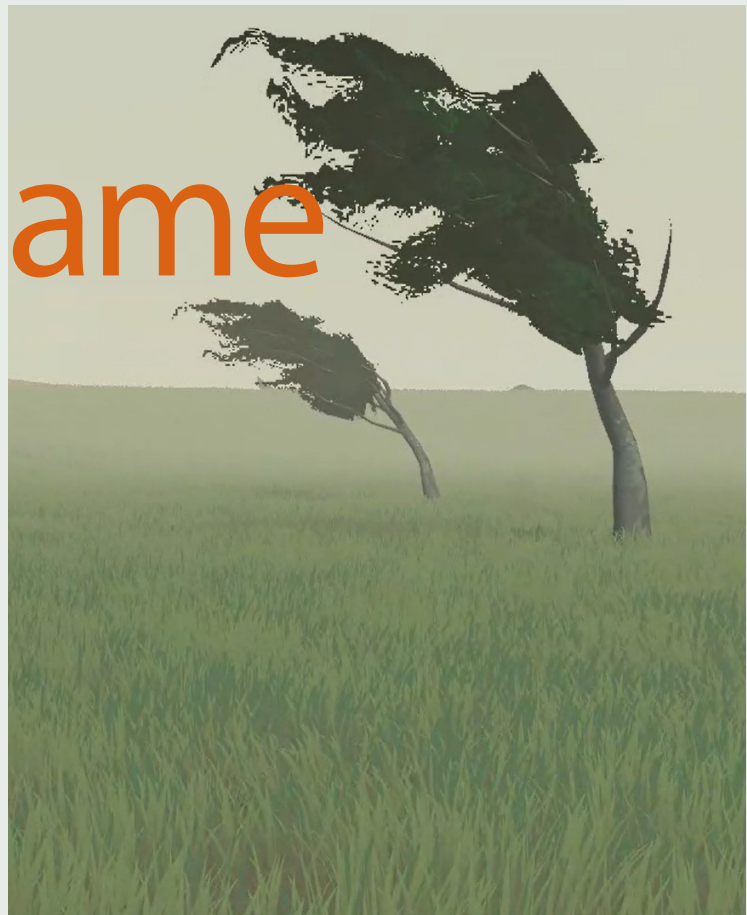Exploring Emotional Engagement
and Artistic Expression in Digital Nature

Moving Trough Natural Landscapes in the Video Game 'Where'

Master Thesis Report
by Aia Kragh

Visual Game and Media Design
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Acknowledgement

When I began this project, I had little experience and, to be honest, interest in 3D game art. However, as I worked to bring the world of "Where" to life, I gradually gained a better understanding and appreciation for the intricacies of vertices, triangles, and cubes. Above all, I've realized just how much there is still to learn.

Introduction

Within the framework of this project, which centers on the practical design process of the video game "Where", part of my role as an art director has been to establish a cohesive visual aesthetic that embodies the theme of losing oneself to nature. This overarching aesthetic serves as the foundation for the artistic goals of the in-game natural environments, which are envisioned as wild, longing, and seemingly alive. This abstract concept of 'aliveness' seems to be a recurring theme/concern when representing nature in art. A concept that becomes even more complicated when we enter the digital arena.

Rather than getting caught up in defining life within the digital realm, I will interpret aliveness based on the question: Does it move? This question is intended to be read dually. Motion and movement are synonymous with liveliness and may be the most literal way to generate a sense of aliveness. However, movement can also occur within the spectator, who emotionally reacts to what they are presented with, perceiving the environment as alive and relating to it on a deeper level. This has led me to the research question that I seek to answer with this paper:

How does the art direction/artistic design of natural environments in the video game "Where" contribute to players' emotional relation to in-game nature?

In this study, I will explore existing literature on the artistic design of natural environments within video games. Following this review, I will detail the methods used in the design process for the natural landscapes in "Where". This includes the process of concept creation and development, a concept art survey focusing on emotional association and color, and a GSR (Galvanic Skin Response) and eye-tracking test.

"Where" is a 3D adventure game centered on the theme of navigation and losing oneself in nature. I will provide a brief overview of the game, highlighting its unique approach to this theme. Then, I will present the design of the four main biomes within the game, analyzing both the emotional responses elicited from players and the design choices made to evoke these responses.

Finally, I will discuss the considerations involved in designing these biomes and conclude by examining how the relationship between humans and nature is addressed through art in "Where" and in video games in general.

Throughout this paper, I've chosen to use the terms 'nature' and 'natural' in relation to wilderness, ecosystems, and outdoor terrains, contrasting them with human-made environments and concepts. Even though the dichotomy between culture and nature appears increasingly illusionary and hard to distinguish in a world where interconnectedness is becoming more evident (Scarso, 2014). The necessity for blurring the boundary between humans and nature is a central theme in the design of "Where". Ironically, that necessitates establishing a dualism between nature and humanity to confront the problematic view of humans as the center of the world, disconnected from our environment.

Literature review

The topic of nature's role in games has long been underrepresented within the field of game studies, but within recent years, due to the growing focus on climate change and ecological crises, the attention has been rising. Notable contributions to this discourse include the works of Raessens, Werning, and Farca (2024), as well as Chang (2019), both exploring how video games can contribute to ecological awareness and understanding.

Chang (2019) suggests that video games have untapped potential to expand ecological awareness and understanding through gameplay. She emphasizes the importance of taking a holistic view when incorporating natural environments in games, urging for new ways for players to interact with these digital ecosystems. By reshaping the player's relationship with in-game surroundings, game design can influence their perception of nature in a broader sense. However, Chang (2019) critiques the simplistic portrayal of in-game ecologies, which often prioritize resource exploitation or visual spectacle over meaningful engagement. She argues that despite advancements in computational and graphical fidelity leading to increasingly detailed environments, the underlying purpose remains superficial. Page (2023) further elaborates on the 'unalive' nature of game environments, noting that while real ecosystems are dynamic and influenced by weather and internal interactions, video game representations typically depict nature as passive, existing primarily for player interaction rather than as self-sustaining entities.

Shinkle (2020) highlights the unique challenges landscape modeling presents in video game design, often serving as a benchmark for graphic realism. He explores how game landscapes are created using mathematical systems inspired by the natural world. Despite the focus on realistic depictions, there is no conclusive evidence that increasingly realistic graphics enhance believability and immersion, according to Wages et al. (2004). This raises the question of why game art, particularly in the representation of natural environments, seems stuck in the focus of systemically enhancing nature believability through more complex simulations, when this advancement hasn't proved emotionally more engaging?

Contrary to the predominant emphasis on realism, particularly in 3D environments, there is value in adopting a more subjective and emotionally resonant approach to depicting nature in games. Instead of treating nature as an object for objective understanding, the emphasis could shift towards fostering a subjective emotional connection between players and their virtual environments—inspired by the principles of Expressionism in art.

Expressionism, an art movement starting in the late 19th and early 20th centuries prioritized conveying inner emotions and feelings above realism (The Editors of Encyclopaedia Britannica, 2024). Similarly, an expressionistic approach to designing in-game nature would focus on evoking emotional responses and connections from players rather than strict adherence to visual realism. This shift in perspective offers new avenues for exploring the potential of video games as mediums for fostering deeper connections with nature and ecological themes.

I propose a shift in focus on how game art should deal with nature/natural environments toward establishing ecological awareness within players, not through realistic simulation but through artistic expressionism, a topic seemingly unexplored in academic literature. In general, the topic

of art and artistic intention in game design is underrepresented, which might relate to the lacking recognition of the media as an art form, a view that hopefully is starting to lose its ground (Pearce, 2006).

Methodology

Iterative design process - Art director

We initiated the process with an analog prototype, testing the core idea of removing the player's location from in-game maps. On a piece of paper, we drew a map containing mountains, forests, and water sources divided into a grid system (Figure 1). The player then had to pay "water" to move through the landscape. The game master would describe what the player saw, and by comparing the map's features with the described landscape, the player could form a mental image of their location and determine where they needed to go.

Maintaining the theme of nature and exploration, the first narrative that both the initial art vision and the first digital prototypes evolved around was the story of a time traveler going back in time to collect seeds from flowers in a landscape that would later be extinct, intending to bring them back to the future. Unbeknownst to the player and character, they would never be able to return alive. Instead, they had to reach a specific spot where their bodies, along with the preserved seeds, would become one with the surrounding landscape, waiting for the people in the future to harvest them years later. Recently, this version was altered based on playtest feedback and clarification of vision.

I have been documenting my process, gathering information, and creating sketches in an art design document. This document has been useful in visualizing my thoughts, presenting concepts to the team, and keeping track of updates and changes throughout the process (Appendix A).

Digital game prototypes are presented in Appendix B.

Figure 1:
inital analogue prototype of
"Where"

Survey - Emotional associations through concept art

As part of creating the color palette for the biomes and natural landscapes in "Where," I conducted an online survey focusing on emotional associations with composition and color in concept art. The concept art was created in Adobe Illustrator and represented the envisioned landscape in a simple 2D vector style (survey in Appendix C).

The survey was distributed via Google Forms and shared within semi-private Discord servers and on my personal LinkedIn on April 11, 2024. It remained active for one month and received 19 responses. To account for color blindness, a question was included asking respondents if they were color blind. Of the participants, 11.1% answered "Yes, but I want to take the color test," while 88.9% replied "No." Given the spectrum of color blindness, it is unclear how specific types of color blindness may have impacted the data. Additionally, no personal information was collected from respondents, making it impossible to draw conclusions based on gender, nationality, age, etc.

The survey included 37 questions. 31 of these questions focused on comparing color combinations with specific emotional words. Respondents were asked questions such as "Which image seems the most 'sad'?" and were presented with 4-5 identical images with different color palettes. The aim of this part of the survey was to gain a better understanding of how different color combinations were perceived emotionally. This insight was intended to aid in the selection of colors for each biome and to enhance the emotional beat of the game. The final 6 questions focused on landscape composition and how each biome was perceived based on simple black and white concept art images. Participants were asked to describe each image with three words.

