key**, adjust the depth (distance) of the brush in real time using the mouse scroll wheel, and practice writing with the mouse, gradually mastering the skills of calligraphy.

Logical Operations (Spatial Perception and Input Generation) BP_Quill



By moving the brush in 3D space, the system enables a writing interaction that blends the virtual and real, continuously tracking the brush tip to map it precisely onto the digital canvas.

Paper-end logic (drawing execution and pen mark accumulation) BP_Paper



The "digital paper" functions as a virtual writing surface, capturing and displaying the brush's strokes in real time, while simulating the ink-retention effect of real paper.

Overall operation logic (pen-paper collaboration mechanism)



The overall interaction logic adopts a collaborative structure where the pen and paper are separated:

The pen handles 3D spatial positioning and interaction, while the paper is responsible for 2D visual rendering. Through a unified coordinate interface, the system maps real-world writing actions onto the virtual canvas in real time. This design not only delivers a physically grounded and immersive writing experience, but also establishes a flexible framework for extending diverse surfaces, materials, and brushstroke effects.

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FUTURE OUTLOOK



Interaction algorithm optimization

- **Precise mapping:** Optimize the ray detection algorithm to enhance the stability of the brush when writing on complex surfaces.
- **Feedback animation:** Add action feedback after the calligraphy is completed, using the subtle movements of the character or the environment to enhance the sense of interaction and accomplishment.



Enhanced sensory experience

- **Dynamic sound effects:** Incorporate sound effects based on physical simulation, so that the sound of the brush rubbing changes in real time according to the writing speed and pressure.
- **Aesthetic UI:** Rebuilding the Interaction Interface (UI Prompts)



Narrative logic construction

- **VFX trigger:** The system continuously monitors the ink coverage of the paper (Paper Logic), and once the standard is met, it automatically triggers the Niagara butterfly particle effect. Through code, the behavior of "academic study" is directly linked to the metaphor of "transformation into a butterfly", achieving digital narrative.



Modularization and Expansion

- **Component-based Integration:** Treat the project as a modular unit and incorporate it into the broader digital heritage framework of the final-year project.
- **Multi-platform Transplantation:** Exploring the adaptation of the scene for VR and AR devices, providing more immersive tools for cultural heritage preservation.

GAMBIT

Game Design | Asymmetrical Power-play | Systemic Bias



Project Info

Duration
2 Months | Individual Project

Skills & Tools
8-bit Pixel Art, Godot Engine

Objective

Gambit is an **independent local two-player pixel-art soccer game** designed to explore the phenomena of **injustice and manipulation** in real-world sports through **game mechanics**. This project translates real-world **institutional biases**—such as *the Calciopoli scandal*, the "sea cucumber" meme, and illicit interventions—into an **asymmetrical power-up system**, disrupting the **logic of fairness** inherent in traditional sports simulations.

Game Demo Download Link

https://zestanbiceps.itch.io/gambit



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RESEARCH & CONCEPTUAL ORIGIN

Social Observation: Injustice in Football

The design of this project is based on observations of the long-standing injustice and manipulation in both global and Chinese football.

Global Context: Systemic Interference



- In the international football arena, the **"Calciopoli"** incident in the Italian Serie A in 2006 revealed that clubs like Juventus interfered with match decisions by contacting referees and officials of the football association, ultimately leading to the clubs being stripped of their championship titles and relegated.

- During the investigation of former FIFA president Sepp Blatter for corruption, British comedian Lee Nelson threw money at him during a press conference. This incident is widely regarded as a symbolic satire of **FIFA's systemic corruption**, reflecting the **public's strong criticism** of the relationship between power and money.



Chinese Background

Former national team head coach Li Tie faced investigation and punishment for official misconduct, reflecting deeper managerial failures.



Fans often use the term **"Sea Cucumber Team"** to satirize the imbalance between the team's performance and material benefits. This playful nickname reflects the **public's disappointment** with the long-term poor performance and has also become a cultural symbol for criticizing the problems of the football system.

