“Rites of the Lights” 2D Platformer Game

Tara Langhorne

Executive Summary – This computer video game project presents an extraterrestrial fantasy adventure in which players control a young girl as she learns to control her new powers and soon finds herself at the center of a plot against the kingdom.

Index Terms – 2D, Alpha Value, Animation, Boolean, Coding, Cutscene, Dialogue Sequence, Gameplay, GameObject, Interactivity, NPC, Photoshop, Platformer, Scripting, UI, Unity

ABSTRACT—This presentation outlines the process taken to create “Rites of the Lights,” a 2D platformer video game built in the Unity game engine for Windows PC and Mac. The game consists of three levels and several short cutscenes to tell a portion of a fantasy story I have been writing under the same title. The document begins with an introduction to my artifact and to the story it is based upon. Next, the processes by which I constructed the levels, player, enemies, and other gameplay elements are examined in depth, followed by a conclusion on the entire 12-week period of production. As this piece was being constructed, I have been able to plan and construct complex levels and gameplay using knowledge built from past game design experience and new skills that I learned through tutorials online and my own trial-and-error. I utilized various industry tools as I designed artwork, compiled code, debugged errors, adapted the narrative, and added free-source sounds and music. In conclusion, the creative journey helped me to grow as an artist and brought to life a deeply personal story.

I. INTRODUCTION

As the capstone of earning our Bachelor’s in Digital Arts & Sciences degree at the Digital Worlds Institute, a branch of the University of Florida’s College of Art, each student was to create a senior project in a specific area: animation, game design, or interactivity. Although I enjoyed learning about each discipline during past courses at Digital Worlds, I decided to specialize in the game design area. I had previously created several two-dimensional (2D) platformer games, in which the player must jump from platform to platform. With this experience, I knew I would be able to create a similar game even faster, thereby giving myself the time to design more advanced features and gameplay.

Additionally, I wanted to marry both my love of game design with my love of creative writing. By combining these two fields, I not only hoped to create a truly special adventure for my players but also to showcase one of my stories in a unique way. In my spare time between coursework, I wrote the majority of a fantasy novel, which I entitled *Rites of the Lights*, and immediately knew that I wanted to feature this story in my senior project when I was deciding on my concept.

Since the story is meant to be a full-length novel, I brainstormed how to condense the story into a short game consisting of the few levels that I would be able to create within the semester. Obviously, I knew that only the bare-minimum plot details should be presented to not confuse the player or overwhelm them with information that could be digested easier over the course of many chapters in a book format. After much thought and several iterations of my plan, I decided to choose three sections of the plot with small cutscenes to explain some of the details of the events in between. Furthermore, I determined that the game would end at the midpoint of the novel, when the characters have a shocking revelation (more details on the story plot in II. STORY OVERVIEW). I felt that this would leave the player with an intriguing cliff hanger that would be a memorable conclusion. For possible

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employers viewing my portfolio, I hoped this would leave them wanting to see more of my work or wanting to hear the rest of the story, if they were involved with story creation.

With my game concept and storyline determined, I was able to quickly draw up my plan for creating the project itself. I worked closely alongside my instructor to continually refine my product and continually made improvements to my work.

II. STORY OVERVIEW

Before discussing the processes of the production of my work, I felt that it was necessary to briefly list the overall plot details of the narrative portrayed in the game, so readers can understand the basic plotline of the game, along with the rationale behind the design. Additionally, my creation of this storyline was also a crucial part of the production of this artifact and is a necessary piece of its development. Below is an outline of the flow of events, followed by a description of each and to what gameplay section each corresponds.