The collected data has been organized and visualized to facilitate better comparison and decision-making in the selection of color palettes and landscape designs for the game (Appendix D).
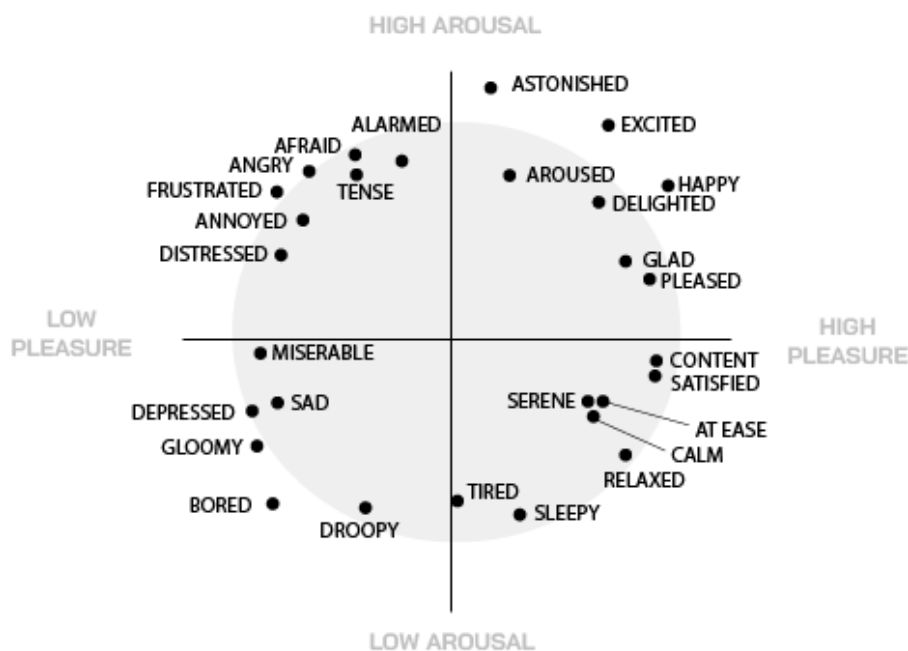

Figure 2: Circumplex Model of Affect inspired by Russell (1980).

In my analysis of the results, I will draw inspiration from Russell's Circumplex Model of Affect (Figure 2) (Russell, 1980). The model contains a specific array of emotions, distributed across the axes of arousal and pleasure. Based on my own association I will distribute the words applied in the survey across the four areas of the model. This should not be seen as an accurate or objective depiction, but rather as a subjective attempt to open avenues for discussion and comparison.

Galvanic Skin Response (GSR) and Eye tracking test

A galvanic skin response (GSR) sensor measures changes in sweat gland activity, which indicates the intensity of our emotional state or arousal (Farnsworth, 2024).

The test was conducted at the Royal Danish Academies' psychology lab with 6 participants (4½). In one case, the quality of the data wasn't valid, therefore this data is not included in the analysis. Another ended halfway through due to technical issues. It is important to note that the lab was not soundproof, which may have influenced the data. The participants were between 20 and 40 years old and represented various national backgrounds and genders.
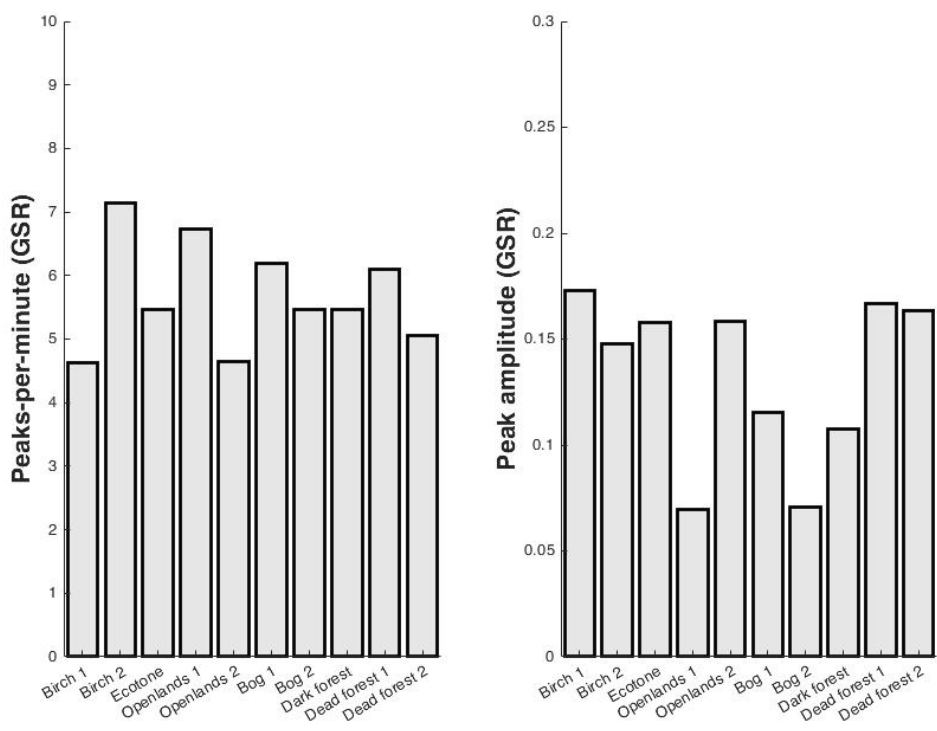

Figure 3:
the results of part 1 of the GSR-test, Diagram showing peaks-per-minute and avarage amplitude of the responses

The test was divided into two parts. The first part consisted of 10 screen recordings of the main character walking through a prototype of the biomes in "Where"(Appendix E, p.).
The biomes are represented twice, with slight variation to compare for differences in the emotional response. The second part was a comparison between six images of a game forest landscape, three of a birch forest, and three of a pine forest (Appendix E, p.) . The images differ in detail and style, one being low poly uniform, one being hyper-realistic with a lot of detail, one being from the biomes in "Where".

The test was later analyzed, focusing on peak-per-minute to reflect the level of arousal (see Figure 3, left side) and the average amplitude of the responses (see Figure 3, right side). Additionally, eye-tracking was recorded, providing insight into how the participants perceived the material (Appendix F). I won't delve into this part of the study, but it was noticed that what got most attention was the player character and vertical objects within the landscape.

Artistic development

Like other design and artistic processes, game design does not occur solely in the mind of the designer but also through active engagement and practice with the materials (Schön, 1992).
I have utilized various software tools in the artistic development of "Where". The game engine plays a crucial role in rendering light and shadow, significantly impacting the overall aesthetic and graphical quality of the game.

Miro, Pinterest, Adobe Color, Coolor: inspiration, mood boards, and color palette
SketchUp, Clip studio paint: Sketching and concept art
Adobe CC: Sketching and concept art, Textures.
Blender: Modeling and refining 3D assets, Texture painting
Unity: Game engine, Shaders, composition.

One standout technique was using Blender's Geometry Nodes for creating trees and rocks (figure 4). By manipulating node-based operations, I achieved diverse yet consistent appearances across various assets. Hand-painted textures in Photoshop added an organic feel to materials, ensuring coherence (figure 5). Movement was vital, realized through dynamic shaders for leaves and grass, enhancing the game's liveliness.

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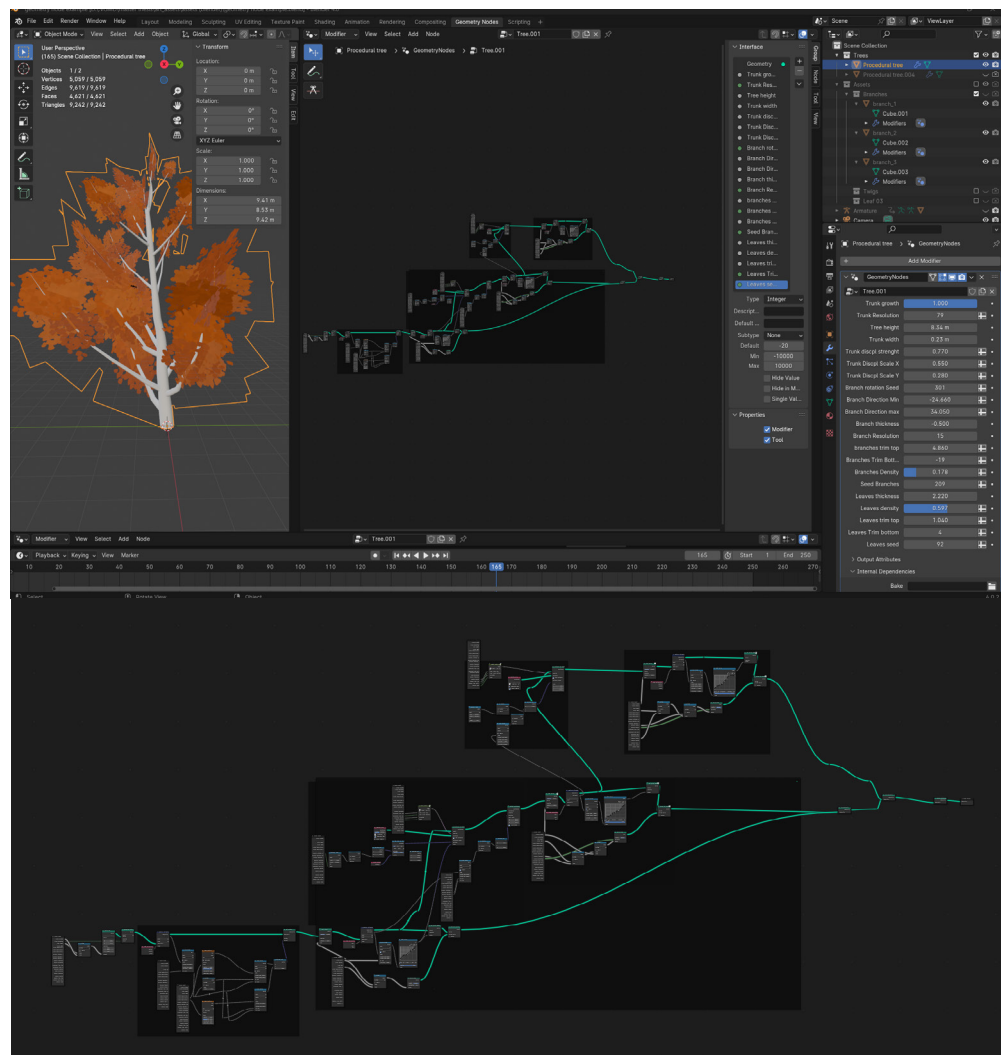

Figure 4:
The node branch used as the base for all tree assets in the game "Where".