Key Insight: Procedural Translation of Institutional Decay

- The design intention of Gambit is not to recreate football, but to simulate the systemic erosion of fairness. Its core insight lies in moving beyond visual satire toward procedural empathy, forcing players to inhabit the same corrupt systems they critique.

From Narrative to Mechanism



Instead of telling a story of corruption, the game embeds it into the **asymmetrical card system**. By choosing a "Bribe" or "Capital Maneuver" card, players become active participants in the institutional bias.

The Dilemma of Choice



The "Gambit" metaphor suggests that winning often requires **a moral trade-off**. The tension between the "Clean Conscience" (integrity) and the "House Advantage" (manipulation) mirrors the real-world pressure to compromise values for strategic survival.

Breaking the "Fair Play" Illusion



By introducing "Sea Cucumber Soup" or "Ref Tilt," the game exposes how **invisible power** can abruptly distort a supposedly equal playing field, transforming a sports game into a critique of systemic injustice.

Conceptual Transformation: From Scandal to Game Mechanics

Gambit translates these socio-political observations into interactive metaphors.

- **Asymmetry as Rhetoric**
  By introducing metaphorical power-ups, the game simulates real-world institutional bias, forcing players to experience the tension between fairness and interference.
- **The "Gambit" Strategy**
  Named after the chess opening, Gambit implies a strategic sacrifice: players may abandon pure integrity to gain a decisive, albeit "corrupt" advantage.

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GAME FUNCTION PLANNING

Core Gameplay Design

Gambit is an indie two-player pixel football game. While grounded in principles of fair competition, the game allows players to create asymmetrical effects by selecting metaphorical bonus items, thereby simulating institutional deviations and intervention behaviors observed in real-world football.

Interaction Rules

Interaction rules



- The player controls a player and engages in confrontation by moving, dashing and shooting.



- The game duration is 120 seconds. The side that scores more goals wins.



- Players can choose to use buff items. Each item brings an advantage or changes the pace of the game, but there may be potential costs.



- The progress of the game and the effects of the props are displayed in real time. Players need to make strategies based on the game situation.

Card-drawing Mechanism / Bonus Item System

- Bonus items are provided through card drawing.



- With 80 seconds remaining in the game, players randomly draw one card from two cards in their own card pool.



- Cards are classified into three tiers: silver, gold, and diamond. Higher tiers provide increasingly powerful buff effects.



- In the card-drawing stage, two players may draw cards of different grades, increasing unfairness.



- The prop copy contains metaphors or black humor, e.g.· Sea Cucumber Soup: "The club's lavish soup works wonders. Speed +30%, no one knows why you're suddenly faster."



- The Easter egg card Clean Conscience: "Untouched by corruption, you play with pure integrity and aim for the trophy." does not offer buffs, symbolizing fair sportsmanship.



- Player decision-making nodes include: the timing of choosing items (whether to break the balance) and offensive and defensive strategies (adjusting the rhythm based on the ball and the opponent).



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Competitive Justice

Players experience the **tension between fairness and unfairness** through interaction, as well as the impact of strategic intervention on the outcome of the game, thereby reflecting the issues of **institutional injustice** and **sportsmanship** in real football.

The description of the existing 12 buff cards:



Silver Cards:

- **Energy Drink**
  Coach's mysterious potion grants you a burst of speed. +50% dash speed.
- **Fake Injury**
  Rumors claim you're hurt, but you trained in secret. Dash duration +0.3s.
- **Spiked Water**
  A seemingly harmless sip slows your rival. Opponent's dash cooldown +0.3s.
- **Home Advantage**
  Familiar turf under your feet gives you an edge. Speed +20%.