I. Cutscene 1: Opening
   a. Establishes the lore of the planet Celestus
   b. Vivienne receives two powers
   c. Vivienne and Chilumen adopted by the Royal Guard
II. Level 1: Training
   a. Vivienne meets Guards Hegai and Jihun
   b. Vivienne learns to use her powers
III. Cutscene 2: Dreams
   a. Vivienne dreams of shadowy Umbra monsters
IV. Level 2: A New Dream
   a. Vivienne sees the Umbra dogs
   b. Hegai disappears
   c. Vision of Satrap Minyo attacked
V. Cutscene 3
   a. Hegai missing
   b. First satrap (Minyo) has powers stolen
   c. Second satrap has powers stolen
   d. The seer foretells the third satrap (Sejong) being attacked
   e. Satrap Sejong won't accept help
VI. Level 3
   a. Vivienne wakes from a dream knowing Sejong is in danger
   b. Vivienne fights the Umbra
   c. Sejong falls victim
VII. Ending Segment

The story centers around the protagonist Vivienne (the player character), a young girl living on the planet called Celestus. At the start of the story (during Cutscene 1), she has come to the age when the youths of the planet receive their one allotted Auralite, which is one of the meteorites that fall from the sky. When broken into stones and worn along the forearms on gauntlet-like garments called Aurasheaths, the Auralite shards glow and may allow their user to control an element from the world around them—water, wind, earth, electricity, etc. However, Vivienne finds that she has received two Auralites, something completely unheard of in the land. After some discussion, the palace officials decide to employ the Royal Guard to train Vivienne as she learns to use her new powers.

The first level of the game opens after these events have occurred. Vivienne and her Chinchilla-like companion, Chilumen, have found themselves in the Royal Guard's training area along the palace grounds. They meet two of the guards, Hegai and Jihun, who help her to use her new abilities of electricity and flora, or the ability to manipulate plants.

As the first level ends and Cutscene 2 begins, all seems to be going well as Vivienne continues training. However, this soon changes when she begins having terrifying dreams. She constantly sees herself trapped within a dark forest of weeping willow trees and hunted by shadowy creatures that appear to resemble the Umbra, monsters found within the myths of Celestus.

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The second level encapsulates one of Vivienne's dreams of the forest. She now begins to see the Umbra creatures more clearly in their full forms as giant dogs. She also watches as Hegai disappears and one of the satraps (governors) over the land, identified as Jihun's friend Minyo, is attacked by the Umbra.

During Cutscene 3, the events of Vivienne's dreams start to come true. Hegai goes missing the next morning, and Satrap Minyo arrives at the palace, attacked by what he claims were Umbra. His powers have vanished and his Auralite shards stolen. Soon after, another satrap is stricken with the same fate, and a third satrap, Sejong, is foreseen by the Royal Seer to soon be attacked, as well. Vivienne and Chilumen are sent with a band of guards to protect Sejong at his residence in one of the kingdom's territories, but he thinks the entire plot is a joke and thinks he can take care of himself.

The third and final level opens after Vivienne has had another dream. The wind is strong, and she realizes that Sejong, who has the power to control the wind, must be in danger. She and Chilumen rush to save him, fighting Umbra along the way, only for the wind to stop before they arrive. They are too late. They find Sejong hurt and powerless, mumbling about a shadowy person who was wearing an Aurasheath. They realize that one of their own must be commanding the Umbra as the game ends.

Much of the story was inspired by various sources, such as anime and Asian culture, mythology, history, and religious references, along with my personal experience with dance and athletic training. Furthermore, video games like *The Legend of Zelda* and *Pokémon* also served as inspirations for their handling of the mythology and the elements in their storylines.

III. PROCESS OVERVIEW

As I began my development process, I needed to decide the exact goals and features of each game level and cutscene to determine what game assets, or components that include art or other items used in the game, would need to be created. Since I had previously determined the story sections my game would be covering, as listed above, I was able to use this to decide what components and art pieces would best tell these portions of the story.