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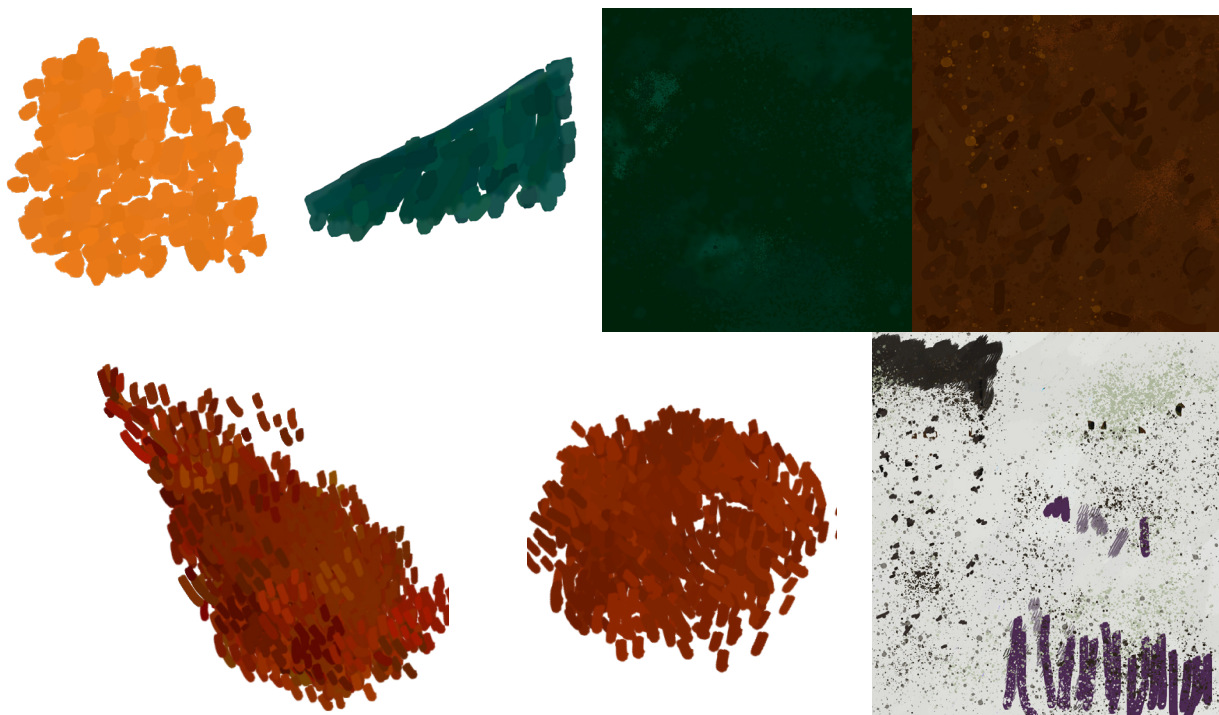

Figure 5:
handpainted textures used in "Where"

'Where' Game overview

design pillars

In the early stages of game design, we establish four core game pillars. These pillars serve as the foundation for our shared vision of the game, guiding our decisions and actions throughout the development process. They act as guidelines for both our individual and collaborative choices. The original four pillars can be found in Appendix G, demonstrating that the dynamism of nature and players' sensory relationship to the environments has been a fundamental factor in all versions of the game. Later, we modified the pillars to align with our revised vision and game experience (Appendix 1)

1. Getting lost in nature
2. Accepting uncertainty and change
3. Sensing the environment
4. Embracing loneliness

storyworld

In the game "Where," players follow the journey of Lilybud (Appendix 1), a young aspiring tech-botanist. She is sent to an ecological area to retrace the steps of an older tech-botanist who has mysteriously disappeared. With access to plant-listening technology, Lilybud must uncover the mystery of the missing botanist. However, the longer she stays and the deeper she ventures into the wilderness, the more disoriented she becomes. As nature begins to encroach, strange things start to happen. Eventually, Lilybud discovers Alvi, the missing tech-botanist, who has been absorbed by plant life, leaving only her suit and skeleton behind (Appendix 1).

Gameplay

The game "Where" is an adventure game enriched with exploration, clues, and navigation. The primary objective is to collect flower-clues and through them follow in the steps of Alvi. Players must strategically traverse the landscape, ensuring they maintain stamina by collecting water from natural sources.

Interacting with clues requires players to return to Base Camp (see Appendix 1), which serves as a strategic hub for reviewing information and planning their next moves.

A unique aspect of the game is the absence of specific location markers for the player while traversing the landscape. Players must rely on comparing the environment with the provided map and create their own cognitive map for navigation.

Art style vision

We've chosen a 3D stylized mid/low-poly aesthetic for "Where," employing hand-painted textures and minimalistic materials, and assets that embrace imperfection and abstraction. This approach prioritizes color and composition over realism and intricate detail. Our artistic direction draws significant inspiration from the expressive illustrations of Chinese concept artist Maojin.Lee (Maojin. Lee, n.d.). Their work often conveys a sense of loneliness and longing, influencing our expressionistic treatment of composition, materials, and foliage. As depicted in Figure 6, Maojin.Lee's use of color and stretched composition effectively captures the rawness and wildness of natural landscapes.
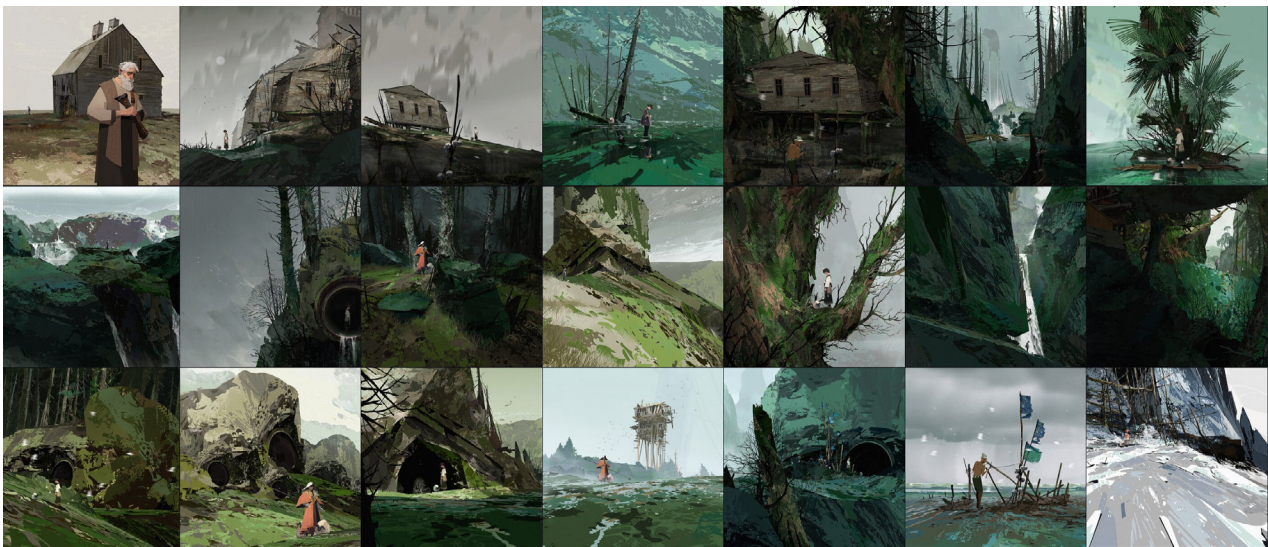

Figure 6:
A snippet of Maojin.Lee's art, a screenshot from their website.

Although the natural elements in the game draw inspiration and resemble real species and ecosystems, they remain fictional and do not have to adhere strictly to real-world examples. The focus is to create expressionistic environments that evoke emotions and support the storyworld and level design in the best possible way.

We employ two complementary color schemes to distinguish between natural and human-made environments (Appendix 1). Natural settings predominantly feature a red and green color range with less saturated tones, whereas human elements and the inside of the Base Camp incorporate blue, orange, and yellow hues with slightly higher saturation levels. The main character's orange suit stands out against the surrounding landscape, emphasizing the unfamiliarity of the environment she navigates. These schemes will gradually become less distinct as the story unfolds, emphasizing the closing gap between human and nature.

The game atmosphere is dark and desaturated, resembling a foggy day or morning with a gray sky, underlining the loneliness. Eventually, we aim to introduce brighter scenes where sunlight pierces through the fog, creating a more hopeful atmosphere and offering peaceful moments.

The environment should strive to achieve an illusion of change and liveliness through curved and stretchy forms. A core artistic and mechanical goal is for elements of the environment to evolve alongside gameplay progression, contributing to a sense of unpredictability that supports the character's shifting mental state and the passing of time. This concept is exemplified in the transformation of the Base Camp environment, gradually becoming overrun by vegetation, and seamlessly blending into its surroundings (Figure 7). Furthermore, our goal is to design different visual states for landscape elements, allowing them to change and transform throughout the game, introducing an element of uncertainty in the player-environment relationship.

Figure 7:
Concept art of Base Camp depicting environmental changes

Visual Design of Biomes in 'Where'

Forest (Dark forest)

1.   Ideation and Concept Creation

Emotional Intention: Looming, Dark, Mysterious, Dense, Stillness
Inspired by: Nordic pine forests.

When I initially conceptualized this biome, I drew inspiration from Rolf Lidberg's illustrations of the dense and mysterious Swedish pine forests. I recalled one of the stories, where a rare orchid grew in the darkest parts of the forest, this inspired the glowing foxgloves flowers (figure 8). These foxgloves, now central to the game, have evolved into the listening flower, Digitalis Auris, spreading from the dark forest and becoming a key visual and interactive element in the latest version of the game.