Gold Cards:

- **Performance Boost**
  A massive dose of stimulants sends your speed soaring. +100% dash speed.
- **Sea Cucumber Soup**
  The club's lavish soup works wonders. Speed +40%, no one knows why you're suddenly faster.
- **Playing Hurt**
  Forced onto the pitch, you push through pain. Cannot dash, but gain +60% extra speed.
- **Ref Tilt**
  "Did that goal count?" The referee looks the other way. Opponent's score -1.



Diamond Cards:

- **Capital Maneuver**
  Mysterious investors intervene. Your goalposts can now shift left and right.
- **House Advantage**
  Instantly adds 2 to your score. The house always wins.
- **Bribe**
  Grease the ref, lose 3 goals now, but future goals count double. Power and money speak.
- **Clean Conscience**
  Untouched by corruption, you play with pure integrity and aim for the trophy.

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GAME ART ASSET DESIGN AND COLLECTION

Art Style

As a 2D game, Gambit adopts a **retro 8-bit pixel art style**, continuing the visual paradigm of FC-era sports games such as Hot Blooded Football. Scenes are constructed from **low-resolution pixel blocks**, characters are rendered as **cute pixel sprites**, and footballs are depicted using basic geometric color shapes. The UI follows a minimalist, function-oriented design, **avoiding redundant decoration**. Overall, the game conforms to the artistic logic of early arcade sports games, characterized by **low visual cost** and high recognizability.







Character Design

There are **two players** in the game, each with a cute pixel image, and their sizes, shapes and movements are all consistent. The distinction is mainly made by the color of the jersey (red or blue).



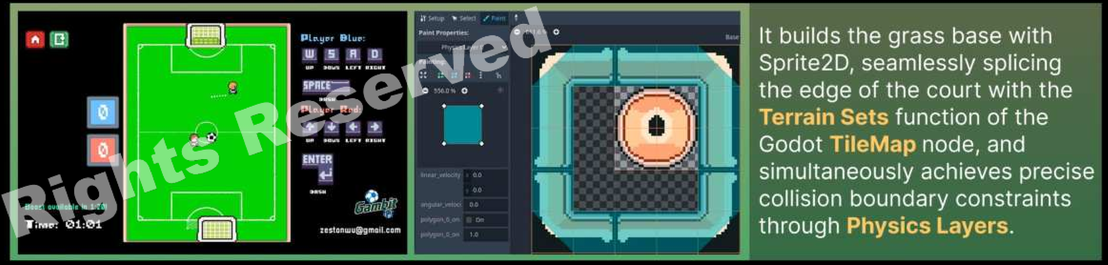
In Godot's **AnimatedSprite2D**, directional animations can be created from a **sprite sheet**. Assigning movement keys in the **input map** and linking the player script enables player movement.





Scene Design

In full-screen layout, Gambit differs from the horizontal pitch in "Hot Blooded Football" by adopting a **vertical design**.



It builds the grass base with Sprite2D, seamlessly splicing the edge of the court with the **Terrain Sets** function of the Godot **TileMap** node, and simultaneously achieves precise collision boundary constraints through **Physics Layers**.

Game Music and Sound Effects

The game features **8-bit style music and sound effects**, recreating the auditory texture of pixel handheld consoles from the 1980s. The materials are sourced from open-source resources or generated by AI. The music is embedded in the scene through **AudioStreamPlayer2D** and played. The sound effects are mostly triggered by the **$Dashsound.play()** code, and the sound effects such as the goal sound will use **randf_range** to randomize the pitch, increasing the richness and fun of the performance.

```
if has_node("ScoreSound"):
    $ScoreSound.pitch_scale = randf_range(0.7, 1.5)
    $ScoreSound.play()
```

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BASIC TSCN SETUP AND PARTIAL CODE DESCRIPTION

Build nodes based on art assets

Player_Blue.tscn (Taking the blue player as an example)