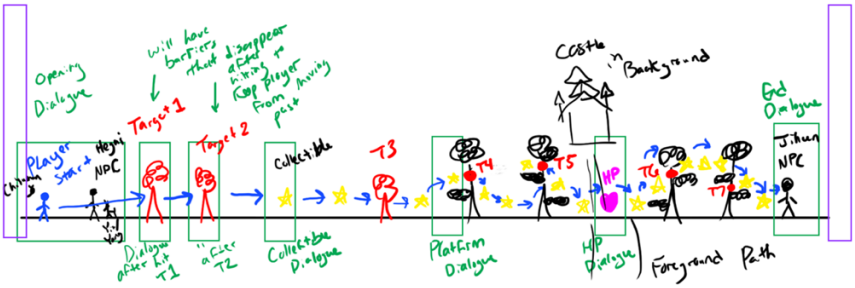

Figure 1: Level 1 Sequence Concept

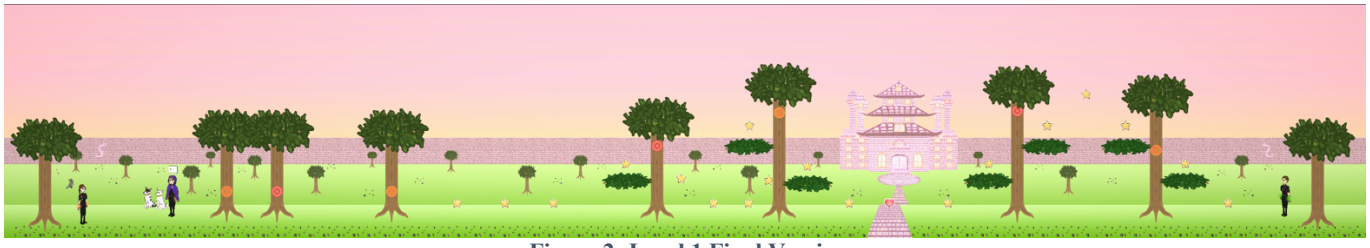

Figure 2: Level 1 Final Version

For the first level, in which Vivienne learns to use her new Auralite powers in the palace courtyard, I determined that the easiest way to illustrate this in an interesting gameplay sequence would be to shoot targets. In the fuller entirety of my story, there is much more detail on exactly how one controls his/her powers and is bonded to a power. However, in a simpler 2D game, I thought shooting targets would make the most sense.

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As I planned out the flow of the level, I determined that I would place seven targets that the player needed to hit to move to the next section of the game. At the start of the level, I placed Hegai the guard to serve as an NPC (non-playable character) that would direct the player to hit the targets with the correct buttons in a click-through dialogue sequence. The player would hit the first two targets, one with each of Vivienne's two powers, to be introduced to these controls. After this, they would be free to wander through the rest of the level and hit the remaining targets. Along the way, they are introduced to the game's collectibles that increase the score, heart points that refill the health bar, and the ability to jump on branch platforms. This is accomplished by another NPC, Vivienne's companion Chilumen. A final NPC, the guard Jihun, stands at the end of the level that the player talks to. If the player has finished hitting each of the targets, the level ends; if they have not, Jihun directs them to find the remaining targets.