Figure 8:
Concept art for Dark
Forest Biome

Based on the results of the color test I first ruled out Color Palette B since it had a low score in almost all categories except "Calm", which was not the core emotion we wanted this environment to express. Color Palette C scored highest in "Mysterious", "Silent", and "Looming", which are core emotions for the environment, but with a significant percentage in "Dramatic" and "Dangerous" it also pointed to threatening atmosphere. Therefore, I chose to combine elements of Color Palettes A and C, as Palette A had a higher score in "Calm," better resembling the intended feeling of stillness. (figure 9 & 10)

Figure 9:
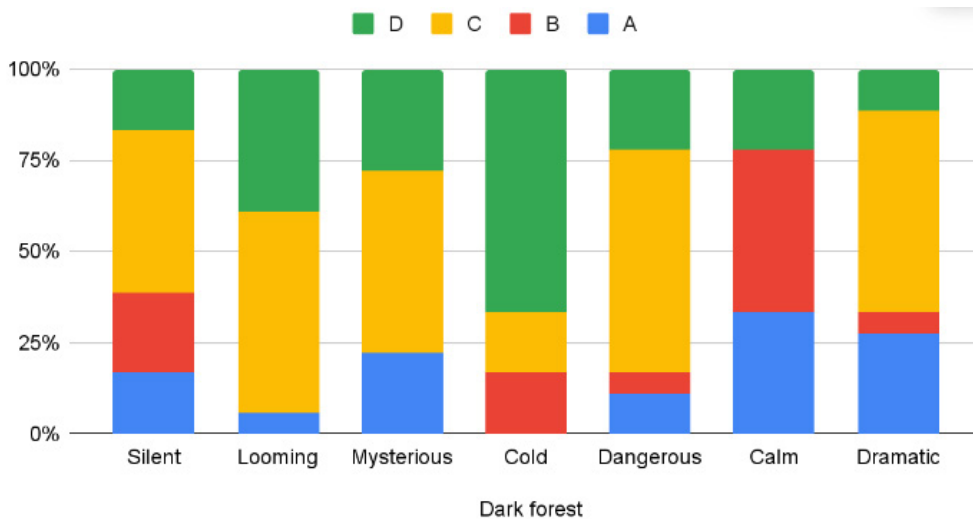The 4 color palettes of Dark Forest presented as options in the survey (Appendix C)

Figure 10:
Diagram showing the percentage of votes each color palette got wihtin the emotional categories (Dark Forest) (Appendix D)

2.   Development and Implementation

Asset List: Pine tree, mossy rocks, ferns
Atmosphere: Post-processing, god rays
Ground Texture: Pine needles, moss, dirt

The first asset that I developed and implemented was the pine trees (Figure 11, 12). I then began experimenting with creating a darker atmosphere and found that local post-processing volumes were the easiest and most effective way (Figure 13). The next step is to implement the ferns, giving the environment more variation and detail.

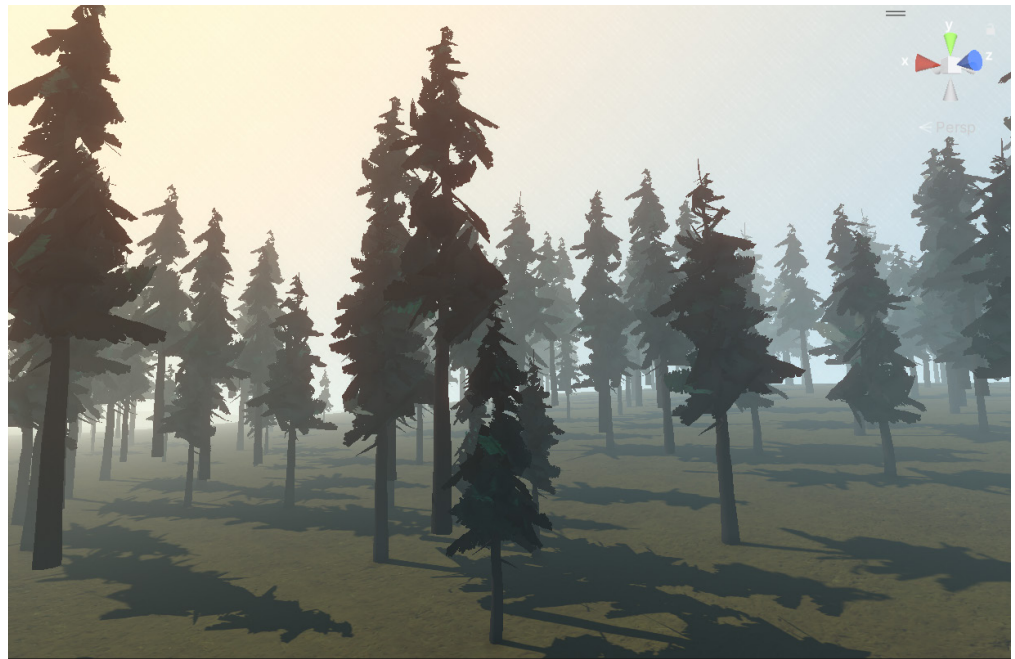**Figure 11:**
First implementati-
on of pine trees in
Unity

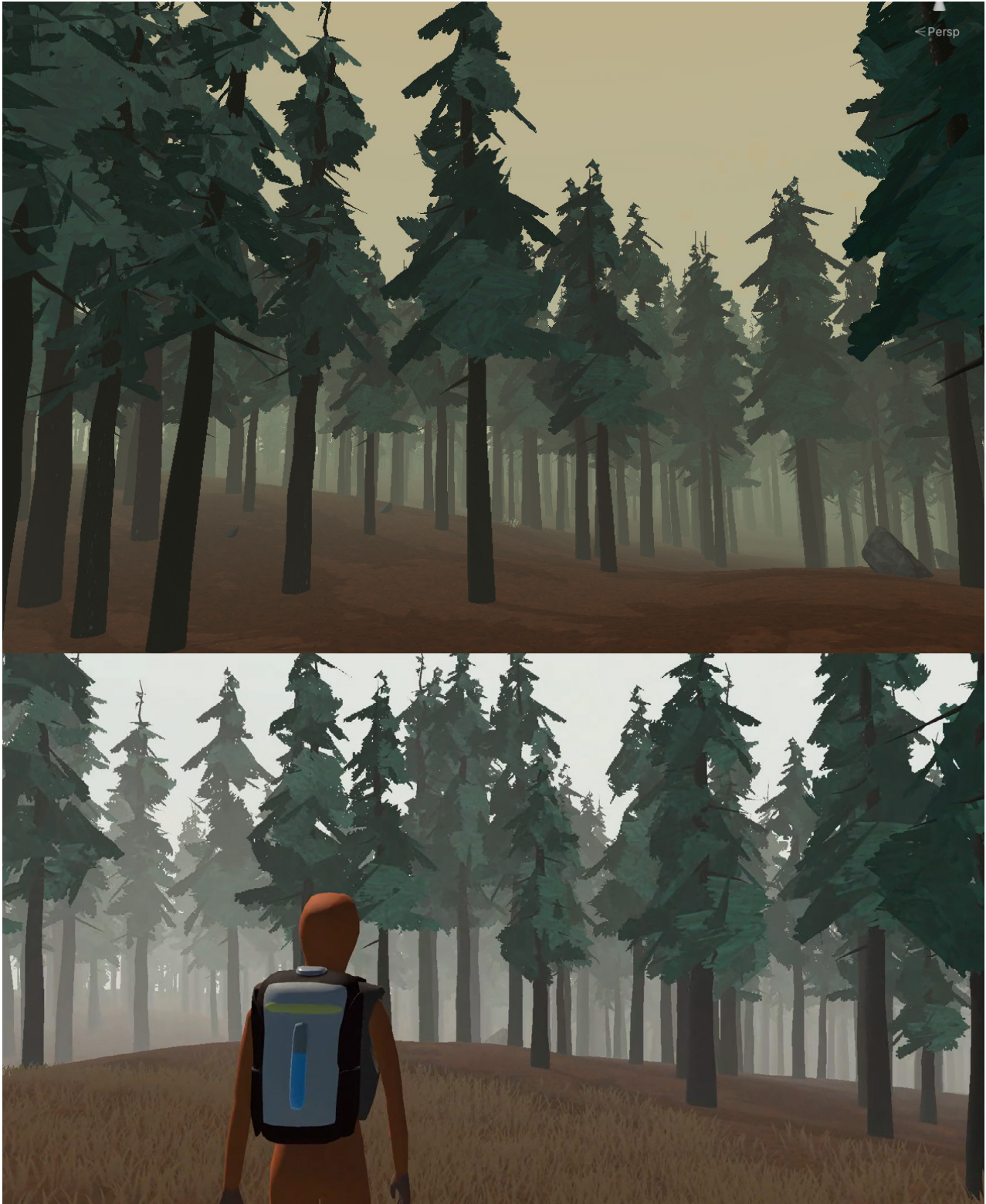**Figure 12:**
Pine tree asset, cycles render

Figure 13:
recent screenshot of the Dark Forest biome
in "Where"

3.   Emotional Analysis and Test Results

The survey results indicate that the black and white concept art was described with the word
"dark" six times, which aligns with the title of the section being "Dark Forest." The next most
popular words used in relation to Figure 14 are "eerie," "mysterious," and "scary." This suggests
that the concept art of the environment is perceived as more threatening than originally intended,
possibly due to its dark atmosphere, fog, and the black-and-white color scheme.

Overall, the descriptions predominantly convey low pleasure related words, depicting an unfri-
endly and even ominous environment with terms like "spooky," "haunted," and "depressive." All
descriptors are listed in Figure 15, divided into the emotional areas that are closest in association.
Particularly noteworthy is the prevalence of the low-pleasure area. Words like "spooky," "haun-
ted," "scary," and "dangerous" represent higher arousal levels, evoking feelings of fear and alarm.
Conversely, words like "depressive," "gloomy," and "sad" belong to lower arousal areas, aligning
with sensations of sadness and silence.

Figure 14:
Concept art of Dark Forest presented in survey

Comparing this division with the measured GSR peak-per-minute (Figure 3), the presented 3D
environment has an average arousal score of around 5 on a scale of 1 to 10, indicating a moderate
level of arousal. In the second part of the test, the image of the dark forest biome had the lowest
arousal score out of all tested images (Appendix F). This suggests that the dark forest environment
evokes a lower arousal experience, predominantly eliciting feelings of sadness, quietness, and
gloominess, in line with the intended atmosphere, rather than signaling fear and danger as sugge-
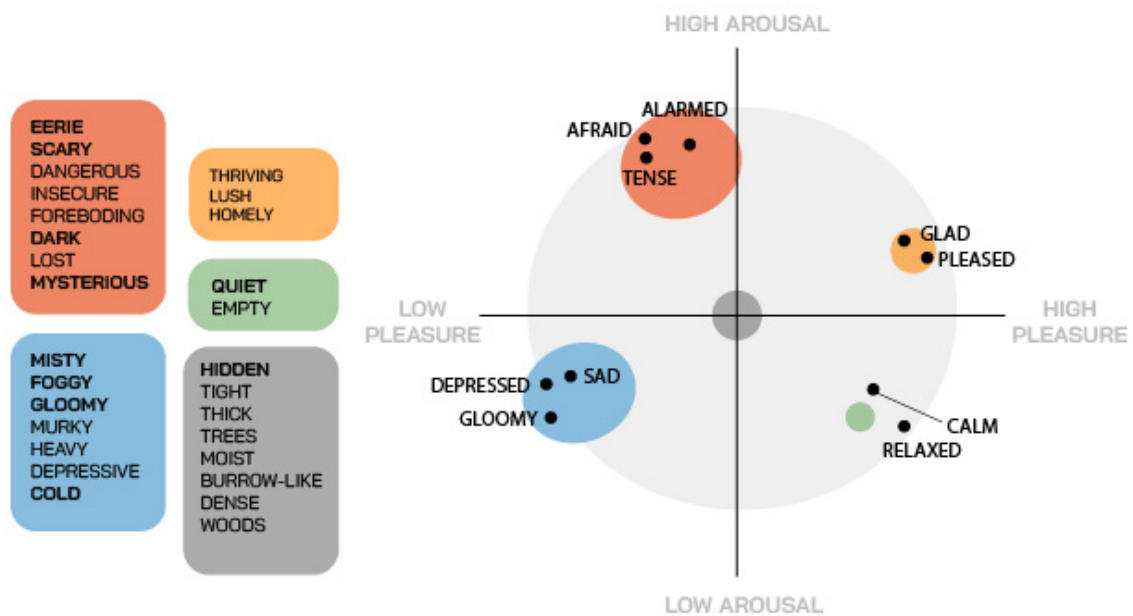sted by the survey.