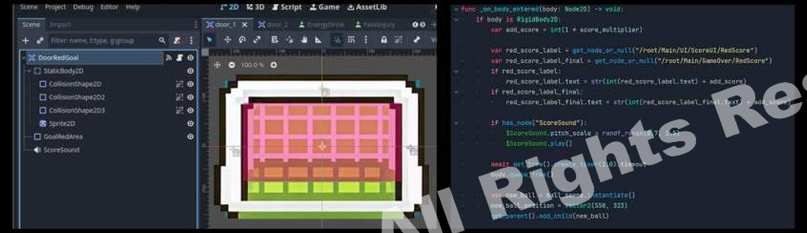


Root node: CharacterBody2D, including GPUParticles2D (Dash wake effect), AnimatedSprite2D, CollisionShape2D (physical collision), and AudioStreamPlayer (Dash sound)

Corresponding script Player.gd:

Player movement, direction detection, and animation switching are implemented through **_physics_process()**. **start_dash()** controls the start of the dash, triggers sound and particle effects, and **stop_dash_effects()** manages the end of the dash and cooldown. Variables such as can_move, is_dashing, and dash_cooldown_timer are used to coordinate movement state, dash logic, and effects.

Door_1.tscn Take the blue goal as an example



Root node: Area2D, which includes two types of CollisionShape2D. One is used as a physical collision for StaticBody2D under the root node, and the other is used for **Goal Detection** at the root node.

Core code snippet description:

Triggered when the ball enters the goal, it first determines whether the body is RigidBody2D (the root node of the football), and then calculates the bonus points based on the score_multiplier and **updates the UI** (Red/BlueScore and Red/BlueScoreFinal). Play the goal sound effect and delay for 1 second to **destroy the old ball** (body.queue_free()), and **instantiate the new ball** (ball_scene.instantiate()) and **put it back to the initial position** to continue the game.

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GODOT GDSCRIPT GAME LOGIC IMPLEMENTATION

Countdown Node2D node

The 120-second game timing is achieved through a timer, and the UI display in the game interface is updated. At the same time, the font color is dynamically changed according to the remaining time to provide visual feedback (light red for the remaining 20 seconds, flickering for the remaining 10 seconds).



Pause the timing at the specified time point (80 seconds) and **trigger the card-drawing process**. When the countdown ends, call **countdown_finished()** to display the settlement interface, freeze the player character, and switch between the sound effect and background music states.

Essential parts of the script:

The _on_timer_timeout() function updates the current time and refreshes the countdown display every second. When the remaining time reaches 80 seconds, **it pauses the timer and calls CardDrawManager.cardselect()** to enter the card selection phase. Once the time runs out, the timer stops and triggers countdown_finished() to uniformly handle the end of the competition and subsequent processes.

```gdscript
func _on_timer_timeout():
    current_time -= 1
    update_display()

    # 在指定时间点触发抽卡并暂停倒计时
    if current_time == 80:
        # 暂停倒计时
        countdown_timer.stop()
        is_counting = false

        # 调用抽卡功能
        if is_instance_valid($"../CardDrawManager"):
            $"../CardDrawManager".Cardselect()

    # 检查是否倒计时结束
    if current_time <= 0:
        current_time = 0
        countdown_timer.stop()
        is_counting = false
        countdown_finished()
```

Card drawing management

Card Draw Manager（Node）

Initialization:
Preload and cache all card scenes in _ready().

Start card drawing:
The game pauses and generates two card options for each player based on randomly assigned rarities.

Selection and Feedback:
When players click to select, a sound effect is triggered and unselected cards gradually fade out.

Resume the game:
After both sides make their choices, gradually close the interface, resume the game countdown and operations, and reset all states.

Core function - Cardselect(This function controls the card-drawing process)



The function first plays the card-drawing prompt sound and sets the can_move of both players to false to pause the operation.

Then, the card-drawing UI for both the red and blue sides is displayed.

Then, randomly select the rarity group for both sides from the set rarity group, and filter the corresponding card pool through is_in_group(), shuffle and instantiate two cards each to add to the interface.