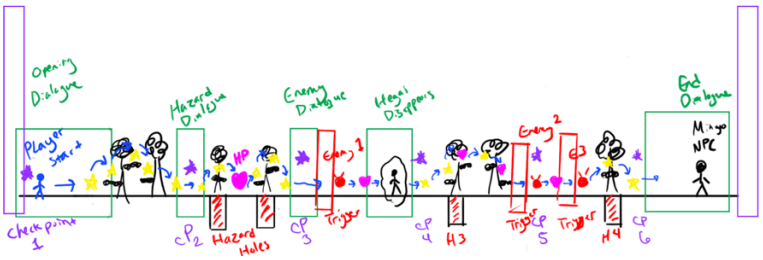

Figure 3: Level 2 Sequence Concept

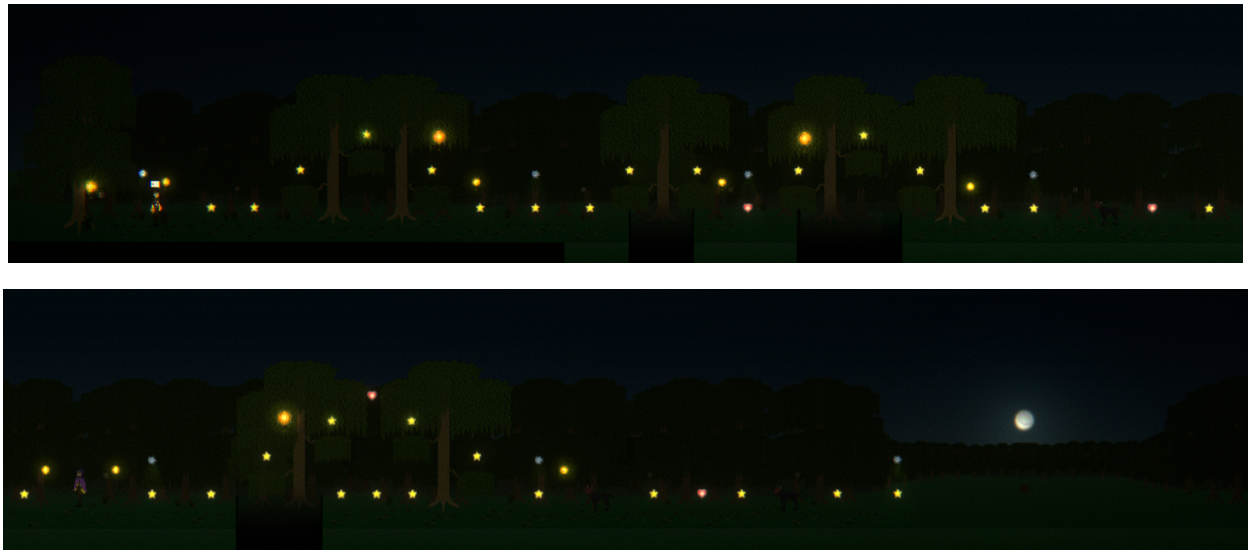

Figure 4: Level 2 Final Version

Figure 5: Extra Level 2 Satrap Minyo Segment Area

For Level 2, which takes place in the forest in one of Vivienne's dreams, I determined that the goal of this level would be to explore the dream world. At the start of the level, Vivienne has an internal dialogue sequence, establishing the location of the dream. She wonders why she is not seeing the Umbra and directs the player to look

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around. I used a similar platform layout to the first level with the player able to jump along branches and collectibles to guide the way. Along the way, the player is introduced to the first hazard (holes the player can fall into) and the first Umbra enemy, with dialogue sequences to tell the player how to avoid and fight these threats, respectively. Checkpoints are scattered throughout the level, where the player will reappear if they fall down a hole or lose a life. Furthermore, I placed two story sequences within the level, with Hegai's disappearance occurring in the middle, and the vision of Satrap Minyo's attack occurring at the end. However, I later extended this ending sequence into two sections, with the player arriving at the infamous clearing in the woods (shown in **Figure 4**), transporting to another area (shown in **Figure 5**), and then seeing Satrap Minyo. This change was to be more in line with the fuller story, since Minyo's attack did not occur in the woods, so the vision of it in the dream would also need to take place elsewhere.

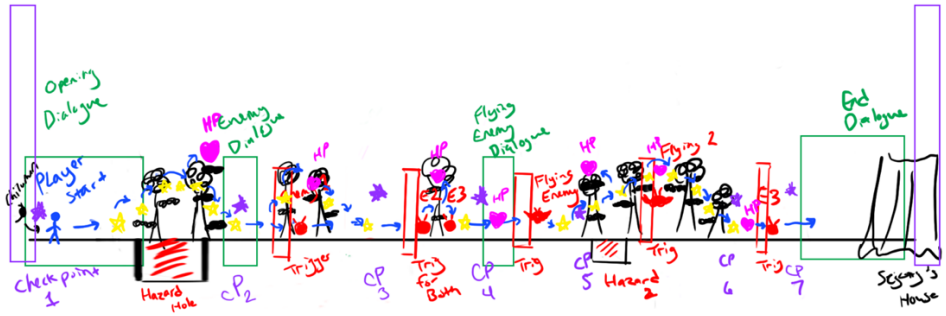

Figure 6: Level 3 Sequence Concept

Figure 7: Level 3 Final Version

For Level 3, which takes place in the territory where Satrap Sejong lives, I determined that the player would need to focus on defeating the enemies in an effort to save Sejong (although the player is unable to save him). I reused similar mechanics from the previous level, although with more enemies to fight against. Additionally, I introduce a second variant of enemy, the flying bird Umbra, as an added threat. I ended the level with a dialogue sequence at Sejong's house, although I added an additional sequence as the player approaches where the wind effects stop, indicating Sejong has lost his fight. After the level has finished, the Ending Sequence briefly displays, telling the player's score before ending the game.