Figure 15:
 Circumplex Model of Affect based on the descriptions of the
Dark Forest image in the survey.

A noteworthy observation is that 4 out of 4 respondents exhibited an arousal response to the moment in the "ecotone" video where the player enters the dark forest (Appendix F, X). However, it remains unclear whether this heightened emotional response stems from transitioning between environments or entering the forest itself.

Forest (Light forest)

1.   Ideation and Concept Creation:

Emotional intention: Alive, messy, openness, serene, secretive
Inspired by: Nordic birch forest.

For me, one of the most recognizable and atmospheric trees are birch trees, with their pale, spotted bark, and slender figures. Being a pioneer species, birch trees are known to quickly spread and colonize new barren areas. Often associated with witchcraft, healing power, and the spirit world, birch trees evoke an atmosphere I wanted to incorporate into the game through the Light Forest Biome (Trees for Life, 2021).

Their white trunks and lively shapes create a contrast to the dark atmosphere of the pine trees in the Dark Forest. In the first concept sketch (Figure 16), the trees were depicted as straight, which did not convey their lively nature. It was only when I decided to give the trees a curvier appearance that the landscape became enchanting in the envisioned way (Figure 17). The addition of large bushes and shrubs enhanced the environment's chaotic feel and limited the player's long-distance view, making the space more immersive and exploratory.

Figure 16:
Concept art for Light Forest

Figure 17:
Concept art for Light Forest

When it came to choosing colors, I initially considered two options: an all-red palette (Color Palette A) and an all-green palette (Color Palette B). However, based on the survey results, I ultimately went with Palette D, an orange-green combination. (See figure 18)

In figure 21, Color Palette C was picked as the most "sad" with almost 75% of the votes and wasn't chosen by anyone as the most "thriving," likely due to its cold, desaturated color tones. This option was never considered due to its negative associations. In contrast, Color Palette B was frequently selected for positive attributes such as "thriving," "hopeful," and "calm," but it scored low on "dramatic." This may be because its greener tones closely resemble a realistic summer forest.

Figure 18:
The 4 color palettes of Light Forest presented as options in the survey (Appendix C).
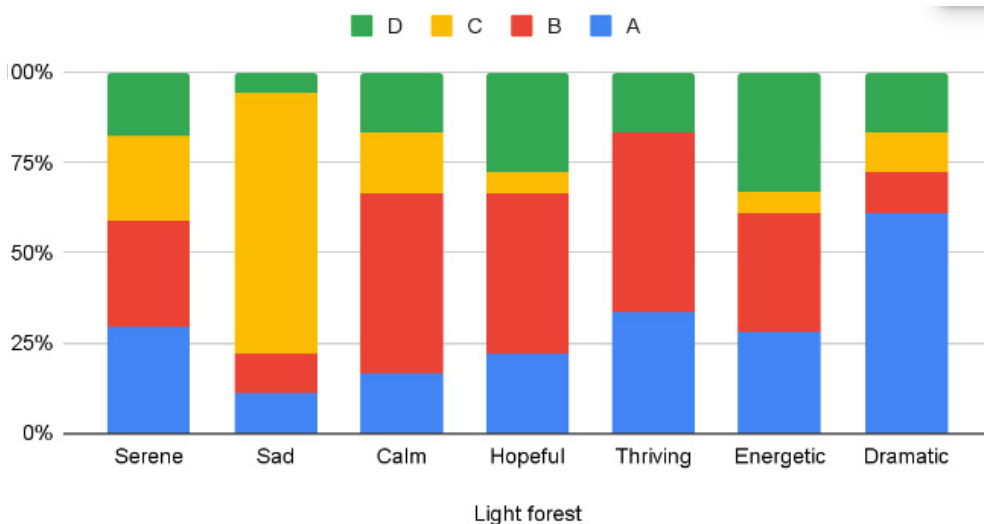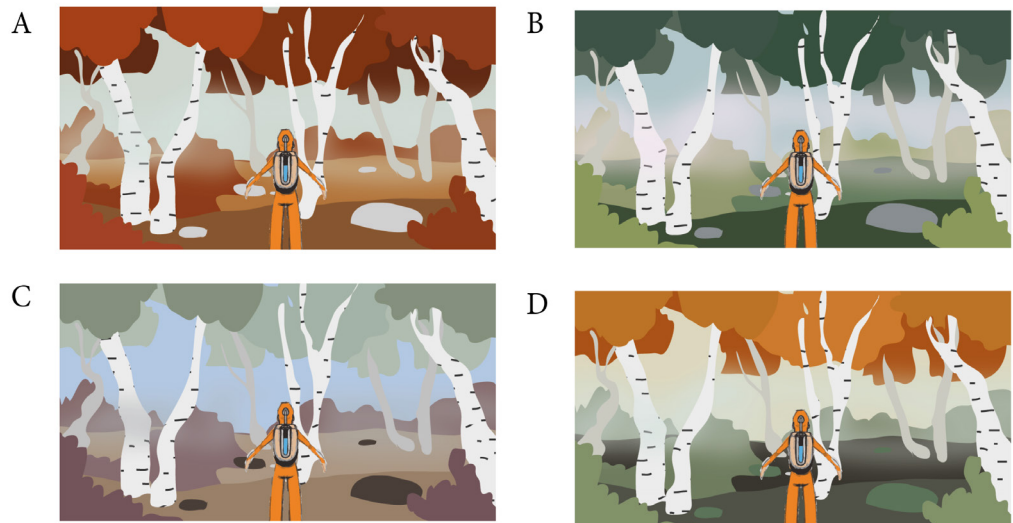

Figure 19:
Diagram showing the percentage of votes each color palette got wihtin the emotional categories (Light Forest) (Appendix D)

However, neither of these palettes was ideal for the atmosphere I aimed to create. I needed a color palette that elicited a more contradictory and complex emotional response. The choice, therefore, came down to Palette A and Palette D. Ultimately, I opted for Palette D, despite it not scoring higher than Palette A in most categories. I chose it because it stood out from the other biome color palettes. I appreciated that it was perceived as an energetic and hopeful environment, and I liked how it complemented the dark forest with its contrasting colors—a warmer tone for the leaves and green for the ground.

2.   Development and implementation

Asset list: Birch trees, Rounded Rocks, Bushes, Grass
Atmosphere: Less fog,
Ground texture: grass, Dirt

As with the other biomes, I initially focused on the development and implementation of the trees. The numerous branches and curved figures posed a challenge in staying within the maximum number of triangles while ensuring a healthy mesh structure (Figure 20, 21, 22). However, with the planned implementation of bushes and stones in the future, I anticipate being able to adjust the density and character of the landscape more dynamically.
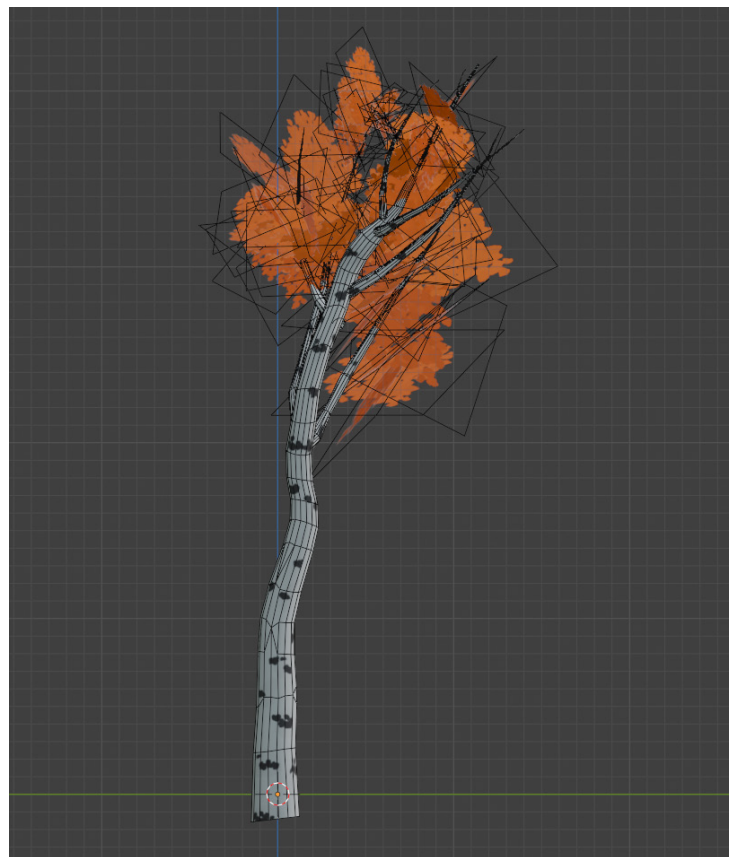

