## **Project Design Document: A Walk in the Woods (AWitW)**

### 1. Project Overview

**Project Title**:  
A Walk in the Woods (AWitW)

**Team Members**:

* Project Lead: Adam Torrey
* Modeling Lead: Jordan Johnson
* Quality Assurance Testing: Michael Long
* Testing Lead: Billy Clayson
* Software Lead: Seth Kirby
* Developers: Adam Torrey, Jordan Johnson, Michael Long, Billy Clayson, Seth Kirby

**Date**:  
November 11th, 2024

**Project Summary**:  
A Walk Through the Woods is a VR application meant to simulate the experience of hiking late at night. There will be multiple tools to assist in interacting with the environment created such as tools to improve visibility (glowsticks, flashlights) and tools to clear obstacles placed on the path (hatchets). The ultimate destination of this simulated hike will be a clearing where a skybox with constellations is no longer obscured by trees.

### 2. Goals and Objectives

**Primary Goal**:  
To create an immersive, simulated hiking trail which the user could explore without any risk, but with minor horror elements.

**Key Objectives**:

* Create an immersive environment with ambient noise and models meant to mimic a hiking trail at night.
* Provide users with tools to allow more interactions with the environment.
* Implement smooth movement as opposed to teleporting. This can be achieved using touchpads found on the VIVE Controllers.

### 3. Target Audience and Platform

**Target Audience**:  
Nature enthusiasts, hikers, and curious individuals who are either incapable of or unwilling to explore real hiking trails at night.

**Platform**:

* **Hardware**: PC with SteamVR, HTC Vive, Oculus Rift, Valve Index.
* **Software**: Unity 2024, SteamVR plugin.

### 4. Core Features

**Feature 1: Touchpad based movement**

* Smooth user movement through use of the Vive controller’s touchpad

**Feature 2: Interactable Tools**

* A flashlight that can be picked up and pointed to light up target areas
* Glowsticks that can be thrown to light up target areas without use of a flashlight
* A hatchet which can be used to interact with the environment and clear obstacles that hinder movement.

**Feature 3: Triggered events**

* Upon reaching certain locations, visual and audio events will trigger
* Upon reaching the ending area, an ending scene will trigger

### 5. User Interface (UI) and User Experience (UX)

**UI Elements:**

* The starting screen will include an explanation of the project, simple controls, and credits.
* Simple outlines for interactable objects to assist in visibility in a low light environment.

**UX Considerations:**

* Smooth movement controls using the Vive controller’s touchpad.
* Easily accessible interactables attached to the user’s model.
* A spooky environment in which the user is free to explore.
* A pause menu to adjust volume, brightness, and to exit the hike.

### 6. Environment and Assets

**Environment Design**:

* A dark hiking trail designed to mimic real hiking trails.
* A non-threatening environment that has events and assets meant to evoke an uneasy feeling.
* All assets and sounds will emphasize a natural aesthetic.

**Asset List**:

* **3D Models**: Virtual trees, a pathway texture, grass textures, bushes, a night sky skybox, hatchet, glowsticks, and a flashlight, lamps, and bridges.
* **Audio**: Crickets chirping, foliage rustiling, wind, owl hoots, wolf howling, and general forest ambience.
* **Plugins**: SteamVR plugin.

### 7. Technical Specifications

**Software Requirements**:

* Unity version: Unity 2024 LTS
* Plugins: SteamVR

**Hardware Requirements**:

* Minimum: Intel i5, 8GB RAM, NVIDIA GTX 1060
* Recommended: Intel i7, 16GB RAM, NVIDIA RTX 2070

**Key Systems**:

* **Input System**: SteamVR input handling for controllers and virtual keyboard.
* **UI System**: Unity’s Canvas and World Space UI for floating toolbar and controls.

### 8. Development Timeline

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| --- | --- | --- |
| **Phase** | **Tasks** | **Estimated Time** |
| Assets and VR Functionality | Gathering and creating necessary assets and creating a scene in unity with VR functionality | 1 week |
| Environment Design | Designing, modeling, and creating the environment in the unity scene | 2 weeks |
| User Interaction | Implementing interactions and movement for the user | 1 week |
| Testing & Polish | Bug fixing, playtesting, putting finishing touches on the project | 1 week |

### 9. Risk Assessment

**Potential Risks**:

* **Risk**: The user may become lost moving through a dark and unfamiliar environment
  + **Mitigation**: Include gentle hints and reminders leading back to the correct path and include a gamma setting to adjust brightness. It would also be possible to make a map where there is no “wrong path”.
* **Risk:** The tools at the user’s disposal may not be intuitive
* **Mitigation:** Include a short explanation of controls and a tutorial like section to ensure the user cannot continue without understanding the controls
* **Risk:** Allowing the user to continually create glowsticks may eventually cause the simulation to stutter or crash.
* **Mitigation:** Implementing a system where there is a maximum number of user made objects (creating more will cause the earliest user made objects to be destroyed) and adding a time limit until the user made objects are destroyed.
* **Risk:** user may lose track of their tools
* **Mitigation:** Tools like hatchets and flashlights will return to a belt attached to the user, and when hovering over tools, an outline could appear.

### 10. References and Resources

* Unity Documentation: Unity Manual
* SteamVR Plugin: SteamVR Plugin Guide
* Assets and Models: Unity Asset Store