Lastly, I decided that each cutscene, not including the Ending Sequence, would be a click-through narrative sequence. I had previously created a click-through narrative game before, similar to the hypertext game genre in which players click on text to advance the story and often choose their own ending. Since this was a linear storyline, which does not offer alternate endings, I decided to purely have these sections offer small details before or between the levels to advance the story and display artwork that added to this story. Initially, I had intended to make these sequences into full short clips created in a video editing software like Adobe Premiere Pro or After Effects and move further away from the hypertext genre; however, I eventually realized that my original click-through concept worked better, as it fit closer with the click-through dialogue sequences in the levels. I had also experimented with making at least one of the sequences as a more interactive and longer sequence. However, this also felt too lengthy, which lead me to create the current design for the Cutscenes.

Based on each level's requirements, I was able to create a schedule of how I could create all of the components within the allotted time period. I formatted my schedule based on priority to the overall game, beginning with Level 1, move to Level 3, then go back to Level 2 (which could have been dropped if necessary), and finish with the Cutscenes and final touches. During the development process itself, I updated this schedule continually based on workflow and changes in design.

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IV. PLAYER MECHANICS

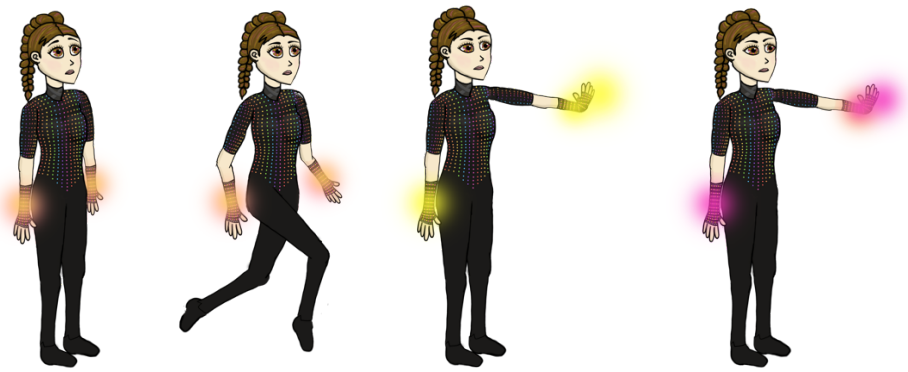

Figure 8: Player Idle, Run, and Attack Animation Sprite Examples

As I began the actual development process, one of my first priorities was to create the player artwork and functionality in the game. From previous experience, I knew I needed to have several states for the player to work properly: idling (standing still), moving/running, jumping, and attacking. For Vivienne, since she received two powers, I would need an additional attack, as well. Each of these states required an animation sequence and values within the scripting (another name for code) to determine the proper animation to play.

While creating the artwork, I patterned Vivienne's look after anime character designs, while creating my own style, which I carried over into my designs of my other characters. I tried to give her a unique hairstyle, gaining inspiration from Google (www.google.com). I settled on the "dragon tail" hairstyle that creates a braid at the top of the head. In both her hair and eye color, I incorporated yellow and pink, the colors of the Auralites she received and bonded with. As mentioned in II. STORY OVERVIEW, I placed Vivienne's Auralite shards along the Aurasheaths on her forearms, with lights that I animated to pulsate as she idles and when she attacks (changing to one color only depending on which attack the player uses). Lastly, she wears the Royal Guard outfit, a bodysuit made for movement and combat. I gained inspiration for this clothing from costumes I have worn for dance performances. I also used dance as an inspiration when creating Vivienne's movements, as evidenced by her pointed toes in her run. I went through several attempts to create these animations, ultimately using Photoshop to create separate sprite images for each frame of the animations. Instead of creating sprites in a line like the traditional 2D sprite sheet, I determined that separating each of the images helped to preserve the size of the sprites and keep the player's movements consistent.

For scripting these animations and the player's functionality, I referenced, adapted, and expanded past scripts that I had used in previous 2D platformer games I had created for Digital Worlds. Each of the components of the script and the player GameObject (unit in the game scene) had to be balanced to achieve a pleasing running and jumping speed. With these determined, I could place the platforms the player would jump on at the proper height and spacing.