Figure 20:
Birch tree asset, mesh structure

Figure 21:
First implementati-
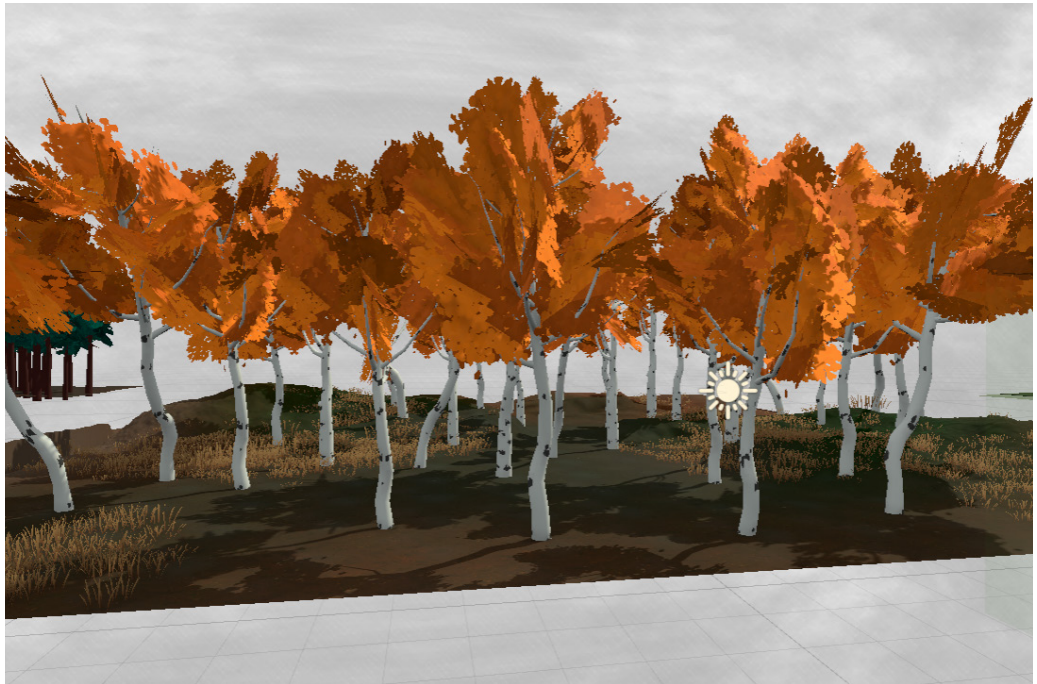on of birch trees in
Unity

Figure 22:
Birch tree asset, cycles render

Figure 23:
recent screenshot of the Light Forest biome
in "Where"

3.   Emotional analysis and test results

The survey data underscores the frequent use of the terms "Light" and "Calm" to describe Figure 24, each mentioned four times. This recurrence of "Light" mirrors what was observed with "Dark" in the case of the dark forest, suggesting that the presentation of the image in the survey potentially shaped participants answer. As visualized in Figure 25, words like "Calm" and its synonyms ("Peaceful" and "Static") typically denote a sensory experience marked by high pleasure but low arousal.

Closer analysis of the survey answers and Figure 25reveals a wider range of descriptions, with a majority in the high arousal/high pleasure area. Terms such as "Lively" and "Fresh" are also mentioned more than once, suggesting that the landscape affords a livelier and more exciting perception and experience.

This observation is further supported by the GSR peak-per-minute results. "Birch 2" received the highest score (7 out of 10), while "Birch 1" scored the lowest. The key difference between these two scenarios lies in the variation in the movement of the shaders of leaves and grass. In "Birch 2," a simulation of a strong wind results in more noticeable changes, likely contributing to the higher arousal (Appendix F). However, we do not know whether this intensified wind equally adds to a lower pleasure rating, which is something that could be further investigated in future tests.

Figure 24:
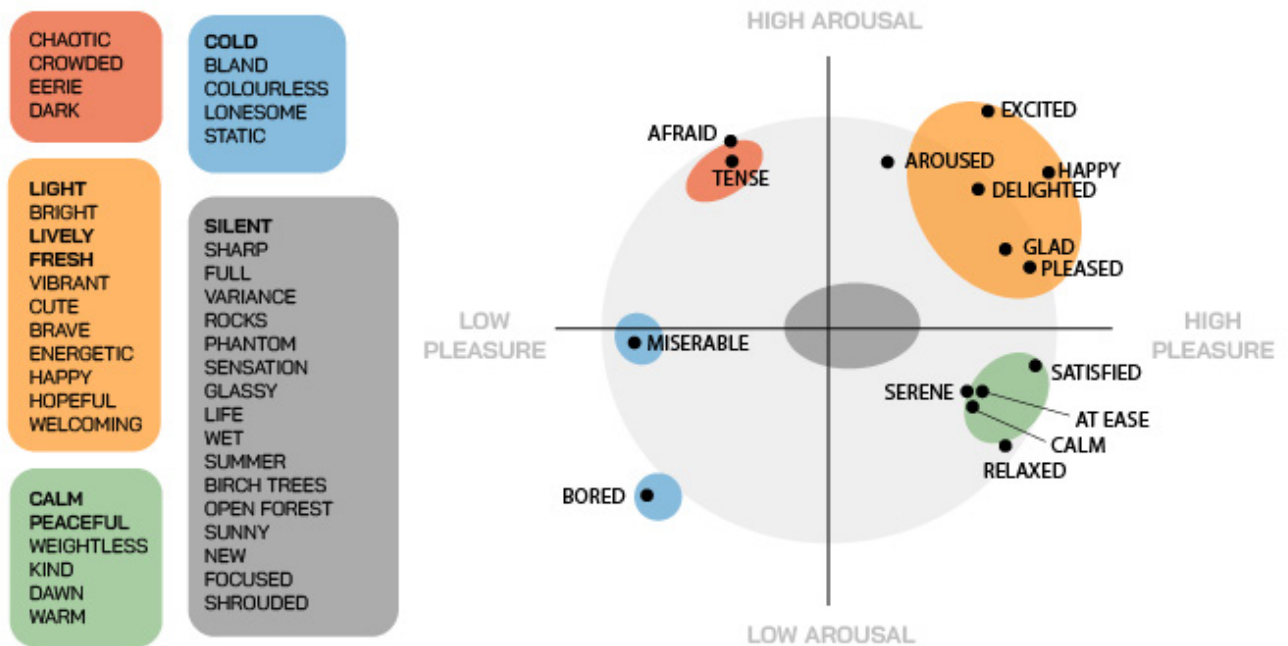Concept art of Dark Forest presented in survey

Figure 24:
The 4 color palettes of Light Forest presented as options in the survey (Appendix C).

Grasslands (Open Lands)

1.   Ideation and Concept Creation:

Emotional intention: motion, time-lessness, loneliness, longing
Inspired by: Scottish Highlands, alpine steppe, wild fields.

In conceptualizing the Open Lands biome, I drew inspiration from Maojin.Lee's evocative illustrations of barren landscapes with stretching trees. The initial design aimed to convey a sense of vastness and solitude while also incorporating elements of longing. As the concept evolved, the landscape became more rugged and windswept, departing from the earlier sketches' softer, brighter atmosphere (figure 25).

Throughout the design process, I struggled to pick the right color palette for this biome. Given that this biome was intended to cover the largest area of the game world, this landscape has a significant influence on the overall game atmosphere. Consequently, this biome offered five distinct options in the survey—a decision made to acknowledge its significant impact and ensure a comprehensive range of choices for respondents (figure 26).

Figure 25:
Concept art of
Open Lands biome

Figure 18:
The 5 color palettes of Open Lands presented as options in the survey (Appendix C)25
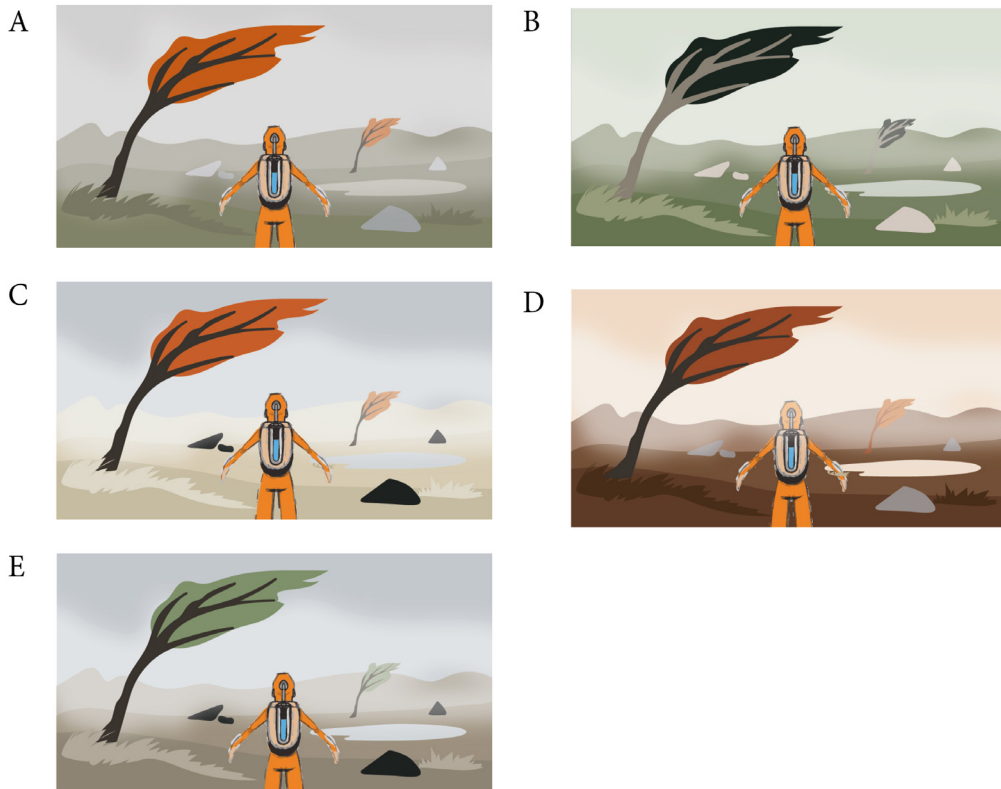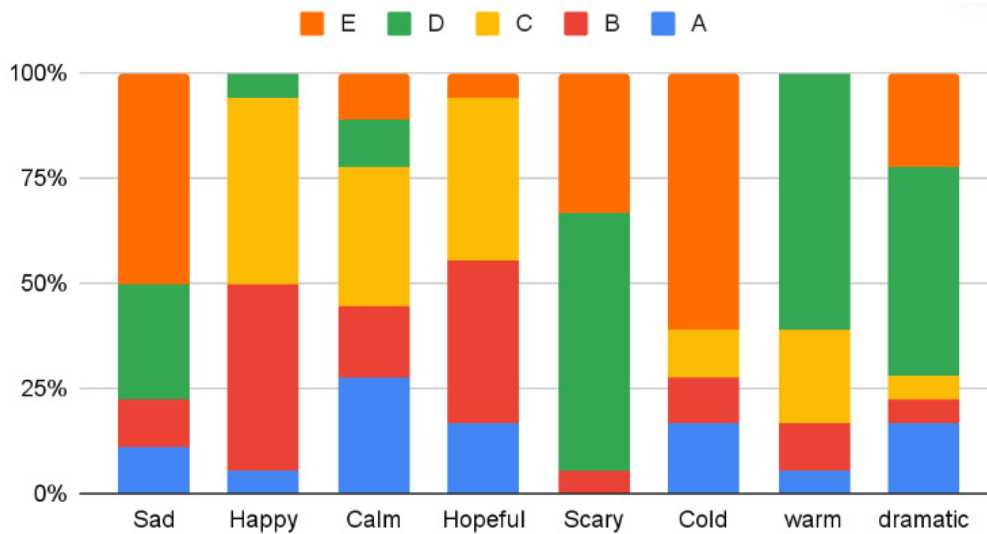
Figure 24:
Diagram showing the percentage of votes each color palette got wihtin
the emotional categories (Open Lands) (Appendix D)

While crafting the survey, I didn't pick words aligned with the biome's emotional intention, which made it harder to decide which color palette represents the vision best. Instead, the selected words aligned with Russell's Circumplex Model of Affect, spanning from emotions like "sad" and "scary" to "happy" and "calm" (figure 24). Despite this deviation, these emotional descriptors can still inform the selection of a color palette based on levels of pleasure and arousal.