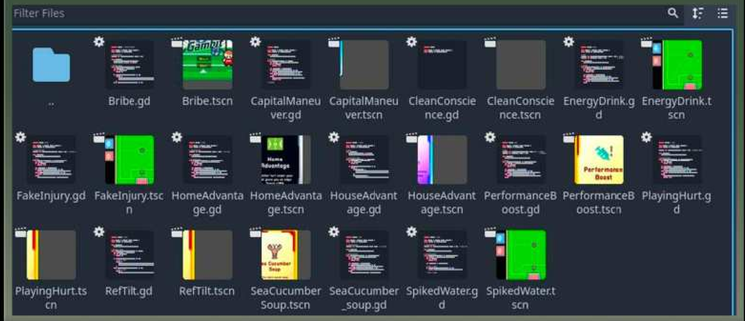
Finally, bind the pressed signal to each card.

When clicked, sound effects are played and unselected cards are gradually hidden through fade_and_free() to prepare for the subsequent check_selection_done() judgment that the card draw is completed and the game process is resumed.

Card function

In the Demo version, Gambit contains **a total of 12 cards**, with **4 cards of each rarity** for players to choose from.

To clearly **distinguish the functional logic** of different cards and maintain **security and scalability** during the script writing and maintenance process, each card is designed as an independent .tscn scene with a separate .gd script for functional control.



Each card's root node is a Button. I will illustrate two representative cards. The first shows a typical **numerical buff**, demonstrating player detection and signal calls. The second is **functional**, showing how it modifies in-game object states. These examples highlight the card system's modularity and maintainability.

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Numerical type, representing / Playing Hurt

Forced onto the pitch, you push through pain. Cannot dash, but gain +60% extra speed.





The Playinghurt.gd script defines the golden rarity card. When clicked, it will identify the faction it belongs to and locate the corresponding player node. In apply_to_player(), the player's dash ability is disabled (can_dash is turned off, the current dash is interrupted, and the related effects and sound effects are disabled).

At the same time, it increases the player's base movement speed based on speed_multiplier. This logic can be reused in other numerical cards to uniformly handle player faction identification and modify player parameters, such as movement speed, sprint duration, and cooldown.

Functional type, representing / Capital Maneuver

Mysterious investors intervene. Your goalposts can now shift left and right.





The Capital Maneuver.gd script defines this card as having a diamond-level rarity. When clicked, it identifies the faction to which the card belongs, locates the corresponding goal node, and then calls the start_moving() function of the goal script to trigger the goal to move left and right while fully retaining the original goal scoring logic.

The goal script continuously updates its position through _process(delta) and achieves back-and-forth movement with a sine function. This type of card can safely modify the status of scene elements.

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FUTURE PLANS

After user testing, we analyzed the parts of the game that need improvement.



- **Optimize the art** on the existing basis, including diversifying character styles and beautifying the UI.
- **Add more cards** and a second card-drawing stage. Currently, most of the cards are numerical adjustments. In the future, more functional cards (similar to Capital Maneuver to move the goal left and right) will be added to enhance the game's playability.
- **Optimize collision determination** and operation feel.
- **List the game for free** on platforms such as Steam, enable the workshop feature, encourage the **player community** to participate in **game co-creation** and sharing, and promote positive sportsmanship.