Creating the attack animation required additional effort in which I caused the player to spawn (make appear) a projectile that shoots forward before disappearing. For the Yellow Auralite attack, an electric bolt spawns, while the Pink Auralite attack spawns a vine with flowers. It took several attempts to spawn these projectiles in a location that made them appear to come from her hand. Additionally, I had to have a delay before the player could attack again to feel more natural, and I achieved this through scripting I had learned in a previous course. In each scripting instance, I set Booleans (true/false values) that determined which animation would play, timing each to occur properly after many rounds of testing.

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V. NPCS, ENEMIES, & TARGETS

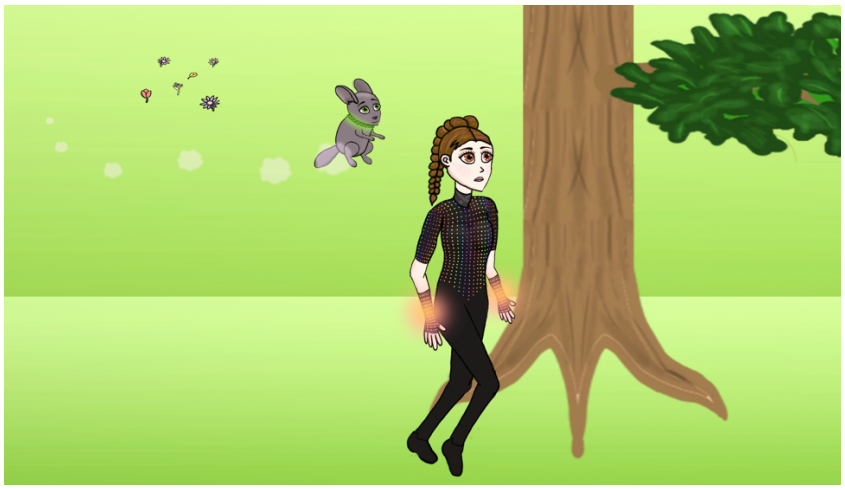

Figure 9: NPC Chilumen Following the Player

Along with the player setup, another priority was to create the major components of the levels, mainly the NPCs, targets in Level 1, and the enemies in Levels 2 and 3. One of the most important NPCs was the player's companion, the Chinchilla-like creature, Chilumen. I had originally listed this character as a possible additional asset, but he soon became a vital piece of the project. Because Chilumen has the Green Auralite power of wind in the story, I got the idea that this NPC could have a similar function to Navi the fairy in *The Legend of Zelda: Ocarina of Time*, who follows and guides the player. Originally, I was unsure how to create this and started with using the MoveTowards command, a function in Unity that makes a GameObject move towards another object or location, hence the name. However, I also wanted the character to float up and down to appear to be flying. The basic script that I had used previously for floating objects was dependent on a constant location to work properly, so having both of these scripts working in unison did not appear to work. However, I soon found that having an invisible GameObject move towards the player, while the actual Chilumen GameObject parented to move with this invisible object while floating up and down would work as intended. Afterwards, I added some clouds that swirl around the character to add to the effect that he is flying.

With this following functionality working, the character became central to much of the gameplay. As mentioned previously, he helps guide the player through many portions of the level in dialogue sequences (not appearing in the dream sequence, since this felt a bit strange). Furthermore, the character also gives a motivation other than increasing the score for the player to gather the collectibles, which are Star Cookies that Chilumen likes to eat. When the player picks one up, a crunching sound plays, and crumbs fly from Chilumen's mouth. This became a fun highlight to the gameplay.

Figure 10: Umbra Enemies

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Figure 11: Umbra Enemies Noticing the Player

Similar scripting was used to cause the enemies to follow the player, as well, though for a completely different reason. However, I added to the scripting for the enemies to cause them to only follow the player when the player is within a specific distance from the enemy. An exclamation point appears in a speech bubble above the enemy to indicate that it has spotted the player before coming toward the player. Additionally, the enemy also takes a chunk of the player's health if it collides with the player and stalls for a moment before continuing to follow again. To make the two types of enemies different, the Umbra dogs will only follow the player in a lateral motion along the ground, while the birds are able to fly in any direction, similar to Chilumen. Additionally, if they are hit by the player's projectile attack, they explode in a cloud of smoke and leave a collectible as a reward.