The initial color palette I ruled out was Color Palette D, primarily due to its dominant scores in "scary," "warm," and "dramatic". This palette seemed misleading in terms of the intended climate, which aimed for a cooler, northern environment, and it appeared to evoke a threatening atmosphere. Palettes B and C yielded very similar results, both scoring higher in the positive emotional area (indicating high pleasure). However, they diverged in that Palette B had a slight percentage of "scary," while Palette C scored higher in "warm". So far, Palette C has been the preferred choice in terms of colors.

However, Palette E presents an interesting outlier. It got half of the votes for "sad" and "cold," which align well with the desired emotional tone. Unfortunately, it scored low in "calm" and received no votes in "hopeful". To finalize the color palette selection, further testing is required.

Development and implementation:

Asset list: Windswept trees, Spikey rocks, Grass
Atmosphere: Varying Fog, Wind Shaders
Ground texture: Grass, Dirt

The first assets I implemented were the windswept trees, arguably the most iconic and visible element in the composition of the biome. The bent shapes were achieved through simple deform modifiers and manual tweaking (figure 25, 26). Next, I focused on creating a grass asset that could add the feeling of being in a wavy sea of straws within the limits of optimization.

Figure 25:
Development of Open Land biome

Figure 23:
recent screenshot of the Light Forest biome
in "Where" And cycles render of windswept
trees

2.   Emotional analysis and test results

In the GSR test, I conducted a comparison between two variations of the Open Land biome: one (Open Lands 2) featuring an all-green palette resembling option B from the survey, and the other (Open Lands 1) resembling option C. While both color palettes received similar results in the survey, the measured peak-per-minute data revealed contrasting outcomes (Appendix F).

Surprisingly, the video resembling option C, with its red leaves and brighter grass, exhibited a significantly higher arousal score compared to its greener counterpart. In fact, it achieved the second-highest score overall in the test. This finding suggests that variations in color, such as the presence of red leaves and brighter grass, can have a significant impact on viewer arousal levels.

In the descriptions provided for Figure 24 in the survey, the term 'windy' was mentioned by half of the respondents, totaling 10 occurrences. While this description aligns with the windswept design of the trees, it does not offer any specific emotional indication. Similarly, other terms such as 'motion,' 'pointy,' and 'drastic' suggest a dynamic landscape. While these descriptors hint at a high arousal environment based on the GSR results, they do not provide any insights into pleasure indicators.

Upon further examination, the remaining descriptors from the survey predominantly fell under the low pleasure/low arousal area (Figure 25). This suggests a discrepancy between the perceived dynamic nature of the environment and its emotional impact. It's challenging to conclusively determine how this environment is emotionally perceived when experienced in-game.
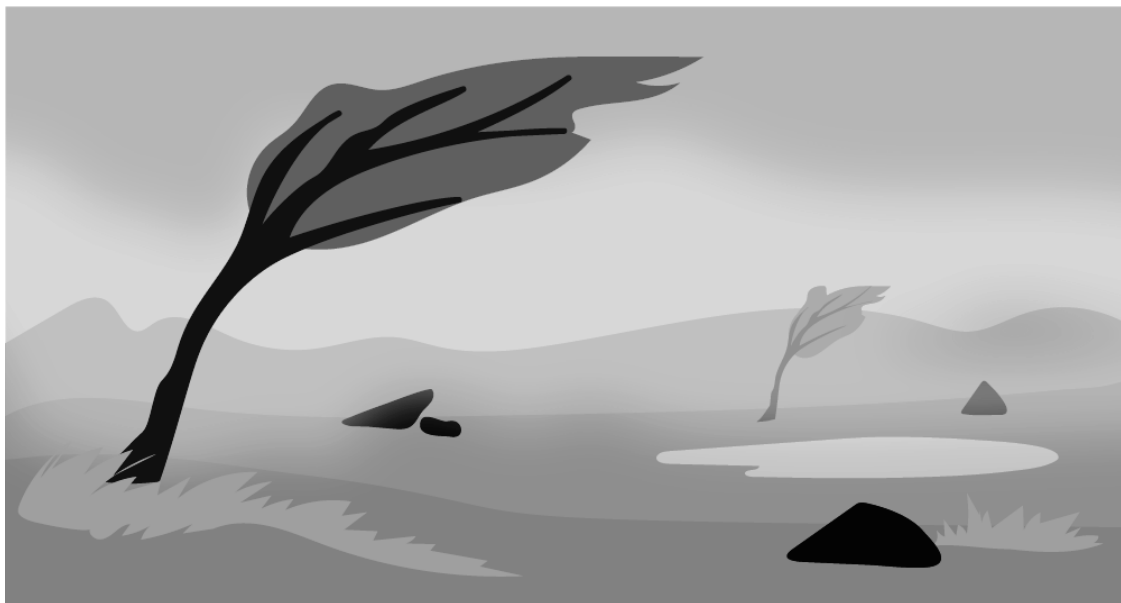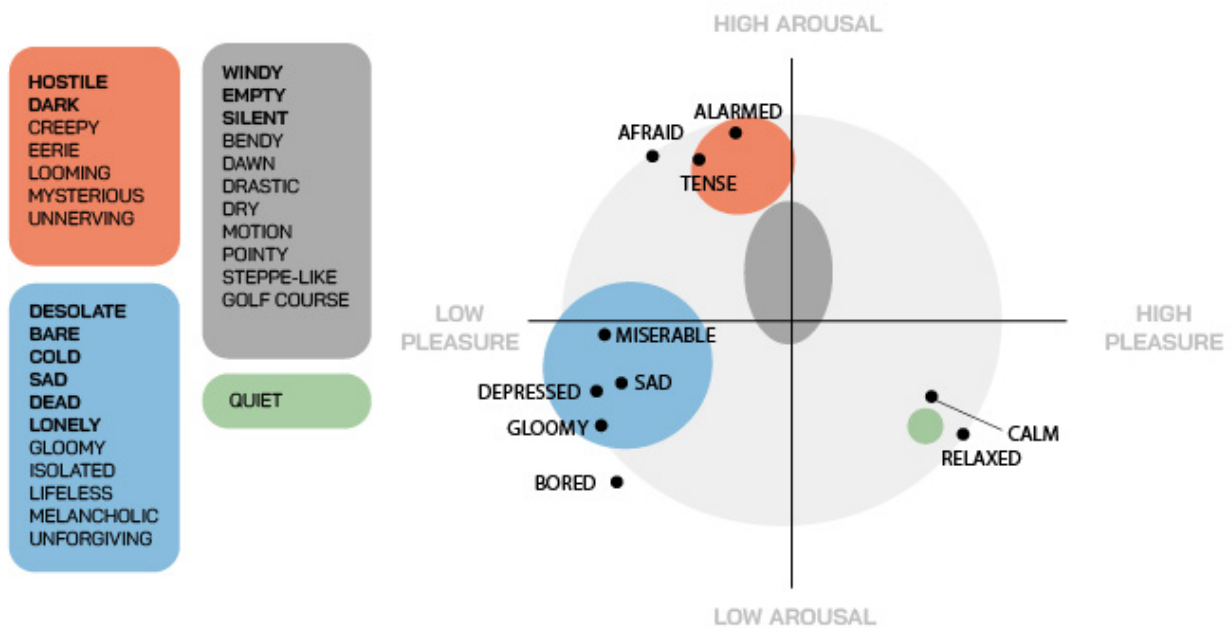

Figure 24

Figure 25

Wetlands (Bog)

1.   Ideation and Concept Creation:

Emotional intention: Hostile, Dead, Deceiving, Mystic
Inspired by: Myth of the bottomless bog "bundløs mose, mosedybet"

Growing up in Scandinavia, I have been familiar with stories and myths set in and around the landscape of the bog. These tales often highlight the dangers lurking in the waters, ready to ensnare the unwary. Historically, bogs and swamps covered up to 20-25% of Denmark, but they have nearly vanished, with only about 1% remaining today (Mosen | Skoven I Skolen, n.d.).

I chose to incorporate the bog as a biome in my design due to its dangerous nature, unique visual indicators, and distinct species. Beyond its visual appeal, the bog biome serves a functional purpose in the game design, acting as an obstacle that players must navigate around or through, with hidden traps hindering those who choose to traverse it.
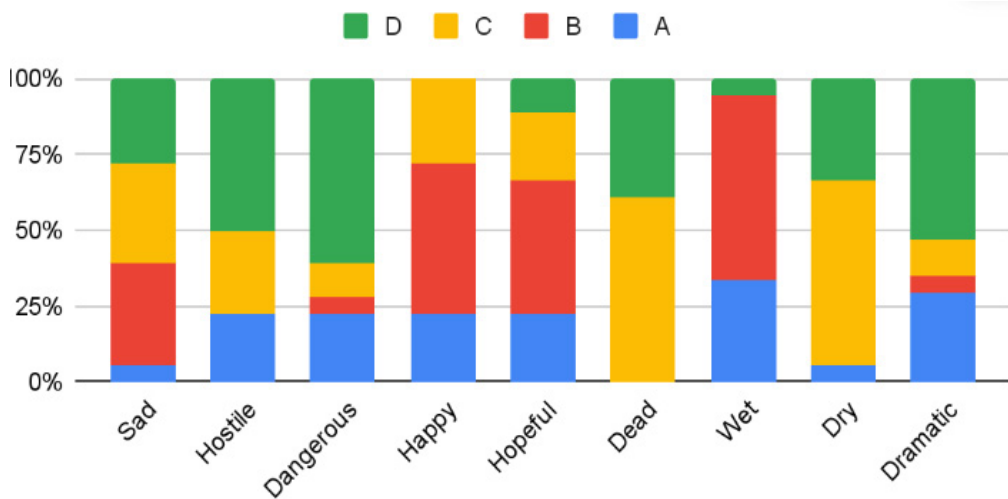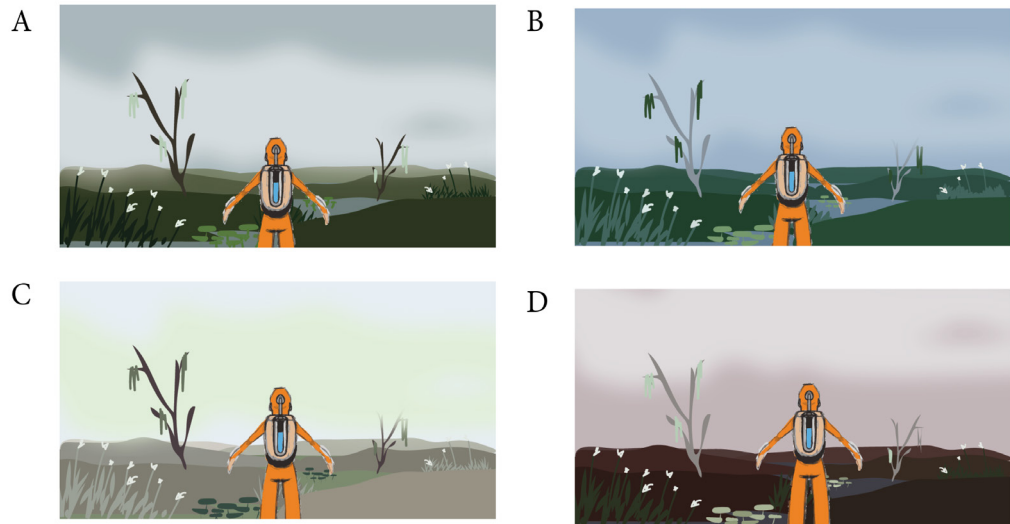
Figure 27:

Figure 28:
Diagram showing the percentage of votes each color palette got wihtin the emotional categories (Bog) (Appendix D)

(Figure 27 & 28) When I received the results from the survey, the uniformity in scores between "dead" and "dry" was surprising. In both categories, Palette C received over 50% of the votes, while Palette D took almost all the remaining percentages. This led me to conclude that a drier environment is more strongly associated with the experience of death than a wet environment, underscoring the close relationship between water and life.

This relationship, however, caused a dilemma. We wanted to emphasize the wet nature of a bog while also signaling an experience of decay and death. Despite Palettes C and D scoring higher in many of the intended emotions like "hostile" and "dangerous," their high scores in dryness ruled them out.

The choice then stood between Palettes A and B, which featured similar color schemes, with Palette B having a cooler and slightly more vibrant tone. Although Palette B scored highest in the "wet" category, it did not receive any votes in crucial categories like "hostile" and "dangerous." Therefore, I decided to go with Color Palette A, the closest to the original planned color palette (figure 29).

Figure 29:
concept art
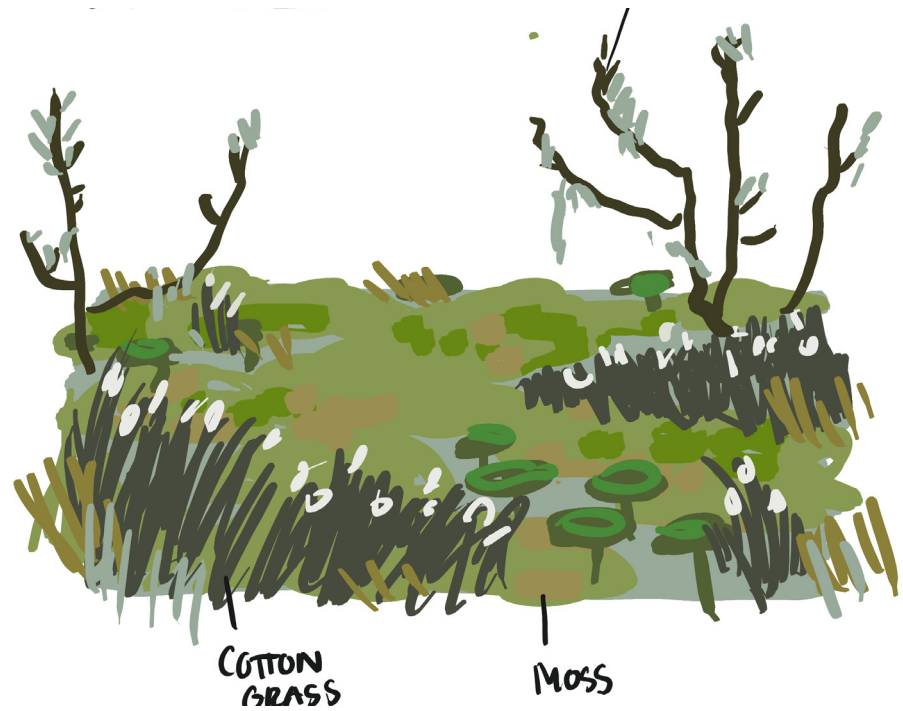
2.   Development and implementation:

Asset list: Bog Islands, Cotton Grass, Pennyworth Plants, Willow trees
Atmosphere: Dense Fog, Water Fog, Insects
Ground texture: Moss, Mud, Water

Out of all the biomes, the bog is the most complex. The bog islands were created using a geometry node system and modifiers (figure 30). Currently, I am not fully satisfied with the bog, as it doesn't fully align with the game's style and doesn't achieve the softness of wet mosses and wavy cotton grass (figure 31).

Figure 30:
Implementation in
Unity.

Figure 31:
recent screenshot of the Bog biome in "Whe-
re"

3.   Emotional analysis and test results

The bog environment in the biome videos presented as part of the GSR test was distinguished by slight changes in island color and material contrast. However, these similarities might have been too subtle, as one participant asked if they had been shown the same clip again. Therefore, I will not elaborate further on the GSR results.

In the survey, Figure 32 was most commonly described with the word "dead," used a total of 10 times, meaning over half of the participants described the landscape this way. The prior question asking participants to pick the option that best resembled "dead" in relation to the landscape could have influenced this association. The abundance of low-pleasure words underscores the danger this environment poses and its low survival probabilities for larger mammals (figure 33). However, for insects and other species, this unique ecosystem manifests life, providing excellent living conditions.

Figure 32:
concept art described in survey

"Deadness" can also be seen as synonymous with "stillness." When examining the words used to describe the bog, there is an overweight of terms in the lower arousal area, contradicting the high arousal emotions such as "afraid," "alarmed," or "tense," which are typically associated with danger.
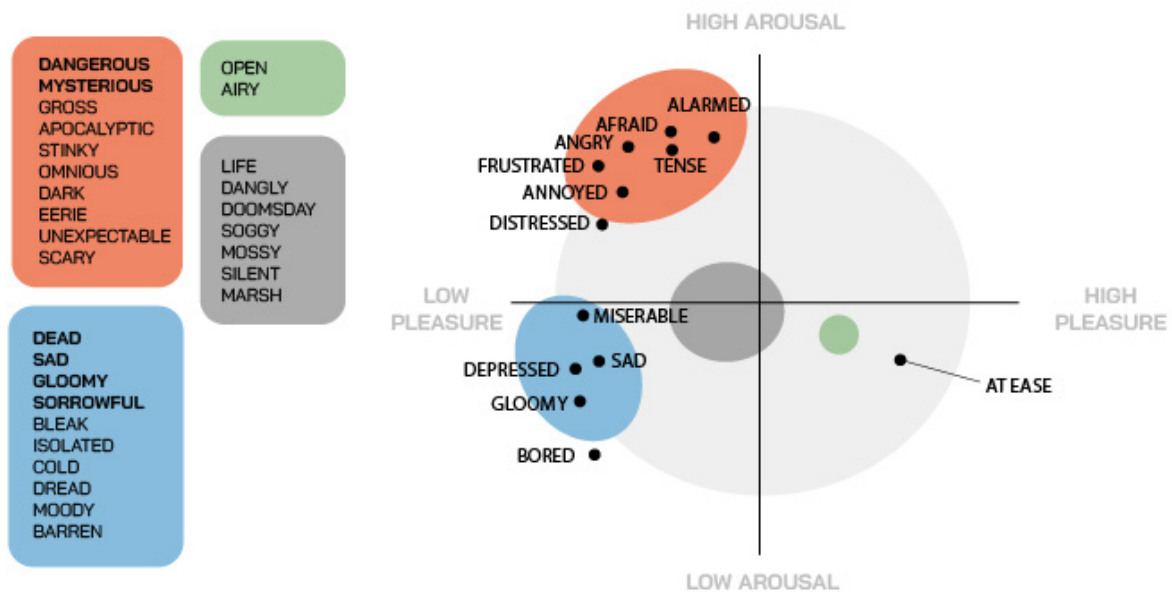
Figure 33:
Circumplex Model of Affect based on the descriptions of the bog image in the survey.

Considerations & Future improvements

Due to the small number of participants and potential external disturbances, such as sounds, the results of the GSR test are inconclusive. Therefore, no conclusion can be drawn based on this test. However, it has provided a foundation for discussion and comparison with the survey results, and most importantly, it has supported reflections on the future development of the biomes.

Art and emotional responses are inherently subjective, shaped by individual experiences, personal taste, and cultural backgrounds. It is ethically imperative to respect and acknowledge these differences rather than impose a one-size-fits-all interpretation.
Future implementations are planned to further refine the game's environment, focusing on enhancing liveliness, emotional relatability, and the overall artistic experience:
Liveliness: Introducing more dynamic elements to make the biomes feel more alive and engaging.
Emotional Relatability: Fine-tuning the visual and auditory elements to evoke stronger emotional responses from players, ensuring that the game atmosphere supports the intended experience.
Artistic Experience: Continuously improving the visual aesthetics and unique characteristics of all the biomes. Adding detail to create visually stunning and memorable landscapes.

Conclusion

The test results provided insight into the choice of color, indicating that color and composition play a significant role in shaping the emotional response to the environment. This underscores the importance of considering both visual and emotional elements in biome design and how they contribute to the overall player experience.

Art in video games cannot stand alone in fostering strong emotional experiences. If the artistic vision is not fully embedded in the overall theme and vision for the game, it will never succeed in becoming more than a pretty backdrop. It is the cohesive integration of various elements—visuals, audio, dynamic interactions—that allows for the creation of truly immersive and emotionally resonant gaming experiences.

Video games become mediums of art when they hold the capacity to explore profound matters such as nature and the interrelation between beings. Especially now, as we need to reestablish our relationship with natural environments, games can play a vital role. It's not just about how things look or behave, real or not; it's how games make players feel something deeper.

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