ODYSSEY

Kinetic Rush

Scenery Design | Concept Art | 3D Animation

Project Info

Final Render

2560 × 1080px | 60 FPS | 00:05

Duration

2 Months | Individual Project

Skills & Tools

Blender, Mixamo, Character Rigging, Cycles Rendering

Video Link

https://youtu.be/dMuc0D-hByo

Objective

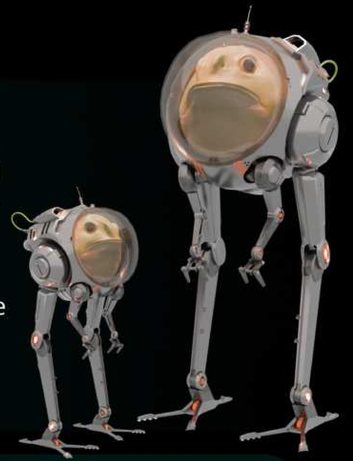
ODYSSEY is a selected work created for the **3D Community Challenge - Kinetic Rush**. Drawing from the "solitary homecoming" motif in **Homer's *The Odyssey***, the project translates the epic into a **Sci-Fi setting**, portraying a space soldier stranded in an alien wasteland. The environment constructs an **absurd ecology** by combining **procedural cyberpunk ruins** with **parametric vines (Ivy Gen).** It reflects on how a **sense of direction and belonging** begins to dissolve within the narrative density of an apocalyptic world.

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CONCEPT & ATMOSPHERE

Visual Conflict The design visualizes an "Ecological Paradox" by juxtaposing rigid cybernetic ruins with organic, chaotic vegetation.

Atmosphere Cold, desaturated tones represent the apocalyptic void, while the warm engine light symbolizes the last spark of survival.





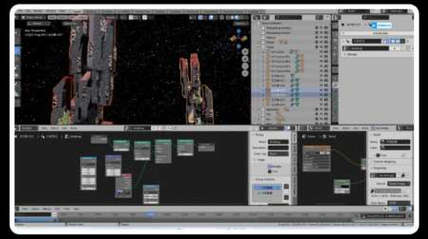
MICRO-NARRATIVE

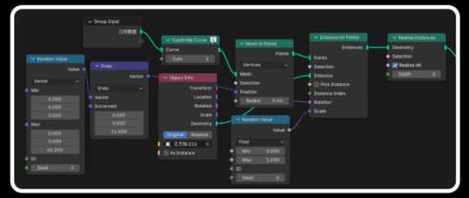
THE SUSPENDED MOMENT By freezing this "Leap of Faith" in zero-gravity, I wanted to capture more than just movement.

It represents my interpretation of the soldier's **internal struggle**—a total disorientation and loss of self in a post-human era.

TECHNICAL BREAKDOWN

GEOMETRY NODES & ADD-ONS





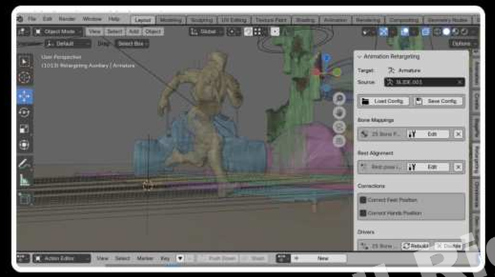
Blender Geometry Nodes
Stochastic Generation of Sci-Fi Buildings



Ivy Gen
Procedural Vine/Leaf Generation

The project's environment is designed using **Geometry Nodes** and plugins. Background buildings are instantiated from a specific mesh via **Mesh to Points** and distributed across points using **Instance on Points**, with **Random Value** controlling scale variation to create subtle differences. Building façades use **Ivy Gen** to generate procedural vines and vegetation, breaking architectural uniformity.

CHARACTER PIPELINE



Character Armature & Rigging
Dashing & Diving Animation



The character mesh uses a Star Soldier asset from FAB and is rigged in Blender. **Auto-Rig Pro** is used for quick bone binding and Inverse Kinematics setup, and the rigged character is remapped to the dashing and diving animations from **Mixamo**, with minor adjustments to fit the character's proportions and movement. Final refinements to skinning and motion tension complete the character and animation design.

TEXTURING & RENDERING

All materials were created in Blender's **Shader Editor**. Most surfaces, such as ground, rocks, and pipes, use a **PBR** workflow with texture maps for Base Color, Roughness, Metalness, and Normals, with some adding bump details. Node combinations achieve extraterrestrial terrain and hard, polished machinery surfaces.

Lighting in Cycles uses Sun Light for base illumination, Spotlights to define forms, and Point Lights to enhance emissive elements and details.



Key Materials



PBR Rock and Pipe Materials with Normal and Displacement Maps



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