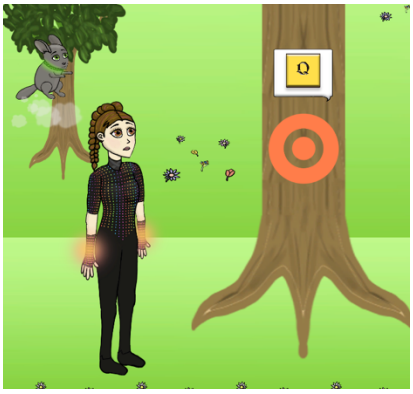

Figure 12: First Version of Target & Indicator

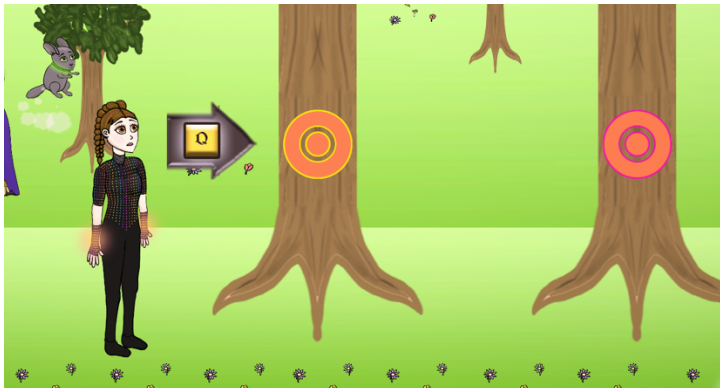

Figure 13: New Targets Based on Attack Color & Updated Indicator

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Another major component I created were the targets in Level 1. As mentioned previously, these targets are painted/placed on the sides of the trees that grow in the palace courtyard. The player is instructed by the NPC guard Hegai to hit these targets with the projectile attacks, and when this has occurred, I needed to make it obvious that the target had been hit. To achieve this, when the projectile collides with the target, I cause a new image to appear over the sprite, a charred spot if the electric attack was used or a pile of leaves if the vine attack was used. A target counter in the upper right corner of the screen in Level 1 also increases.

One issue I found with the targets was during the introduction sequence at the beginning. At first, I merely had the NPC Hegai indicate in the dialogue text to hit the target; however, this was not overly clear for the player. As shown in **Figure 12**, I added a visual instruction of which button to press in the form of a speech bubble that sits above each target after Hegai instructs the player. Unfortunately, this ended up appearing as though the player should stand beneath the target when pressing the button, which would cause the projectile to shoot past the target, instead of hitting it. I finally settled on an arrow indicator that sits to the side of the targets far enough away for the player to hit the target, as shown in **Figure 13**.

Furthermore, I decided to add an extra challenge to Level 1 by making each target able to be affected by only one of the two attack types, as indicated by the rings of color surrounding them (also shown in **Figure 13**). I tried to choose tones that were very distinguishable from one another, while still matching the colors of Vivienne's two powers. When using the wrong attack, an unpleasant sound plays, and there is no effect on the target, indicating that the player is not using the correct power. I found that this added to the gameplay storyline of using both powers, along with making the gameplay itself more interesting.

VI. ADDITIONAL MECHANICS & ASSETS

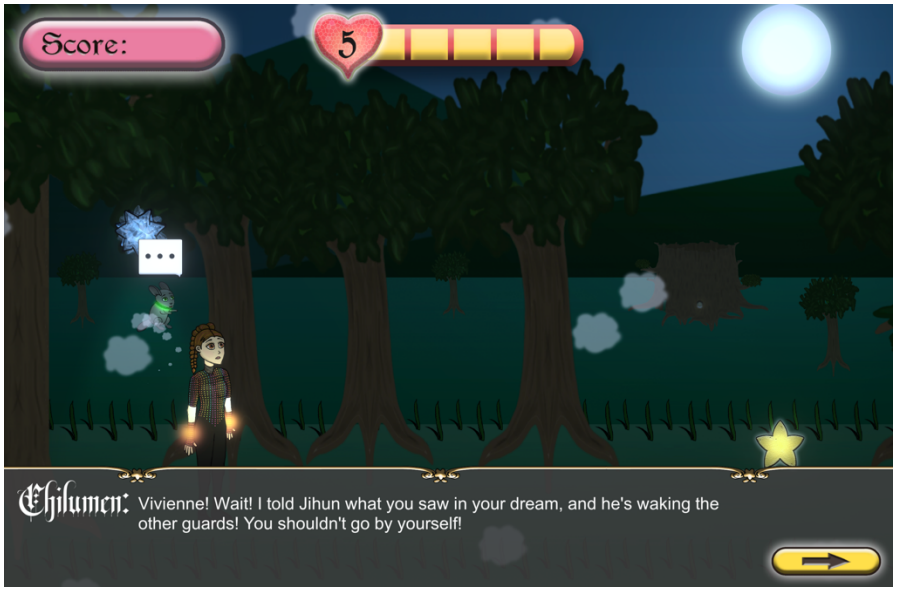

Figure 14: Dialogue Sequence in Level 3

One of the additional mechanics that was highly important to the project was the dialogue functionality, whether this was for an NPC or for the Cutscenes. I expanded upon scripting that I had created for my past text-based game and developed a highly complicated system for displaying and transitioning between pieces of dialogue. This would control what text would display, each with its own background that laid over the gameplay at the bottom of the screen, what characters would animate to appear to be talking, which speech bubbles appeared above the corresponding characters, or which sounds or other sequences would play, if applicable. All of these items needed to be properly coordinated, or else the sequence would not flow correctly. This was somewhat time consuming, but I found that this was highly worth the effort to make the story and player instruction work together. Additionally, I

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had to cause the player to be unable to move during these dialogue sequences, so the player would not miss vital information (although the player could keep clicking the advance arrows if they desired). Furthermore, I also added the functionality for the text to be typed out on the screen. I learned how to create this effect in a tutorial I found on YouTube (www.youtube.com), which added a lot to these sequences.

Another mechanic that became important was the ability to cause images to appear and disappear by adjusting their alpha (transparency) values. I was able to find several tutorials and discussions on this topic and discovered how to manipulate these values, both for UI (user interface) images and for regular sprites. I utilized this mechanic in various areas including: the Cutscenes, in which background images appear and disappear depending on the portion of the story; transitions in and out of levels, in which the background fades to and from black; and in the levels themselves, such as when the NPC Hegai disappears.

Another feature that I created was the wind-stopping sequence in Level 3. As mentioned previously, this sequence was not originally intended in my first version of the level layout. However, I thought this would be an interesting effect to further bring out the story of Sejong falling victim to the Umbra. During my development of Level 3, I created animations for the trees and grass in the scene, so they appeared to be blowing in the strong wind. Additionally, I utilized the wind sprites I had used for Chilumen's flying effect to blow across the screen to further indicate the severity of the wind. However, when the player reached a certain point in the level, I needed all of these effects to stall suddenly. After many attempts, I was able to force these animations to stop and the wind to disappear at the precise time to create a dramatic moment in the level.

VII. CONCLUSION

Over the course of this 12-week journey of game development in creating *Rites of the Lights*, I have brought one of my own pieces of writing to life. I have pushed myself as an artist both in the sheer amount of artwork and coding I was able to create but also in the concepts and techniques I was able to learn. Below is a list of post-mortem conclusions I have drawn about this development process.

What Went Well:

- Built upon my past experience with developing Unity game projects to create a more complex artifact.
- Planned out the schedule of task development such that almost all features were able to be implemented.
- Summarized and simplified my novel-length story into a short gameplay experience.
- Utilized references and tutorials to learn new skills and new mechanics for the game.

Even Better If:

- Had researched and utilized rendering methods in preparation for or earlier in the development process to include extra polish to the graphics.
- Was afforded more time to create additional assets and features, specifically more complex animations for the characters.
- Had been able to include more of the story, perhaps with longer gameplay.

I am proud of the portfolio piece I have created and the work that I have done over the semester. I am excited as I transition from being a student to becoming part of the workforce, hoping to learn and grow even more and produce more projects that I enjoy and can inspire others.

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